Canada Wood
加拿大木业协会

加拿大针叶木锯材分级规则详解

Canada Wood
加拿大木业协会

前 言

加拿大是木材资源极其丰富的国家，加拿大的铁杉-冷杉、花旗松、西部红柏、云杉、黄柏、SPF等锯材在国内的工厂加工和建筑中已经被广泛应用，为了让国内加工厂、木材经销商、建造商等更多地了解加拿大针叶木锯材，促进针叶木锯材的销售和应用，加拿大木业协会(Canada Wood)经过几个月的筹划、编写、翻译、校审、定稿，继《加拿大针叶木锯材分级培训手册》出版后我们又出版了此本《加拿大针叶木锯材分级规则详解》，希望对中国的业内人士有所帮助。

加拿大锯材分级中，使用很多中国木材分级中没有的名词和术语。在翻译校对过程中，与 "锯材检验国家标准(GB/T 4822-1999)" 和 "锯材缺陷国家标准(GB/T 4823-1999)" 进行了对比。对于含义与国标中已有名词相同者，尽量采用国标中已有名词；对于国标中已有名词不适用、或与加拿大定义不同、或国标中没有对应名词者，采用新译名词。新译名词力求简单明确。衷心希望业内人士在使用本手册过程中，提出改进意见。

储斌豪
中国区项目总监
加拿大木业协会

Introduction to Canada Wood
加拿大木业协会介绍

Canada Wood is a non-profit organization registered in Canada as the group that represents the Canadian Forest Industry overseas.
加拿大木业协会是一家在加拿大注册、在海外代表加拿大林业的非营利机构。

Canada Wood is comprised of several prominent Wood Product and Technical Organizations in Canada which combine their efforts to support the growth and development of wood construction in China.
加拿大木业协会是由一些著名的加拿大木材产品和木材技术机构所组成，为支持木制品和木建筑在中国的成长和发展而共同努力。

Canada Wood receives major funding support from both the Federal Government of Canada, the Provincial Governments of British Columbia and Quebec and Canadian Forest Industry.
加拿大木业协会的经费来源主要来自联邦政府、卑诗省省政府、魁北克省省政府和加拿大林木工业界。

Canada Wood has offices in both Shanghai and Beijing and works closely with several Chinese government agencies including the Ministry of Construction and Ministry of Public Security Fire Bureau plus the Construction and Management Commission in Shanghai.
加拿大木业协会在上海和北京设有办事处，正与几家中国政府机构 — 包括建设部、公安部消防局及上海建筑管理委员会 — 紧密合作。

Canada Wood has also signed MOU's institutions such as the Academy of Forests and Tongji University.
加拿大木业协会也和如中国林业科学院和同济大学等学术机构签定了备忘录。

Please do not hesitate contacting us if you require further information. at info@canadawood. cn or visit our website at www.canadawood.cn.
如果你想得到更多的资料，请用电子邮件 info@canadawood.cn 与我们联系或者浏览我们的网站 www.canadawood.cn。

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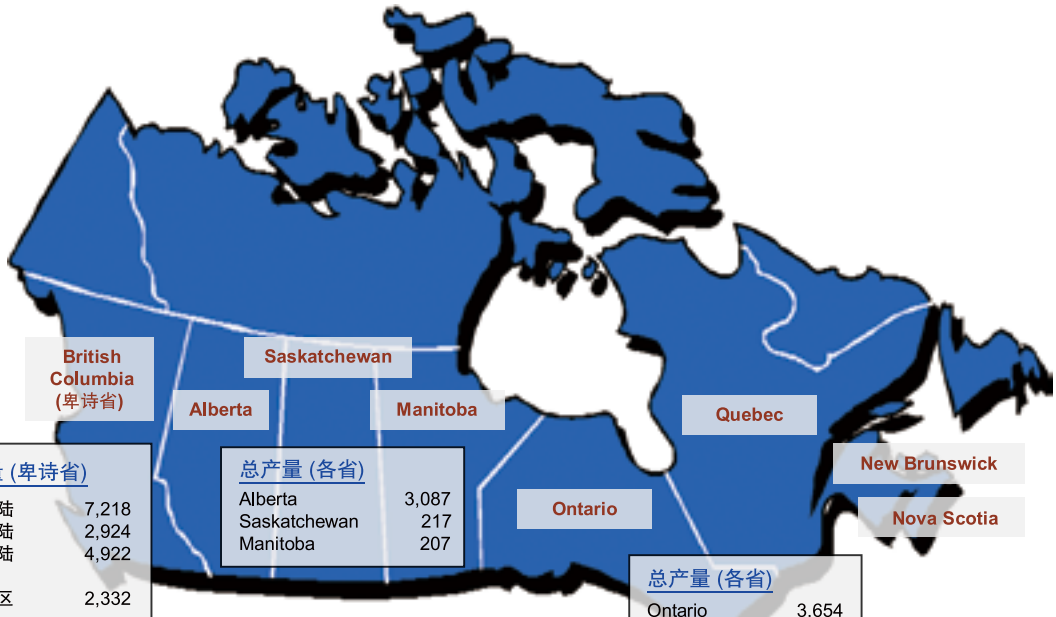
CANADIAN SOFTWOOD LUMBER PRODUCTION
加拿大针叶树锯材产量

Softwood Production by Region for 2006
2006年各地区针叶树锯材产量

Millions of Board Feet (百万板尺)
Total for Canada 全加拿大: 33,575 MMFBM (百万板尺)



总产量 (卑诗省)	
北部内陆	7,218
中部内陆	2,924
南部内陆	4,922
沿岸地区	2,332

总产量 (各省)	
Alberta	3,087
Saskatchewan	217
Manitoba	207

总产量 (各省)	
Ontario	3,654
Quebec	6,908
Nova Scotia	593
New Brunswick	1,511

卑诗省沿岸 (按树种)	
Douglas Fir 花旗松	257.9
Yellow Cedar 黄柏	90.1
Western Hemlock 西部铁杉	884.6
S-P-F 云杉-松木-冷杉	454.8

卑诗省内陆 (按树种)	
Douglas Fir 花旗松	433.8
Yellow Cedar 黄柏	
Western Hemlock 西部铁杉	361.0
Sitka Spruce 锡特加云杉	86.62
S-P-F 云杉-松木-冷杉	13,943.9

INTRODUCTION TO COMMERCIAL WOOD SPECIES OF BRITISH COLUMBIA
卑诗省商用木材树种介绍

Lumber Identification
锯材鉴别

Wood Properties and End Uses
木材性状及用途

COASTAL SPECIES
沿岸树种

DOUGLAS FIR
花旗松

Lumber Identification
锯材鉴别

Prominent Characteristics: contrast in color between heartwood and sapwood, resinous (pitch pockets and resin ducts), prominent summerwood.
显著特征：心材和边材颜色对比鲜明，有树脂(树脂囊和树脂管)，晚材明显。

- Douglas Fir is a heavy, dense and comparatively hard softwood. Rate of growth (rings per inch on the end) can range from very fine grain to very rapid growth.
  花旗松是一种沉重、致密、而且相当坚硬的针叶材。生长率(端头每英寸年轮数)可以从非常细密到非常粗宽(速生)不等。

- The heartwood is typically a distinctive reddish / brown color. If heart stain is present the heartwood may be dark brown to deep purple in color (easily distinguishable from the normal heartwood). Sapwood is a light creamy color.
  心材通常为特征性的红色或棕色。如果有心材变色出现，心材可能呈深棕至深紫色(与普通心材很容易区分)。边材为淡奶色。

- The contrast in color between the summerwood and springwood bands is very distinct on the ends and the face of the piece.
  在表面和端头，晚材和早材的颜色对比非常明显。

- Douglas Fir is a resinous species and resin ducts can usually be seen on the surface of a flat grain piece (resin ducts appear as light brown scratches approximately 1/4" to 1" long or longer and run within the true line of the wood fibers on the piece).
  花旗松属有脂类树种，在平纹木材表面通常可见树脂管(树脂管呈浅棕色)，大约为1/4英寸至 1英寸长或更长，在木纤维的纹路内延展。

- If pitch pockets (other than blisters) exist they are generally long and narrow and are filled with a thick dark amber liquid pitch. The pitch will eventually dry and crystallize white. Douglas Fir rarely has bark pockets other than occasionally around knots.
  如果存在树脂囊(与包状突起物不同)，它们通常长而窄，充满浓

稠深琥珀色液状树脂。树脂最终会干燥、结晶为白色。花旗松很少有树皮囊(仅偶尔可能在节疤周围出现)。

- Douglas Fir has a relatively strong resinous smell.
  花旗松具有相当浓的树脂气味。

- Occasional pieces will have small green mineral streaks scattered through the piece.
  偶尔，在一些木材上会出现小的绿色矿物线。

- White specks, if present, will appear as small very white pits occurring along the line of fibers. Knots which are not intergrown will often be encased with dry white pitch.
  如果有白斑朽，会沿着纤维条纹以小的、很白的坑痕出现。节疤如果不是连生节，会被干燥白色树脂环绕。

- Shake, if present, is often filled with pitch (crystals or liquid).
  如果有轮裂，通常充满树脂(晶体或液体)。

Wood Properties and End Uses
木材性状和用途

Douglas Fir's suitability for widespread use in the construction and secondary remanufacturing industries derives from both its desirable physical properties and the wide range of grades in which it is available. All Douglas Fir lumber is manufactured, graded and sorted in compliance with the provisions of the relevant domestic or foreign grading rule. Douglas Fir is readily available in the following Canadian grade classifications:

花旗松令人满意的物理性状及众多的供货等级使得它被广泛应用于建筑和再加工行业中。所有花旗松锯材均按照相应的国内或国外分级规则的要求进行加工、分级和分类。花旗松通常可以按如下加拿大等级供货：(见右图表)

Douglas Fir has many uses and is a widely specified structural timber, well regarded by engineers and builders, especially for structural components and heavy timber applications. It is also used extensively for pilings, railway ties, sawmill and warehouse construction and numerous other areas where structural performance is paramount. A framing lumber for both light and heavy construction, Douglas Fir can be counted on as strong, stiff, stable wood.

花旗松具有多种用途。它被广泛用作结构材，尤其是用作结构部件和重型木建筑中时，更是受到工程技术人员和建筑人员的高度肯定。它还被广泛用于打桩、铁路枕木、工厂和仓库建筑、以及多种其它对结构性能要求极高的场合。无论作为轻型或重型建筑的框架材料，花旗松都是一种牢固、坚硬、稳定的木材。

Because of Douglas Fir's high strength and good gluing characteristics, it is commonly used in the manufacture of glued-laminated beams for a variety of structures, including arenas, pools, churches and supermarkets.

由于花旗松的高强度和良好的胶合能力，它被广泛用于层积胶合梁的制造。这类胶合梁被用于诸如体育馆、游泳池、教堂和超市等建筑结构中。

The surface appearance and easy-working properties of Douglas Fir are appropriate to the manufacture of window and door frames, mouldings, cabinets and other joinery. The hardness and strength of Douglas Fir add the dimension of durability.

花旗松的外观和易于加工的特性也使得它很适合用于制作窗框、门框、装饰条、橱柜及其它木制品。它的硬度和强度使得它具有尺寸稳定性。

Industrial applications, including tanks, vats and other storage containers are also prime applications for Douglas Fir because of its high resistance to corrosion as well as its structural performance.

由于花旗松具有较好的抗腐蚀能力和结构性能，工业容器槽、储存罐等容器物也是它的重要用途。

	NLGA	Grade Names 等级名称	R LIST R 目录	Grade Names 等级名称
Clear (knot free) 清材（无节疤）	Industrial Clears 工业清材	B & Better，B级及以上清材 C Clear，C级清材 D Clear，D级清材	R List Clears R 目录清材	No 2 Clear，2级清材 No 3 Clear，3级清材 No 4 Clear，4级清材
Factory (to be remanufactured for clear recovery) 工厂级（用于再加工，以获取清材）	Flitches 大料级	Factory Flitch，工厂级大料 Shop Flitch，车间级大料		
	Door Stock 门料级	Factory Select，工厂优选级 No 1 Shop，车间1级 No 2 Shop，车间2级 No 3 Shop，车间3级		
	Shop 车间级	Select Shop，优选车间级 No 1 Shop，车间1级 No 2 Shop，车间2级 No 3 Shop，车间3级		
	Window Stock 窗料级	Clear Window，清材级窗料 A Window，A级窗料 B Window，B级窗料 C Window，C级窗料 Select Window，优选级窗料		
Boards (lumber under 2" in thickness) 板材（厚度小于2英寸的锯材）	Para 114 Sheathing and Form Lumber 114款 封装及模板用锯材	Select Merchantable，优选商品级 Construction，建筑级 Standard，标准级 Utility，实用级 Economy，经济级		
Dimension (for structural use) 规格材（结构用材）	Stud 墙柱级	Stud，墙柱级		
	Light Framing 轻型框架	Construction，建筑级 Standard，标准级 Utility，实用级 Economy，经济级	Merch & Commons 商品及普通级	Select Merchantable，优选商品级 No 1 Merch，商品1级 No 2 Merch，商品2级 No 3 Merch，商品3级
	Structural Light Framing and Joists and Planks 结构轻型框架、搁栅和平铺木板	Select Structural，优选结构级 No 1，1级 No 2，2级 No 3，3级		

HEM-FIR (N) (Western Hemlock and Amabilis Fir Only)
铁杉-冷杉 (N) (仅限西部铁杉和太平洋银冷杉)

Lumber Identification
锯材鉴别

Prominent Characteristics: light uniform color, purple/black mineral streaks, mineral and bark pockets, no resin, and sour odor when green.
显著特征：均匀的浅色，紫色/黑色矿物线，矿物囊和树皮囊，无树脂，湿材时有酸性气味。

- Hem-Fir can range from very heavy in the pieces of wet Hemlock (particularly in those pieces containing sapwood) to quite light in the heartwood pieces of Amabilis Fir.
  铁杉-冷杉树种组合的比重变化较大，如西部铁杉的湿材(尤其是含边材的锯材)非常沉重，而太平洋银冷杉心材的锯材则较轻。

- The color is a uniform, milky brown, sometimes purplish color in Hemlock and lighter color in the Amabilis. There is very little difference in color between the sapwood and the heartwood in both these species.
  颜色均匀，为奶黄色，有时铁杉呈浅紫色而太平洋银冷杉颜色较浅。两树种的边材和心材在颜色上几乎没有差别。

- Very little difference in color between the springwood and summerwood bands on the end or face of the piece.
  在端头或表面，早材和晚材的颜色几乎没有差别。

- Hem-Fir has a slightly sour smell when wet. Almost odorless when seasoned.
  铁杉-冷杉潮湿时有轻微酸性气味，干燥后几乎无气味。

- Hem-Fir is non resinous (no resin ducts) but in a very rare case a small pitch pocket may be found. Bark pockets are quite common and many pieces contain numerous very small pockets appearing like bark pockets in nature but having only a lightly perceptible opening in Hemlock to a short tear-drop appearance in Amabilis Fir. These are referred to as mineral pockets and are restricted differently than bark pockets.
  铁杉-冷杉为无树脂树种(无树脂管)，在非常罕见的情形下可能有小树脂囊出现。树皮囊较常见，许多锯材中包含为数众多的非常小的貌似树皮囊的囊状物。它们在铁杉中只有隐约可见的开口，而在太平洋银冷杉中以泪滴状形式出现。这些被称为矿物囊，对它们的限制与对树皮囊的限制不同。

- Pieces of Hem-Fir will often have narrow purple streaks or an individual grain that is purple in color (these markings may be the most

distinguishing characteristic of the Hem-Fir group). These are known as mineral streaks or in the latter cases as a dark grain and are not considered as irregularities.

铁杉-冷杉锯材通常有紫色窄条痕或单条紫色木纹(这些痕迹可能是铁杉-冷杉树种组合最显著的特征)。这些就是所谓的矿物线，或在后一种情形下又被称为深色木纹，在这一树种组合中，这些特征不是异常现象。

- Knots if intergrown will be relatively dark sometimes with a faint purple hue (Hemlock) to a pale light brown (Amabilis) in color. Knots not intergrown will often be surrounded by bark and may be dark brown to black in color. (These black knots may appear unsound as particles may be easily scratched out but often these particles are simply a layer of bark).

  如果是连生节，通常颜色较深，有时带有浅紫色(铁杉)、有时稍带浅棕色(银冷杉)色调。如果不是连生节，通常被树皮环绕，颜色可能为深棕色至黑色。(这些黑色的节疤可能呈腐朽的颗粒状，容易被刮出，通常这些颗粒为一层树皮)。

- The pits of white specks and honeycomb in Hem-Fir (N) are usually a light brown in color, as opposed to the usual white color in other species.

  铁杉-冷杉的白斑朽和蜂窝朽的斑孔通常呈浅棕色，其它树种通常为白色。

Wood Properties and End Uses
木材性状和用途

Hem-Fir's versatility for widespread use in the construction and secondary remanufacturing industries derives from both its desirable physical properties and the wide range of grades in which it is available. All Hem-Fir lumber is manufactured, graded and sorted in compliance with the provisions of the relevant domestic or foreign grading rule. Hem-Fir is readily available in the following Canadian grade classifications:

铁杉-冷杉令人满意的物理性状及众多的供货等级使得它被广泛应用于建筑和再加工行业中。所有铁杉-冷杉锯材均按照相应的国内或国外分级规则的要求进行加工、分级和分类。铁杉-冷杉通常可以按如下加拿大等级供货：(见右图表)

Hem-Fir has an extremely wide range of uses because it offers good strength, appearance and working qualities. On construction projects it is often used interchangeably with Douglas Fir and is a reliable performer in both light and heavy construction.

由于拥有良好的强度、外观和加工性能，铁杉-冷杉具有极其广泛的用途。在建筑项目中，它可以与花旗松替换使用，它在轻型或重型建筑中的表现都令人满意。

The wood's physical and visual properties make it well suited for remanufacturing applications, where it is used in a variety of joinery items. It is attractive as paneling, a major area of use, because of its uniform tone, luster and hardness.

铁杉-冷杉的物理和外观特性使得它很适合于再加工，如用于制造多种木制品。由于它独特的色调、光泽和硬度，用它制作的装饰板非常具有吸引力。

Hem-Fir's appearance and ease of finishing make it well suited for commercial installations. Its easy treatability contributes to the species' popularity for treated wood applications. And because it takes well to fire-retardant treatment, Hem-Fir is frequently specified as paneling in public buildings such as theatres and large shopping centres.

铁杉-冷杉的外观和易于表面加工的特性也使得它很适合用于商用设施。它易于被化学处理，因而被广泛用作防腐处理的木材。它对阻燃处理剂吸收良好，因而常被指定用于如剧场、大型购物中心等公共场所的内墙板。

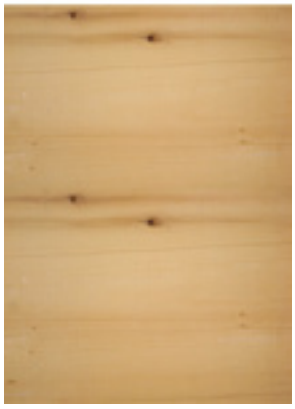
The species ease of machining and finishing combined with its strength and stability in service make it suitable for windows, ladders and doors. It is used for both household step ladders as well as industrial extension ladders, and for mouldings, louvered cupboards, kitchen doors and decorative front doors. Remanufactured products of Hem-Fir typically have straight, clean edges and smooth accurate contours. These qualities, plus the fact that the wood takes heavy wear without detriment, make it appropriate for furniture, staircase components, and other items in constant use. The uniformity and grain and color make it a common choice for finger-joined and edge-glued decorative components.

该树种易于加工和表面处理的特性、以及它在使用中表现出的强度和稳定性，使得它很适合于制造窗户、梯子和门。它既可用做家用阶梯形式梯子，也可用作工业伸缩式梯子，同时也可用作装饰条、百叶橱柜、厨房门及装饰性外门。用铁杉-冷杉制成的木制品通常具有通直、边角整齐、轮廓精确的特点。这些特性，加之该木材耐磨而不损坏的特点，使得它很适合被用于处于持续使用状态的场合，如家具、楼梯等场合。对于用于生产装饰部件的指接材，铁杉-冷杉的均匀性、纹理和色彩使得它成为的常用原材料。

	NLGA	Grade Names 等级名称	R LIST R 目录	Grade Names 等级名称
Clear (knot free) 清材（无节疤）	Industrial Clears 工业清材	B & Better，B级及以上清材 C Clear，C级清材 D Clear ，D级清材	R List Clears R 目录清材	No 2 Clear，2级清材 No 3 Clear，3级清材 No 4 Clear，4级清材
Factory (to be remanufactured for clear recovery) 工厂级（用于再加工，以获取清材）	Flitches 大料级	Factory Flitch，工厂级大料 Shop Flitch，车间级大料		
	Door Stock 门料级	Factory Select，工厂优选级 No 1 Shop，车间1级 No 2 Shop，车间2级 No 3 Shop，车间3级		
	Shop 车间级	Select Shop，优选车间级 No 1 Shop，车间1级 No 2 Shop，车间2级 No 3 Shop，车间3级		
	Window Stock 窗料级	Clear Window，清材级窗料 A Window，A级窗料 B Window，B级窗料 C Window，C级窗料 Select Window，优选级窗料		
Boards (lumber under 2” in thickness) 板材（厚度小于2英寸的锯材）	Para 114 Sheathing and Form Lumber 114款 封装及模板用锯材	Select Merchantable，优选商品级 Construction，建筑级 Standard，标准级 Utility，实用级 Economy，经济级		
Dimension (for structural use) 规格材（结构用材）	Stud 墙柱级	Stud，墙柱级		
	Light Framing 轻型框架	Construction，建筑级 Standard，标准级 Utility，实用级 Economy，经济级	Merch & Commons 商品及普通级	Select Merchantable，优选商品级 No 1 Merch，商品1级 No 2 Merch，商品2级 No 3 Merch，商品3级
	Structural Light Framing and Joists and Planks 结构轻型框架、搁栅和平铺木板	Select Structural，优选结构级 No 1，1级 No 2，2级 No 3，3级		

SITKA SPRUCE
锡特加云杉

Lumber Identification
锯材鉴别



Prominent Characteristics: light color, bearded knots, sheen, pink color streaks, very long fibers, resinous.

显著特征：浅色，胡须状节疤，有光泽，粉红色条痕，木纤维非常长，有树脂。

- Sitka Spruce is a strong, yet relatively light-weight species. It is white in color often with faint pink streaks appearing, especially around knots. Sitka Spruce has a shiny appearance. Under the right kind of light conditions it will appear to have a sheen.

  锡特加云杉是一种强度高但相对重量轻的树种。呈白色通常带有浅粉红色条痕，特别是在节疤周围。锡特加云杉呈有光泽的外观。在适当的光线条件下，光泽明显。

- Sitka Spruce is resinous. The resin ducts can only be seen on the surface under favorable conditions and will appear as small white scratches. When green, Sitka Spruce has a light spicy smell but is virtually odorless when dry.

  锡特加云杉分泌树脂。树脂管仅在理想条件下可见，呈小的白色条痕。潮湿时，锡特加云杉有轻微辛辣气味，干燥时几乎无气味。

- Pitch pockets, if present, will be shorter and wider than in Douglas Fir and Pine, the pitch will be very thick to almost solid and will be creamy white in color.

  如果有树脂囊出现，会比比花旗松和松树的树脂囊短而宽，树脂非常浓，几乎成固态，颜色呈奶白色。

- Knots in Sitka Spruce will be a light tan color and can be extremely large. Encased knots will usually show a ring of white pitch. A somewhat unique characteristic of Sitka Spruce is the appearance of grain distortion and coloring occurring around some knots (often referred to as a beard or eye) that appear like whiskers trailing away on both sides of the knot.

  锡特加云杉的节疤常为浅褐色，直径可以很大。包裹节通常有一圈白树脂环绕。锡特加云杉有一独特特征，即在有些节疤周围，出现木纹变形和变色(通常被称为胡须或眼睛)，象连鬓胡须一样在节疤两边逐渐消失。

- Knots in dry lumber are prone to shatter/crack more than other species.

  与其它树种相比，干燥锡特加云杉锯材的节疤更易破碎/破裂。

- The wood fibers in Sitka Spruce are the longest of all coast species. If a strand of fibers are lifted and pulled from the piece they will often run for a foot or more. Occasionally dressed pieces will have a fuzzy dressing, particularly on the edges, due to the long fibers in this species.
  在所有沿海树种中，锡特加云杉的木纤维最长。如果剔起一束木纤维，通常能抽出一英尺或更长。偶尔，刨光的锯材表面呈绒毛状，特别是在边缘，这是由于该树种的长纤维所致。

- There is little distinction between the springwood and the summerwood.
  早材和晚材几乎没有区别。

Wood Properties and End Uses
木材性状和用途

Sitka Spruce's suitability for widespread use in the construction and secondary remanufacturing industries derives from both its desirable physical properties and the wide range of grades in which it is available. All Sitka Spruce lumber is manufactured, graded and sorted in compliance with the provisions of the relevant domestic of foreign grading rule. Sitka Spruce is available in the following Canadian grade classifications:

锡特加云杉令人满意的物理性状及众多的供货等级使得它被广泛应用于建筑和再加工行业中。所有锡特加云杉锯材均按照相应的国内或国外分级规则的要求进行加工、分级和分类。锡特加云杉通常可以按如下加拿大等级供货：(见右图表)

Spruce gained early fame as an aircraft and boat building material because of its high strength to weight ratio and shock-absorbing qualities. Although no longer used in aircraft manufacture, except for the construction of lightweight gliding planes, Sitka Spruce is still a sought-after boat building material for masts, spars and structural framing. It is widely used in racing craft, from shells to offshore yachts, because it offers great strength without adding undue weight. It is ideally suited for oars and paddles and is considered a preferred choice for racing oars.

云杉有很高的强度/重量比和抗冲击能力，因此它曾被大量用做飞机和帆船的制作材料，并由此而赢得声誉。除了用于滑翔机以外，锡特加云杉已不再被用于飞机制造，但它依然是制造帆船桅杆、帆杆及结构框架的上佳材料。由于它强度高、不增加不必要的重量，仍被广泛使用在从轻型赛艇到多人赛艇的各种赛艇制造中。它的材质对于橹和桨最为理想，所以被认为是赛艇桨的首选材料。

Its strength, light weight and exceptional resilience make Sitka Spruce one of the world's top ranking woods for ladder manufacture. Once machined, Sitka Spruce ladder rails retain their shape throughout their service life. It also excels as a wood for scaffolding and other industrial uses where strength, light weight and resilience are important.

锡特加云杉的高强度、低重量和超常的弹性使得它成为全世界制造梯子的最佳材料。一经制成，锡特加云杉梯子会始终保持其形态。在对材料强度、重量和弹性有高要求的场合，如在脚手架等工业用途中，它也大大优于其它木材。

Its good working properties make Sitka Spruce a highly regarded species for specialized joinery work such as interior finishing and sliding screens. Because it finishes well and glues easily, Sitka Spruce can take on a wide variety of woodworking assignments. It is also valued for the manufacture of sounding boards for fine musical instruments because of its long wood fibers, great resonance, dimensional stability and good gluing properties.

由于具有易于加工的特点，锡特加云杉被认为特别适合于制作内装饰材料和推拉屏等特殊木制品。它的表面加工性能和着胶性能良好，因而可以对它进行多种多样的加工。鉴于锡特加云杉具有很长的木材纤维、优异的共鸣性能、良好的尺寸稳定性和胶合能力，它也是制造高级乐器音板的宝贵材料。

Sitka Spruce has a fine reputation as a construction wood in residential house framing and is also used for many decorative purposes.

在应用于民用木建筑的结构框架上，锡特加云杉也有良好的声誉，它同时也被用于很多装饰用途上。

Because it weathers well and evenly and does not sliver or splinter easily, Sitka Spruce is often used for outdoor stadium seats.

由于能经受风雨，且风化均匀，不会出现起片和碎裂情况，锡特加云杉也经常被用于户外体育馆的座椅。

	NLGA	Grade Names 等级名称	R LIST R 目录	Grade Names 等级名称
Clear (knot free) 清材（无节疤）	Industrial Clears 工业清材	B & Better，B级及以上清材 C Clear，C级清材 D Clear，D级清材	R List Clears R 目录清材	No 2 Clear，2级清材 No 3 Clear，3级清材 No 4 Clear，4级清材
Factory (to be remanufactured for clear recovery) 工厂级（用于再加工，以获取清材）	Flitches 大料级	Factory Flitch，工厂级大料 Shop Flitch，车间级大料		
	Door Stock 门料级	Factory Select，工厂优选级 No 1 Shop，车间1级 No 2 Shop，车间2级 No 3 Shop，车间3级		
	Shop 车间级	Select Shop，优选车间级 No 1 Shop，车间1级 No 2 Shop，车间2级 No 3 Shop，车间3级		
	Window Stock 窗料级	Clear Window，清材级窗料 A Window，A级窗料 B Window，B级窗料 C Window，C级窗料 Select Window，优选级窗料		
Boards (lumber under 2" in thickness) 板材（厚度小于2英寸的锯材）	Para 114 Sheathing and Form Lumber 114款 封装及模板用锯材	Select Merchantable，优选商品级 Construction，建筑级 Standard，标准级 Utility，实用级 Economy，经济级		
Dimension (for structural use) 规格材（结构用材）	Stud 墙柱级	Stud，墙柱级		
	Light Framing 轻型框架	Construction，建筑级 Standard，标准级 Utility，实用级 Economy，经济级		
	Structural Light Framing and Joists and Planks 结构轻型框架、搁栅和平铺木板	Select Structural，优选结构级 No 1，1级 No 2，2级 No 3，3级		

WESTERN RED CEDAR
西部红柏

Lumber Identification
锯材鉴别

Prominent Characteristics: dark color, variation in color, pleasant aroma, presence of peck, very light weight.
显著特征：深色，色彩多变，有气味，会出现袋状朽，重量非常轻。

- Western Red Cedar is usually a very light, very soft, fine textured species, but it is not completely uncommon to find an occasional piece with very coarse grain and the odd piece can be very heavy when green.
  西部红柏通常是一种非常轻、软、质地细腻的树种，但是偶尔也会碰到一块纹理很粗的锯材或潮湿时非常重的锯材。

- Western Red Cedar heartwood ranges in color from a light straw shade through shades of red-brown to a dark chocolate-brown. It is not unusual to find both color extremes in streak form in the same piece of lumber. The sapwood of Western Red Cedar is a narrow band, creamy white in color and the line between sapwood and heartwood is very distinct.
  西部红柏的心材在颜色上从暗浅草色到暗红棕色、再到巧克力褐色不等。在同一件锯材上不难找到有两种极端颜色的条纹。西部红柏的边材呈窄带状，奶白色，边材和心材的分界线非常明显。

- Western Red Cedar has a strong, pleasant, cinnamon-like aroma that is likely its most distinguishing characteristic.
  西部红柏有浓烈、怡人、类似肉桂的气味，这可能是其最显著的特征。

- Bark pockets can be found in Western Red Cedar and knots not intergrown will often be surrounded by bark. Western Red Cedar is not a resinous species so pitch will not be found.
  西部红柏存在树皮囊，非连生的节疤则通常被树皮包裹。西部红柏为不含树脂的树种，因此其锯材中看不到树脂。

- Knots are usually dark brown in color. Soft knots will occur in Cedar.
  节疤的颜色通常为深棕色，会出现软节(腐朽节)。

- White specks will appear as very white pits. When advanced to the stage of honeycomb these pits will often be well separated but each pit can be 1" to 3" long.
  白斑朽常以非常白的斑孔出现。当发展至蜂窝朽阶段时，斑孔即完全分离，单个斑孔的长度可达1英寸至 3英寸。

- A decay occurring only in the Cedars, known as Peck, will appear as well-defined pockets of a dark brown rot. The fibers take on a cube-like appearance and will crumble easily under thumb pressure.

  袋状朽，一种只在柏木中出现的腐朽，以轮廓分明的深棕色腐朽囊的形式出现。木纤维会变成小方块状，在指力作用下会很容易溃散。

- Western Red Cedar reacts with iron and will often show bands of reddish to dark brown surface stain across the face of the piece where it has been sitting on steel transfer chains in the mill.

  西部红柏与铁起反应，在工厂接触钢质传送带时，表面常会出现红色条纹至深棕色表面变色。

Wood Properties and End Uses
木材性状和用途

The density, strength and stiffness of Western Red Cedar is not as high as other coastal softwoods and so it is not commonly used for structural applications other than in larger sizes for applications such as exposed posts and beams where dimensional stability and appearance are important considerations. The knotty portions of the log are usually manufactured into specialty siding and decking products rather than into structural grades. Western Red Cedar is readily available in the following Canadian grade classifications:

西部红柏的密度、强度和坚度不如其它沿岸针叶材，因此除了以大尺寸用做外露的梁、柱(这些部位通常对尺寸稳定性和外观有重要要求)之外，它很少被用于结构方面。原木中有节的部位也通常不会加工为结构等级，而是加工成外墙板和露台板的特殊产品。西部红柏通常可以按如下加拿大等级供货：(见右图表)

Beauty and durability, the hallmarks of Western Red Cedar, have made it one of the world's most widely specified woods for many aspects of residential design. Cedar tends to be used for applications where dimensional stability, natural durability and fine appearance is required. Architects and designers, who appreciate visual continuity of materials, specify Western Red Cedar for outdoor landscape elements such as decks, planters, fences, screens, garden furniture and sheds, as well as for exterior siding, roof tiles, interior wall and ceiling paneling, doors and windows, and a variety of joinery items.

美观和耐久是西部红柏最明显的两个特点，并使得西部红柏成为在全球的家居设计中被使用得最为广泛的木材之一。西部红柏适宜用于对木材的尺寸稳定性、自然耐久性和外观有要求的场合。讲究材料视觉连贯性的建筑师和设计师经常将西部红柏用在户外景观的下列元素中：露台、植物槽(桶)、栅栏、隔屏、庭园家具和庭园小木房，以及如外墙板、屋瓦、内墙板、天花板、门、窗，以及其它多种木制品。

Western Red Cedar is well suited for decks and fencing. Lightweight and stable, it is easy to work with and weathers the elements naturally. Its excellent insulating qualities are an added advantage to use its use as an exterior siding, an application where it is both practical and visual pleasing.

西部红柏很适宜用于露台和栅栏。轻而稳定的特点使得它很易于加工，而且具有自然抗风雨侵蚀的能力。卓越的绝缘能力是它的另一优点，用它做外墙挂板时，既实用有美观。

It's well known ability to receive paint and stain finishes allows a range of effects to be achieved with Western Red Cedar, the preferred species for siding, house trim and fascias. The wood is equally appropriate for residential, commercial and institutional construction.

西部红柏另一个众所周知的优点是，它具有良好的吸收油漆和着色剂的能力，可以做成多种装饰效果，因而是很受欢迎的外墙板、房屋装饰和屋面板的材料。该木材对民居、商业和机关用建筑都同样适用。

As an interior paneling, Western Red Cedar offers tonal and textural qualities which add a natural character to any area.

用作内墙板时，西部红柏富于韵律和质感的特点可以为任何场所增加自然气息。

Doors and windows are major end uses of Western Red Cedar, utilizing the wood's weather resistance, stability, longevity and excellent working properties.

门和窗是西部红柏的主要用途之一，主要利用的是该木材的抗侵蚀能力、稳定性、使用寿命和卓越的加工性能。

	NLGA	Grade Names 等级名称	R LIST R 目录	Grade Names 等级名称
Clear (knot free) 清材（无节疤）	Industrial Clears 工业清材	B & Better，B级及以上清材 C Clear，C级清材 D Clear，D级清材	R List Clears R 目录清材	No 2 Clear，2级清材 No 4 Clear，4级清材
Factory (to be remanufactured for clear recovery) 工厂级（用于再加工，以获取清材）	Flitches 大料级	Factory Flitch，工厂级大料 Shop Flitch，车间级大料		
	Shop 车间级	Select Shop，优选车间级 No 1 Shop，车间1级 No 2 Shop，车间2级 No 3 Shop，车间3级		
Interior Panelling (KD) 内墙板（窑干）	Finish Panelling Ceiling Drop Siding 饰面板、内墙板、天花板、挂板	Clear Heart，清材全心材 A，A级 B，B级		
Exterior Siding 有节型外墙板	Knotty Panelling and Siding 有节型内墙板和外墙板	Select Knotty，优选有节型 Quality Knotty，优质有节型		
	Clear Bevel Siding 清材斜搭型外墙板	Clear V.G. Heart，清材直纹全心材 A，A级 B，B级 Rustic，乡村级 C，C级		
	Knotty Bevel Siding 有节型斜搭型外墙板	Select Knotty，优选有节型 Quality Knotty，优质有节型		
Decking 露台板	Exterior Patio Decking 户外露台板	Select Patio，优选露台板 Commercial Patio，商用露台板		

YELLOW CEDAR (CYPRESS)
黄柏(柏木)

Lumber Identification
锯材鉴别

Prominent Characteristics: light to bright yellow color, strong pungent odor, fine grain, may contain peck, no resin.
显著特征：浅黄至明黄色，有浓烈的辛辣气味，纹理细致，可能包含袋状朽，无树脂。

- Yellow Cedar is a very fine-grained, dense, hard and comparatively heavy species. The color ranges from light yellow to bright yellow. No distinction between sapwood and heartwood.
  黄柏是一种木纹非常细腻、致密、坚硬和相对较重的树种。颜色从浅黄至明黄不等。边材和心材无区别。

- Yellow Cedar has a strong pungent odor in the green but is only faintly present in seasoned pieces.
  黄柏的湿材具有浓烈的辛辣气味，但在干燥锯材中只是隐约可闻。

- Yellow Cedar is a non-resinous species so no pitch will be found.
  黄柏是一种不分泌树脂的树种，因此没有树脂。

- The annual rings of Yellow Cedar are not often distinguishable due to the fine grain and lack of distinction between the springwood and the summerwood.
  由于木纹非常细腻、边材和心材无区别，黄柏的年轮通常不易分辨。

- Knots will be pale yellow in color and soft knots are common as in Western Red Cedar.
  节疤的颜色呈浅黄色，与西部红柏一样常有软节(腐朽节)。

- Some pieces have black and grey or purple-black streaks of stain.
  一些锯材有黑色、灰色或紫黑的变色条纹。

- Yellow Cedar react with iron and will often show bands of reddish to dark brown marks across the face of the piece where it has been sitting on steel transfer chains in the mill.
  黄柏与铁起反应，在工厂接触钢质传送带时，表面常出现红色条纹至深棕色表面变色。

Wood Properties and End Uses
木材性状和用途

Yellow Cedar's suitability for widespread use, particularly in the secondary remanufacturing, joinery, architectural millwork and boatbuilding industries derives from its desirable physical properties and the wide range of grades in which it is available. All Yellow Cedar lumber is manufactured, graded and sorted in compliance with the provisions of the relevant domestic or foreign grading rule. Yellow Cedar is available in the following Canadian grade classifications:

黄柏令人满意的物理性状及众多的供货等级使得它被广泛应用，尤其是应用在再加工、木制品、建筑装饰木制品、造艇行业中。所有黄柏锯材均按照相应的国内或国外分级规则的要求进行加工、分级和分类。黄柏通常可以按如下加拿大等级供货：

	NLGA	Grade Names 等级名称	R LIST R 目录	Grade Names 等级名称
Clear (knot free) 清材（无节疤）	Industrial Clears 工业清材	B & Better，B级及以上清材 C Clear，C级清材 D Clear，D级清材	R List Clears R 目录清材	No 2 Clear，2级清材 No 3 Clear，3级清材 No 4 Clear，4级清材
Factory (to be remanufactured for clear recovery) 工厂级（用于再加工，以获取清材）	Flitches 大料级	Factory Flitch，工厂级大料 Shop Flitch，车间级大料		
	Door Stock 门料级	Factory Select，工厂优选级 No 1 Shop，车间1级 No 2 Shop，车间2级 No 3 Shop，车间3级		
	Shop 车间级	Select Shop，优选车间级 No 1 Shop，车间1级 No 2 Shop，车间2级 No 3 Shop，车间3级		
Decking 露台	Patio Decking 户外露台	Select Patio，优选露台级 Commercial Patio，商用露台级		
Dimension (for structural use) 规格材（结构用材）	Light Framing 轻型框架	Construction，建筑级 Standard，标准级 Utility，实用级 Economy，经济级		
	Structural Light Framing and Joists and Planks 结构轻型框架、搁栅和平铺木板	Select Structural，优选结构级 No 1，1级 No 2，2级 No 3，3级		

The unique properties and easy working characteristics of Yellow Cedar make it suitable for all types of joinery and carpentry where factors such as quality, appearance, natural durability and stability are important. The wood's strength, stability, uniform color and fine finish are appropriate for doors and

windows, decorative paneling and custom joinery in both residential and commercial buildings. High grade Yellow Cedar is often sought by craftsmen for specialty construction projects such as temples, shrines and carvings. The comparative scarcity of Yellow Cedar adds a further element of prestige.

黄柏性状独特、易于加工，适合用于所有对质量、外观、天然耐久性、稳定性有高要求的各类木制品。这种木材的强度、稳定性、均匀的颜色、优良的表面加工性能使它适合于民用和商用建筑的门、窗、装饰板、和其它细木工制品。高等级的黄柏常被木工们用作庙宇、圣殿和雕刻。黄柏的稀缺性更增加了它的珍贵。

In boat building, Yellow Cedar has a long history of use dating back to the native Indian culture of Canada's west coast. Today the durability, structural integrity and impact resistance of the species is valued in the construction of fresh- and salt-water craft from racing shells to pleasure cruisers. The wood's strength, freedom from twist, and ease of machining make it well suited to the manufacture of oars and paddles.

黄柏在船艇制造中的使用可以追溯到加拿大西海岸印第安原住民漫长的历史中。今天，黄柏的耐久性、优良的结构性能和抗侵蚀能力，使得它成为制造从轻型赛艇到休闲游轮(海水或淡水)的珍贵材料。该木材高强度、不扭曲、易加工的特点也很适于制造划桨。

The structural grades of Yellow Cedar are ideal for uses where strength and/or natural durability are important. It is commonly used for exterior applications such as bridges, patio decking, sill plates, stairs and in the landscape. It is often specified for environmentally sensitive purposes such as water reservoirs or railway ties over streams where chemically treated wood is unsuitable. Its strength, hardness, stability, durability and excellent wear resistance allows the wood to stand up to traffic and load impact without forming ridges or splitting. Because of its smooth-wearing properties, weather resistance and long life it is sometimes used for seating in outdoor sports facilities.

在材料强度和天然耐久性很重要的场合，使用结构等级的黄柏锯材非常理想。它通常用于户外用途，如桥梁、院子、露台、天井、窗台板、门槛等。它常被用于环境敏感的、不适合使用化学处理木材的场合，如水库、跨越河川的铁路枕木等。它的强度、硬度、稳定性、耐久性和优越的抗摩擦能力使它能够承受交通和负荷的影响而不会劈裂或被磨蚀成垄状。

Yellow Cedar's resistance to decay and corrosion also give it practical applications in industry for the manufacture of tanks, flumes and chemical containers.

由于黄柏的抗腐朽和抗腐蚀能力，在工业中，它也被用于制造储液罐、液体槽和化学容器。

WESTERN WHITE PINE
西部白松

Lumber Identification
锯材鉴别

Prominent Characteristics: dark color, variation in color, pleasant aroma, presence of peck, very light weight.
显著特征：深色，色彩多变，有气味，会出现袋状朽，重量非常轻。

- Prominent characteristics: obtains its name from its light colored wood, fine grain, uniformed texture.
  显著特征：其名称来自于它浅色的木材，纹理细致，质地均匀。

- Creamy white to light straw brown heartwood. Heartwood darkens upon exposure to sunlight.
  奶白至浅草棕色心材。心材暴露于阳光后颜色变深。

- Almost white sapwood. Sapwood is narrow to medium in width.
  边材几乎呈白色。边材宽度窄至中等。

- There are numerous knots which are typically darker in color. Knots are reddish in color but the inner portion of the knots tend to be lighter in color.
  节疤为数众多，通常颜色较深。在颜色上，节疤呈红色，但是节疤的内核部分倾向于颜色较浅。

- Grain is usually straight and even.
  纹理通常平直、均匀。

- A resinous species, aromatic with a sweet resinous, cinnamon-like smell.
  含树脂树种，发出有甜味、类似肉桂气味的芳香。

- Wood is characterized by very distinctive, visible resin ducts which sometimes result in a waxy to sticky feeling surface.
  具有非常明显、可见的树脂管，导致表面摸上去有一种蜡状、粘稠的感觉。

- Texture is typically medium to coarse, doesn't tend to split or splinter.
  质地通常为中等到粗糙，不易劈裂或破碎。

Wood Properties and End Uses
木材性状和用途

Western White Pine's pleasing appearance and softness, make it particularly desirable for use in shelving, wood paneling and furniture. Western White Pine is probably the most popular pine species used for interior paneling and high-end pine furniture in Canada today. Western White Pine has a naturally sweet aroma (cinnamon-like) and a smooth waxy finish, which lends itself well to these types of products.

西部白松令人愉快的外观和柔软的材性使它特别适合用于搁架板、木质内墙板和家具的制造。今天，西部白松是加拿大用于制造内墙板和高档松木家具最普遍的松木树种。西部白松的天然、肉桂般的香甜气味和光滑的腊质外表，使它特别适合这类用途。

Due to its relatively low density and softness, it is generally unsuitable for structural uses. This type of Pine is not permitted in the species group S-P-F (Spruce, Pine, Fir). However as a by-product of logging in S-P-F areas, Western White Pine may be harvested and turned into dimension product items.

由于相对柔软和密度较低，它通常不适合用于结构方面。这一类型的松木不容许出现在S-P-F树种组合中。然而，作为S-P-F树种组合砍伐时的附产品，西部白松可能也会被采伐、并被混入到规格材产品中去。

Western White Pine trees can grow to a considerable size, and therefore will yield relatively wide lumber for manufacture into boards for shelving etc.

西部白松可生长至相当大的直径，因此可以产出相当宽的锯材和板材，进而用于搁架板等的制造。

Western White Pine is readily available in the following Canadian grade classifications:
西部白松通常可以按如下加拿大等级供货：

	NLGA	Grade Names 等级名称
Clears / Selects 清材/优选级	Selects 优选级	B & Better – 1 and 2 Clear (Supreme), B级及以上清材 – 1级和2级清材（最高级） C Select (Choice), C级优选材（选择级） D Select (Quality), D级优选材（优质级） Stained Selects, 变色优选材
Boards (lumber under 2" in thickness 板材（厚度小于2英寸的锯材）	Commons 普通级	2 Common & Better (Sterling), 普通2级（纯正级） 3 Common (Standard), 普通3级（标准级） 4 Common (Utility), 普通4级（实用级） 5 Common (Industrial), 普通5级（工业）
Dimension (for structural use) 规格材（结构用材）	Stud 墙柱级	Stud，墙柱级
	Light Framing 轻型框架	Construction，建筑级 Standard，标准级 Utility，实用级 Economy，经济级
	Structural Light Framing and Joists and Planks 结构轻型框架、搁栅和平铺木板	Select Structural，优选结构级 No 1，1级 No 2，2级 No 3，3级

Lumber Identification Summary
锯材鉴别概要

DOUGLAS FIR 花旗松	Reddish-brown heartwood, white sapwood. Distinction more noticeable than other species 红棕色心材，白色边材，两者的区别较其它树种明显 A dense, heavy species 致密、沉重的树种 Resin ducts are quite noticeable. Also look for small, dark, pitch pockets or brownish pitch streaks 树脂管较明显。也可见小的、深色树脂囊，或棕色树脂斑 Reddish-brown knot colour 节疤为红棕色 Yellow-brown or purple heartstain. Specks are usually white in colour 黄棕色或紫红色心材变色。斑朽通常为白色
WESTERN HEMLOCK/ AMABILIS FIR 西部铁杉/太平洋银冷杉	Bone-white colour. Amabilis Fir more to the white colour, Western Hemlock more to a light brown colour with streaks of purple 骨白色。太平洋银冷杉偏白色，西北铁杉便淡棕色并带有紫色线条 Look for mineral streaks (purplish dark lines) and bark pockets 可观察到矿物线（紫色暗线条）和树皮囊 Compression wood streaks (different shade of brown) stand out 应压木条纹（不同的深浅的棕色）明显 Dark brown to black knot colour 节疤颜色为深棕色到黑色 No smell when kiln dried 窑干后无气味 Brown heart stain, brown specks 心材变色为棕色，斑朽为棕色
SITKA SPRUCE 锡特加云杉	Shiny, white in colour but look for yellow or pink streaks 有光泽的白色，有黄色或粉红色条纹 Knots are brownish-purple in colour and the large ones tend to check and open up. Look for “beards” around the knots 节疤颜色为棕紫色，大节疤通常开裂或开放。注意节疤周围呈胡须状 Look for pitch pockets containing a creamy white to yellowish pitch 注意树脂囊含奶白色或黄色树脂 Grain tends to be coarse 纹理通常较宽
WESTERN RED CEDAR 西部红柏	Colour varies from brown to reddish-brown to a creamy white sapwood 颜色从棕色到红棕色变化，奶白色边材 Distinct, loveable smell 独特的、令人喜爱的气味 Lightest in weight compared to other softwood species 与大部分其它针叶材相比，重量较轻
YELLOW CEDAR 黄柏	Yellow in colour, and so are the knots 黄色，节疤也为黄色 Distinct, pungent smell 独特的、辛辣气味
WESTERN WHITE PINE 西部白松	Creamy white. Resin ducts are usually noticeable 奶白色。通常树脂管明显 Knots are reddish in colour but the inner portion of the knots tend to be lighter in colour 节疤通常为红色，但节疤的中心部分通常颜色较浅 Aromatic, sweet resinous smell 芬香的、带甜味的松脂气味

INTERIOR SPECIES
内陆树种

SPRUCE-PINE-FIR (S-P-F)
云杉-松木-冷杉 (S-P-F)

White Spruce, Lodgepole Pine and Alpine Fir, the three softwood species comprising the principal species in the S-P-F group share many common characteristics and properties as well as the same native habitat.
白云杉、扭叶松和高山冷杉，这三个针叶树种是构成S-P-F树种组合的主要针叶树种，它们具有许多共同的性状和相同的产地。

All yield high grade lumber with relatively small, sound tight knots.
它们都产出节疤相对较小、健全紧固节的高等级锯材。

S-P-F lumber is distinctly white wood, with very little color variation between springwood and summerwood. The wood generally has a bright, clean appearance, ranging in colour from white to pale yellow, with a fine straight grain and smooth texture.
S-P-F锯材是一种典型的浅色木材，早材和晚材的颜色差别很小。木材通常具有光亮整洁的外观，颜色从白色到淡黄色，呈致密的通直纹理和光滑的质地。

Kiln dried S-P-F lumber is used as a structural framing material in all types of residential, commercial, industrial and agricultural building applications.
窑干的S-P-F锯材用于各种类型的民用、商用、工业用、农业用建筑的结构框架。

Kiln dried S-P-F lumber is also used extensively in the manufacturing of prefabricated housing, trusses and other structural components. In addition to producing high quality structural lumber, with a little preparation, S-P-F can be made into very appealing, economical solid wood furniture.
窑干的S-P-F锯材还广泛用于制造预制房屋、屋桁架和其它结构件。除了用于生产高质量的结构材外，经过少许加工，S-P-F木材也可以用来制造非常有吸引力、且经济的实木家具。

WHITE SPRUCE
白云杉

Lumber Identification
锯材鉴别

In general, White Spruce is light in colour, nearly white to pale yellowish brown.
通常白云杉的颜色较浅，从近乎白色到淡黄棕色。

- Often White Spruce will have a shiny appearance.
  白云杉通常带有发亮的外观。

- Lighter in weigh compared to other species.
  与其它树种相比，重量较轻。

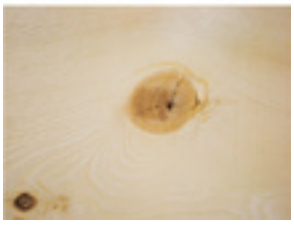
- Distinctly white wood, with very little color variation between springwood and summerwood.
  典型的浅色木材，早材和晚材的颜色差别很小。

- Dry, checked, brown knots. Look for beards around knots.
  干燥、开裂、棕色节疤，注意节疤周围呈胡须状。

- May have numerous small intergrown or encased pin knots.
  可能含有为数众多的、小的、连生或包裹的针节。

- Resinous, look for pitch pockets.
  有树脂，注意树脂囊。

- Brown heartstain; brown specks.
  棕色心材变色，棕色腐朽斑。



- White Spruce is usually straight-grained, non-porous with a fine to medium texture.
  白云杉通常为通直纹理、无孔、致密到中等质地。

- Growth ring figuration is slight.
  年轮花纹较淡。

- White Spruce does not have a distinctive odour or taste.
  白云杉没有明显的气味或味道。

LODGEPOLE PINE
扭叶松

Lumber Identification
锯材鉴别

Generally, Lodgepole Pine is light in colour, ranging from whitish to pale yellow, distinct difference between sapwood and heartwood colour. Light honey coloured sapwood, pinkish heartwood.
通常扭叶松的颜色较浅，从近乎白色到淡黄色，心材和边材的颜色差别明显。浅蜜黄色边材，带粉色的心材。

- A distinctive characteristic of this species are dimples that you can often see on flat grain surfaces.
  该树种的一个特征性的性状是，在平纹面上有涟漪现象。

- Typically, you will see pencil marks around the pith.
  典型地，可以髓心周围观察到笔痕。

- You will feel a waxy or soapy feeling to knots, knots are dark in color.
  节疤有蜡质或皂状感觉，节疤为深色。

- Red to reddish-brown heartstain.
  心材变色为红色到红棕色。

- White to yellowish specks.
  腐朽斑呈白色到黄白色。

- Distinctive resinous odor.
  有明显的树脂气味。

- Lodgepole Pine is generally straight-grained, non-porous with a fine and uniform texture.
  扭叶松通常为通直纹理、无孔、致密均匀的质地。

- The wood has a resinous odour, especially when green.
  该木材具有树脂气味，尤其是潮湿时。

ALPINE FIR
高山冷杉

Lumber Identification
锯材鉴别

IAlpine Fir has a dull finish, ranging in colour from white to yellowish in colour.
高山冷杉的外表暗淡，颜色从白色到黄白色。

- Live knots are a yellow to greenish in colour, dead knots are grey.
  活节为黄色或带绿色，死节为灰色。
- Non-resinous. Look for pockets of checks (from kiln drying).
  无树脂。注意干裂形成的空腔(源于窑干)。
- Look for mineral streaks and pockets.
  注意矿物线可树脂/树皮囊。
- Brown heartstain; brown specks.
  心材变色为棕色，斑朽为棕色。
- Has a distinct odor when green.
  潮湿时，一种特别的气味。
- Fine straight grain and a smooth texture.
  纹理通直细腻，质地平滑。
- Often many small heart shakes around the pith.
  在髓心周围，通常有很多小的心材轮裂。
- Water pockets in Alpine Fir make this species harder to kiln dry.
  高山冷杉中的水囊使得该木材很难窑干。

SPRUCE-PINE-FIR (S-P-F)
云杉-松木-冷杉 (S-P-F)

Wood Properties and End Uses
木材性状和用途

S-P-F is the predominant lumber species used in North American construction. Its extensive use in structural applications is due to both its abundance and its suitability.
在北美的建筑上，S-P-F是占支配地位的锯材树种。它们在结构上的广泛应用，既是源于它们丰富的资源、也是源于它们适宜的性状。

S-P-F species grow slowly in Northern temperate forests, which results in fine grained and strong lumber, with relatively small sound knots. Such lumber is well suited for construction purposes and is used extensively in structural framing for residential, commercial, and agricultural buildings.
S-P-F缓慢生长于北方温带森林中，从而形成了密纹、高强度的锯材，其节疤通常为小的健全节。这类锯材非常适合建筑用途，所以被广泛使用于民用、商用、和农业建筑的结构框架中。

S-P-F lumber seasons (dries) well and yields straight lumber with a smooth finish which is easily fastened by nails or screws. It is also easy to glue with a variety of adhesives for finger-joined or laminated lumber products.
S-P-F锯材干燥性能良好，干燥后的锯材通直而且表面光洁，易于用钉或螺丝固定。它们也易于用多种胶粘剂胶合，适宜用于制作指接材和层积材。

S-P-F lumber is also used as decking, fascia and trim, and can be manufactured into very appealing and economical wood furniture.
S-P-F锯材也被用于露台、屋面板、装饰件等，也可用于生产经济而且非常有吸引力的实木家具。

S-P-F is readily available in the following Canadian grade classifications:
S-P-F通常可以按如下加拿大等级供货：

	NLGA	Grade Names 等级名称
Clear (knot free) 清材（无节疤）	Industrial Clears 工业清材	B & Better，B级及以上清材 C Clear，C级清材 D Clear，D级清材
Factory (to be remanufactured for clear recovery) 工厂级（用于再加工，以获取清材）	Shop 车间级	Select Shop，优选车间级 No 1 Shop，车间1级 No 2 Shop，车间2级 No 3 Shop，车间3级
Boards (lumber under 2" in thickness) 板材（厚度小于2英寸的锯材）	Para 113 Commons 113款 普通级	No 1 Common，普通1级 No 2 Common，普通2级 No 3 Common，普通3级 No 4 Common，普通4级 No 5 Common，普通5级
	Para 114 Sheathing and Form Lumber 114款 封装及模板用锯材	Select Merchantable，优选商品级 Construction，建筑级 Standard，标准级 Utility，实用级 Economy，经济级
Dimension (for structural use) 规格材（结构用材）	Stud 墙柱级	Stud，墙柱级
	Light Framing 轻型框架	Construction，建筑级 Standard，标准级 Utility，实用级 Economy，经济级
	Structural Light Framing and Joists and Planks 结构轻型框架、搁栅和平铺木板	Select Structural，优选结构级 No 1，1级 No 2，2级 No 3，3级

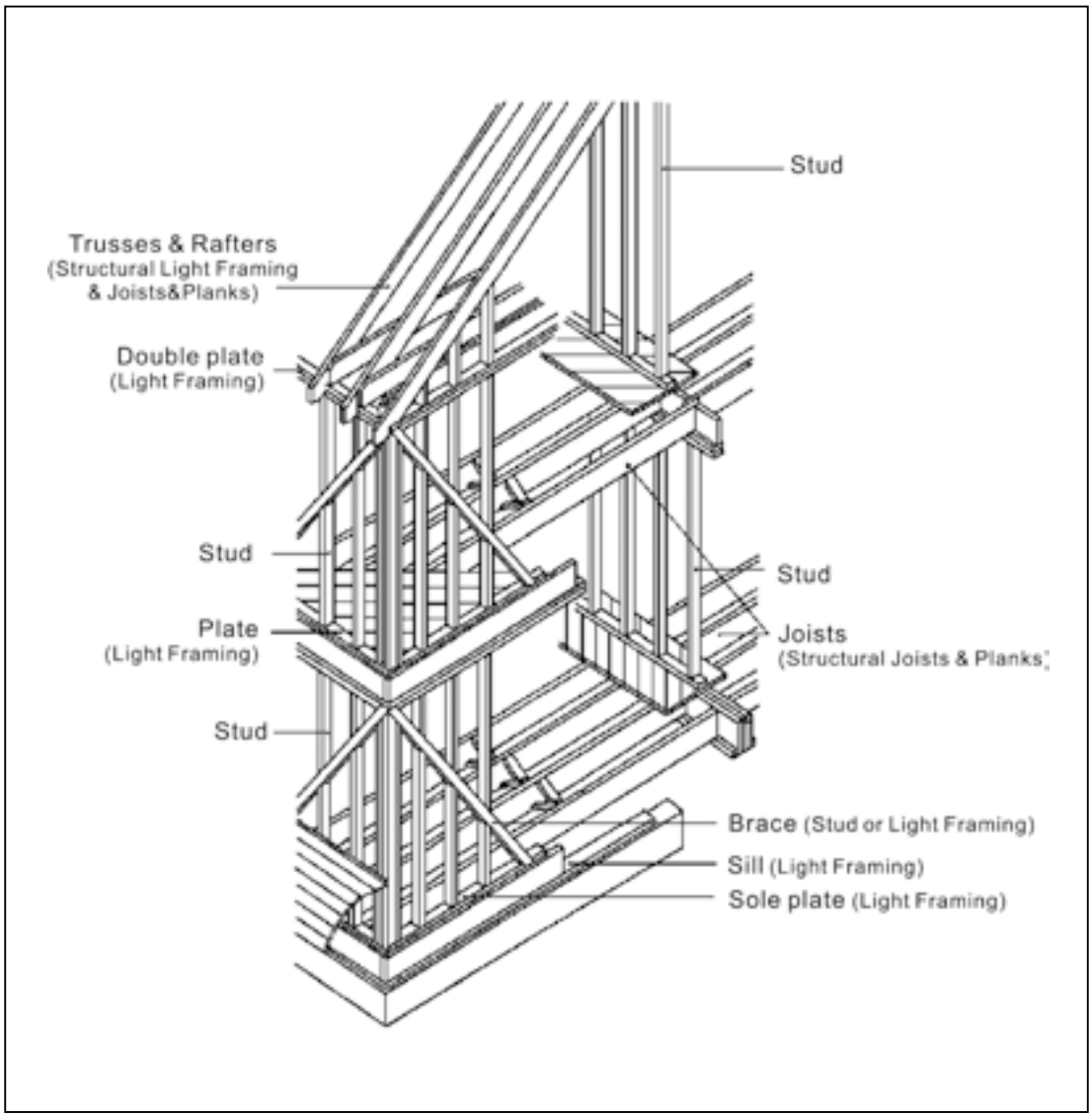
SPRUCE-PINE-FIR (S-P-F)
云杉-松木-冷杉 (S-P-F)

Lumber Identification Summary
锯材鉴别概要

WHITE SPRUCE 白云杉	▪ Shiny, white in colour. Lighter in weight compared to other species 有光泽的白色。与其它树种相比重量较轻 ▪ Dry, checked, brown knots. Look for beards around knots. 干燥、开裂、棕色节疤，注意节疤周围呈胡须状 ▪ Resinous, so look for pitch pockets 有树脂，注意树脂囊 ▪ Brown heart stain; brown specks 棕色心材变色，棕色腐朽斑
LODGEPOLE PINE 扭叶松	▪ Shiny, whitish to yellow in colour 有光泽，白色到黄色 ▪ Look for dimples on flat grain surfaces 注意在平纹面上有涟漪现象 ▪ Look for pencil marks around the pith 注意髓心周围笔痕 ▪ Waxy or soapy feeling to knots. Knots are dark in color 节疤有蜡质或皂状感觉，节疤为深色 ▪ Red to reddish-brown heart stain; white to yellowish specks 心材变色为红色到红棕色，腐朽斑呈白色到黄白色
ALPINE FIR 高山冷杉	▪ Dull finish, yellow-white in colour 外表暗淡，颜色黄白色 ▪ Live knots are yellow colour, dead knots are grey 活节为黄色或带绿色，死节为灰色 ▪ Non-resinous. Look for pockets of checks (from kiln drying) 无树脂。注意干裂形成的腔（源于窑干） ▪ Look for the black mineral streaks and pockets 注意黑色的矿物线和树脂/树皮囊 ▪ Interesting smell when in the green form 潮湿时，一种特别的气味 ▪ Brown heart stain; brown specks 心材变色为棕色，斑朽为棕色

Structural application of S-P-F Lumber in North American Platform Construction
S-P-F锯材在北美平台式建筑结构上的应用

(Number 1 market use for S-P-F Lumber)
(S-P-F锯材在市场上的最大用途)

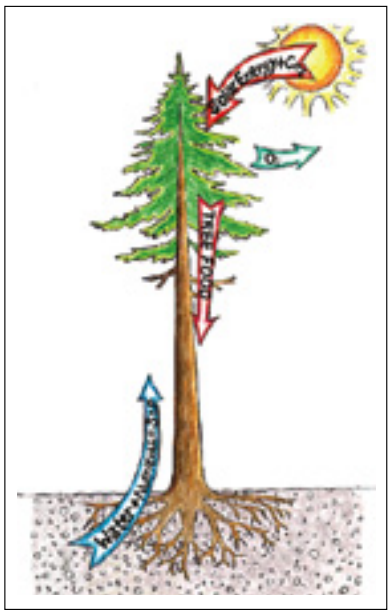


Structural Component 结构部件	Lumber Grade Category 所用锯材等级类型	Structural Component 结构部件	Lumber Grade Category 所用锯材等级类型
Trusses & Rafters 桁架和椽条	Structural Light Framing & Joists & Planks 结构轻型框架及搁栅和平铺木板等级	Stud 墙柱	Stud 墙柱等级
Double Plate 双层顶梁板	Light Framing 轻型框架等级	Stud 墙柱	Stud 墙柱等级
Stud 墙柱	Stud 墙柱等级	Joist 搁栅	Structural Light Framing & Joists & Planks 结构轻型框架及搁栅和平铺木板等级
Plate 底梁板	Light Framing 轻型框架等级	Brace 支撑	Stud or Light Framing 墙柱等级或轻型框架等级
Stud 墙柱	Stud 墙柱等级	Sill 地梁板	Light Framing 轻型框架等级
		Sole Plate 单层底梁板	Light Framing 轻型框架等级

TREE GROWTH AND WOOD STRUCTURE
树木生长和木材结构

To understand wood formation and lumber recovery it is essential to understand how softwood trees grow. For this purpose (and simplicity) a tree can be divided into three main parts from bottom to top.

为了理解木材的形成和锯材在原木上的出产区域，有必要了解树木是如何生长的。为此目的及叙述简洁，一棵树木可以从上到下被分成三个主要部分。



Parts of the Tree
树木的不同部分

The Roots — serve to anchor the tree and absorb large quantities of soil moisture with small quantities of mineral salts. The resultant solution, called Sap, passes up to the trunk to the leaves (needles) of the crown.

根系 — 用于固定树木，同时吸收大量土壤水分和少量矿物盐类。其形成的溶液，称为树液，顺着树干向上输送至树冠的叶(针叶)中。

The Trunk — the main portion of the tree above the ground - is the part of the tree from which most lumber is obtained. It provides mechanical support for the crown, conducts liquid materials between the roots and the crown and stores reserve food. Moisture or sap is able to rise and be held in the tree because wood is composed of millions of hollow cells so small that they are only visible under a microscope.

树干 — 树木地上的主要部分 - 树木中出产锯材的主要部分。它为树冠提供机械支撑，在树根和树冠之间传导液体物质并储藏养分。水分或树液能够在树木中上升和保存的原因是，木质部分是由数以百万计的、中空的、仅能在显微镜可见的细胞所组成。

The Crown — or upper portion of the tree is where the sap from the roots is transformed into tree food. Most of the prepared tree food is then transported through the inner bark (bast) to the growth (cambium) layer where it is formed into new wood substance.

树冠 — 或称为树木的顶部，它将从根系而来的树液转化为树木的食物。大部分的食物通过树木的内皮(韧皮)被输送到形成层(新生组织)，用于形成新生的木材物质。

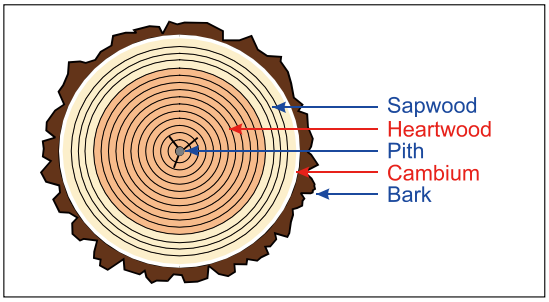
Wood Structure is essentially the same in the roots, branches and trunk, but lumber comes only from the trunk and it is, therefore, this portion of the tree in which we are most interested. The quality of lumber produced depends largely on the part of the trunk from which it comes. The trunk consists of a cylinder of wood surrounded by a layer of rind of bark. To explain the various components of a log in cross-section the woody part can be divided into Pith, Heartwood and Sapwood. Between the wood and the bark is the active growth layer of the tree called the Cambium.

本质上而言，树根、枝条、树干的木材结构都是一样的。但锯材仅来自于树干，因此它也是我们最感兴趣的部位。锯材的质量与它在树干上的出材部位有很大关系。树干是由一个木质的圆柱体及其外面包裹的一层树皮外壳所组成。从原木横切面上来观察不同的构成，其木质部分可依次划分为髓心、心材、和边材。在木质和树皮之间是树木的活跃的生长层，称为形成层。

Parts of the Trunk
树干各部分

The trunk may be considered therefore as consisting of five parts:
树干可被认为有五个部分组成：

a) The Pith — or heart is a soft pulpy core, normally occurring in or near the centre of a cross section of the tree, and represents the initial growth of the tree. It is always small in relation to the total cross section.
髓心 — 或树心，为柔软絮状内核，通常位于树木横切面的中心或接近中心的部位，代表树木初始生长的位置。与全部横切面相比，它总是相对较小。



Pith or heart centres are allowed in all Construction type grades, unless the orders specifically state FOHC (Free of Heart Centres), then the pith is not allowed.
在建筑用材类型的等级中，可以允许髓心或树心的存在，除非在订单中特别指明FOHC(不含树心)时，髓心才不允许出现。

b) The Heartwood — is the central portion of the wood of the trunk, between the pith and the sapwood. Heartwood represents the earlier years of growth and its function is that of mechanical support for the tree.
心材 — 为树干木材的中心部分，位于髓心和边材之间。心材为树干早期生长的部分，其主要功能是为树木提供机械支撑。

c) The Sapwood — is that portion of the wood of the trunk surrounding the Heartwood and immediately inside the Cambium. It is usually lighter in colour than the heartwood and represents the youngest wood of the tree's growth in diameter. Its principal function is to conduct sap from the roots to the crown of the tree.
边材 — 是树干木材中环绕心材、直接位于形成层内侧的部分。它的颜色通常比心材浅，代表了树木较晚生长的部分。其主要功能是为树木从树根到树冠传导树液。

The width of the sapwood band varies with the species of the tree, and the age of the tree. For example, Ponderosa Pine from the Interior normally has a wide sapwood band, whereas Western red cedar has narrow sapwood. A vigorous second growth Douglas Fir tree will have a much wider sapwood band than wild and old mature tree.
边材的宽度随树种和树木的年龄而变化。例如，内陆出产的西部黄松(Ponderosa Pine)通常具有较宽的边材带，而西部红柏的边材则较窄。生长旺盛的二代花旗松的边材则远大于野生、成熟的老龄花旗松。

It should be realized that all Heartwood once functioned as Sapwood. Heartwood can be thought of as "retired" sapwood. As the tree increases in girth the cells nearest the pitch cease to conduct Sap. The action is progressive; that is, as the tree continues to increase in diameter, the oldest sapwood cells, those on the side nearest the pith, cease to function and become Heartwood. During the change from Sapwood

to Heartwood the cells lose much of their moisture and are infiltrated with gums, resins, oils and tannins, many of which are toxic to wood destroying organism.

必须了解的是，所有心材都曾经是边材。心材可以被看成是“退休”的边材。当树木的直径不断生长时，靠近髓心的细胞停止传导树液。这一过程是渐进式的，也就是，当树木的直径不断生长时，靠近髓心一侧最老的边材细胞，功能停止并转化成心材。在从边材转化成心材的过程中，细胞丧失大部分的水分，同时填充了树胶、树脂、油类和单宁。这些物质中的大部分对侵害木材的生物有毒性。

The difference between Sapwood and Heartwood is, therefore, one of function (conduction versus support), and colour (as affected by infiltrated materials). In addition, sapwood lumber has a higher moisture content, and is therefore heavier in the green or unseasoned condition The infiltrated and crystallized materials in Heartwood may also give it unique properties, such as Western Red Cedars decay and weather resistance.

因此，边材和心材的区别在于功能(传导作用和支撑作用)和颜色(受填充物的影响)。此外，边材具有较高的水分含量，所以在潮湿或未干燥时较重。心材中的填充物和结晶体也会赋予心材独特的性状，例如西部红柏所具有的抗腐朽和抗侵蚀能力。

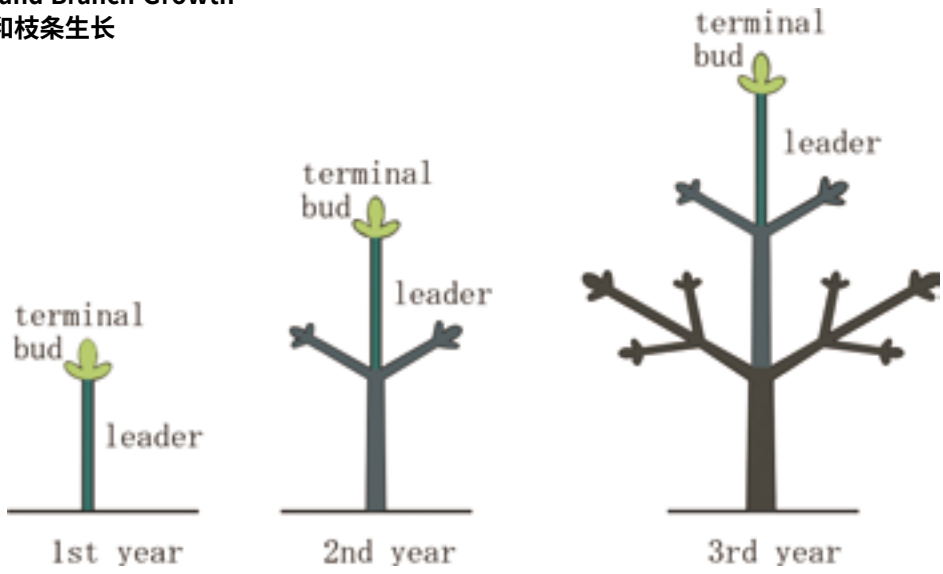
d) Cambium — A juicy and slimy layer between the bark and the sapwood where the new growth takes place by cell multiplication.

形成层 — 位于树皮和边材之间的、多汁、粘稠状的层次。在这里，通过细胞分裂，树木形成新生组织。

e) Bark — is the outer layer or rind of the tree which serves to protect the tree from fungal attack, insects, fire, etc. The inner layers of bark, called Bast, serve to carry the prepared food material from the leaves (needles) to the cambium and to other parts of the tree.

树皮 — 树木的外层或外壳，用于保护树木免受真菌、昆虫、林火的侵害。树皮的内层，又称韧皮，起着将合成的养分从叶(针叶)运往形成层、再运往树木其它部位的作用。

Tree and Branch Growth
树木和枝条生长



A tree begins its growth in height by sending up a single shoot, and, as the growing season progresses, small buds are formed along and at the top of the shoot. Growth stops in the fall and the tree remains in a dormant state throughout the winter. As the growing season commences each spring, another shoot, known as the leader, will grow from the top (terminal) bud. Twigs will also form from the buds along the shoot. Year after year the growth in height will be from the Terminal Bud and the length of the branches (twigs) from the buds at the ends.

树木通过向上抽出一个枝条而开始长高。而且，随着生长季节的进行，在枝条的顶部会形成小的芽。生长会在秋季停止。在冬季，树木处于休眠状态。在每个春季，随着生长季节的开始，另一个称为顶枝的枝条将从顶芽上长出。小枝也会从枝条上的其它芽中长出。一年又一年，树木的高度不断从顶芽长出，而枝条(小枝)的长度也从其顶端的芽上不断生长延长。

It can therefore be said that a tree grows in height "from the top up".

所以，可以说树木的长高是“ 从顶端向上 ”进行的。

A tree also grows in girth or circumference. This is accomplished by adding a layer of wood around the tree every year. This layer of wood is known as an annual ring. The annual ring is composed of two parts or bands. The first band is soft in texture, and light in colour and weight. This band is known as Springwood, (or early wood) as it grows in the spring or fast growing season. The second band known as Summerwood (or late wood), and is put on in the summer or slower growing season. Summerwood has more wood substance per unit of volume that Springwood (denser), so is therefore heavier, stronger, harder in texture and darker in colour than the springwood band. The two bands together constitute an annual ring - tree trunks and branches (while alive) grow by one annual ring, in each year.

树木同样也会进行直径或胸围的生长。这一过程通过每年增加一圈木材组织实现。这样一圈木材组织被称为年轮。年轮由两部分或两个生长带所组成。第一个生长带质地较软、颜色较浅、重量较轻。这一生长带被称为春材(或早材)，它生长于春季或快速生长季内。第二个生长带被称为夏材(或晚材)，它生长于夏季或生长速度较慢的季节内。单位体积内，晚材比早材含有较多的木质物质(密度较大)，因此更重、强度更大、质地更硬、颜色更深。两个生长带一起构成一个年轮。树干和枝条(活着时)每年长出一个新年轮。

The width of the annual rings varies with the rate of growth. A tree growing under ideal growing conditions

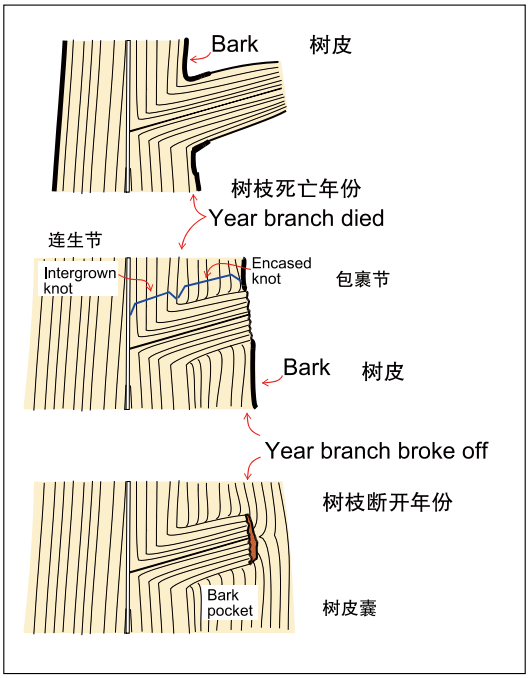
will have wider annual rings (coarser grain) than a slow-growing tree. Coarse grained lumber may only have three or four annual rings to the inch. The number of rings to the inch has a definite bearing on the strength of lumber. All other characteristics being equal, lumber sawn from a tree with three to four rings would be weaker than lumber with 8 or 10 rings per inch. It is for this reason that grades, requiring high strength values, must have a certain minimum number of rings to the inch. In lumber grading this is referred to as Rate of Growth.

年轮的宽度随着生长率的不同而变化。一棵处于理想生长条件下的树木，具有比生长缓慢的树木更宽的年轮(粗纹)。每英寸内年轮的数量对木材的强度有明显影响。其它性状相同时，从每英寸只有三到四个年轮的树上锯得的锯材的强度，低于从每英寸有八到十个年轮的树上锯得的锯材。由于这一原因，在强度要求高的等级中，对其每英寸中的最低年轮数有所限制。在锯材分级中，这被称为“生长率”。

Some clear grades also have a rate of growth specification, however, this is more for grain texture or workability and appearance rather than strength qualities.

一些清材等级也对生长率有所规定。然而，这更多是从纹理质地、加工性能和外观的角度而不是从强度的角度考虑的。

Knot Formation and Quality
节疤的形成和质量



A knot, as it appears in a piece of lumber, is a portion of a branch, imbedded in the wood, cut through by a saw.

出现在一块锯材中的节疤，是枝条的一部分，它被包埋在木材中，又在加工中被锯开。

Branches start at the pith, increasing in diameter and length each year in the same manner as the tree itself. While a branch is living, the fibres of the trunk grow around and intergrow with the fibres of the branch. If you were to saw lumber from a tree with live branches, it would result in intergrown knots in the lumber. The knots would be largest in lumber sawn from the outer portions of the log and reduced in size as each cut is made towards the pith.

枝条发源于髓心，象树木本身一样，其长度和直径每年都会增长。当枝条活着时，树干的纤维在枝条周围与枝条的纤维交织生长，因而会在锯材中形成连生节。如果从原木的外围开始锯切，越靠近髓心时，节疤越小。

In order to live, a tree needs a sufficient amount of sunshine (needed for processing sap into tree food) - the same applies to branches. If the lower branches are shaded from sunlight, they cease to play an active part in the life of the tree and die off. When this occurs, the fibres of the trunk gradually disassociate themselves from the fibres of the branch.

要存活，树木必须获得足够的阳光(以将树液加工成养料) - 这同样也适用于枝条。如果下部的枝条被遮荫，它们在树木中的作用就会停止并逐渐死亡。当这一情况发生时，树干的纤维就会逐渐与枝条的纤维分离。

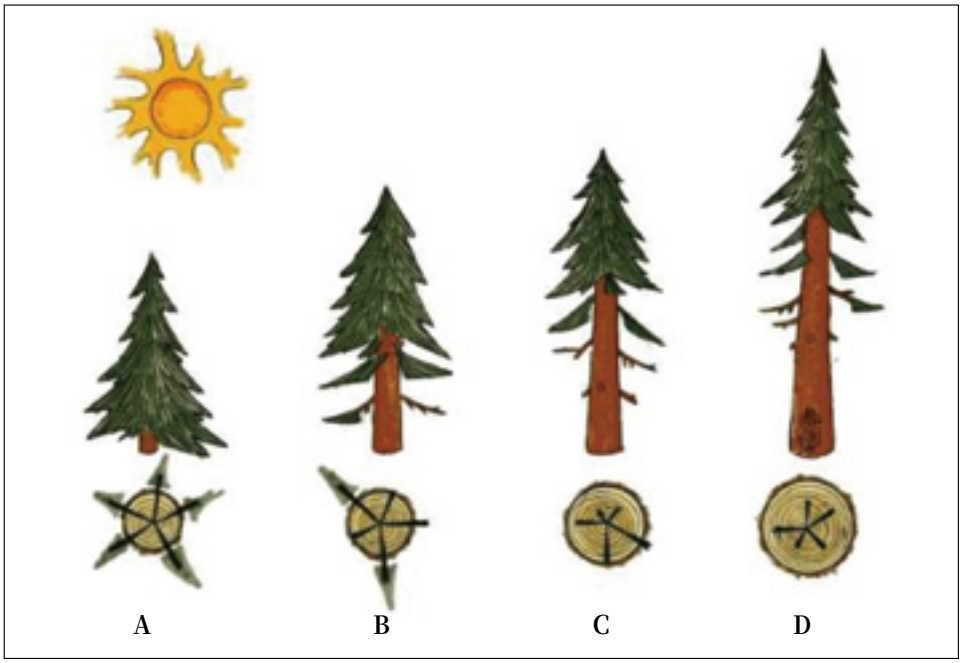
As time goes on growth in diameter of the trunk continues. Growth in the dead branch, however, has ceased. As a result, the fibres of the trunk fail to intergrow with those of the branch. Instead they terminate at the branch itself either partially or abruptly. If lumber is sawn from this area of the tree, it will result in not firmly fixed (loose) knots. The knots would be smallest in lumber sawn from the outer portion of the log, increasing in size as each cut is made until the point where the branch was alive is reached.

随着时间的推移，树干的直径会持续增加。然而，死亡的枝条已停止生长。结果，树干的纤维就无法与枝条的纤维交织生长。相反，纤维会在枝条的周围逐渐或突然终止。如果一块锯材是从树木的这一部分锯出，就会形成松动节。如果从原木的外围开始锯切，节疤最小；向内锯切，节疤尺寸会逐步变大，直至到达活节位置为止。

After a branch dies, it eventually casts or breaks off, leaving a projecting stub that is eventually covered over with new wood. From this point on the layers of wood added each year will be void of branches and, subsequently, when sawn into lumber will yield the high quality Clear Grades.

枝条死亡后会逐渐断开、脱落，留下的突出的残桩也会被新生的木材所覆盖。从这一点往外，每年新生的木材就不会再含有枝条，结果锯切出的锯材就是高质量的清材等级。

The development of clear wood fiber in trees
树木中清材木质纤维的发育



A - Open Grown Tree - live branches to the ground
全日照条件下生长的树木 - 活枝条直达地面

B - Canopy Closes in, lower branches start to die off
林冠开始郁闭，下部枝条开始死亡

C - Lowest dead branches break off and become stubs
最下部的枝条开始断落并形成残桩

D - Branch stubs grown over, first Clear lumber formed
枝条残桩被后续生长超过，清材开始形成

In dense mixed forest stands some trees are more tolerant to shade than others, and consequently, will retain a greater number of live lower branches, even under crowded conditions. Hemlock, for example, is a relatively tolerant tree.
在一个较密的混交林中，有些树种比其它树种耐荫，因此就会保持较多的下部枝条(即使在比较稠密的情况下)。例如，西部铁杉就是一个比较耐荫的树种。

Trees with low branches produce knotty lumber and trees with a long trunk free of branches would likely produce lumber free of knots on the outer portion of the trunk.
具有下部枝条的树会产出多节疤的锯材，而具有很长一段树干没有枝条的树则会在其原木的外围部分产出没有节疤的锯材。

Douglas Fir, on the other hand, is a rather intolerant tree; that is, it does not tolerate shade well and therefore grows rapidly upward to the light. As the lower branches become shaded by neighbouring trees they die and drop off.

相反，花旗松就是一个相对不耐荫的树种。也就是它不能忍耐遮荫，因而尽量快速向上增加高度。当低处的枝条被临近树木遮荫后，它们就会死亡并脱落。

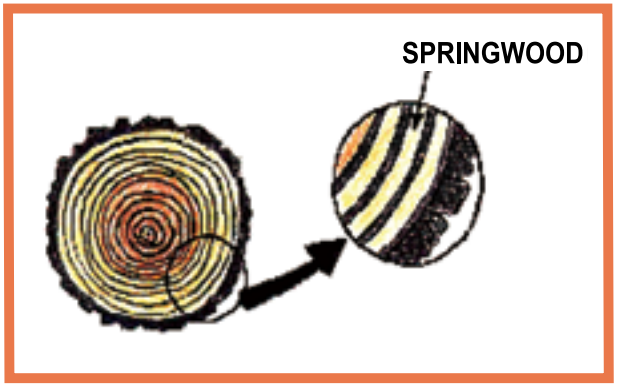
As a result, Douglas Fir and other intolerant trees tend to have long trunks devoid of branches and carry small crowns. This growth characteristic is an important factor in the development of clear lumber as the outer heartwood of the trunk of intolerant trees contains fewer knots that of tolerant trees.

结果就是，花旗松及其它不耐荫的树种通常会有较长的树干没有枝条，只有一个较小的树冠。这种生长特性是清材发育的重要条件。因而，不耐荫树种的心材的外层要比耐荫树种同部位的节疤数量少。

Growth in Diameter & Annual Rings
直径生长及年轮

Springwood versus Summerwood
早材与晚材

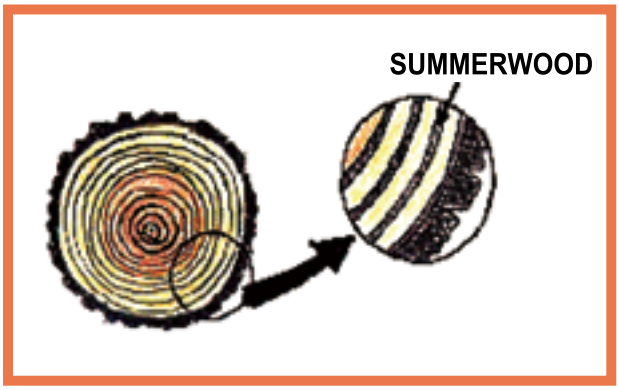
Springwood is the layer of wood cells formed during growth in the spring.
早材是春季形成的一层木质细胞。



Growth is most rapid resulting in wood cells with large cavities and thin walls.
这一时期的生长最为快速，导致木细胞的空腔较大、细胞壁较薄。

These less dense cells create a lighter colored band.
这些密度较低的细胞形成了一个颜色较淡的生长带。

Summerwood is the layer of wood cells formed during tree growth later in the season.
晚材是在树木生长季节的晚期形成的一层木质细胞。



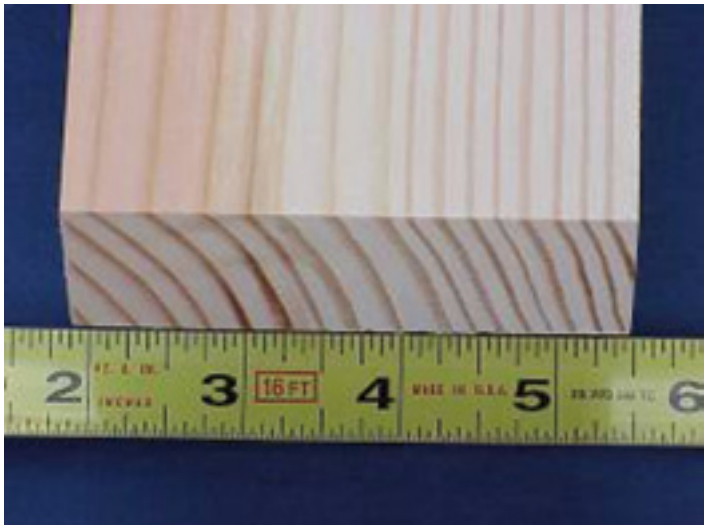
Growth is slower resulting in wood cells with small cell cavities and thick cell walls.
较慢的生长速度导致木细胞的空腔较小、细胞壁较厚。

These denser cells create a darker colored band.
这些密度较高的细胞形成了一个颜色较深的生长带。

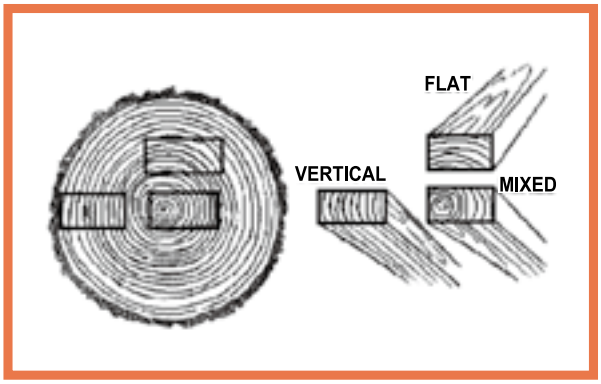
The heavy thick-walled Summerwood cells are stronger and denser than the thin-walled Springwood cells and therefore provide a good visual guide to the relative strength and density of the wood in question. The greater the Summerwood component the denser and stronger the lumber.
细胞壁较厚的晚材的强度和密度均大于细胞壁较薄的早材，因此它为目视判断木材的强度和密度提供了良好的指标。晚材的成分越高，木材的密度和强度越高。

Rate of Growth — is described and measured by the number of annual growth rings per inch as determined on the end section of a piece of lumber. Rate of Growth may also refer to the maximum permitted width of an annual ring as also seen on an end section. Rate of Growth requirements are often stated as part of a grading rule due to its impact on strength, texture, and appearance.

生长率 — 被描述为锯材一端每英寸年轮的数量。生长率也可以用锯材一端年轮的最大允许宽度来表示。由于它对强度、质地和外观的影响，生长率通常也被包括在分级规则之中。



Lumber Grain
锯材纹理



In the wood industry we use the word "grain" to describe wood fibres and their relative direction, size, appearance or quality.
在木材行业中，我们通常使用“纹理”一词来木纤维的相对方向、大小、外观和质量。

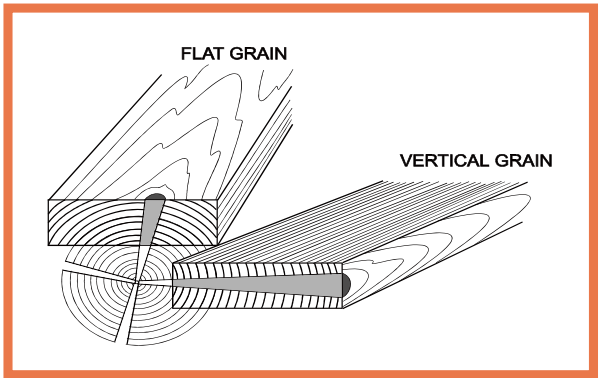
Flat Grain
平纹

- Lumber sawn so that all or some of the rings form an angle of less than 45 degrees with the surface of the piece.
  锯材中全部或部分年轮与锯材表面呈小于45度的角度。

- Results in contrast between the springwood and summerwood bands.
  导致早材和晚材之间的对比较大。

- Round knots are found on flat grain surfaces.
  平纹表面形成圆形节疤。

- Advantages include pleasing appearance in clear and knotty lumber and superior strength due to the lower displacement of round knots versus spike knots.
  优点包括，无论清材或节疤材都有令人愉快的外观，较高的强度(由于圆节的占据面积低于条状节的占据面积)。



Vertical Grain
直纹

- Lumber sawn so that all or some of the rings form an angle of greater than 45 degrees with the surface of the piece.
  锯材中全部或部分年轮与锯材表面呈大于45度的角度。

- Spike knots are found in vertical grain surfaces.
  直纹表面形成条状节疤。

- Advantages include less shrinkage, less warp, less raising of grain, less checking and better wearing properties.
  优点包括，收缩较小、扭曲较小、纹理突起较少、开裂较少以及耐磨性更好。

LUMBER CHARACTERISTICS
锯材缺陷(性状)

In grading lumber, wood characteristics are defined as any deviations from perfect wood structure. A thorough understanding of wood characteristics and terminology is necessary in order to understand and apply grading rules accurately.
在锯材分级中，木材缺陷(性状)被定义为任何与完美木材结构的偏离。为了理解和准确应用分级规则，对木材缺陷和术语的透彻了解是必不可少的。

For purposes of classification, wood characteristics can be divided into three broad groups.
从起源角度看，木材缺陷可被分为三大类型。

Natural
自然缺陷

Those caused by nature; that is, characteristics which occur or develop within the living tree.
由自然因素引起的缺陷，即那些在活着的树木中所形成的缺陷。

Manufacturing
加工缺陷

Those caused by equipment during manufacturing and handling.
那些在加工和操作过程中由设备所引起的缺陷。

Seasoning
干燥缺陷

Those caused by drying.
在干燥过程中所产生的缺陷。

Natural Growth Characteristics
自然生长缺陷

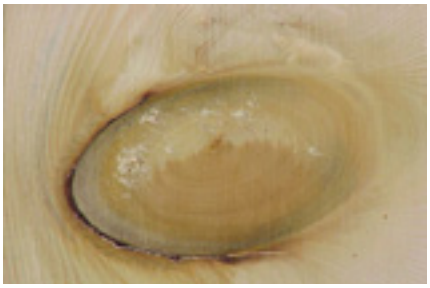
Knots
节疤

Knots Classified as to "Form"
以“形态”分类的节疤

Knots vary in form according to the degree or angle of length to which they are sawn.
节疤形状随着锯切方向与枝条长度方向的角度或度数的不同而变化。

Round Knot
圆节

A Round Knot is produced when the limb is cut at approximately right angles to the length of its axis. Round Knots are found on flat grain surfaces.
当枝条被几乎垂直于其长轴方向锯开时，则形成圆节。在平纹表面的节疤为圆节。



Oval Knot
椭圆节

An Oval Knot is produced when the limb is cut at slightly more than right angles to the length of its axis. Oval Knots are found on angled grain surfaces.
当枝条被以不垂直于其长轴方向锯开时，则形成椭圆节。在斜纹表面的节疤为椭圆节。

Spike Knot
条状节

A Spike Knot is produced when the limb is cut either lengthwise or diagonally to the length of its axis. Spike Knots are found on vertical grain surfaces.
当枝条被沿着其长轴或对角与方向锯开时，则形成条状节。在直纹表面的节疤为条状节。

Knots Classified as to "Size"
以“尺寸”分类的节疤

Knots in a tree increase in size as they extend outward form the pith to the bark. The NLGA defines knot sizes as:
在树木中，从髓心向树皮方向延伸，节疤的尺寸逐渐增大。NLGA将节疤尺寸分为以下类型：

A Pin Knot is not over 1/2"
针孔节疤小于1/2英寸

A Small Knot is over 1/2", but not over 3/4"
小节疤大于1/2英寸，但小于3/4英寸

A Medium Knot is over 3/4", but not over 1 1/2"
中节疤大于3/4英寸，但小于1 1/2英寸

A Large Knot is over 1 1/2"
大节疤大于1 1/2英寸

Knots Classified as to "Quality"
以“质量”分类的节疤

An Intergrown Knot (also referred to as a Red Knot) is a knot whose growth rings are partially or completely intergrown on one or more faces with the growth rings of the surrounding wood. An Intergrown Knot is cut from that part of the trunk where the branches are still living and thus having fibres intergrown partially (minimum 1/3 of circumference of one face) or wholly with the surrounding wood.
连生节(又称为红节)节疤的年轮和周围树木的年轮在一面上、或多个面上交织生长在一起。连生节是从树干上节疤仍活着的部位锯切下来的，因此节疤纤维(至少为圆周的1/3)和周围树木纤维交织生长在一起。

Intergrown knots generally reduce strength fully as much as knots that are Not Firmly Fixed (NFF) or Holes. Actually the weakening effect of most knots is not due to the knots themselves, as they are usually harder or more dense than the surrounding wood, but rather due to the deflection of grain which occurs around the knot.
连生节对强度的损害与松动节或节孔完全一样。事实上，节疤通常比周围木材更坚硬、更致密，它们对强度的损伤作用并不是由于它们本身，而是由于它们引起周围的纹理发生偏斜。

A Sound Knot is a knot that contains no decay. It may be red or black.
健全节不含有任何腐朽。它可以是红节或黑节。

A Tight Knot is a knot that is so fixed by growth, shape or position that it retains its place in the piece. It may be red or black.
固定节是由于其生长状况、或形状、或位置的原因而被固定在其所在位置。它可以是红节或黑节。

Although a Sound Knot and a Tight Knot are defined separately, it will be found that in some grades, the two definitions are combined; ie "Sound and Tight".
虽然健全节和固定节有各自的定义，但可以发现，在一些等级中，这两者被组合在一起，例如：“健全固定节”。

A Loose or Not Firmly Fixed Knot (NFF) is a knot that is not held tightly in place by growth, shape or position. This type of knot, although it is in its place at the time of inspection, cannot be relied upon to retain its place in the piece. It usually has a film of pitch or bark encompassing it and will separate from the wood surrounding it as drying takes place.
松动节或非紧密固定节(NFF)由于其生长、形状和位置的原因没有被固定在其所在位置。这类节疤，虽然在检验分级的时候它仍在所在位置，但不能保证它会一直保持在所在位置。通常，它们被一层树脂或树皮所包围，但干燥时就会与周围的木材组织分离。

An Encased Knot (also referred to as a black knot) is a knot that is surrounded with pitch or bark and is not intergrown with the growth rings of the surrounding wood.
包裹节(又称黑节)被树脂或树皮所包围，与周围木的年轮没有交互生长在一起。

A Fixed Knot is a knot that will retain its place in dry lumber but can be moved under pressure though not easily pushed out.
固着节在干燥木材中会保持在其所在位置，在压力下可被移开(虽然不易推出)。

An Unsound Knot is a knot that contains decay.
腐朽节包含腐朽。

A Star Checked Knot is a knot that contains seasoning checks, usually occurring from the pith to the edge of the knot.
星裂节有辐射状干燥裂缝，通常从节疤的髓心延伸至边缘。

A Firm Knot is a knot that is solid across its face but contains incipient decay.
结实节表面坚固但是包含早期腐朽。

Knots Classified as to "Occurrence"
以“存在状态”分类的节疤

A Knot Cluster is two or more knots grouped together as a unit with the fibres of the wood deflected around the entire unit.
丛生节是两个或多个节疤组合成一个单位，其周围的木纤维围绕整个单位偏转。

Well Scattered Knots are knots not in clusters, but each knot shall be separated from any other by a distance at least equal to the diameter of the smaller of the two knots.
散生节是节疤不以丛生节的方式存在，每个节疤均与另外的节疤分开，其间距至少等于两节疤中较小节疤的直径。

Well Spaced Knots means that the sum of the sizes of all knots in any 6" of length of a piece must not exceed twice the size of the largest knot permitted. More than one knot of maximum permissible size must not be in the

same 6" of length and the combination of knots must not be serious. This term is only applied to stress grades.
良好分布节是指在一块锯材的任意6英寸长度内的节疤尺寸总和必须小于可允许最大节疤尺寸的两倍。在同一个6英寸长度内，不可以出现一个以上的尺寸为最大允许尺寸的节疤，节疤的组合必须不严重。这一名词只用于应力等级中。

Holes
孔洞

Holes either extend partially or wholly through a piece and may be from any cause. Holes that extend only partially through a piece may also be designated as "Surface Pits" or "Slough Knots". Unless otherwise specified, Holes are measured the same as knots, but are limited to size and/or number as specified for the respective grades.
孔洞 — 孔洞可能贯穿或未完全贯穿锯材。未完全贯穿锯材的孔洞的另外一个名称为表面凹坑或边缘脱节。除非特别说明，孔洞的测量方法与节疤相同，其限定的大小和尺寸取决于相关的等级。

Holes Classified as to "Size"
以“尺寸”分类的孔洞

A Pin Hole is approximately 1/16" in diameter
针孔直径不超过1/16英寸

A Medium Hole is not over 1/4" in diameter
中(小)孔直径不超过1/4英寸

A Large Hole is not over 1" in diameter
大孔直径不超过1英寸

A Very Large Hole is over 1" in diameter
特大孔直径超过1英寸

A Knot Hole is a hole resulting from the loss of the knot in a piece of lumber.
节孔是锯材上节疤脱落后留下的孔洞。

A Slough Knot is a corner knot hole running from one wide face into the adjoining narrow face and measured by taking the average of its measurement on the wide face.
边缘脱节是指从宽面延伸到相邻窄面的边缘节孔，其尺寸是其在宽面上测量值的平均值。

Pin Holes (Ambrosia Beetle holes) are holes that appear in lumber usually as small black holes about 1/16" in diameter. This beetle's activities are mostly confined to the Sapwood in wood. The heartwood is seldom attacked. Felled logs in the woods is most susceptible to attack, particularly if left for any length of time when the insects are in the egg laying stage of their life cycle. These small holes do not materially affect the strength of the lumber but do affect te appearance in some grades.
针孔虫眼(安布柔思亚甲虫孔)通常以1/16英寸大小的小黑孔出现在锯材上。甲虫的活动主要局限于边材，心材很少会受到侵蚀。林中的倒木最易受到侵扰，尤其是在甲虫的产卵期。这些小孔对强度没有实质性的影响，但在一些等级中对外观有影响。

Grub Holes are holes that are much larger in diameter than pin holes and are more serious when strength is considered. The holes made by wood boring grubs are oval or circular in cross section and are found chiefly in felled timber left too long in the woods. At times penetration is quite deep into the heartwood of the tree. Grubs may also infest living trees and fire-killed timber. Grub holes are easily recognized by the fact that the cavities are filled with powder boring excrement similar to fine sawdust.

虫孔是比针孔虫眼直径大很多的孔洞，对强度的影响也较严重。在锯材的横切面上，这些由钻孔昆虫所引起的孔洞通常呈椭圆形或圆形。它们一般是由于伐倒木在林分中放置过久所引起。很多时候，虫孔可以深入到心材之中。这类昆虫也可以侵染活树或火烧木。虫孔很容易判别，因为孔洞中充满锯屑样的昆虫钻孔排泄物。

Teredo Holes are holes caused by marine borers which attack logs stores in salt water. The holes are usually larger in size to holes made by grubs. The two can be distinguished very easily by the fact that the teredo leaves a clean cut hole, uniformly circular in cross section and very rarely, if ever, showing boring excrement. Frequently the walls of the holes are covered with a chalky white calcium substance.

海虫孔是由海水中钻孔虫侵袭储存在海水中的原木所致。其孔径通常大于虫孔。两者的区别很明显，海虫孔为光洁的孔，在横切面上通常为均一的圆形，而且很少会含有钻孔排泄物。在孔壁上，常常会出现白色的、石膏质的钙沉积物。

Pitch Streaks
树脂斑

Pitch Streaks are areas where an accumulation of resin has saturated the wood fiber. A Pitch Streak is a well-defined accumulation of pitch in the wood cells in streak form.

树脂斑是木材纤维被积累的树脂所饱和的一块区域。树脂斑通常为斑状、界限清晰的树脂积累区。

Pitch Streaks should not be confused with dark grain. Pitch Streaks are described as follows, with equivalent areas being permissible.

不应将树脂斑与深色纹理相混淆。树脂斑划分方法如下，允许按面积进行等效换算。

Very Small Pitch Streak - 3/8" in width and 15" in length
非常小树脂斑宽度为3/8英寸，长度为15英寸

Small Pitch Streak - 1/12 the width and 1/6 the length of the piece
小树脂斑宽度为锯材宽度的1/12，长度为锯材长度的1/6

Medium Pitch Streak - 1/6 the width and 1/3 the length of the piece
中等树脂斑宽度为锯材宽度的1/6，长度为锯材长度的1/3

Large Pitch Streak is not over 1/4 the width and 1/2 the length of the surface
大树脂斑宽度不超过锯材宽度的1/4，长度为锯材表面长度的1/2

Very Large Pitch Streak is over 1/4 the width and 1/2 the length of the surface
非常大树脂斑宽度超过锯材宽度的1/4，长度为锯材表面长度的1/2

Pockets
树脂/皮囊

Pockets are well defined openings between the annual growth rings which develop during the growth of the tree, usually containing liquid or granulated pitch or bark.
树脂/皮囊是在树木生长时形成的年轮之间轮廓清晰的开口。通常包含液体或颗粒状的树脂或树皮。

Classification of pockets as to name and size are as follows with equivalent areas being permissible:
树脂/皮囊的名称和大小分类如下，允许按面积进行等效换算。

Very Small Pocket	1/16" in width and 3" in length or 1/8" in width and 2" in length
非常小树囊	宽度1/16英寸，长度3英寸或者 宽度1/8英寸，长度2英寸
Small Pocket	1/16" in width and 6" in length or 1/8" in width and 4" in length or 1/4" in width and 2" in length
小树囊	宽度1/16英寸，长度6英寸，或者 宽度1/8英寸，长度为4英寸，或者 宽度1/4英寸，长度2英寸
Medium Pocket	1/16" in width and 12" in length or 1/8" in width and 8" in length or 3/8" in width and 4" in length
中树囊	宽度1/16英寸，长度12英寸，或者 宽度1/8英寸，长度8英寸，或者 宽度3/8英寸，长度4英寸
Large Pocket	is not over 4 square inches in area
大树囊	面积不超过4平方英寸
Very Large Pocket	is over 4 square inches in area
非常大树囊	面积超过4平方英寸

Pitch or Bark Seams
树脂或树皮缝

A Pitch or Bark Seam is a shake or check which contains pitch or bark. No size classifications are laid down, however, seams are permitted in the various grades according to their effect on the piece.
树脂或树皮缝为包含树脂或树皮的裂缝。对它们没有明确的划分标准。根据其影响，允许它们在不同的等级中出现。

Shake
轮裂

Shake is a lengthwise separation of the wood which develops in the standing tree and usually occurs between or through the annual growth rings. Often more than one separation is present at times, not following the fibres but running across at an angle to the grain in a series of fine separations that are actual ruptures of the fibres.
轮裂是在年轮之间或穿过年轮的、沿长度方向的木材组织分离。通常，一条以上的开裂会同时出现，不是顺着纤维，而是一组小开裂以一定角度穿过纹理。这实际上是纤维的断裂。

Light Shake 轻度轮裂	is not over 1/32" wide 宽度不超过1/32英寸
Medium Shake 中等轮裂	is not over 1/8" wide 宽度不超过1/8英寸
Surface Shake 表面轮裂	occurs on only one surface of a piece 仅出现在一个表面
Through Shake 贯通轮裂	extends from one surface of a piece to the opposite or to an adjoining surface 从锯材的一个表面延伸到对面或相邻表面
Pith Shake 髓心轮裂	extends through the growth rings from or through the pith towards the surface of a piece, and is distinguished from a seasoning check by the fact that its greatest width is nearest the pitch whereas the greatest width of a season check in a pith-centered piece is farthest from the pith. 始于或穿过髓心、并穿过年轮延伸至表面。与干燥裂缝显然不同的是，髓心轮裂的最宽处接近髓心，而干燥裂缝的最宽处在含髓心的锯材上离髓心最远。
Ring Shake 环型轮裂	occurs between the growth rings to partially or wholly encircle the pith 出现在年轮之间、部分或全部环绕髓心

Stained Sapwood
边材变色

Sometimes known as "Blue Stain" is a variation from the natural colour of the sapwood. It has no effect on the utility of pieces in grades where permitted. It does not reduce the strength of wood. It may be sorted into three classes according to its affect on appearance.
有时称为“蓝变”，是颜色偏离边材自然颜色的一种现象。在允许边材变色的等级中，不会影响锯材的用途。它也不会降低木材的强度。根据它对外观的影响，可以分外三个等级。

Light Stained Sapwood is so slightly discoloured that it does not materially affect natural finishes.
轻度边材变色的变色很轻微，对表面无色涂层没有影响。

Medium Stained Sapwood has a pronounced difference in colouring which sometimes affects its usefulness for natural finishes but not for paint finishes.
中等边材变色在颜色上显著不同，有时对表面无色涂层有影响，但对油漆表面不会有影响。

Heavy Stained Sapwood has such a pronounced difference in colour that the grain may be obscured by the stain. Lumber with heavy stain is acceptable for paint finishes.
严重边材变色在颜色上有显著不同，使得木纹变得模糊，但经油漆表面后尚可接受。

Stained Heartwood is a marked variation from the natural colour. It may range from pink to brown. It should not be confused with natural red heart. Natural colour is usually uniformly distributed through certain annual rings, whereas stains are usually in irregular patches. In grades where it is permitted, it has no more effect on the intended use of the piece than other characteristics permitted in the grade.
心材变色与心材的自然颜色显著不同。颜色从粉红到褐色不等。不应与自然红心混淆。自然颜色通常在一些年轮中均匀分布，而变色通常分布不规律。在允许心材变色的等级中，它对该锯材使用性能的影响不应大于该等级所允许的其它缺陷。

Decay (Unsound Wood)
腐朽

Decay (unsound wood) is disintegration of wood substance due to the action of wood-destroying fungi. It is also known as 'rot'.
腐朽是由于蛀蚀木材的真菌所造成的木质瓦解，也称为腐烂。

The early or incipient stage is followed by the advanced stage of Decay, during which the cell walls show evidence of breaking down and the tissue definitely changes in appearance. Depending on the type of fungus and the manner in which it works, the decayed wood becomes spongy, pitted or ring-shaped; its natural colour, texture and odour are altered; and its strength properties are definitely affected. Decay in any form is either severely restricted or prohibited in strength grades because its extent is difficult to determine and its effect on strength is often greater than it appears on the surface of a piece of lumber.
早期或初始腐朽后，木材的腐朽进一步发展。在这一阶段，细胞开始出现破碎，组织的外观也出现明显的变化。依据真菌种类和其侵蚀方式的不同，腐朽的木材会变成海绵状、凹痕状或环状；其自然的颜色、质地和气味也会改变；强度也必然受到明显影响。由于其范围很难确定、而且它对锯材强度的影响通常要比其外观显露出来的要大，所以在强度等级中，腐朽受到严格限制甚至完全禁止。

Fungi which cause Decay are in common with other members of the plant kingdom to which they belong as they require for their development, food, air, moisture and suitable conditions of temperature.
与植物界的其它生物一样，引起腐朽的真菌在其发展过程中需要养分、空气、水分和合适的温度。

Food
- Wood-inhabiting fungi find food suitable for the requirements in cellulose, lignin and other chemical components of the cell walls and food reserves contained in the wood tissue.

养分
- **栖息于木材中的真菌可以从下列成分中获得所需要的养分：细胞壁中的纤维素、木质素及其它化学成分，以及储存于木材组织中的养分。**

Air - Wood destroying fungi require oxygen in order to maintain life.
空气 - 侵蚀木材的真菌需要空气以维持生命。

Moisture - Fungi must be provided with a moderate amount of moisture.
水分 - 真菌需要适量的水分。

Temperature - Wood destroying fungi find favorable conditions for growth in open areas during the season when trees and other plants are in active growth.
温度 - 有利于侵蚀木材的真菌生长的条件是：树木和其它植物活跃生长的季节、空旷地。

Incipient Decay
早期腐朽

Incipient Decay is an early stage of Decay in which disintegration of the wood fibres has not proceeded far enough to soften or otherwise change the hardness of the wood perceptibly. It is usually accompanied by a slight discoloration or bleaching of the wood. Heartstain is a form of Incipient Decay.
早期腐朽是处于早期阶段的腐朽，这时木纤维的瓦解没有发展到足以软化、或明显改变木材硬度的程度。通常伴随着木材的轻微变色或褪色。心材变色就是一种早期腐朽。

White Specks
白斑朽

White Specks are small white or brown pits or spots in wood caused by the fungus "Fomes Pini" and is filled partially or wholly with a white cellulosic substance. It only develops in the living tree and does not develop further in service. The size of each White Speck varies from one-quarter of an inch to one inch long, and are about a sixteenth of an inch wide, with their length parallel to the grain of the wood.
白斑朽是由真菌“ fomes pini ”引起的白色或黄色小坑或斑点，其中被部分或全部填充有白色纤维状物质。它仅形成于正在生长的树木中，而在使用中的木材中它不再继续发展。白斑的长度约为1/4英寸至1英寸不等，宽度大约为1/16英寸，其长度方向平行于木材纹理。

Honeycomb
蜂窝朽

Honeycomb is similar to White Speck but the pockets are larger, more numerous and running together. Where permitted in the Rules, it is so limited that it has no more effect on the intended use of the piece than other characteristics permitted in the same grade. Pieces containing Honeycomb are no more subject to Decay than pieces which do not contain it.
蜂窝朽与白斑朽相似，但是孔洞更大、数量更多，而且连在一起。当规则中允许某等级含蜂窝朽时，会对它有所限制，以使它对该等级锯材目标用途的影响不大于其它可允许缺陷。包含蜂窝朽的锯材不会比没有蜂窝朽的锯材更容易发生新的腐朽。

Peck
袋状朽

Peck is channeled or pitted areas or pockets found in Cedar and Cypress. Wood tissue between areas of

Peck remain unaffected in appearance and strength. All further growth of the fungus causing peck ceases after the tree is felled.

袋状朽是在西部红柏和黄柏中可见的条状凹形或囊状腐朽。处于几个袋状朽之间的木材组织的外观和强度不受影响。在树被砍伐后，引起袋状朽的真菌会停止进一步发展。

Wane

钝棱

Wane is bark or lack of wood from any cause - except eased edges - on the edge or corner of a piece of lumber.

钝棱是在锯材的边缘和角落带有树皮或其它因任何原因造成的木材缺损(人为圆角除外)。

Manufacturing Characteristics
加工缺陷

Manufacturing Characteristics occur as a result of the manufacturing process.
加工缺陷是加工过程中出现的现象。

Tolerance in Sawing
锯切公差

In the normal manufacturing process, some rough pieces may deviate from the intended line of cut. However, it shall be the intention to manufacture such lumber full size. Unless otherwise specified and in reference to NLGA Rules Para 747, an occasional piece may have the full tolerance in sawing, which at the time of manufacture, is as follows:
在正常的加工过程中，一些毛面的锯材可能会与要求的切割线有偏差。但是，加工中的目标是尽量将锯材锯切成规定尺寸。根据NLGA规则747款，如果没有另外明确说明，在加工过程中，一块随机的锯材可以允许的最大锯切公差为：

Nominal Size 名义尺寸	Under负公差	Over正公差
Under 2" — 小于2英寸	1/16英寸	1/8英寸
2" and larger not including 5" — 2英寸及以上，不含5英寸	1/8英寸	1/4英寸
5" and larger not including 8" — 5英寸及以上，不含8英寸	3/16英寸	3/8英寸
8" and larger — 8英寸及以上	1/4英寸	1/2英寸

Full Sawn
足尺锯切

When specified, to be "Full Sawn" lumber may be manufactured to the oversize tolerance but may not be undersize at time of manufacture.
当标明为“足尺锯切”时，在加工中，锯材只能加工成正公差而不能为负公差。

Saw-Sized
定尺锯切

Saw-Sized Lumber is lumber uniformly sawn to the standard surface size but permitting in 20% of the pieces a manufacturing tolerance of 1/32" under, in addition an oversize tolerance of 1/8" is permitted.
定尺锯切是指锯材被均一地锯切为规定的表面尺寸，但允许总片数的20%有1/32英寸的负公差；此外，允许有1/8英寸的正公差。

Sized Dimension
定尺规格

"Sized Dimension Lumber" is lumber uniformly manufactured to the net surfaced sizes and may be rough, surfaced or partially surfaced on one or more faces.
“定尺规格锯材”是指被均一地加工至净刨光面尺寸的锯材，它们可以是毛面的、刨光面、或某一面或数面是部分刨光的。

When opposing faces are rough a variation oversize of 1/32" is permitted in No 2 & Better and Standard & Better and in addition a variation of 1/32" undersize in 20% of the pieces is permitted. In Stud, Utility and No 3 a variation of 1/16" over or under is acceptable in 20% of the pieces. When opposing faces are rough, grade stamps on Sized Dimension lumber must be identified with Sized (SZD).
当反面为毛面时，在2级及以上和标准级及以上中，允许有1/32英寸的正公差，此外允许总片数的20%有1/32英寸的负公差。在墙柱级、实用级和3级中，允许总片数的20%有1/16英寸的正负公差。当反面为毛面时，定尺规格锯材的等级章中必须包括“ SZD ”字样。

Skip
漏刨

Skips are areas on a piece of lumber that failed to surface smooth and clean.
漏刨是指锯材表面的一些区域没有被刨削至平整光洁。

Skips in Dressing are areas that the planer knives failed to touch in the finishing process. This could be caused by scant sawing (insufficient thickness or width) or variations in sawing from the intended line of cut.
漏刨是在表面加工过程中，刨刀未能接触到的部分表面。这可能是由于锯切不足尺(厚度或宽度不够)，或锯切时偏离了锯路。

Hit and Miss means a series of Skips not over 1/16" deep with surfaced areas between (may be 4' in length).
间隔漏刨为一系列的漏刨，漏刨深度不大于1/16英寸，漏刨面之间夹有刨光面(长度可为4英尺)。

Hit or Miss means completely surfaced or partially surfaced or entirely rough. Scantness may be 1/16".
连刨或连漏为完全刨光，或部分刨光、或全部未刨光(毛面)。缺尺可为1/16英寸。

Trim
截锯

Trimming of Lumber is the act of cross-cutting a piece to a given length.
截锯是将一块锯材横向锯切到一定长度。

Double End Trimmed is lumber trimmed square on both ends. The out-of-square tolerance is limited to 1/16" for each nominal 1" of thickness or width.
两端截齐为锯材的两端被截齐成方形。每1英寸名义厚度或宽度，不成正方形的容许值为1/16英寸。

Precision End Trimmed is lumber trimmed square on both ends to uniform lengths with a manufacturing tolerance of 1/16" over or under in length in 20% of the pieces.
端头精确截齐指锯材的两端被修整成正方形，长度相同，长度加工的正负误差小于1/16英寸，出现误差的片数低于20%。

Square End Trimmed is lumber trimmed square having a manufacturing tolerance of 1/64" for each nominal 2" of thickness or width.
端头正方截齐为锯材的两端被修整成正方形。每2英寸名义厚度或宽度，加工的允许误差为1/64英寸。

Trimmed length: unless otherwise stated in the contract of purchase, all lumber under these rules is trimmed for the removal of sniped, splintered or uneven log ends. It must be trimmed full to the length specified and if 2" and thinner, not more than 3" over length, 3" and 4", not more than 4" over length, 5" and thicker not more than 6" over length.

截齐长度除非在合同中特别注明，依照规则生产出售的锯材均已截齐并去除断裂、开裂或不平整的原木端头。它们必须被足尺截齐到规定长度，如果厚度小于2英寸，超长部分应小于3英寸；如果厚度为3英寸和4英寸，超长部分应小于4英寸；如果厚度大于5英寸，超长部分应小于6英寸。

Improper Trimming occurs when a piece of lumber is trimmed under or excessively over the standard length or when a piece is cut at any angle which exceeds the provisions for reasonably square.

不当截齐指截齐后的锯材长度低于或超过标准长度，或端头被切成斜角且度数超过规定要求。

Dog Holes
钩孔

Dog Holes are holes occurring as a result of handling logs or cants by dogs, tongs, turners or other such equipment. Since Dog Holes are not mentioned in the Grading Rules, their damaging effect must be considered as equivalent to other characteristics permitted and the piece graded accordingly.

钩孔指在原木或方胚在加工时被钉钩、夹钩、翻转钩或其它类似设备所损伤而产生的孔洞。在锯材分级规则中，钩孔没有被明确规定，它对锯材的破坏影响，应根据等效的其它缺陷来评价。

Torn Grain
刨撕

Torn Grain consists of small pieces of the wood fibre being torn out in dressing below the line of surfacing. It usually occurs around knots; in spiral or diagonal grain pieces or in pieces having irregular growth. It may also result from the chip breaker being too far away from the planer knives or from running stock too rapidly through the planning machine for the number of knives in the planer heads.

刨撕是指在锯材刨光中，刨光面下的的木材纤维被撕裂形成的沟痕。这一现象容易出现在节疤周围、螺旋纹理、对角纹理和生长不规则处。也可以是由于刨花粉碎器离刨刀太远、或材料通过刨刀的速度太快(相对而言刀片数量太少)而产生的。

Improper kiln drying can also contribute to Torn Grain. Torn Grain can, to a large degree, be prevented. It is classified as very light, light, medium, heavy and very heavy.

不适当的窑干也会导致刨撕的发生。刨撕在很大程度上是可以避免的。它可以被分为五个等级：轻微、轻度、中等、严重、非常严重。

Loosened Grain
松脱纹理

Loosened Grain is a grain separation or loosening between springwood and summerwood without displacement.

松脱纹理是在早晚材之间发生的纹理分离或疏松现象，尚没有发生错位。

Raised Grain
凹凸纹理

Raised Grain is an unevenness between springwood and summerwood on the surface of dressed lumber in which the hard summerwood is raised above the softer springwood but not torn loose from the piece. It is classified as very light, light, medium, and heavy.

凹凸纹理是指刨光锯材的表面，早晚材之间的凹凸不平现象。较硬的晚材部分凸出于较软的早材之上，但尚没有发生松脱。凹凸纹理分为：轻微、轻、中等、严重。

Torn, Loosened and Raised Grain	刨毛表面、松脱纹理、凹凸纹理
Very Light，轻微	1/64 英寸
Light，轻度	1/32 英寸
Medium，中等	1/16 英寸
Heavy，严重	1/8 英寸
Very Heavy，非常严重	>1/8 英寸

Knife Marks
刀痕

Knife Marks are the imprints or markings of the machine knives on the surface of dressed lumber. Very slight Knife Marks are visible only from a favourable angle and are perfectly smooth to the touch. Slight Knife Marks are readily visible but evidence no unevenness to the touch; may be caused by improper jointing or setting of the planer knives.

刀痕是指刨刀在刨光锯材的表面上留下的痕迹。非常轻微的刀痕仅在适当视角才可以观察到，但触摸时感觉完全光滑。轻度的刀痕容易观察到，但触摸表面时，没有明显的不平整。刀痕是由于刨刀连接和安装不当所致。

Machine Burn
机械灼焦

Machine Burn is a darkening of the wood due to overheating by machine knives or rolls when pieces are stopped in the machine while the cutter heads are turning, or by feed rolls revolving on one spot.

机械灼焦是指在加工过程中，锯材被卡住、而刀具或进料辊在某一固定位置上一直旋转，致使木料局部温度过高而发生的锯材表面灼焦变黑。

Machine Bite
机啃

Machine Bite is a depressed cut of the machine knives at the end of the piece and is usually caused when the bed or tail plate is not properly lined up in the horizontal position.

机啃是刀具在锯材端头过分刨切所形成的凹陷，通常是由于机床或出料台未能安装在同一水平面上所致。

Sawcuts
锯缝

As a defect this refers to an unintended sawcut somewhere along the intermediate length of the piece. Sawcuts are generally perpendicular to the length of the piece of lumber and are usually caused by a malfunctioning trimsaw (retracting too slowly, or extending too soon etc).

锯缝是指在锯材中间某一位置出现的意外锯缝。锯缝通常垂直于锯材的长度方向，一般是在截锯时的误操作所造成(缩回太慢或伸出太快等)。

Sawcuts may occur in two ways:

(1) the cut passes completely through the thickness and extends across a portion of the width; or

(2) the sawcut does not pass completely through the thickness however it may extend partially or completely across the width

锯缝可能有两种情况：

(1) 锯缝在锯材的厚度方向上贯通，但在宽度方向上没有贯通；或

(2) 锯缝在厚度方向上没有贯通，在宽度上完全或不完全贯通。

Mismatched Lumber
偏斜锯材

Mismatched Lumber consist of pieces that do not fit tightly at all points of contact between adjoining pieces or in which the surfaces or adjoining pieces are not in the same plane. Mismatching can occur for a number of mechanical reasons. A common cause of this defect - not mechanical - is when a sliver becomes caught in the bed of the machine, causing tilting of the piece of lumber when passing over it.

偏斜锯材中，它们与相邻木料之间，不是所有的点都紧密接触，也就是两个相邻锯材的接触面不在同一平面上。偏斜的情况可以由多中机械原因造成。一个常见的原因是，非机械性的，当一片较细的锯材在通过刀具时被卡在加工台面上，就会产生偏斜。

Machine Gouge
机械沟槽

Machine Gouge is a groove cut by the machine below the desired line of cut, across the full width of the face and usually an inch or so in length, sometimes associated with machine burn.

机械沟槽是指由机器导致的、在加工线以下的凹槽，横跨锯材的整个宽面，长度通常为1 英寸左右，有时还伴随机械灼焦现象。

Chip and Saw Channel
边缘锯陷

A Chip and Saw Channel (Rabbeted Edge) is a channel or recess cut out of the edge or edges along the length of a piece of lumber caused by mis-aligned chipper heads.

边缘锯陷是指在锯材一侧或两侧、沿长度方向出现的条状凹形槽，是由于刨片机刀头对边不齐所引起的。

Double Arbour Saw - Steps
阶梯状偏移

A Double Arbour Saw - Step occurs when two opposing saws are mis - aligned in a double arbour saw setup. Commonly referred to as "Stepping".

如果双轴锯的上下锯片未能对齐安装，两锯片从两侧锯切同一锯材时就会产生阶梯状偏移，俗称“爬阶”。

Seasoning Characteristics
干燥缺陷

Checks
干裂

Checks are small lengthwise separations of the wood normally occurring across or through the rings of annual growth and are caused by rapidly evaporating the moisture from the surface. To illustrate; when green lumber is exposed to the sun, the moisture is evaporated rapidly from the surface, while the centre (core) of the board is still saturated, causing the surfaces to contract around an unshrinking interior, resulting in surface checking. Checking can be controlled by slower and more even seasoning (drying), whether the lumber is in the yard or in the dry kiln.

干裂是指沿锯材长度方向的、细小的木质分离，通常垂直或穿过年轮，是由于木材表面水分蒸发过快所导致。可描述为，当湿材暴露在阳光下时，其表面水分快速蒸发，而内部的含水率仍然处于饱和状态，在内部未收缩的情况下出现表面收缩，从而产生表面裂缝。无论在堆场还是在干燥窑中，都可以通过减缓和均匀干燥，来控制干裂的发生。

Roller Checks
卷压裂缝

A Roller Check is a crack in the wood structure caused by a piece of cupped lumber being flattened in passing between the machine rollers.

卷压裂缝是瓦弯木材被放置在机器卷轴之间压平时、在木材结构中所产生的裂缝。

Split
劈裂

A Split is a lengthwise separation of the wood due to the tearing apart of the wood cells. It is commonly caused by severe checking on the ends or by pressure in the planer on a cupped board.

劈裂是由于木细胞撕裂而造成的、长度方向的、木材组织分离，通常是由端头的严重干裂，或刨光机压迫瓦弯木材所引起的。

Warp
翘曲

Warp is any deviation from a true or plan surface, including bow, crook, cup and twist or any combination thereof. Warp restrictions are based on the average form of Warp as it occurs normally, and any variation from this average form, such as short kinks, shall be appraised according to its equivalent effect. Pieces containing two or more forms shall be appraised according to the combined effect in determining the amount permissible. Warp is classified as very light, light, medium, and heavy, and applied to each width and length as set forth in the various grade in accordance with the provisions and tables in the NLGA Para 752.

翘曲是任何与真实或平整表面的偏差，包括平弯、侧弯、瓦变和扭曲或它们的组合。对翘曲的限制是根据正常状态下翘曲的平均形态所制定的；如果出现任何与平均形态不同情况，例如短扭结，应按照等效原则对其进行评估。包含两个或多个翘曲形态的，应按照它们的综合效果进行评估，从而确定可允许的量。翘曲被分成非常轻微、轻微、中等和严重等几类，适用于不同等级不同宽度和长度(NLGA752款规定)。

Cup
瓦弯

Cup is a deviation in the face of a piece from a straight line drawn from edge to edge of a piece.
瓦弯是锯材表面与从一边至另一边所划直线的偏差。

Crook
侧弯

Crook is a deviation edgewise from a straight line drawn from end to end of a piece and is measured at the point of greatest distance from the straight line.
侧弯是锯材侧面与从边缘一端至另一端所划直线的偏差。侧弯的测定是以离直线最远的点计算。

Bow
平弯

Bow is a deviation flatwise from a straight line drawn from end to end of a piece and is measured at the point of greatest distance from the straight line. It does not include short kinks.
平弯是锯材平面与从一端至另一端所划水平方向直线的的偏差。平弯的测定是以离直线最远的点计算。平弯中不包括短扭结。

Twist
扭曲

Twist is a deviation flatwise, or a combination of flatwise and edgewise, in the form of a curl or spiral, and the amount is the distance an edge of a piece at one end is raised above a flat surface against which both edges at the opposite end are resting snugly.
扭曲是水平偏差、或水平偏差和边缘偏差的组合，以卷曲或螺旋形态出现。扭曲量是指当一个端顶的两边均贴地平放时，另一端的边缘离开水平面的距离。

Collapse, Casehardening or Honeycombing
皱缩、表面硬化或蜂窝裂

Collapse, Casehardening, and Honeycombing are caused by the lumber being subjected to improperly controlled temperatures during kiln drying.
皱缩、表面硬化和蜂窝裂都是由于在窑干过程中温度控制不当所引起的。

Collapse
皱缩

Collapse is the severe distortion of single cells which may occur in wood during the early stages of drying. Evidenced by caved-in appearance of the surface of the lumber.
皱缩是在锯材干燥早期出现的严重细胞变形，锯材表面呈现下陷的现象。

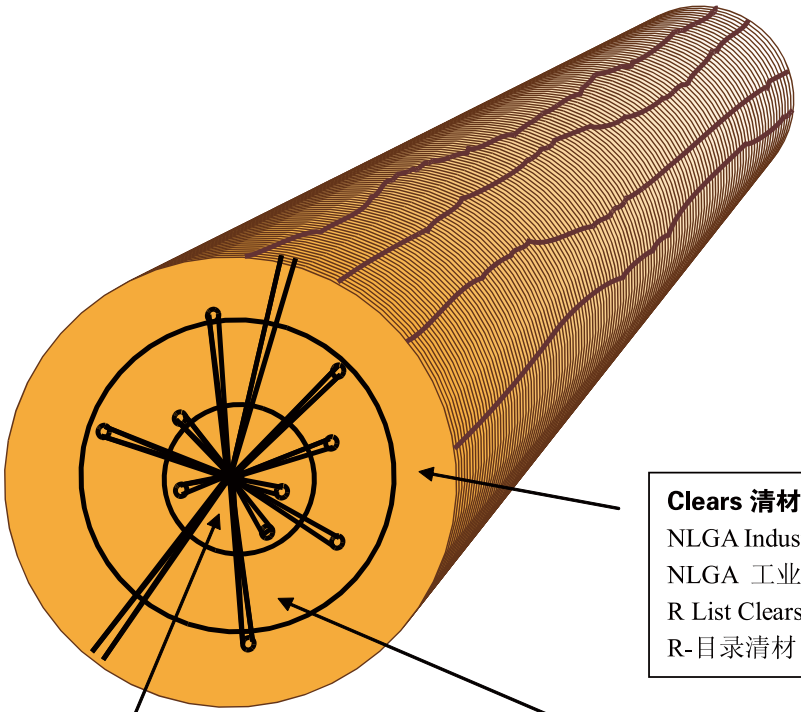
Casehardening
表面硬化

Casehardening is a condition set in wood under stress. The outer fibres (face) are under compression stresses and the inner fibres (core) are under tension stresses.
表面硬化是当木材存在应力的条件下产生的一种状态。锯材外部纤维(表面)存在压应力，而内部纤维(核心)存在拉应力。

Honeycombing
蜂窝裂

Honeycombing is a condition of internal checking in lumber.
蜂窝裂是锯材中存在内裂的情况。

Lumber Recovery Zones in Logs
原木上不同锯材的出材区



Clears 清材
NLGA Industrial Clears
NLGA 工业清材
R List Clears
R-目录清材

Factory 工厂级
NLGA Shop
NLGA 车间级
NLGA Flitches
NLGA 大料级
NLGA Door Stock
NLGA 门料级
NLGA Window Stock
NLGA 窗料级

Construction 建筑等级
NLGA 113 Commons/114 Boards
NLGA 113 款 普通级/114 款 板材级
NLGA Stud
NLGA 墙柱级
NLGA Light Framing
NLGA 轻型框架级
NLGA Structural Light Framing
NLGA 结构轻型框架级
NLGA Joists and Planks
NLGA 托梁及平铺木板级
R LIST Merch
R-目录 商用级

THE INTENDED USE OF GRADES
不同锯材等级的目标用途

No two pieces of lumber are exactly alike. Wood is a heterogeneous material whose properties may vary widely. Wood properties will differ dependent on many factors including species, climate, geography, growing conditions and age etc.

没有任何两块锯材会完全一样。木材是一种非均质的材料，其性状可以变异极大。木材的性状会随多种因素的影响而有差异，如树种、气候、地理环境、生长条件和年龄等。

In order to classify wood into a more homogeneous product we sort it into lumber grades. Lumber grades were all developed with specific end-uses in mind. By sorting lumber into grades we can separate lumber into product groups which share similar appearance and/or strength values.

为了将木材归类为较为均质的产品，我们将它按不同锯材等级进行归类。锯材等级都是为特定的使用目的而建立的。通过将锯材归类到不同的等级，我们将锯材区分为具有相似外观和强度值的不同产品类别。

Grading lumber also allows manufacturers to derive the greatest possible value from the wood. For the purposes of lumber grading, it is useful to divide lumber grades into three distinct groups.

锯材分级也可以使生产商尽可能地从木材中获得最大价值。从锯材分级的目的出发，可以将锯材的等级分为三个不同的类型。

Clears — Appearance grades of lumber which are virtually knot-free, designed to be used where the attractive features of the wood are the main objective. For example, the NLGA Grade Rules list the purpose intended for rough green Clears as appearance. Products graded under these rules are commonly used for Paneling, Ceiling, Flooring, Furniture, and Veneers.

清材级 — 锯材中的外观等级，几乎无节疤，目的是用于需要将木材美观特性作为主要目标的场合。例如，NLGA等级规则中毛面、潮湿清材的目标用途就是外观。根据这些规则分级的产品主要用于内墙板、天花板、地板、家具，和旋切/刨切单板。

Factory Lumber — Lumber in these grades in intended to be further manufactured. The prime consideration, when producing or grading Factory Lumber is the percentage of clear cuttings which are recoverable, after the buyer has further remanufactured it by ripping or cross-cutting. The NLGA refers to the purpose intended for Factory Lumber as its cutting qualities (clear lumber recoverable). Some products graded under these rules are very specific to the end use, such as door stock and window stock. Other factory grades are for more generic use such as Shop and Flitch grades.

工厂级锯材 — 这个类型中的锯材是用于再加工的。在生产和评定工厂等级时的主要考虑因素是，购买者在再加工中，通过进一步的纵锯、横锯，可以从中获得清材锯块的百分率。NLGA将工厂等级的分级目的称为锯切质量(清材出材率)。有些根据这些规则分级的产品的最终用途非常具体，如门料和窗料。其它一些工厂等级，如车间级和大料级，则用途相对广泛。

Construction type lumber — Is intended to be used in building structures. Different Grade Rules are applied depending on the type of structural application that the product is to be used for. One of the factors that the strength properties required in construction lumber depends on is its intended orientation in use. In other words, will the lumber be used on edge, on flat, or in a vertical application. Engineers, designers, and architects require building materials with known strength properties. All NLGA dimension (structural)

lumber grades have published design values, for this purpose. The NLGA refers to the purpose intended for construction type lumber as strength.

建筑类型锯材 — 目的是使用在建筑结构中。根据产品被使用的结构类型的不同，使用不同规则对锯材进行分级。建筑类型锯材中，影响强度性状的一个因素就是锯材的设计使用方向。也就是说，锯材将被以边立、平面或直立使用。工程师、设计师、建筑师要求建筑材料必须有明确的强度性状。为此，所有NLGA规格材(结构材)等级都有公开颁布的强度值。NLGA将建筑类型锯材的分级目的归结为强度。

Dimension — is construction type lumber 2" to 4" thick. Like other items that are graded primarily for strength, the worst face determines the grade. The number of knots dimension lumber contains is not important. What is important is their size, quality and location.

规格材 — 为2英寸至4英寸厚的建筑类型锯材。与其它以强度分级的材料一样，最差面决定等级。规格材含有多少节疤并不重要，重要的是节疤的尺寸、质量和位置。

GRADE RULE EXPLANATIONS AND INTERPRETATIONS
等级规则解说

EXPORT R-LIST GRADING AND DRESSING RULES
出口R-目录分级和表面加工规则

(All species except Western Red Cedar)
(适用于除西部红柏之外的所有树种)

Commonly known as the R List. This Rule was designed to meet the requirements of export markets and it is still used extensively in the Coastal Regions of British Columbia. Most lumber shipped under these Rules is in the rough state.

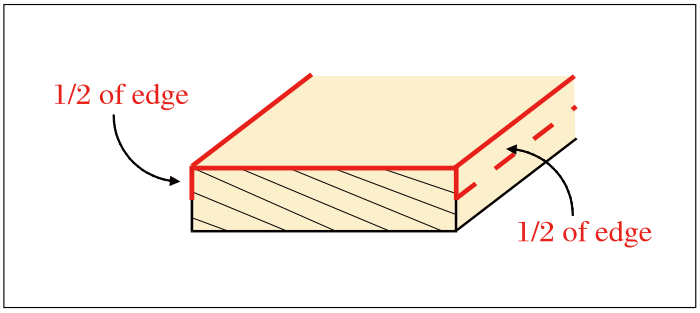
通常称为R-目录。这一规则是为满足出口市场的要求而制定的，目前在卑诗省的沿岸地区仍在广泛使用。在这类规则下，大部分锯材以毛面状态出售。

Grade Names
等级名称

No 2 Clear & Better
2级清材及以上

No 3 Clear
3级清材

No 4 Clear
4级清材



Faces Graded
评级面

Pieces are graded from the best face and corresponding half of the edges in all sizes.

所有尺寸的锯材中，评级均以最好面和两个相邻的半边。

Size Classifications
尺寸类型

The sizes of characteristics are based on the thickness of the piece. Generally, the thicker the piece, the larger individual characteristics may be. The size classifications are:

允许缺陷的尺寸随锯材的厚度而不同。通常，厚度越大，单个缺陷的允许尺寸越大。尺寸类型为：

A. Under 3"
小于3英寸

B. 3" and thicker, to under 5"
3英寸及以上，小于5英寸

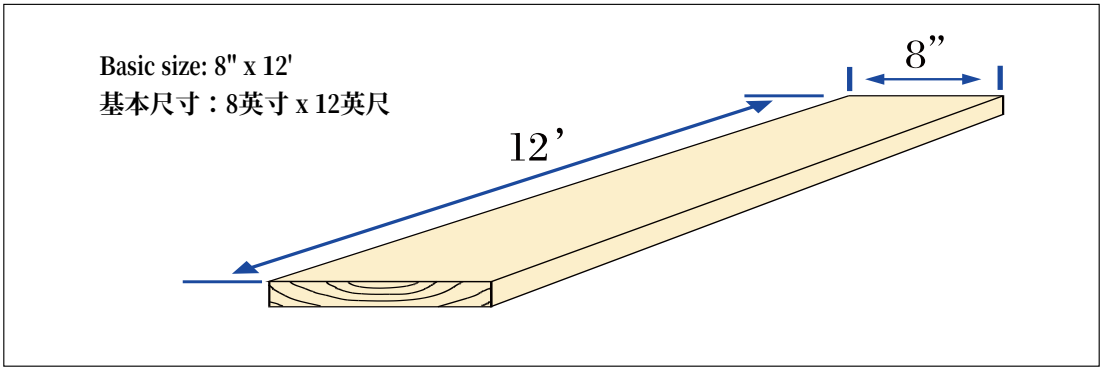
C. 5" and thicker
5英寸及以上

All Species versus Western Red Cedar
所有树种与西部红柏

There are separate paragraphs for grading Coast Species (Douglas Fir, Sitka Spruce, Western Hemlock, Western White Pine) and Western Red Cedar. Western Red Cedar is substantially different and is treated separately. All species not listed in the R List grading rule will be graded by the paragraphs for Douglas Fir. The grade rules for Western Red Cedar are listed separately.
沿岸树种(花旗松、西特加云杉、西部铁杉、西部白松)的分级和西部红柏的分级有各自不同的条款。西部红柏与其它树种非常不同，所以被单独处理。在R-目录中没有列出的所有其它树种均按照花旗松的条款进行分级。西部红柏的等级规则单独列出。

Basic Size
基本尺寸

The number of characteristics permitted varies with width and length of the piece.
允许缺陷的数量随锯材的宽度和长度而不同。



The description of characteristics permitted in the grades are based on a piece 8" wide by 12' long. This is known as the basic size for the grade. Larger pieces permit more characteristics and smaller pieces permit fewer characteristics. A piece 4" x 12' would be one half the basic size and thus would permit only on half the listed characteristics.
对各等级允许缺陷的表述均基于8英寸宽、12英尺长的锯材。它被称为该等级的基本尺寸。较大尺寸的锯材允许较多的缺陷，较小尺寸的锯材允许较少的缺陷。一块4英寸x12英尺的锯材的尺寸为基本尺寸的一半，所允许的缺陷也为规定缺陷的一半。

The size of a piece is usually referred to in surface units (length x width).
一块锯材的尺寸通常以表面单位(长 x 宽)表示。

The basic size is 96 Surface Units (SU) i.e. 8" x 12' = 96 SU
一个基本尺寸为96表面单位(SU)，即：8英寸 x 12英尺 = 96表面单位

A piece of 4" x 12' is 48 SU
一块4英寸 x 12英尺的锯材为 48表面单位。

Some example sizes:
一些尺寸示例：

8" x 12' = 96 SU	The basic size – permit the number of characteristics listed. 基本尺寸 – 允许规则中所列数量的缺陷
6" x 16' = 96 SU	Same as basic size – permit same number of characteristics. 与基本尺寸相同 – 允许规则中所列数量的缺陷
8" x 18' = 144 SU	1 1/2 the basic size – permit 1 1/2 times the characteristics listed. 基本尺寸的1 1/2 – 允许缺陷为规则中所列数量的1.5倍
12" x 16' = 192 SU	Twice the basic size – permit double the listed characteristics. 基本尺寸的两倍 – 允许缺陷为规则中所列数量的两倍
4" x 8' = 32 SU	1/3 the basic size – permit only 1/3 the listed characteristics. 基本尺寸的1/3 – 允许缺陷为规则中所列数量的1/3
6" x 12' = 72 SU	3/4 basic size – permits only 3/4 the listed characteristics. 基本尺寸的3/4 – 允许缺陷为规则中所列数量的3/4

Knots
节疤

Allowances for the face and the reverse are specified.
正面和反面的允许值均有明确规定。

On a basic size piece, No 2 Clear & Better permits zero (0) knots on the face and four on the reverse. No 3 Clear permits four knots on the face and five on the reverse. No 4 Clear permits 8 - 1/2" knots on the face and permits 10 - 1/2" on the reverse face.
在一个基本尺寸的锯材上，2级清材及以上允许正面零个(0)节疤、反面4个节疤。3级清材允许正面4个节疤、反面5个节疤。4级清材及以上允许正面8个1/2英寸节疤、反面10个 1/2英寸节疤。

Number of knots permitted **允许的节疤数量**	**Face** **正面**	**Reverse** **反面**
No 2 Clear & Better 2级清材及以上	0个	4个1英寸
No 3 Clear 3级清材	4个1英寸	5个1英寸
No 4 Clear 4级清材	8个1英寸	10个1/2英寸

If the size of a piece determines that 2.5 irregularities are permitted, then three irregularities would be accepted. However, the number of knots cannot be broken down this way. A third knot could not be over 1/2 of the normal size permitted even if the other knots are less than full size.

如果一块锯材的尺寸决定了它可以允许2.5个缺陷，那3个缺陷也可以认可。但对于节疤数量而言，不允许如此推算。即使另两个节疤均小于最大规定尺寸，第三个节疤的尺寸最大也不能超过允许尺寸的1/2。

Example:
示例：
In No 3 Clear (under 3" thick), four - 1" knots are permitted on the face of a basic size piece.
3级清材(厚度小于3英寸)，一块基本尺寸锯材允许4个1英寸的节疤。

In a 2 x 8 - 8':
在一块 2 x 8 - 8英尺

$$\frac{64}{96} \times 4 = 2.67 = 2 \text{ knots up to 1" and 1 knot Approx. } 11/16\text{" or less (3 knots in total)}$$

2个最大为1英寸的节疤和1个大约11/16英寸或较小的节疤 (总共3个节疤)

The third knot may not be larger even if the others are not maximum size.
即使其它节疤小于最大尺寸，第三个节疤的尺寸也不能超过。

NB: to convert a decimal to a fractional knot size in 8ths, 16ths etc., multiply the decimal by the desired fraction of an inch, i.e. in eighths, .67 x 8 = 5.4 or 5/8ths; in sixteenths, .67 x 16 = 10.7 or 11/16ths; in thirty-seconds, .67 x 32 = 21.4 or 21/32nds; in sixty-fourths; .67 x 64 = 42.9 or 43/64ths. It is usually adequate to work to the nearest 1/16th.

提示： **将小数单位的节疤尺寸换算为分母为8、16等的分数单位时，将小数乘以所需英寸分数的分母，如分母为8，0.67 x 8 = 5.4，或5/8；如分母为16，0.67 x 16 = 10.7，或11/16；如分母为32，0.67 x 32 = 21.4，或21/32；如分母为64，0.67 x 64 = 42.9，或43/64。通常，1/16单位已经足够使用。**

Characteristics cannot be taken as more in number if equivalent smaller except on pockets where an extra pocket (see pockets) will be accepted as equivalent if the total length of the pockets does not exceed the basic allowance.
不可以用较小尺寸等效换算的方法来接受超过规定数量的缺陷，树脂/皮囊例外。如果树脂/皮囊总长度小于基本的允许值时，允许接受一个额外的树脂/皮囊。

No 4 Clear
4级清材

All the characteristics permitted in No 4 Clear may be present in the piece to the maximum extent in any combination with any other irregularities permitted in the piece. As an example, a piece could have maximum knots and maximum pockets. However, the grade specifically excludes those rare pieces which contain all or nearly all the characteristics permitted in maximum form when the serviceability of the piece is affected.
所有允许在4级清材上出现的缺陷可以以最大程度、与其它缺陷以任何组合形式出现在某一锯材上。举例来说，一块锯材上可以出现最大允许尺寸的节疤和最大允许尺寸的树脂/皮囊。然而，

规则也明确排除了那些不常见情况，及所有或几乎所有缺陷都以最大值出现在一些板块上，使得其使用性能受到影响。

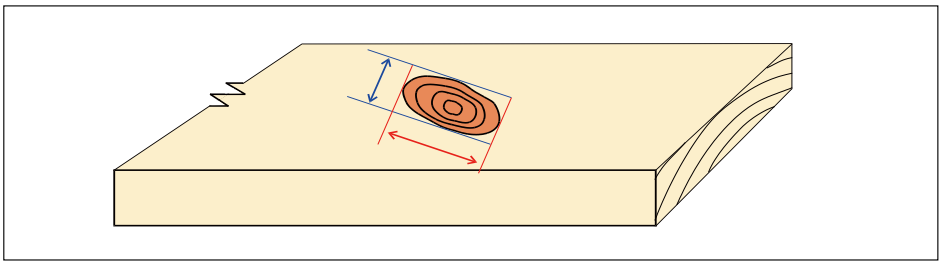
Knot Measurement
节疤测量

Measure as average diameter on the wide face. The width of the knot on the edge cannot exceed the allowable knot size. Disregard the edge knot size in No 4 Clear. Knots need only be sound in No 2 and No 3 Clear (ie could be NFF) and may be any quality in No 4 Clear.

在锯材宽面上测量平均直径。锯材窄面上的节疤的宽度不可以超过节疤尺寸允许值。但在4级清材窄面上的节疤可以忽略。2级清材和3级清材上节疤只须为健全节(即可以为松动节)，4级清材中的节疤可以为任何质量。

Knot measurement is by average diameter

以平均直径测量节疤



When any amount of wood occurs between the knots, they are counted as two knots.

只要节疤之间存在任何数量的木材组织，它们将被视为两个节疤。

Measure as average diameter on the wide face. Measure the width only on the edge as in Examples E and F as shown below.

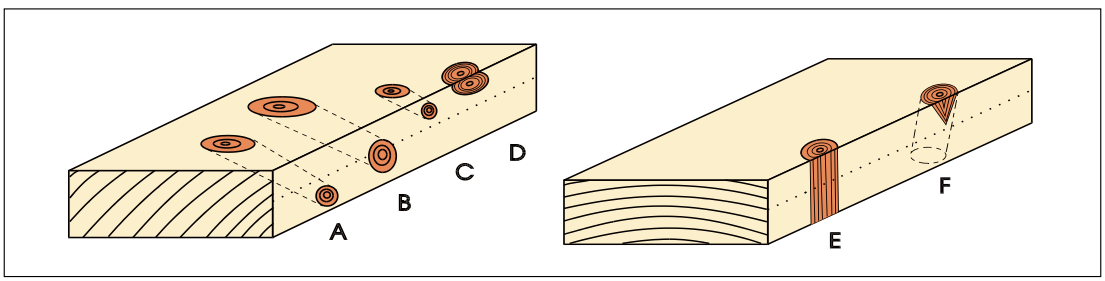
在宽面上测量平均直径。在如下示例E和F中，仅测量窄面上节疤的宽度。

Narrow face knots which appear on both halves of the edge are counted and the knot and its size is applied to the allowance for both faces, as in Examples B and E.

如示例B和E所示，窄面上跨越上下两半的节疤须计入，节疤数量和尺寸计入两个宽面的允许值中。

Knot Examples

节疤示例



Knot A
节疤 A

- a through knot, which limits the highest grade to No 3 Clear.
- 贯通节疤，它使得该锯材最高只能为3级清材。

- measured by average diameter on the wide face. With on the narrow face is restricted to the allowable knot size.
- 在宽面上测量平均直径。在窄面上，限定只能为允许节疤尺寸。

Knot B
节疤 B

- a through knot
- 贯通节疤

- measured by average diameter on the wide face. Width on the narrow face is restricted to the allowable knot size. This knot counts as two characteristics on the best face plus one characteristic on the reverse face.
- 在宽面上测量平均直径。在窄面上，限定只能为允许节疤尺寸。该节疤在较好面上计为两个缺陷，另外在反面还须计一个缺陷。

Knot C
节疤 C

- not a through knot, but counts as 2 knots on the face.
- 非贯通节疤，在较好面上计为两个节疤。

- measured by average diameter on the wide face. Width on the narrow face is restricted to the allowable knot size.
- 在宽面上测量平均直径。在窄面上，限定只能为允许节疤尺寸。

Knot D
节疤 D

- Not a through knot
- 非贯通节疤

- measured by average diameter on the wide face. Width on the narrow face is restricted to the allowable knot size.
- 在宽面上测量平均直径。在窄面上，限定只能为允许节疤尺寸。

Knot E
节疤 E

- a through knot
- 贯通节疤

- measured by average diameter on the wide face. Width on the narrow face is controlled to the allowable knot size in No 3 Clear. In No 4 Clear, the size of a knot on the narrow face can be disregarded.
- 在宽面上测量平均直径。在3级清材窄面上，限定只能为允许节疤尺寸。在4级清材窄面上，节疤尺寸可以忽略。

Knot F
节疤F

- a through knot
- 贯通节疤

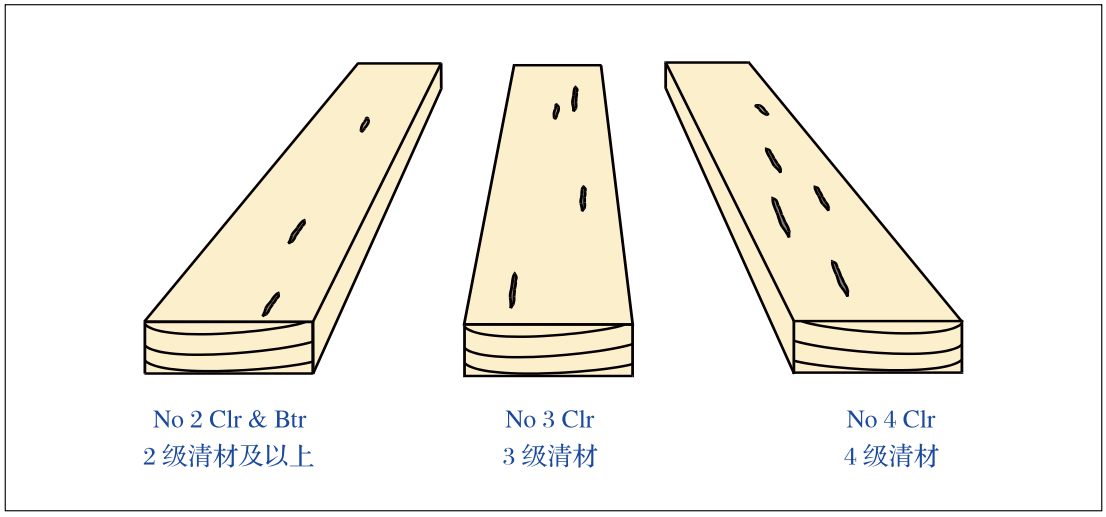
- measured by average diameter on the wide face. Width on the narrow face is controlled to the allowable knot size.
- 在宽面上测量平均直径。在窄面上，限定只能为允许节疤尺寸。

Pockets
树脂/皮囊

Pockets are restricted to 1/8" in width in No 2 / No 3 Clear under 3" stock and No 4 Clear all thicknesses. Pockets could be 25% wider or longer on the back of No 4 Clear. Pocket width (within reason) is not restricted in No 2 Clear or No 3 Clear in 3" and thicker.
在厚度3英寸以下的2级和3级清材中、及所有厚度的4级清材中，树脂/皮囊的限定宽度为1/8英寸。在4级清材的背面，树脂/皮囊的宽度可放宽25%。在厚度3英寸及以上的2级和3级清材中，树脂/皮囊的宽度没有限制(合理范围内)。

Only one pocket may be through the piece (from one wide face to the opposite wide face) in No 2 Clear under 3".
在厚度3英寸以下的2级中，只能有一个树脂/皮囊是贯通性的(从一个宽面到另一个宽面)。

Examples of Pockets in R List Clears
R-目录清材中树脂/皮囊示例



Evaluating Pockets
树脂/皮囊评估

For a basic size piece, the following 3 rules apply:
以基本尺寸锯材为例，使用下列三个原则：

1st Look for the largest pocket and determine which grade will accept that pocket
第一 找出最大的树脂/皮囊，确认哪一个等级可以接纳

2nd Count total number of pockets and determine which grade will accept that number
第二 数算出树脂/皮囊的总数量，确认哪一个等级可以接纳

3rd Calculate total combined length of all pockets, determine grade
第三 算出所有树脂/皮囊的总长度，确定等级

For Basic Size 8" W x 12' long 基本尺寸8英寸宽 x 12 英尺长	**Face 2 Clear 正面 2级清材**	**Back 2 Clear 背面 2级清材**	**Face 3 Clear 正面 3级清材**	**Back 3 Clear 背面 3级清材**	**Face 4 Clear 正面 4级清材**	**Back 4 Clear 背面 4级清材**
Largest Pocket 最大树脂/皮囊	4英寸	4英寸	6英寸	6英寸	8英寸	10英寸
Max Number of Pockets 树脂/皮囊的最大数量	4个	5个	5个	6个	any number 任意数量	any number 任意数量
Max Combined Length 最大总体长度	12英寸	16英寸	16英寸	20英寸	40英寸	50英寸

Equivalent Smaller Pockets in No 2 / No 3 Clears
2级和3级清材中等效小尺寸树脂/皮囊

In lumber under 3" thick, one extra pocket in number is permitted if the total length overall is equivalent.
在厚度3英寸以下的锯材中，如果总长度等效，允许额外增加一个树脂/皮囊。

Example:
示例

No 2 Clear permits 3 small pockets (1/8" x 4") or 4 equivalent smaller on the face. Therefore, a basic size piece could contain:
2级清材正面允许3个小树脂/皮囊(1/8英寸 x 4英寸)或4个稍小但等效的树脂/皮囊。因此，一块基本尺寸的锯材可以含有：

3 x 4"	Or 或	2 x 4" = 8"	Or 或	4 x 3" = 12"
as basic allowance 基本允许量		2 x 2" = 4"		
		4 = 12"		

In 3" and thicker lumber, two additional pockets are allowed if the total length overall is equivalent. These two additional pockets are restricted to the edges only and total length permitted is not extended.
在厚度3英寸及以上的锯材中，如果总长度等效，允许额外增加两个树脂/皮囊。这两个额外的树脂/皮囊只允许出现在窄面上，而且不得超过总允许长度。

Occasional longer pockets in No 3 Clear (# as per grade table)
3级清材中可偶尔出现超长树脂/皮囊(数量以各等级表为准)

In No 3 Clear, one pocket may be longer than the basic pocket permitted, up to the maximum length specified but the total length allowance for the size and grade may not be exceeded.
在3级清材中，允许一个树脂/皮囊可以超过规定的基本值，至最大规定值，但不可超过该等级和尺寸所允许的总长度。

A longer pocket and an additional pocket (as above) is permitted.
此时，允许一个超长的树脂/皮囊或额外多一个树脂/皮囊 (如上所述)。

Example: No 3 Clear permits 5 small pockets (1/8" x 4") on the back for a total of 20" (5 x 4") of pocket length.
示例：3级清材允许在背面有5个小树脂/皮囊(1/8英寸 x 4英寸)，即允许树脂/皮囊的总长度为20英寸 (5 x 4英寸)。

Therefore, in a basic size piece the following number and size of pockets are permitted in a No 3 Clear:
因此，在一块基本尺寸的锯材上，允许在3级清材中出现下列数量和尺寸的树脂/皮囊。

Pockets x Length = Total Length 树脂/皮囊数量 x 长度 = 总长度		
a) 1 x 6" = 6" 3 x 4" = 12" 1 x 2" = 2"	**b)** 3 x 4" = 12" 3 x 2" = 6"	**c)** 1 x 6" = 6" 5 x 2" = 10"
Total = 5 pockets for 20" 总量 = 5个共20英寸树脂/皮囊	Total = 6 pockets for 18" 总量 = 6个共18英寸树脂/皮囊	Total = 6 pockets for 16" 总量 = 6个共16英寸树脂/皮囊

a) piece has a longer pocket but does not exceed basic pocket count (5) or total length permitted (20").
该块锯材有一个超长的树脂/皮囊，但没有超过规定数量(5个)和总长度(20英寸)。

b) piece has one additional pocket (6) but does not have a longer pocket or exceed the total length permitted.
该块锯材有一个额外的树脂/皮囊(6个)，但没有超长的树脂/皮囊、也没有超过允许的总长度(20英寸)。

c) piece has longer pocket and an additional pocket and does not exceed the total length allowed.
该块锯材有一个超长的树脂/皮囊、及一个额外的树脂/皮囊，但没有超过允许的总长度。

Pockets in No 4 Clear
4级清材中的树脂/皮囊

Pockets in No 4 Clear are not restricted in number, only in individual and total length. Pockets on the face of a basic size No 4 Clear could total 40 inches, on the back 50 inches.
4级清材没有限制树脂/皮囊的数量，只对单个长度和总长度有限制。基本尺寸的4级清材允许其表面有40英寸、背面有50英寸的树脂/皮囊。

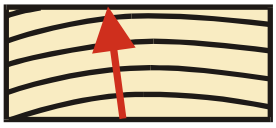
Rate of Growth
生长率

Rate of Growth in R List clears is measured along the centre three inches of the longest radial line. The best end must meet the requirements for the grade.
在R-目录清材等级中，生长率在最长半径线中间3英寸中测算。最好端必须符合等级的要求。

Calculating Rate of Growth
生长率的计算

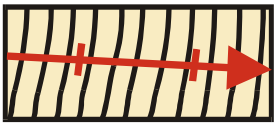
Flat Grain
平纹

Determine where the pith would be and take the longest radial line at right angles to the annual rings. Count the number of annual rings and divide by the length of the radial line to get rings per inch
确定髓心的可能位置，在垂直于年轮的方向划一条最长的半径线。沿这条线数出年轮总数、除以半径线长度，即可得出每英寸的年轮数。



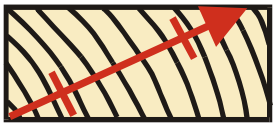
Vertical Grain
直纹

Count the number of annual rings found within the center 3" of the longest radial line running at right angles to the annual rings. Divide the number of annual rings by 3 to get rings per inch.
在垂直于年轮的方向划一条最长的半径线，在该半径线中间3英寸内数出年轮总数。将该数除以3即可得出每英寸的年轮数。



Angle Grain
角纹

Count the number of annual rings found on the center 3" of the longest radial line running at right angles to the annual rings. Divide the number of annual rings by 3 to get rings per inch.
在垂直于年轮的方向划一条最长的半径线，在该半径线中间3英寸内数出年轮总数。将该数除以3即可得出每英寸的年轮数。



Rate of Growth Allowances
生长率的允许值

No 2 Clear requires 6 rings per inch.
2级清材要求每英寸6个年轮。

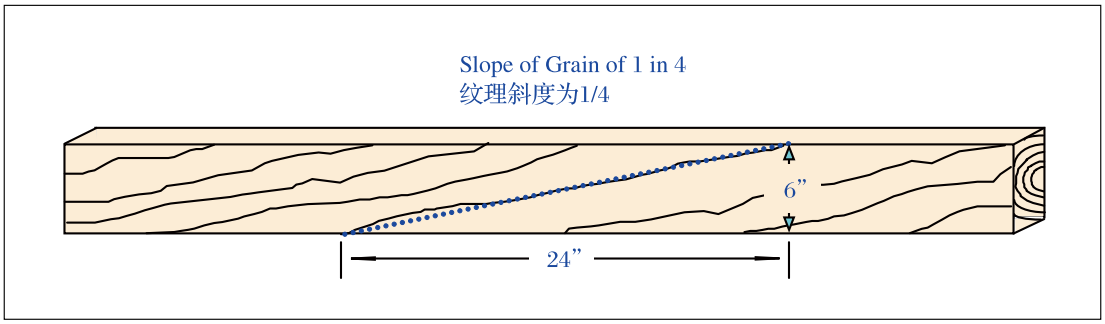
No 3 Clear requires 4 rings per inch.
3级清材要求每英寸4个年轮。

No 4 Clear has no requirements.
4级清材没有规定要求。

Slope of Grain
纹理斜度

A term used to describe the amount that wood fibres deviate from a line parallel to the edges of a piece.
是一个用来描述木纤维与锯材边缘平行线偏离程度的术语。

The deviation is expressed as a ratio (ie 1 in 8 or 1 in 6)
偏离程度以比率表示(如1/8或1/6)



Measure Slope Of Grain at the worst area of the piece.
在锯材最差处测量纹理斜度。

Place the tape measure parallel to the worst slope and measure from one side of the piece to the other (dotted line above).
将尺子与最斜纹理平行放置，从锯材一侧量至另一侧(上图点线)。

To calculate the Slope of Grain divided this measurement (24") by the nominal width of the piece (6").
将这个测量值(24英寸)除以该锯材的名义宽度(6英寸)就可以得出纹理斜度。

24 / 6 = 4, so Slope of Grain = 1 in 4
24 / 6 = 4，因此纹理斜度 = 1/4

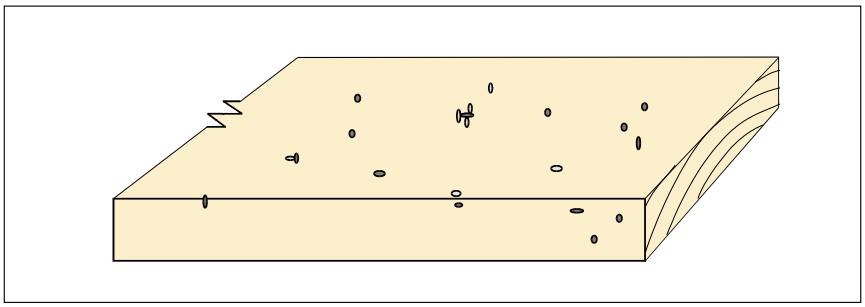
Slope of Grain Allowances in R List Clears
R-目录清材等级中纹理斜度的允许值

No 2 Clear and Better allows a slope of grain of 1 in 8
2级清材及以上纹理斜度的允许值为1/8

No 3 Clear allows 1 in 6
3级清材纹理斜度的允许值为1/6

No 4 Clear allows 1 in 4
4级清材纹理斜度的允许值为1/4

Pin Holes
针孔虫眼



The highest grade permitting pin holes is No 4 Clear. Pin holes occurring on the edges are counted as part of their corresponding face.
可以允许针孔虫眼的最高等级是4级清材。发生在窄面的针孔虫眼计入相应的表面。

Allowance permits 15 per square foot for the entire length of the piece or equivalent.
允许每平方英尺15个，在锯材的整个长度内均可出现，或等效。

Pin holes are permitted to be 25% more numerous in the worst square foot. This means that the worst square foot on the face allows 19 pinholes maximum, and the worst square foot on the back allows 38 pinholes if the number permitted by the piece's size is not exceeded.
允许在最差的一个平方英尺内，针孔虫眼数量比规定值高25%。这表示在表面最差的一个平方英尺内，允许针孔虫眼的数量最多可达19个；背面最差的一个平方英尺内，允许针孔虫眼的数量最多可达38个，但全长范围内的总数不能超过该尺寸锯材的允许数量。

Wane
钝棱

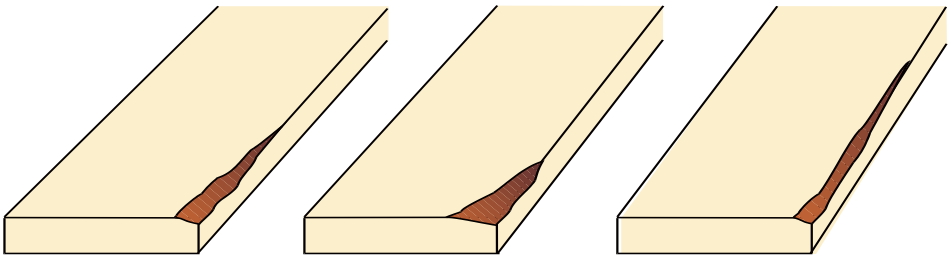
- The highest grade which permits wane on the best face is No 4 Clear.
  可以允许钝棱的最高等级是4级清材。

- When evaluating wane, consider the face and the edge separately.
  评价钝棱时，宽面和窄面要分开考虑。

- Wane on the face is evaluated according to the area it occupies.
  宽面上的钝棱根据它占据的面积来评价。

- Wane on the edge is evaluated according to the thickness it affects.
  窄面上的钝棱根据它影响的厚度来评价。

Examples of Wane Equivalency
钝棱等效性的示例



Wane on the Face
宽面上的钝棱

May be the equivalent area of that described (ie 1/8 width, 1/6 length). Example: on a 2x8-12', 1/8 width equals 1" and 1/6 length equals 2' (24") which equates to 24 square inches. Therefore, wane is permitted, in any combination of width or length, if it does not exceed an area of 24 square inches.
宽面上的钝棱可以是与规定钝棱(即1/8宽度，1/6长度)面积等效的其它钝棱。例如：在一块2x8-12的锯材上，1/8 宽度等于1英寸，1/6 长度等于2英尺(24英寸)，即面积为24 平方英寸。因此钝棱可以为任何宽度和长度的组合，只要其面积不超过24 平方英寸即可。

Wane on the Edge
窄面上的钝棱

May never exceed the allowable depth (1/4 thickness), but may be the full depth allowed for the entire length of the wane.
不可以超过允许深度(1/4厚度)，但可以允许钝棱在全长范围内以最大深度出现。

Wane on the Reverse Face
背面上的钝棱

Permits 50% more wane than the area allowed on the best face.
允许比最好面多50%的面积。

Permits 50% more depth on the edge (up to 3/8 thickness).
允许窄面上钝棱深度大50%(最大可达 3/8 厚度)。

Cut-Outs
(待锯除) 废料

- A 4" Cut-Out is permitted in No 4 Clear in all thicknesses.
  所有厚度的4级清材中，允许有一块4英寸长的废料。

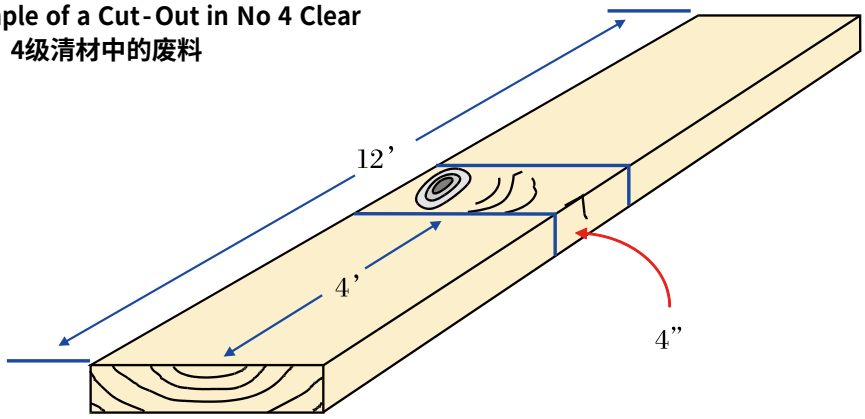
- The piece must be 12' long or longer and the Cut-Out must be at least 4' away from the end.
  该锯材必须为12英尺或更长，而且废料必须距任意一端4英尺以上。

- A 1' Cut-Out is permitted in No 2 and No 3 Clear only in 5" and thicker stock.
  在2级和3级清材、厚度为5英寸或以上的材料中，允许有一块1英寸长的废料。

- The piece must be 18' long or longer and the Cut-Out must be at least 8' away from the end.
  该锯材必须为18英尺或更长，而且废料必须距任意一端8英尺以上。

- In No 2 Clear & Better, each resultant piece (on either side of the Cut-Out) must be acceptable in the grade based on its own merit.
  在2级清材及以上这一等级中，锯除废料后得到的任意一块锯材(在废料的任意一侧)的自身质量必须也能达到该等级。

Example of a Cut-Out in No 4 Clear
示例，4级清材中的废料



Holes (Knot Holes)
孔洞(节孔)

The highest grade to permit holes (from any cause) is No 4 Clear. One 1/4" hole on the face and two 1/2" holes on the back per basic size. Any number of equivalent smaller holes is permitted.
可以允许孔洞(任何原因引起的)的最高等级是4级清材。每一个基本尺寸正面允许有一个1/4英寸的孔洞、背面允许有两个1/2英寸的孔洞。允许任何数量的等效小孔洞。

Grub and/or Teredo holes are assessed as above.
虫孔和海虫孔的评级方法与上同。

Stain
变色

Pieces are assumed to be anti-sap stain treated so normal bright sap is not a defect in any grade or specie.
通常假定，对锯材均进行过边材防变色处理，所以在任何等级中，正常、光亮的边材都不被当成缺陷。

No Stain of any type is permitted on the face or back of a No 2 Clear.
在2级清材中，无论正面或背面都不允许有任何变色。

Sap Stain permitted on the face of a No 3 Clear varies with the thickness class as follows:
3级清材表面允许的边材变色随厚度而变化，如下表所示：

Under 3" 3英寸以下	– medium stain – 1/4 the face – 中等变色，表面的1/4
3" and over but not 5" 3英寸及以上但不超过5英寸	– medium stain – 1/3 the face – 中等变色，表面的1/3
5" and over 5英寸及以上	– medium stain – 1/2 the face – 中等变色，表面的1/2
Note: medium stain does not obscure the grain 注：中等变色尚没有使纹理模糊不清	

In Douglas Fir and Sitka Spruce, "stained sap" is limited, so if any of the sap is stained, the total amount of sap on the face becomes limited as above.
在花旗松和锡特加云杉中，“ 边材变色 ”受到限制，如果边材任何一处有变色，全部表面的边材将受到如上所述的限制。

In Hemlock, Sap Stain is limited as above and only that portion of the sap which is stained is considered.
在西部铁杉中，边材变色受到如上所述的限制，但只考虑边材中实际变色的部分。

Heart stain is limited to "Slight" (25% medium stain on the face) in No 3 Clear.
在3级清材中，心材变色限定只能为“ 轻度 ”(正面的25%，中等变色)。

No 4 Clear permits any amount of medium Heart Stain.
4级清材允许任何数量的中等心材变色。

Pitch Streaks
树脂斑

A Pitch Streak is permitted to be twice the size of the allowable pocket to be considered as equivalent in No 2 Clear & Better. and No 3 Clear.
在2级清材及以上和3级清材中，树脂斑可以被视为树脂/皮囊的等效缺陷，允许其尺寸为树脂/皮囊允许值的两倍。

Splits
劈裂

R List permits only one maximum size split per piece. Multiple splits on the same or opposite ends are only permitted if the combined total length of all splits still meets the grade. The length is the average penetration on both faces.

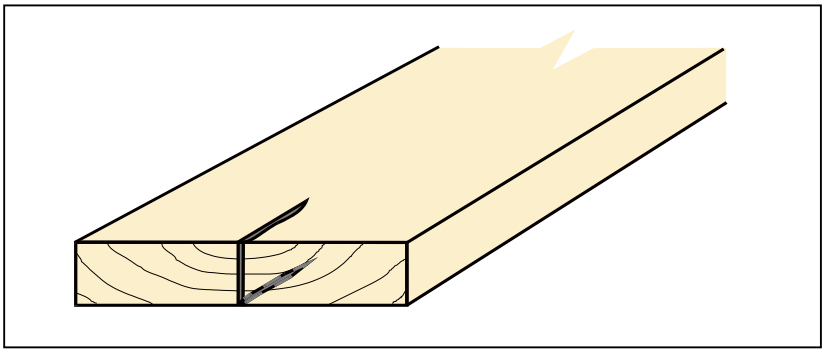
R-目录只允许每块锯材出现一个最大允许尺寸的劈裂。在同一端或另一端的多个劈裂只有在其长度总和仍然符合等级要求时才允许。长度是指在两个面上延伸长度的平均值。

No 2 Clear in under 3" thickness restricts the total length of Splits to 1/2 the width of the piece.
厚度3英寸以下的2级清材中，劈裂的总长度最大为锯材宽度的1/2。

No 2 Clear in 3" and Thicker, and No 3 and No 4 Clear in all thickness, permit splits totalling the width of the piece.
厚度3英寸以上的2级清材、所有厚度的3级和4级清材中，允许劈裂总长度为锯材的宽度。

The length of a split is the average of the measurements on both faces.
劈裂长度是指在两个面上测量值的平均值。

Example of a Split
劈裂示例



(Western Red Cedar only)
(仅适用于西部红柏)

Grade names
等级名称

No 2 Clear & Better
2级清材及以上

No 4 Clear
4级清材

Evaluation for Grade and General Notes
等级评估和总体注释

All the notes and interpretation on R List Clears for All Species apply to Western Red Cedar except for the areas listed below.
除了下列情况外，针对R-目录所有其它树种清材的注释和解释对西部红柏同样适用。

There are only two grades in R List for Western Red Cedar Clears, No 2 Clear & Better. (Para 401) and No 4 Clear; Western Red Cedar has no No 3 Clear.
R-目录中，西部红柏仅有两个清材等级，2级清材及以上(401款)和4级清材；西部红柏中没有3级清材。

There are only two thickness classifications: Under 3" and 3" and thicker.
厚度类型仅有两种：3英寸以下和3英寸及以上

Number of Characteristics Permitted in the Basic Size
基本尺寸中允许的缺陷数量

A true No 2 Clear permits 3 characteristics on the face and 4 on the back. However, 4 characteristics are accepted on the face per the 15% clause (see below).
真正的2级清材正面允许3个缺陷，背面允许4个缺陷。然而，根据15%条款(见下文)，也可以接受正面有4个缺陷。

A clause exists for No 2 Clear & Better., called the "15% clause", (in some ways compensates for the lack of No 3 Clear) which states that 15% of a shipment may contain 4 characteristics on the face side and that soft knots permitted may appear on the face.
对于2级清材及以上，存在一个所谓的“ 15%条款 ”(这部分地补偿了缺乏3级清材的状况)，它规定在一批出货中允许15%的锯材在正面含有4个缺陷、而且规则允许的软节可以出现在正面。

For grading classes the provisions of the 15% clause will be applied to all pieces, i.e. allow soft knots (1/2 the size of Sound and Tight) on the face of No 2 Clear.

在分级课程中，15%条款的规定可在每一块锯材上使用，即允许软节(健全固定节尺寸的1/2)出现在2级清材的正面。

Knots
节疤

Sound and Tight knots are permitted on the face of a No 2 Clear and Better.
在2级清材及以上等级中，允许健全固定节出现在正面。

Characteristic Western Red Cedar soft knots are permitted if 1/2 the size of Sound and Tight knots.
允许西部红柏特有的软节，但允许尺寸为健全固定节尺寸的1/2。

Knot size is specified independently for the face and the back in No 2 Clear.
在2级清材中，正面和背面的节疤尺寸是分别规定的。

In under 3" material, knots may be 1/2" on the face, and 3/4" on the back.
在厚度3英寸以下的材料中，正面允许的节疤尺寸为1/2英寸，背面为3/4英寸。

In 3" and thicker, No 2 Clear permits a 3/4" knot on the face. For the back of a No 2 Clear, see the following guideline.
在厚度为3英寸及以上的类型中，2级清材正面允许的节疤尺寸为3/4英寸。对于2级清材的背面，参见下列原则：

- permit a 1" knot on a 3" thick piece, increase proportionately to a 2" knot on the back of a 6" thick piece.
- 在3英寸厚的材料中允许一个1英寸的节疤，随后按比例增加，最后，在6英寸厚的材料中允许一个2英寸的节疤。

Pockets
树脂/皮囊

Pockets are not listed as an irregularity in No 2 Clear. However, occasional pieces may have bark pockets and these are evaluated the same as in the all species rules.
在2级清材中，树脂/皮囊没有被列为一种缺陷。然而，偶尔会出现有树皮囊的材料，这时可以使用“所有其它树种”的规则对它们进行评价。

NLGA PARA 108 INDUSTRIAL CLEARS
NLGA 108款 工业清材

(All Species except Western Red Cedar)
(适用于除西部红柏之外的所有树种)

2" thinner, 3" & wide
厚度2英寸以下，宽度3英寸及以上

Grade Names
等级名称

B & Better Clear
B及以上级清材

C Clear
C级清材

D Clear
D级清材

Faces Graded
评级面

Pieces are graded from the best face, the reverse face may be one grade lower, except for certain characteristics in B & Better and C Clear, or in D Clear where the allowance for the back is specified.
评级以最好面为基础，反面可以低一个等级，除非在B级清材及以上、C级清材，或D级清材中对背面某些缺陷的允许值做了明确的规定。

The grade of the piece is the grade of the best face unless the worst face is more than one grade lower:
一块锯材的等级就是其最好面的等级，除非其背面比正面低一个等级以上。

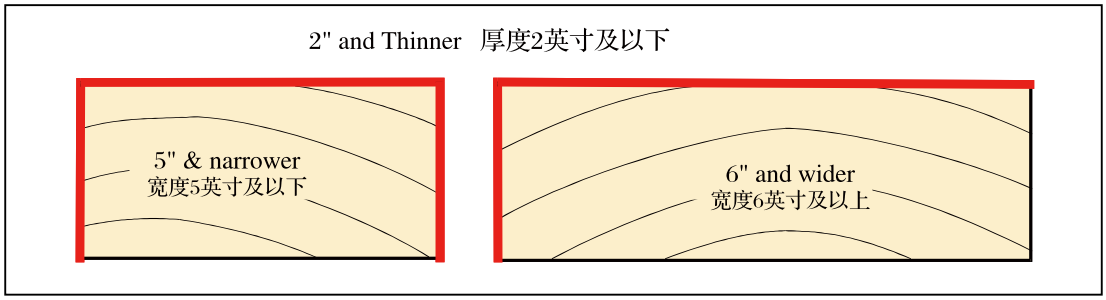
Examples
示例

Face Grade **正面等级**	**Back Grade** **背面等级**	**Grade of Piece** **整块等级**
B & Better, B级清材及以上	C Clear，C级清材	B & Better Clear，B级清材及以上
C Clear, C级清材	D Clear，D级清材	C Clear，C级清材
B & Better, B级清材及以上	D Clear，D级清材	C Clear，C级清材
D Clear, D级清材	D Clear，D级清材	D Clear，D级清材
B Clear, B级清材	Reject，等外品	Reject，等外品

In 2" and thinner:
厚度2英寸及以下：

- pieces 5" and narrower the best face and both edges (defects on both edges are counted as occurring on the best face.
  宽度5英寸及以下，最好面及两边(两个侧面上的缺陷视同出现在最好面)。

- pieces 6" and wider the best face and one edge. Defects on one edge can be considered to be occurring on the back.
  宽度6英寸及以上，最好面及一边。另一边上的缺陷可视同出现在背面。



This allows the Grader to combine the best face with the edge which yields the highest grade.
这一规则允许分级员将最好面与任意一边组合，以评出尽可能高的等级。

In 2 1/4" and thicker:
厚度2 1/4英寸及以上：

The face includes the corresponding half of the edges
最好面与两个窄面相邻的一半。

Basic Size
基本尺寸

Basic size is 8" x 12'
基本尺寸：8英寸 x 12英尺

Allowances for Dressing to Finished Size
刨光到规定尺寸之前的加工余量

Pieces of KD S2S clears will accept characteristics which will be removed when the piece is dressed to the standard width (see NLGA Para 820B). An allowance of 1/16" must be made to dress off the inside edge (call the best edge the inside edge). Any excess material on the opposite edge will be removed in the final dressing along with any defects in that material and thus these defects can be disregarded.
窑干的两面刨光清材中，允许存在材料被加工到规定宽度时可去除的缺陷(见NLGA 820B款)。对于内边(最好边被称为内边)，必须为加工留1/16英寸的余量。在最后的刨光加工中，另一边的多余材料都将被去除，所以如果其中有任何缺陷都可以被忽略。

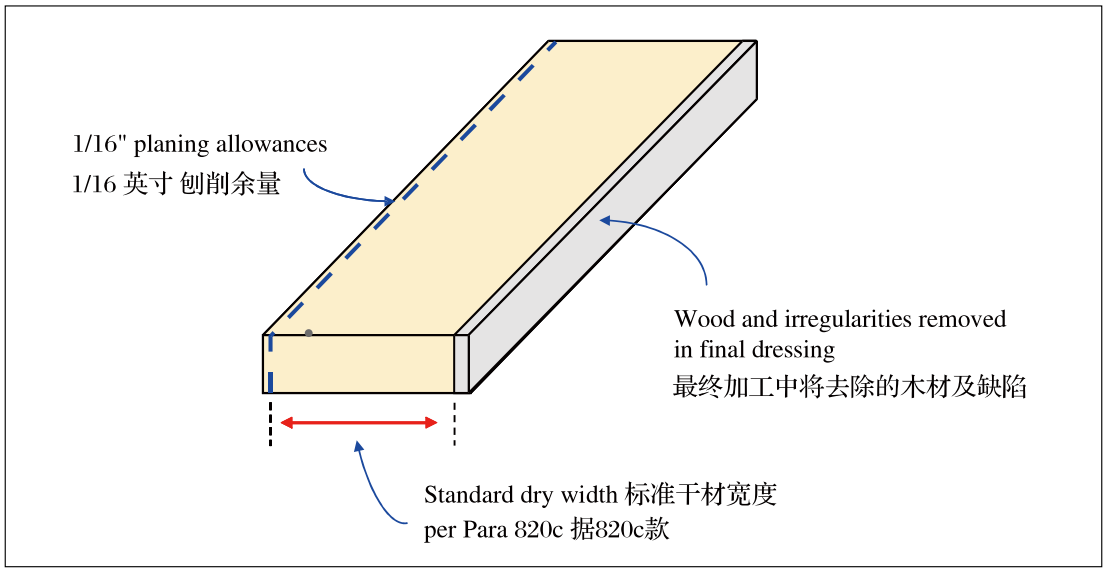
- Characteristics commonly dressed off are wane, edge bruises, slough knots, knot holes and skips.
  通常，可以在加工中被去处的缺陷为钝棱、边缘擦伤、边缘脱节、节疤孔、漏刨等。

- Do not dress off characteristics whose complete extent cannot be visually determined such as pitch or bark pockets and pin or grub/teredo holes unless they are only on the corner of the piece and both sides are visible.
  对于不能确定其完整范围的缺陷，如树脂囊、树皮囊、针孔虫眼、虫眼/海虫眼等，不可以假定它们会在加工中被去除，除非它们仅在材料的角上而且两面可见。

- Do not dress off characteristics such as knots, pitch streaks, stain, white specks, checks, etc.
  不可以假定节疤、树脂斑、变色、白斑朽、干裂等缺陷会在加工中被去除。

- No allowance for dressing off is permitted in rough lumber.
  在毛面锯材中，不允许存在缺陷的加工余量。

Dressing Off Allowances
可加工去除的余量



- Industrial Clears are generally surfaced on the two wide faces (S2S). The edges are left rough. The grade rule assumes that the material will be dressed to the standard widths detailed in NLGA Para 820c. Some characteristics will be removed or reduced in effect by this final dressing. These characteristics are assessed as to their effect after final dressing has occurred. Characteristics removed in this way are said to be "dressed off" or "dressed out".
  工业清材通常为两面刨光(S2S)。两边为未刨光的毛面。它的等级规则假定所有的材料都将加工到NLGA820c款所规定的宽度。一些缺陷会在最终的表面加工过程中被去除或减轻。所以，这些缺陷是根据最终表面加工后的效果来评价的。可以在这一过程中被去除的缺陷被描述为“被加工掉了”。

- Characteristics whose total extent cannot be judged (i.e. pitch streaks, white specks, stain, etc.), cannot be dressed off.
  不能确定其完整范围的缺陷(如树脂斑、白斑朽、变色等)，不会被加工掉。

- Students must be urged to use caution in attempting to dress off pockets and pin holes, grub holes or teredo holes. The total extent of these characteristics cannot be accurately judged, therefore the characteristic cannot be dressed off.
  应提醒学员，在试图“加工掉”树脂囊、树皮囊、针孔虫眼、虫眼/海虫眼等，必须小心。因为不能确定这些缺陷的完整范围，不可以假定它们会在加工中被去除。

CAN be dressed off **能够被加工掉**	**Cannot be dressed off** **不能够被加工掉**
Wane，钝棱	Pitch streaks，树脂斑
Bruises，擦伤	Stain，变色
Slough knots，边缘脱节	Checks，干裂
*Other characteristics，其它缺陷	Knots，节疤

* where the full effect can clearly be seen to be removed by dressing to a standard width.
可以清楚预测缺陷的全部影响范围、而且可以在加工至标准宽度时被去除。

Calculating the Size and Number of Characteristics Allowed (in pieces other than Basic Size)
计算允许缺陷的尺寸和数量(在非基本尺寸锯材中)

Certain characteristics may vary in size and number permitted, depending on the size of the piece of lumber. This applies to the following defects only:
一些缺陷的允许尺寸和数量随锯材的尺寸而变化。这一规定只适用于下列缺陷：

- Knots
  节疤
- Pockets
  树脂囊/树皮囊
- Checks
  干裂
- Pinholes
  针孔虫眼
- Holes
  孔洞

Knots
节疤

To determine the number of characteristics permissible in a piece that is other than basic size use the following formula:
要确定一块不是基本尺寸的材料的允许缺陷的数量，使用下列公式：

Surface Units of Piece 该材料的表面单位 Basic Size Surface Units 基本尺寸表面单位	x	Number of Characteristics Permitted in the Basic Size 基本尺寸中允许的缺陷数量	=	Number of Characteristics Permitted in the Piece 该块材料中允许的缺陷数量

Example: In D Clear, 8 knots totalling 4" are permitted on the face of a basic size piece.
示例： D级清材正面，每个基本尺寸允许8个、总尺寸为4英寸的节疤。

In a piece of 2 x 6 - 12' :
在一块 2 x 6 - 12英尺的材料中:

72 SU (6 x 12) 96 SU (basic size 基本尺寸)	x 4 knots per BS = 3 – 1" knots permitted in this size piece x 4 节疤/基本尺寸 = 3个1英寸 (该块材料允许3个1英寸的节疤)

When the above calculation returns an answer with a fraction such as 2.5 then the grade permits characteristics whose combined total is equal to two (2) full size and 1 half size characteristic in total.
如果上述计算得出一个带分数的结果如2.5，此时规则允许的总缺陷数等于2个全尺寸的缺陷和一个尺寸为一半的缺陷。

In a piece 2 x 6 - 10' , for full size characteristics:
在一块 2 x 6 - 10英尺的材料中, 对于全尺寸的缺陷:

60 SU (6 x 10) 96 SU (basic size 基本尺寸)	x 8 per BS = 5 knots (1/2" in size) or 2 1/2 knots (1" in size) for a total of 2 1/2" x 8/基本尺寸 = 5个节疤 (1/2英寸) 或2 1/2个节疤 (1英寸) 总量为2 1/2英寸

In the above example we are allowed 2 1/2 - 1" knots, which equates to 2 full size knots (1") plus 1- 1/2" knot.
在上述例子中，可以允许2.5个1英寸的节疤，它等于2个足尺寸的节疤(1英寸)加一个1/2英寸的节疤。

When two knots are full size, the third knot may not exceed 1/2 the size (0.5), ie 2 - 1" knots and 1 - 1/2" knot. Otherwise, any 3 knots with a combined size of less than 2.5" and individual sizes of 1" or less are permitted.
当两个节疤为足尺寸时，第三个节疤不能超过足尺寸的1/2(0.5)，即2个1英寸节疤和1个 1/2英寸节疤。或者，可允许三个总量为2.5英寸节疤、但单个节疤的尺寸不能超过1英寸。

Any combination of five knots totalling 2 1/2" or less would be permitted as long as no single knot exceeds the maximum size (1").
可允许5个节疤的组合，但其总量要等于或小于2.5英寸节疤、单个节疤的尺寸不能超过1英寸。

Where characteristics are permitted to be equivalent smaller, the number of characteristics may be increased provided their combined size does not exceed the combined size of the characteristics allowed and each individual characteristic is less than the maximum size permitted.
当允许缺陷以等效但较小的尺寸出现时，如果其尺寸总量不超过允许的尺寸总量、单个缺陷的尺寸也小于允许的尺寸，则可以允许其数量有所增加。

Example: In D Clear, Reverse Face, knots totalling 5 inches are permitted.
示例：D级清材，背面，允许总量为5英寸的节疤。

60 SU (6 x 10) 96 SU (basic size 基本尺寸)	x 10 per BS = 6.25 knots or 7 knots x 10 /基本尺寸 = 6.25个节疤或7个节疤

Note: the 7th knot can only be 1/4 of the knot size allowed - 1/8"
注：第7个节疤只能为允许节疤尺寸的1/4，即1/8英寸

Equivalent Smaller Knots
等效较小尺寸节疤

The grade limit for knots is eight as equivalent smaller (per basic size), the knots may not be broken down further, ie You could not take 10 - 1/4" knots as equivalent.
规则允许8个较小的等效的节疤(每个基本尺寸)，至此节疤不能再拆分为更小的等效节疤，即不可以允许10个1/4英寸的等效节疤。

Example: If you were allowed 2 1/2" of total knot the following knot configurations would be acceptable:
示例：如果允许2 1/2英寸的节疤总量，则下列节疤组合都是可以接受的：

- 1 - 1" knot plus 2 - 3/4" knots
  1个1英寸节疤加2个3/4英寸节疤

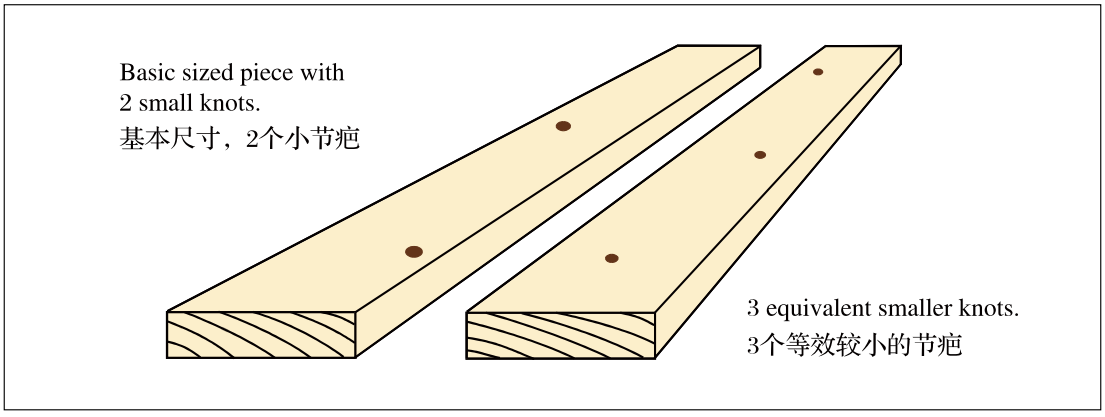
- 2 - 1/2" knots plus 2 - 3/4" knots
  2个1/2英寸节疤加2个 3/4英寸节疤

- 5 - 1/2" knots
  5个1/2英寸节疤

Knot Allowances per Face in Industrial Clears
工业清材中每面的节疤允许值

For Basic Size 基本尺寸	Number of Knots 节疤数量	Max Size 最大尺寸	Max Total Inches 最大总尺寸
B & Better Clear – Face B级及以上清材–正面	0	0	0
B & Better Clear – Reverse B级及以上清材–背面	3个	3/4英寸	1 1/2英寸
C Clear C级清材	3个	3/4英寸	1 1/2英寸
D Clear – Face D级清材–正面	8个1/2英寸	1英寸	4英寸
D Clear – Reverse D级清材–背面	10个1/2英寸	1 1/4英寸	5英寸

Knots in C Clear
C级清材中的节疤



- The highest grade which permits knots on the best face is C Clear.
  允许节疤出现在正面的最高等级为C级清材。

- C Clear knots must be Sound and Tight.
  C级清材中的节疤必须为健全固定节。

- A Basic Sized C Clear face will allow:
  基本尺寸C级清材的正面允许：

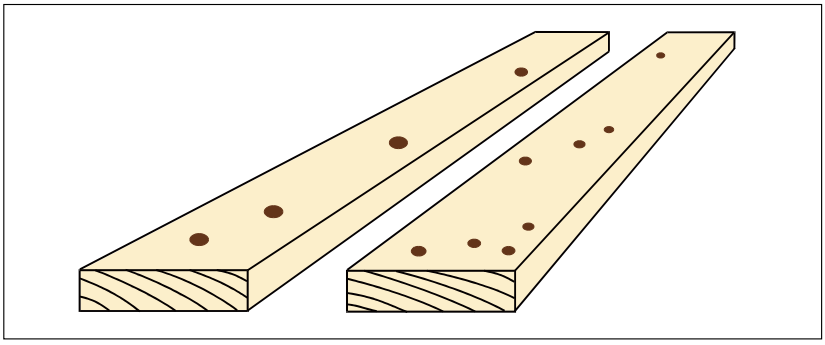
  2 small knots or 3 equivalent smaller knots which means:
  2个小节疤或3个等效的较小节疤，即意味着：

- a maximum of 3 Sound and Tight knots
  最多有3个健全固定节

- none larger than 3/4"
  尺寸不能超过3/4英寸

- the sum of their sizes not to exceed 1 1/2" (2 x 3/4")
  节疤的总尺寸不能超过 1 1/2英寸 (2 x 3/4英寸)

Knots in D Clear
D级清材中的节疤



- D Clear Knots must be FIXED.
  D级清材中的节疤必须为紧固节

- A Basic Sized D Clear face would permit:
  基本尺寸D级清材的正面允许：

  - 4 - 1" knots or 8 equivalent smaller knots
    4个1英寸节疤或8个等效的较小节疤

  - the combined sizes of all knots may not exceed 4"
    节疤的总尺寸不能超过4英寸

Knots on the Reverse Face
背面的节疤

Knots on the reverse face can be 25% Larger or more numerous. The allowance therefore, would be as follows:
背面的节疤可以尺寸大25%或数量多25%。因此，这一允许值为：

- maximum number - 10 (25% more)
  最大数量，10个(多25%)

- maximum individual size 1 1/4" (25% larger)
  最大单个尺寸为1 1/4英寸 (大25%)

- combined size of all knots - 5" or less
  所有节疤的总尺寸，5英寸以下

Knot Measurement
节疤测量

Round and Oval knots are measured by averaging the diameter of the longest dimension (A) and the narrowest dimension (B).
圆节和椭圆节是其直径最长尺寸(A)和最短尺寸(B)的平均值。

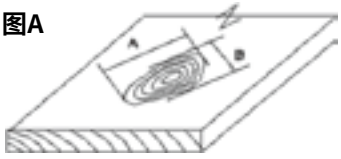
It is important to stress that the knot measurements be taken on the smallest imaginary rectangle that can enclose the knot, and that the longest and narrowest dimensions be at right angles to each other, as in Fig. A
有必要强调的是，节疤的测量值是在一个虚拟的、能套住节疤的、最小长方形上进行的，长轴方向和短轴方向互相垂直，如图A。

Spike knots as in Fig. B are measured by the average of their length and width (taken across the knot's widest point).
条状节，图B，是测量其长度和宽度(从最宽出测量)，然后求平均值。

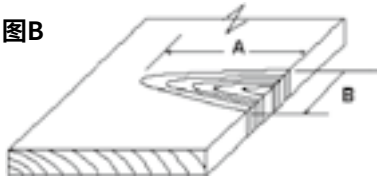
Irregular shaped knots as in Fig. C are measured as the average dimension of the smallest rectangle which will box in the knot.
不规则形状的节疤，图C，以能套住节疤的、最小长方形的平均值。

$$\frac{A + B}{2} = \text{knot size 节疤尺寸}$$

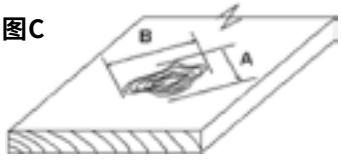
图A



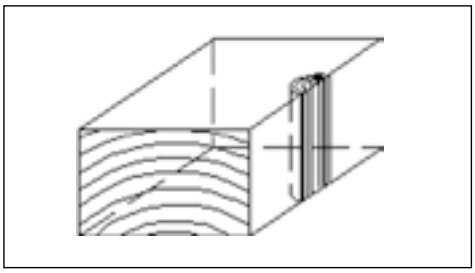
图B



图C

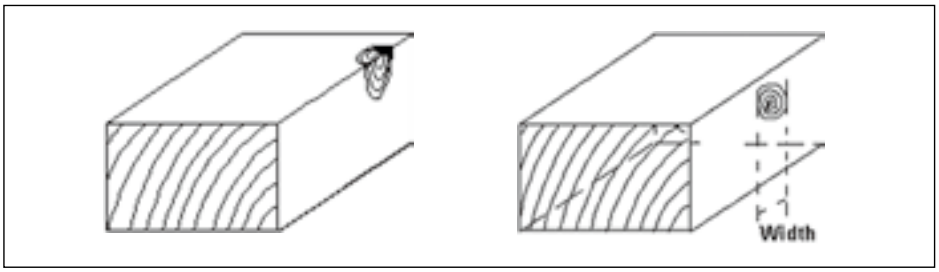


Knot Measurement in NLGA Industrial Clears
NLGA 工业清材中节疤的测量



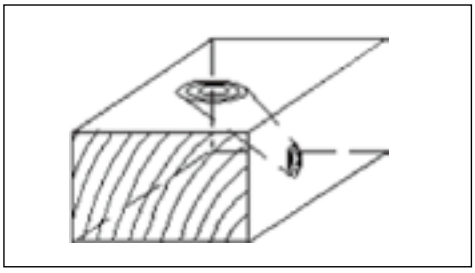
Single knots (as shown above) — Measure as average diameter on the wide face. The width of the knot on the edge cannot exceed the allowable knot size. Disregard the edge size in D Clear.

单个节疤(如上所示) — 测量宽面上的平均直径。窄面上节疤的宽度不能超过允许的节疤尺寸。D级清材窄面上的节疤可忽略。



The knots shown above illustrate measurement of knots on the corners and edges in clears. Note that in D Clear, knots on the narrow face (edge) may be ignored for size.

上图演示清材中边角节疤、窄面节疤的测量。注意在D级清材窄面上的节疤可忽略其尺寸。



Two Knots (as shown above) — any amount of wood between the knots and they are counted as two knots. Measure as average diameter on the wide face. Measure the width only on edge.

两个节疤(如上所示) — 只要有木材组织出现在节疤之间，它们就应当被看成是两个节疤。在宽面上测量其平均直径。在窄面上只须测量其宽度。

Measure spike knots as average of length and widest width.

条状节测量其长度和最宽处宽度的平均值。

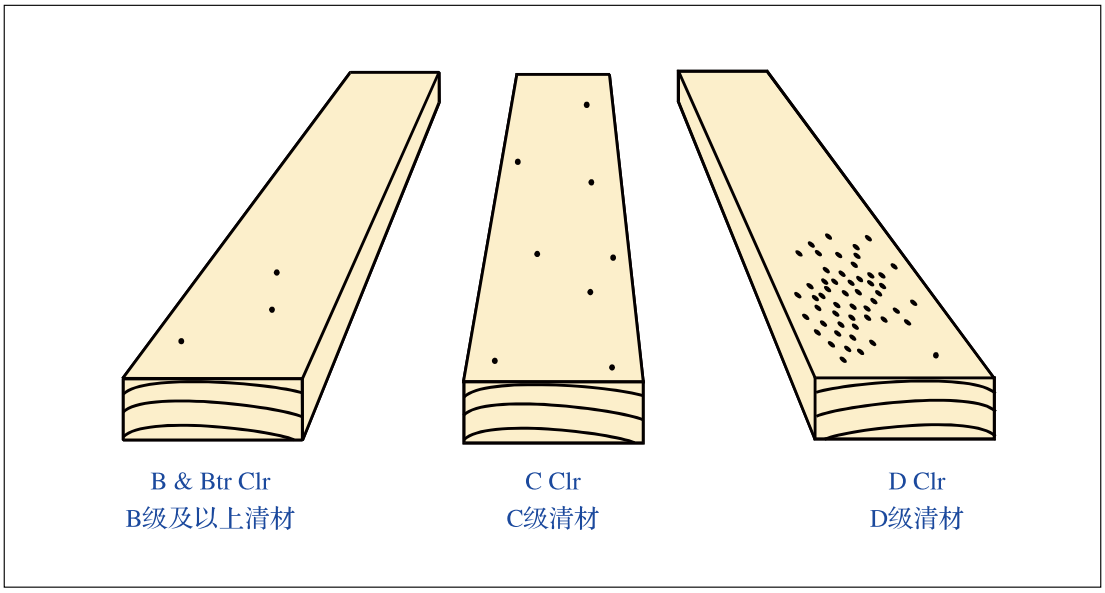
Pin Holes
针孔虫眼

B & Better Clear - maximum of 3 per basic size, on the face and edges
B级及以上清材，正面和边，每个基本尺寸最多3个。

C Clear - maximum of 8 per basic size, on the face and edges
C级清材，正面和边，每个基本尺寸最多8个。

D Clear - Face — pinholes are not restricted by basic size and are permitted to be 25% more numerous in a concentrated area, providing the piece balances out overall.
D级清材，正面 — 不是根据基本尺寸对针孔虫眼进行限制，在分布相对集中的区域允许数量比规定值高25%(如果整片锯材平摊后能符合规定)。

Pin Hole Allowances in Industrial Clears
工业清材中针孔虫眼的允许值

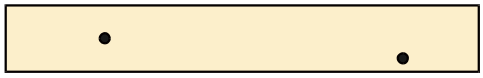
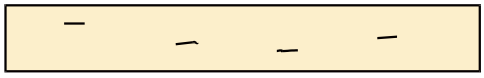
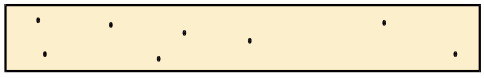
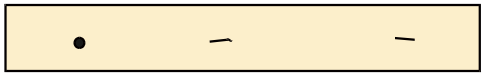
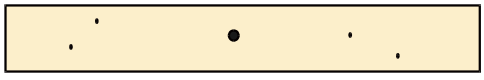
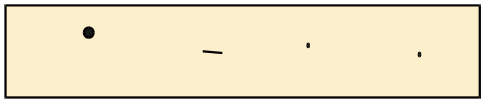


Equivalent Characteristics
等效缺陷

In C Clear and better, characteristics such as knot (C Clear only), pin holes, pockets and streaks are restricted to one or the other, or an equal combination:
在C级清材及更高等级中，限定节疤(仅C级清材)、针孔虫眼、树脂囊/树皮囊、和树脂斑等缺陷只能为一种、或另一种、或一个相等的组合：

C Clear could have C级清材可以有	- 2 Small Knots or 2个小节疤，或 - 1 Small Knot + 2 Small Pockets or 1个小节疤 + 2 个小树脂/皮囊，或 - 4 Pin Holes + 1/2 Small Streak 4个针孔虫眼 + 1/2 个小树脂斑

D Clear permits all characteristics listed to occur in one piece.
D级清材允许所有规则中列出的缺陷出现在同一片锯材上。

2 small knots		2个小节疤
4 small pockets		4个小树脂/皮囊
8 pin holes		8个针孔虫眼
1 small knot and 2 small pockets		1个小节疤及 2个小树脂/皮囊
1 small knot and 4 pin holes		1个小节疤及 4个针孔虫眼
1 small knot and 1 small pocket and 2 pin holes		1个小节疤及 1个小树脂/皮囊及 2个针孔虫眼

Pockets
树脂囊/树皮囊

Pockets in Industrial Clears are restricted by their individual size and the combined length in inches. The total length of pockets permitted is based on the length of a 1/8" wide pocket in each of the pocket size classifications.

工业清材中既限制单个树脂囊/树皮囊的尺寸、也限制它们的总尺寸。允许的树脂囊/树皮囊的总长度是以每个类型中宽度1/8英寸的树脂囊/树皮囊为基准确定的。

The total number of pockets is not restricted.

对树脂囊/树皮囊的总数量没有限制。

If the grade accepts 4 small pockets, this means Any number of pockets whose combined length in inches is equal to that of 4 small (4 x 4" - 16") is permitted. No pocket shall exceed the maximum individual size specified for that classification of pocket.

如果规则可接受4个小树脂囊/树皮囊，这意味着任何数量的树脂囊/树皮囊都是允许的，只要它们的总长度等于4个小树脂囊/树皮囊(4 x 4英寸 - 16英寸)。任何单个树脂囊/树皮囊的尺寸都不能超过相应类型规定的最大尺寸。

A pocket could be 1/16" x 6" and would be acceptable as a small pocket, but as in the above example the total length allowance could not exceed 16".

根据树脂囊/树皮囊的尺寸分类，一个1/16英寸 x 6英寸可以被看成是小树脂囊/树皮囊，但在上述示例中，总允许长度不能超过16英寸。

Example:
示例：

A 2 x 8 - 12' (Basic Size) "C" Clear permits 4 small pockets.

一块2 x 8 - 12英尺(基本尺寸)的C级清材允许4个小树脂囊/树皮囊。

$$\frac{4}{\text{small pockets permitted}\ \text{允许的树脂囊/树皮囊数量}} \times \frac{4"}{\text{per 1/8" pocket}\ \text{以1/8英寸为准}} = \frac{16"}{\text{of pockets permitted}\ \text{允许的总长度}}$$

The grade permits any number or combination of small pockets (1/4" x 2" or 1/8" x 4" or 1/16" x 6") whose combined length is less than 16".

该等级允许任何数量的小树脂囊/树皮囊(1/4英寸 x 2英寸 或 1/8英寸 x 4英寸 或 1/16英寸 x 6英寸)，只要它们的总长度小于16英寸。

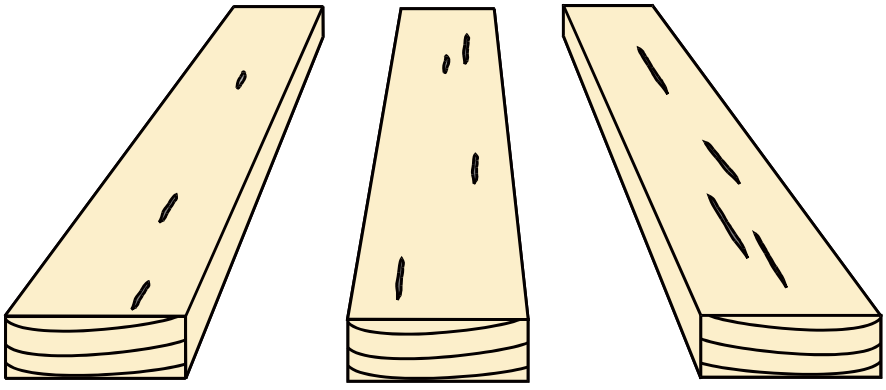
Example:
示例：

A 2 x 6 - 12' (3/4 basic size) on the face of a C permits:

一块2 x 6 - 12英尺(3/4基本尺寸)C级清材的正面允许：

3/4	x 16"		12"
2 x 6 – 12' Fraction of basic size	total =		of pockets permitted
2 x 6 – 12英尺占基本尺寸的分数	总量		允许的树脂囊/树皮囊

Pockets in Industrial Clears
工业清材中的树脂囊/树皮囊



B & Btr Clr
B级及以上清材

C Clr
C级清材

D Clr
D级清材

Checks
干裂

Checks must be considered for size and number on dressed faces of NLGA Industrial Clears. In D Clear the number of checks is not controlled, only the individual size. In rough clears, checks are not considered.
NLGA工业清材的正面中，既限制干裂的尺寸也限制它们的数量。在D级清材中不限制它们的数量，只限制单个干裂的尺寸。在毛面的清材中，不考虑干裂。

B & Better Face B级及以上清材正面	B & Better Reverse B级及以上清材背面	C Clear Face C级清材正面	C Clear Reverse C级清材背面	D Clear Face D级清材正面	D Clear Reverse D级清材背面
Size – 4" 尺寸 – 4英寸 Total –16" 总量 – 16英寸	Size – 4" 尺寸 – 4英寸 Total –16" 总量 – 16英寸	Size – 4" 尺寸 – 4英寸 Total –16" 总量 – 16英寸	Any Number 任何数量 Max 15" 最大15英寸	Any Number 任何数量 Max 15" 最大15英寸	Any Number 任何数量 Max 15" 最大15英寸

Holes
孔洞

Holes can be from any cause and are permitted only in D Clear (or on the back of a C Clear). Any number of holes may be taken as equivalent smaller provided the size of each hole is not more than that permitted and the sum of the holes does not exceed the sum total allowed (e.g. four 1/4" holes would be accepted as equivalent to two 1/2" on the back of D Clear).
孔洞可以是任何原因形成的，但只在D级清材中允许出现(或在C级清材的背面)。任何数量的孔洞都可以作为较小的等效孔洞，只要其单个孔洞的尺寸不大于规定尺寸、孔洞的总尺寸也不超过允许的总尺寸(例如在D级清材的背面，4个的1/4英寸的孔洞可以作为2个1/2英寸的等效孔洞被接受)。

A hole over 1/2" is only accepted as a Cut-Out.
超过1/2英寸的孔洞只能被当作废料。

Rate of Growth
生长率

B & Better requires 6 rings per inch on the best end. C and D Clear have no rate of growth specification.
B级及以上清材要求在较好一端有6个年轮。C级和D级清材对生长率没有规定。

Skips
漏刨

Skips are restricted as follows:
对漏刨的限制如下：

No skips on the face of B & Better clear B级及以上清材正面无漏刨		
Skips on back of B & Better or face of C Clear B级及以上清材背面和C级清材正面的漏刨	1/64" x 6" 1/64英寸 x 6英寸	20% of face area 20% 的表面积
Skips on back of C Clear C级清材背面的漏刨	1/32" x 12" 1/32英寸 x 12英寸	20% of face area 20%的表面积
Skips on face and back of D Clear D级清材正面和背面的漏刨	Hit and Miss on the face, max size 1/16" deep x 4" long, 1/8" scant on edge. 正面间隔漏刨，最大1/16英寸深 x 4英寸长，窄面最大 1/8英寸缺尺(深) Hit or Miss on the back 背面可连刨或连漏	

* Note: C Clear will not accept D Clear skips on the back because the grade stipulates the amount of skip permitted on the back.
* 注：C级清材背面不允许如D级清材上的漏刨，因为规则已经明确规定了在其背面漏刨的数量和尺寸。

If the skips above are only 1/2 width accept them twice as long.
如果漏刨的宽度只有上述宽度的1/2，则允许它们的长度为规定的两倍。

Raised Grain
凹凸纹理

Raised Grain must be evaluated by feel. Evaluate the finish of surfaced KD clears by running the hand over the entire surface of the piece. Raised Grain will not be taught in regular grading classes.
凹凸纹理须以感觉来判断。对于刨光、窑干清材的表面，用手在整个锯材的表面抚摸。在一般的分级教学中，对凹凸纹理不做讲解。

Torn Grain
撕破纹理

Torn Grain is evaluated by visually judging the depth which the grain is torn.
撕破纹理通过目视判断纹理撕破的深度来评估。

Machine Burn
机械灼焦

Machine Burn would be acceptable providing it is no deeper than the torn grain permitted in the grade and the discoloration does not exceed the following conditions:
机械灼焦在下列情况下可以允许：其深度不大于规定允许的撕破纹理的深度、以及其变色没有超过下列条件：

B & Better – barely visible. **B级及以上清材 –** 几乎不可见	Can be removed with a light sanding to be suitable for a natural finish. 轻轻的砂光就可以去除，可适用于需本色饰面的产品。
C Clear – colour is not controlled. **C级清材 –** 不限制颜色	Only slightly felt depth which is suitable for paint finishes. 只有可轻微感觉到的深度，可适用于需油漆饰面的产品。
D Clear – colour is not controlled. **D级清材 –** 不限制颜色	Depth can be readily felt. 其深度很容易感觉到。

Slope of Grain
纹理斜度

NLGA Para 360
NLGA 360款

The NLGA describes Slope of Grain as the deviation of the wood fibre from a line parallel to the edges of a piece. The deviation is expressed as a ratio such as a Slope of Grain of 1 in 8, 1 in 6, 1 in 4.
NLGA将纹理斜度定义为木纤维偏离锯材边缘平行线的程度。它用纹理斜度为1/8、1/6、1/4这种方式来表述。

In lumber 2 inches and thicker and 4 inches and wider, Slope of Grain is measured over a sufficient length and area to be representative of the general slope of the fibres. Local deviations around knots and elsewhere are disregarded in the general slope measurement.
在厚度为2英寸及以上、宽度为4英寸及以上的锯材中，纹理斜度必须测量足够的长度和面积，以使得它能代表纤维的总体斜度。在测量纤维的总体斜度时，节疤周围及其它局部的纹理偏斜不予考虑。

In thinner or narrower lumber, the displacement of local grain deviation (other than around knots) which exceeds the slope provisions of the grade is limited to the knot displacement permitted.
在厚度、宽度较小的锯材中，如果局部纹理偏斜(非节疤周围)超过了该等级规定的斜度，则对其占据面积的限制与节疤允许占据面积相同。

Wane
钝棱

Wane on the face and the edge of D Clear is evaluated separately. D Clear wane on the face may be equivalented for width and length (total area governing). Do not exceed the thickness allowance unless the wane will be accepted for the back.

D级清材正面和窄面上的钝棱单独评估。D级清材正面的钝棱可以是宽度和长度的等效钝棱(以总面积为准)。厚度的允许值不可以超过，除非该钝棱可被当成背面钝棱。

50% more wane on the back of D Clear means a full 50% increase in allowable wane in face area or in depth or equivalent combination of smaller wane increases in both.
D级清材背面钝棱的允许值比正面大50%，即钝棱面积的允许值大50%、或深度大50%、或等效稍小但面积和深度均超标的钝棱。

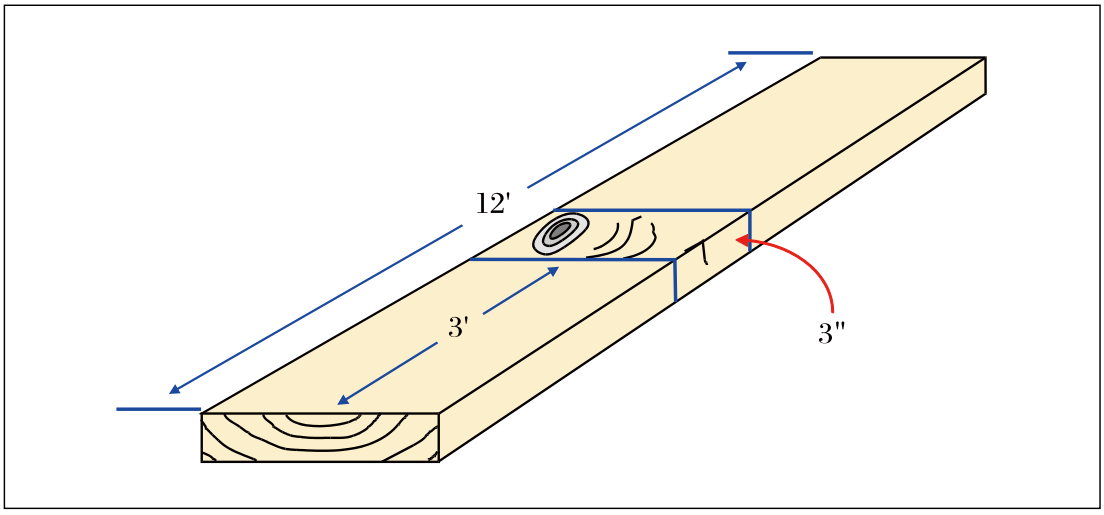
Cut-Out
废料

3" long, 3' from the end in pieces 12' and longer.
3英寸长，离端头3英尺以上，锯材总长度为12英尺及以上。

In pieces 12 foot or longer, excessive or oversize characteristics may be permitted in D Clear as a small area of waste to be Cut-Out by the end user. The Cut-Out must be 3' or more from the end of the piece and no more than 3 inches may be wasted.
在总长度为12英尺及以上的锯材中，D级清材中允许有超过规定数量或尺寸的缺陷，它们必须位于小块区域，用户可以把它们作为废料锯除。废料必须距离端头3英尺以上，废料的长度不能超过3英寸。

If a three inch Cut-Out does not completely remove the characteristic, the remaining amount of the characteristic must be allowable in D Clear.
如果锯除3英寸后仍不能完全去除该缺陷，剩下的缺陷必须在D级清材的允许值范围内。

This clause can be applied to eliminate or reduce a single oversize characteristic or to reduce the total number of characteristics to that allowed.
这一条款可以被用来去除或减小单个过大的缺陷、或减少允许缺陷的总数量。



White Specks
白斑朽

White specks are permitted only in D Clear (also, back of C Clear) and are restricted to 1/4 the face. Allow 25% more on the back of D Clear.
白斑朽仅在D级清材(还有C级清材的背面)被允许，限制其为表面的1/4。D级清材的背面允许其比表面多25%。

Splits
劈裂

Splits are measured on the face they occur and are permitted the nominal width of the piece in all grades. Longer splits reject the piece.
劈裂在它们出现的表面测量。所有等级中，允许其最大为该片锯材的名义宽度。含超长劈裂的锯材不能评为清材等级。

Stain
变色

Stain of any type is not permitted on the face of a B & Better.
在B级及以上清材的正面，不允许任何形式的变色。

Heart Stain is unlimited on the face of C Clear (back of B & Better) and D Clear but the piece should be examined closely for white specks and unsound wood.
在C级清材(B级及以上清材的背面)和D级清材的正面可以允许心材变色，但一定要对该片锯材进行详细检查，以防出现白斑朽和腐朽。

Sap Stain is permitted on the face of C Clear (back of B & Better) as medium stain for 1/4 the face or equivalent more if lighter. Medium stain is any amount of stain which does not obscure the grain. Sap Stain is unlimited in D Clear.
在C级清材的正面(B级及以上清材的背面)可以允许边材变色，允许范围为中等变色、1/4表面积，如果较浅可以等效较大。中等变色为任何程度的变色只要它没有使纹理模糊不清。D级清材不限制边材变色。

NLGA PARA 155 SHOP
NLGA 155款 车间级

(All species except Western Red Cedar)
(适用于除西部红柏之外的所有树种)

1" & 2" thicknesses
厚度1英寸和2英寸

Grade Names
等级名称

Select Shop
优选车间级

No 1 Shop
车间1级

No 2 Shop
车间2级

No 3 Shop
车间3级

The grade of a piece of shop lumber is determined by identifying the percentage of clear cuttings obtainable in the piece and comparing this percentage to the requirements for each grade of shop.
一块车间级锯材等级的确定是通过计算一块材料中可获得清材锯块的百分比、并将该百分比与每一个车间级对百分比的要求进行比较后评定的。

There are three basic types of cuttings acceptable in the shop grade: (Cuttings are measured in whole inch increments).
车间级中允许三种类型的锯块：(锯块测量时以英寸整数进尺)

A Wide Cuttings
A **宽锯块**

In lumber which is 9 1/4" or wider, cuttings may be as short as 18" (minimum)
在宽度为9 1/4英寸及以上的锯材中，锯块最短为18英寸。

B Medium Width Cuttings
B **中等宽度的锯块**

In lumber 5" or wider, the cuttings must be 3' or longer
在宽度为5英寸及以上的锯材中，锯块必须为3英尺及以上。

C Full Width Cuttings
C 全宽锯块

In lumber narrower than 5", the cuttings must be full width and 3' or longer
宽度为5英寸以下的锯材中，锯块必须为全宽、而且长度为3英尺及以上

In determining the grade of cuttings consider the following:
在评定锯块的等级时，应考虑如下因素：

- Although all faces are considered, the poorest face of the cutting will determine the grade of the cutting.
  虽然所有的面都要考虑，但最差的面决定锯块的等级。

- Cuttings maybe taken up to the edge of the knot, but damaging grain distortion should not be accepted in cuttings.
  锯块可以直至节疤的边缘，但有危害性的纹理变形不可以被包含在锯块中。

- A cuttings must be completely clear on both sides.
  清材锯块的两面都必须是“清材”(无缺陷)。

- B cuttings must conform to the grade of B & Better Clear (Para 108b). Due to the fact that the allowance of characteristics in B & Better Clear is based on a Basic Size (8" x 12') these shop cuttings must be virtually clear on both sides.
  B级锯块必须符合B及以上级清材的要求(108b款)。由于B及以上级清材的缺陷允许值是基于基本尺寸(8英寸 x 12英尺)的，车间级的锯块必须是两面都几乎无缺陷。

- Sash must conform to the grade of No 2 cutting qualities as outlined in the Door Stock grade (Para 157e).
  窗框锯块的质量必须符合2级锯块的质量(如窗料等级条款，157e款)。

Calculating percentage of recovery
出材率的计算

Select Shop - 70% or more
优选车间级 - 70% 及以上

No 1 Shop - 50%
车间1级 - 50%

No 2 Shop - 33 1/3%
车间2级 - 33 1/3%

No 3 Shop - 50% Sash Cuttings or a combination of 30% Sash Cuttings plus 10% Clear Cuttings
车间3级 - 50% 的窗框锯块、或30% 窗框锯块加10% 清材锯块

For grades of shop the following two methods are easiest to use:

在车间级中，下列两个方法是最容易使用的：

Cross Cutting Only - If all the cuttings on the piece are full width then the percentage recovery may be determined based on total lineal inches (length of cuttings / length of piece x 100).
仅有横锯 - 如果锯块是材料的全宽，那么出材率可以根据英寸为单位的总长度来求得(锯块长度/材料总长度 x 100)。

Combination of Cross Cutting and Ripping - If all the cuttings are not full width or are a mixture of different widths then the recovery should be based on total square inches (total area of cuttings / total area of the piece x 100).
横锯和纵锯的结合 - 如果锯块不是全宽或为不同宽度的综合，这时出材率必须根据总平方英寸来求得(锯块总面积/材料总面积 x 100)。

Determine the total recovery of cuttings as follows:
以下列方法求得锯块的总出材率：

Method #1
方法 #1

1) Multiply the total inches (lineal inches or square inches as described above) for the piece being graded by the percentage required in the grade being considered (.7 for 70%, .5 for 50%, .333 for 33.3%, etc.). This identifies the minimum inches of cuttings required to make this grade.
用待评级锯材的总量(如上文所述的总长度或总面积)乘以所考虑等级要求的百分比(用0.7 代表 70%, 用0.5 代表 50%, 用0.333 代表 33.3%，等)。这样可以得到要达到该等级所需要的最低英寸数。

2) Compare total inches of cuttings available to the required figure. If the total exceeds (or is equal to) this amount, the piece makes the grade. If the total is less, then the piece should be considered for the next lower grade.
将锯块的总英寸数与要求的数量相比较。如果总量超过(或等于)这一数量，该块锯材达到这一等级。如果总量小于这一数量，应该认为该块锯材为下一个较低的等级。

Method #2
方法 #2

1) Find the total inches (either total lineal or total square as described above) for the piece being graded.
求出待评级锯材的总英寸数(如上所示的总长度或总面积)。

2) Find the total inches for all the cuttings obtainable in the piece.
求出该块锯材中可得到的锯块总英寸数。

3) Divide the total inches of cuttings obtainable by the total inches for the piece and multiply this result by 100 (this method is only suggested where a calculator is available)
将可得到的锯块总英寸数除以待评级锯材的总英寸数、再乘以100(建议该方法只是在有计算器的情况下使用)。

Select Shop
优选车间级

Each piece contains 70% or more of clear recovery
每块锯材有70%及以上的清材出材率

No 1 Shop
车间1级

Eace piece contains 50% to 70% of clear recovery
每块锯材有50%到70%的清材出材率

Select Shop
优选车间级

No 1 Shop
车间1级

NLGA PARA 150 FLITCHES
NLGA 150款 大料级

Grade Names
等级名称

Factory Flitch
工厂级大料

Shop Flitch
车间级大料

- Graded on the premise that they will be ripped into one inch strips across the width.
  分级时假定，大料将在宽度方向上被纵锯成1英寸宽的条状材料。

- Individual cuttings must be completely clear.
  每个锯块必须完全是清材(无缺陷)。

- Rate of Growth requirement is 6 rings per inch.
  生长率的要求为每英寸6个年轮。

- Slope of Grain permitted is 1 in 8.
  允许的纹理斜度为1/8。

- Cuttings maybe taken up to the edge of the knot (nearest whole inch), but damaging grain distortion should not be accepted in cuttings.
  锯块可以直至节疤的边缘(最接近的整数英寸数)，但有危害性的纹理变形不可以被包含在锯块中。

- Flitches may be mixed grain, but recovery is generally reduced if pieces are other than flat grain. In grading class, it may be necessary to "read" the grain to detect where knots run out on the hidden wide face.
  大料可以是混合纹理，但如果锯材不是平纹，出材率通常会下降。在评级时，有必要认真查看纹理，以发现有无隐藏的节疤将会在锯开的宽面上出现。

  - Knots appearing on the narrow face of a pure vertical grain piece and which do not show in either wide face must be considered as passing completely through the piece.
    在一块纯直纹的材料上，如果有节疤出现在窄面上而且在两个宽面上都不露出，应该视为该节疤穿越整个材料。

Grade Requirements:
等级要求：

Factory Flitch
工厂级大料

A minimum of 80% of the piece must yield 2' and/or longer cuttings (maximum waste is 20%).
每块锯材最少能产出80%长度2英尺及以上的锯块(废料最多为20%)。

In 12' or longer lengths a minimum of 40% of the piece must yield cuttings 7' and/or longer.
在长度为12英尺及以上的锯材中，40%的锯块必须为长度7英尺及以上。

Example: A 4 x 8 - 12' yields 96 lineal feet of 1 x 4 when ripped, 40% or 38.4' must be 7' or longer.
示例：一块4 x 8 - 12英尺的锯材，锯开后可得到96英尺长度的1 x 4锯块，其中的40%，即38.4英尺，必须长度为7英尺及以上。

Tip: In pieces 12' and longer, check to see if any 7' cuttings are present, then check for waste. Pieces shorter than 12' determine the waste first.
提示：在长度为12英尺及以上的锯材中，先检查7英尺以上的锯块是否存在，然后检查废料比率。在长度为12英尺以下的锯材中，先确定废料比率。

Shop Flitch
车间级大料

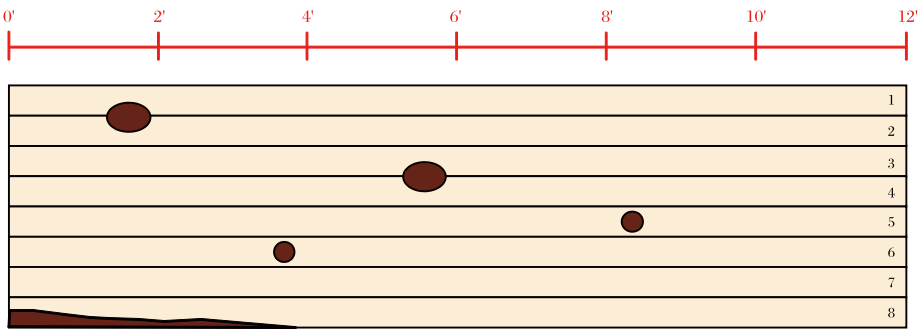
A minimum of 60% of the piece must yield 2' and/or longer cuttings (max. waste 40%).
每块锯材最少能产出60%长度2英尺及以上的锯块(废料最多为40%)。

Note:
注意：

While it is generally easier to determine the amount of waste present in the piece, if the percentage of recovery is close to that required, then the actual recovery must be determined.
通常，计算一块锯材的废料比率相对比较容易，但如果出材率很接近出材率的规定要求，这时候应直接采用出材率来计算。

Actual waste present is biased by slight overlength and may indicate that insufficient recovery exists when recovery is within requirements.
废料出现的实际比率常常会受到锯材少量超长部分的影响，所以当出材率接近规定要求时，实际出材率可能不足。

Grading Flitches
大料的评级



8" x 12' Flitch
8英寸 x 12英尺大料

Procedure for Grading
评级程序

1. Calculate Lineal Feet of 1" strips
   Width in inches x Length in Feet
   ie 8 x 12 = 96 lineal feet
   计算一英寸宽的条状材料的长度
   宽度(英寸) x 长度(英尺)
   即 8 x 12 = 96 英尺长度

2. Calculate percentage of waste allowed for lineal feet of piece
   20% x 96 lineal feet = 19.2 lineal feet of waste permitted (or 76.8 lineal feet of recovery)
   计算该块锯材允许废料的长度
   20% x 96英尺长度 = 19.2 英尺长度的废料允许值(或 76.8英尺长度的出材率)

3. If piece is 12' or longer, calculate 40% of 7' or longer required
   40% x 96 lineal feet = 38.4 lineal feet of 7' or longer required
   锯材的长度为12英尺及以上，计算7英尺以上的锯块的总长度是否达到40%

Worksheet 计算表

Piece Size (w x l) _____ total lineal possible

锯材尺寸 (宽 x 长) _____ 可能的总长度

20% = _____ 40% = _____

Strip Number 条料号	2' to 7' cuttings 2英尺至7英尺锯块	7' + cuttings 7英尺以上锯块	Waste 废料
1		10英尺	2英尺
2		10英尺	2英尺
3	5 1/2英尺 + 6英尺		6英寸
4	5 1/2英尺 + 6英尺		6英寸
5	3 1/2英尺	8英尺	6英尺
6	3 1/2英尺	8英尺	6英尺
7		12英尺	0
8		8英尺	4英尺
Total 总量	30英尺	56英尺	10英尺

Total Waste = 10' **Total Recovery = 30' + 56' = 86 lineal feet**

总废料 = 10英尺 **总出材率 = 30英尺 + 56英尺 = 86 英尺长度**

For the grade of Factory Flitch you are allowed 19.2 lineal feet of waste and you need 38.4 lineal feet of 7' or longer cuttings. This piece makes the grade.

要达到工厂级大料，可以允许19.2英尺长度的废料、需要有38.4英尺长度的锯块长度为7英尺及以上。该块锯材达到了等级要求。

NLGA PARA 156 DOOR STOCK
NLGA 156款 门料级

1 3/8" & thicker
厚度1 3/8英寸及以上

Grade Names
等级名称

Factory Select
工厂优选级

No 1 Shop
车间1级

No 2 Shop
车间2级

No 3 Shop
车间3级

The grade of a piece of Door Stock is determined by identifying the percentage of clear cuttings obtainable in the piece, establishing the grade of each of these cuttings and comparing these findings to the minimum requirements for each final grade of door stock.
一块门料级锯材等级的确定是通过计算一块材料中可获得清材锯块的百分比、确定每个锯块的等级、并将这些数据与每一个门料级对百分比的要求进行比较后评定的。

In determining the types of cuttings available consider the following:
在评定锯块的类型时，应考虑如下因素：

Size classifications for the various cuttings will be based on 2" Door Stock.
不同锯块的尺寸类型划分是基于2英寸厚度的门料

Cuttings are measured in whole inch increments only (47 3/4" = 47") and a cutting must remain at least 1" away from Knots. Where there is extreme grain distortion around knots an even greater allowance may be necessary.
锯块测量时以仅以英寸整数计量(47 3/4英寸=47英寸)，锯块离节疤最少1英寸以上。如果在节疤周围有极端严重的纹理变形，应该让出更大的尺寸。

Characteristics appearing on the narrow face such as knots, pockets, shake, etc., which do not run out on the face must be considered as passing completely across the piece.
出现在窄面上的缺陷，如节疤、树脂囊/树皮囊、轮裂等，如果没有在表面出露，则应当被视为横过整个锯材。

The priority for desirability of cuttings is as follows:
获得锯块的优先顺序为：

1. Stiles and bottom rails - #1 quality
   边框和底档 - #1 质量

2. Stiles - #2 quality
   边框 - #2 质量

3. Muntins - #1 quality
   门梃 - #1 质量

4. Top rails - #1 quality
   顶档 - #1 质量

5. Any of above cuttings - #3 quality and better
   上述任何锯块 - #3 质量及以上

6. Sash - #2 quality and better
   窗框锯块 - #2 质量及以上

In determining the grade of cuttings consider the following:
在评定锯块的类型时，应考虑如下因素：

The Poorer Face of the cutting will determine the grade of the cutting.
最差的面决定锯块的等级。

Cuttings must be Vertical Grain (for reasons of less checking, shrinking, swelling, warping and good appearance).
锯块必须为垂直纹理(因为较少干裂、收缩、膨胀、扭曲及美观等因素)。

The Rate of Growth for an individual cutting is determined by averaging the number of rings on the best 3" line across the width of the cutting. Care must be exercised to ensure that grain angle does not distort this count, if possible the ring count should be made on the end of the piece. (The high rate of growth specification - 8 rings/inch - is to ensure the texture.)
单个锯块的生长率是在锯块宽度方向上最佳的3英寸范围量算获得的。需要谨慎的是，不要让年轮角度干扰了计算。如果可能，最好在端头测量年轮。(对生长率规定了较高的要求 — 每英寸8个年轮 — 是为了保障质地优良)。

Slope of Grain, when present, will generally appear on the narrow face.
纹理斜度，如果有，一般应出现在窄面上。

A few pin holes scattered on one side only (#3 cutting) is interpreted to mean 15 per square foot.
只能有少量针孔虫眼散布在一面(#3锯块)，允许值为每平方英尺15个。

Pockets — No 1 Cuttings permits one small not thru pocket. No 2 cuttings permit one small not thru pocket. 2 small not thru pockets are permitted in a #2 stile if they are within 20" of opposite ends.
树脂囊/树皮囊 — 1级锯块允许一个小的、非贯通树脂囊/树皮囊。2级锯块允许一个小的、非贯通树脂囊/树皮囊。2级边框中允许两个小的、非贯通树脂囊/树皮囊，但它们必须分别分布在两端20英寸范围内。

Door Stock Grade Requirements:
门料级等级要求

Factory Select
工厂优选级

- 70% of the piece must yield acceptable door cuttings (clear).
  一块锯材的70%能产出合乎要求的门料锯块(清材)。

- 4" to 6" widths require that a Stile be present.
  宽度为4英寸到 6英寸的锯材要求能出一块边框。

- All cuttings must be No 1 quality unless three stiles are required to make the minimum percentage, in which case one of the stiles may be No 2 quality.
  所有锯块必须为1级质量，除非需要三块边框才能达到最低的百分比要求，在这种情况下可以有一块边框为2级质量。

- Only one top rail may be counted.
  只能有一块顶档被计入百分比。

- Muntins and sash are not permitted.
  门梃和窗框锯块不能被计入百分比。

No 1 Shop
车间1级

- 50% of the piece must yield acceptable door cuttings (clear).
  一块锯材的50%能产出合乎要求的门料锯块(清材)。

- 4" to 6" widths a Stile must be present.
  宽度为4英寸到 6英寸的锯材要求能出一块边框。

- All cuttings must be No 1 quality except that ONE ONLY No 2 quality stile may be accepted.
  所有锯块必须为1级质量，或者只能有一块边框为2级质量。

- Two top rails and/or two muntins may be accepted, but not more than two in total if each is present.
  只能有两块顶档或两块门梃被计入百分比，如果两者均有，不可以总量超过两块的顶档或门梃被计入百分比。

- Sash cuttings are not permitted.
  窗框锯块不能被计入百分比。

No 2 Shop
车间2级

- No 3 and Better cuttings are accepted to make the required percentage. Percentages required vary with the different combinations of qualities present.

3级及以上质量的锯块均可以接受用于计算百分比。随着不同质量锯块的组合情况，要求的百分比有所变化。

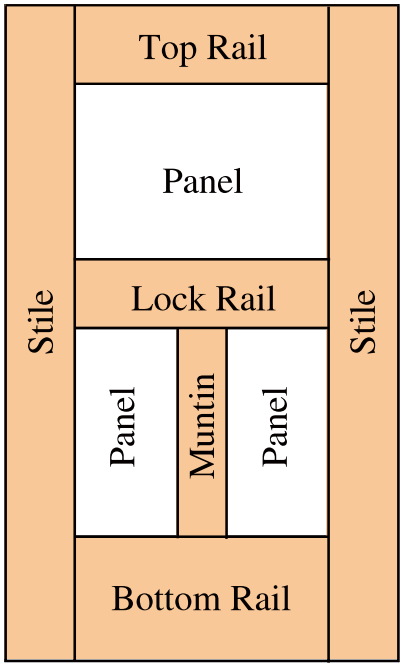
- Top rails may not be considered as No 1 quality in determining the percentage of cuttings recoverable.
  顶档不可以计入1级质量的出材率百分比中。

- Sash cuttings are not permitted.
  窗框锯块不能被计入百分比。

No 3 Shop
车间3级

- All cuttings are permitted, including sash.
  允许所有类型/质量的锯块，包括窗框锯块。

Door Parts
门的部件



Stile	边框
Top Rail	顶档
Lock Rail	锁档
Bottom Rail	底档
Muntin	门梃
Panel	门板

Size of Cuttings
锯块尺寸

Measured to the nearest whole inch, excluding a minimum 1" around knots.
测量至最接近的英寸整数，节疤周围最少空出1英寸。

Cutting 锯块	Width 宽度	Length 长度
Stiles 边框	4英寸 – 6英寸	81 英寸 – 97 英寸
Bottom Rail 底档	8英寸 – 12 英寸	23 英寸 – 48 英寸
Top Rails 顶档	4英寸 – 6英寸	23 英寸 – 48 英寸
Muntins 门梃	4英寸 – 6英寸	42 英寸 – 48 英寸
Sash Cuttings 窗框锯块	2 1/2 英寸, 3 1/2 英寸 和 4 1/2英寸	28 英寸及更长

Tips for Evaluating Door Stock
门料评级要点

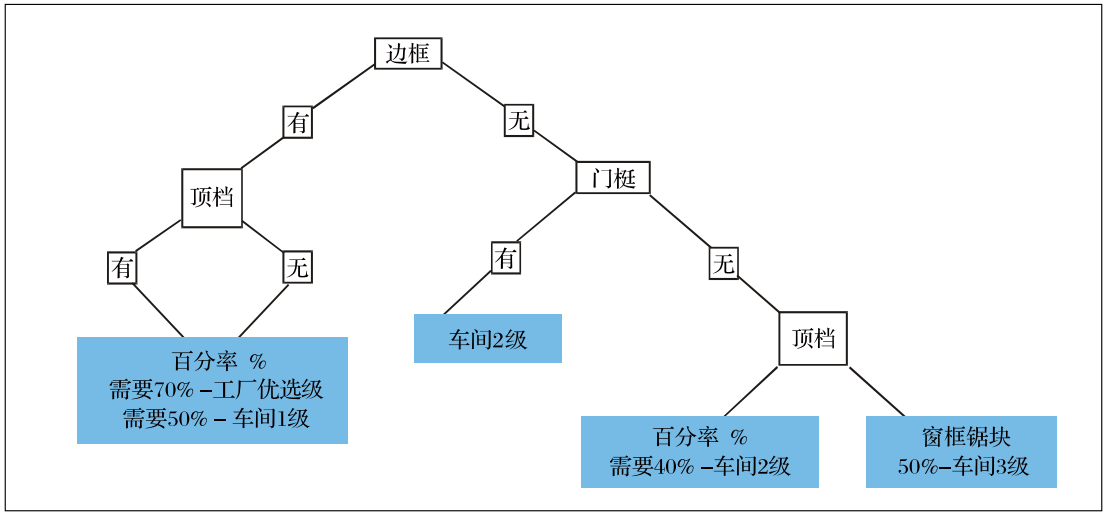
In 4" and 6" widths, always search for a Stile first. Without a Stile a piece of these widths can be no higher than No 2 Shop.

宽度为4英寸到6英寸的锯材，首先检查有无边框料。如果没有边框料，这类宽度的锯材等级不可能高于车间2级。

When considering a piece for No 2 Shop, where no Stile is present, search for Muntins first. Muntins may be counted as No 1 cuttings while Rails may not, thus No 1 Muntins reduce the required percentage of cuttings to only 25% (only one 4' No 1 Muntin would be required in pieces up to 16').

在考虑一块锯材能否被评为车间2级时，这时其中已确定没有边框料，先找门梃料。门梃可以被计为1级锯块，而门档不能。因此，1级锯块的门梃可以将锯块出材率百分比的要求降到仅为25%(在一块长达16英尺的锯材中，只要求一块4英尺长的1级门梃)。

Procedure for Grading Door Stock
门料等级的评级程序



1. Look for Stile
   No Stile - highest grade - No 2 Shop
   Watch for 4" or 5" stiles in 6" widths
   先找边框
   无边框 - 最高等级 - 车间2级
   在6英寸宽的材料中，查找4英寸或5英寸的边框

2. Look for a Muntin
   One 42" muntin will make No 2 Shop in pieces up to 14' long
   查找门梃
   一块42英寸长的门梃就可以让长度为14英尺的锯材成为车间2级

3. Look for Top Rails
   Two 50" top rails will make No 2 Shop in pieces up to 12' long
   查找顶档
   两块50英寸长的顶档可以让长度为12英尺的锯材成为车间2级

Notes:
注意：

measure 1" away from Knots
从距节疤1英寸量起

measure right up to Wane/Saw Cuts/Holes
钝棱/锯缝/孔洞可以量至边缘

knots on narrow face are considered to go right across
窄面上的节疤被视为横穿整个锯材

NLGA PARA 153 WINDOW STOCK
NLGA 153款 窗料级

All widths, up to 5" in thickness
所有宽度，厚度最大至5英寸

Grade Names
等级名称

Clear Window
清材级窗料

A Window
A级窗料

B Window
B级窗料

C Window
C级窗料

Select Window
优选级窗料

These grades are designated to provide a product where only cross-cutting is required for the manufacture of window components.
根据这些等级划分出来的产品，在再加工制作窗户部件时只需要横切。

Window stock may be supplied green or dry, rough, surfaced or worked, vertical, flat or mixed grain as ordered.
窗料可以根据定单以湿材或干材、毛面、刨光面或加工面、直纹、平纹、或混合纹供货。

Grades are based on the quality and percentage of cuttings available from each piece.
等级的确定是基于一块材料中可获得清材锯块的质量和百分比。

The grade is determined by the Poorest Face.
等级以最差面评定。

Size of Cuttings
锯块尺寸

Cuttings must be Full Width and 3" and longer.
锯块必须为全宽、长度为3英寸及以上。

Grade of Cuttings
锯块等级

The cuttings for the top four grades (Clear, A, B and C Window) will permit the following:
用于评定较高四个等级(清材级、A级、B级和C级窗料)的锯块可以允许以下情况：

Checks — in dry stock, one - 4" per cutting; in rough or green - not limited
干裂 — 在干燥材料中，每个锯块一个4英寸长度的干裂; 在毛面或湿材中，无限制

Mineral Streaks — 2 per cutting on occasional pieces
矿物线 — 偶尔出现，每个锯块2个

Rate of Growth — 6 rings per inch average
生长率 — 平均每英尺6个年轮

Slope of Grain — 1 in 8
纹理斜度 — 1/8

Slough Knots — occasional piece may have 1 slough knot extending 1/2" into the wide face andnot more than 1/2" deep in thickness
边缘脱节 — 偶尔在一些锯材中出现，可有1个向宽面内延伸1/2英寸的边缘脱节，但深度不能超过1/2英寸

Wane — 1/2" in thickness and width, full length, on one corner only
钝棱 — 厚度和宽度均可为1/2英寸，可全长，只可以在一边出现

Warp — Crook/Bow - 1/32" for each 1' of length; Twist - 1/2 of Crook/Bow allowance
翘曲 — 侧弯/平弯 - 每1英尺长度 1/32英寸；扭曲 - 1/2侧弯/平弯允许值的一半

These same cuttings will not permit the following:
但上述这些锯块中不允许下列情况：

Pockets, Knots, Sapstain or Heartstain
树脂囊/树皮囊，节疤，边材变色或心材变色

Grade of Cuttings - Select Window
锯块等级 - 优选级窗料

The cuttings for Select Window Stock are not as strict because this grade is of a quality for uses where a high appearance is not required. This grade is more suitable for paint finishes.
对优选级窗料锯块的要求不如以上严格，因为这一等级是用在对外观质量要求不高的场所。这一等级更适合用于表面会被油漆的产品。

The cuttings of Select Window Stock will permit the following:
优选级窗料的锯块可以允许以下情况:

Checks — in dry stock, one - 4" per cutting; in rough or green - not limited
干裂 — 在干燥材料中，每个锯块一个4英寸长度的干裂; 在毛面或湿材中，无限制

Heartstain — not limited
心材变色 — 无限制

Knots — sound and tight pin knots
节疤 — 健全坚固针状节

Mineral Streaks — not limited
矿物线 — 不限制

Pockets — very small
树脂囊/树皮囊 — 很小

Rate of Growth — average 4 rings per inch
生长率 — 平均每英寸4个年轮

Sapstain — medium
边材变色 — 中等

Slope of Grain — 1 in 6
纹理斜度 — 1/6

Slough Knots — occasional piece may have 1 slough knot extending 1/2" into the wide face andnot more than 1/2" deep in thickness

边缘脱节 — 偶尔在一些锯材中出现，可有1个向宽面内延伸1/2英寸的边缘脱节，但深度不能超过1/2英寸

Wane —1/2" in thickness and width, full length, on one corner only
钝棱 — 厚度和宽度均可为1/2英寸，可全长，只可以在一边出现

Warp — Crook/Bow - 1/32" for each 1" of length; Twist - 1/2 of Crook/Bow allowance
翘曲 — 侧弯/平弯 - 每1英尺长度 1/32英寸；扭曲 - 1/2 侧弯/平弯允许值的一半

Clear Cutting Requirements Required
对清材锯块的要求

CLEAR Window
清材级窗料

100% of the piece must yield acceptable window cuttings.
锯材的100%都可以锯切出合乎规则要求的窗料锯块。

A Window
A级窗料

90% of the piece must yield acceptable window cuttings
锯材的90%都可以锯切出合乎规则要求的窗料锯块。

B Window
B级窗料

70% of the piece must yield acceptable window cuttings
锯材的70%都可以锯切出合乎规则要求的窗料锯块。

C Window
C级窗料

50% of the piece must yield acceptable window cuttings
锯材的50%都可以锯切出合乎规则要求的窗料锯块。

SELECT Window
优选级窗料

70% of the piece must yield acceptable Select window cuttings — lower, paint-finish grade (see acceptable cutting defects)
锯材的70%都可以锯切出合乎优选级窗料规则要求的锯块 — 较低、表面油漆的等级(见允许的锯块缺陷)。

NLGA PARA 114 BOARDS
NLGA 114 款 板材

(All Species)
(适用于所有树种)

Under 2" in thickness and 2" and wider
厚度2英寸以下，宽度2英寸及以上

Grade Names
等级名称

Select Merchantable
优选商品级

Construction
建筑级

Standard
标准级

Utility
实用级

Economy
经济级

Evaluation for Grade
等级的评定

Pieces are graded from the Best Face, the reverse face may be one grade lower, except where specified, for example - skips and wane in Standard grade.
等级评定以最好面进行，背面可以低一个等级，除非另有说明，例如，标准级中的漏刨和钝棱。

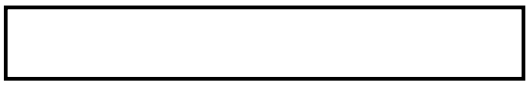
A Select Merchantable face with Standard reverse face becomes a Construction because the back cannot be two grades lower. The edges of the piece are considered part of the back.
一块正面为优选商品级、背面为标准级的锯材变成建筑级，因为背面不可以比正面低两个等级。板材的两侧视为背面。

The face graded does not change when the piece is surfaced. S1S2E boards are still graded from the best face (which is not the necessarily the surfaced face).
一块刨光的板材不会改变其评级面。一面和两边刨光(S1S2E)的板材依然从最好面评级(它不一定是刨光面)。

The back of Economy must conform to the Economy grade.
经济级的背面也必须符合经济级的要求。

Patterns
形状

Rough or Surfaced (to any combination of sides or edges)
毛面或刨光面(任何面或边的组合)



Ship Lapped (SL)
船式搭接(SL)

Centre Matched (T &G and CM)
中央企口(T &G and CM)

Pin Holes
针孔虫眼

Pin holes may be increased to 50% more in a concentrated area, providing the total number permitted in the piece is not exceeded.
如果整片板材上针孔虫眼的数量没有超过规定的话，在相对集中的区域，它的量可以增加50%。

Limited — approximately 30 per square foot.
限制 — 每平方英尺大约30个。

Scattered — approximately 15 per square foot.
分散分布 — 每平方英尺大约15个。

Where pin holes are observed, the piece should be closely examined for unsound wood.
在出现针孔虫眼的板材上，应仔细检查有无腐朽现象。

Skips and Scantness
漏刨和短尺

Skips on the face of Standard & Better pieces are limited in depth and length and total effect.
在标准级及以上的板材中，对漏刨的深度、长度和总的影响范围都有限制。

	Face Depth Length 正面深度和长度	Back & Edges Depth Length 背面和窄面深度和长度	Total Effect 总影响
Select Merchantable 优选商品级	1/64" x 6"	1/32" x 12" back 背面 1/32" x 24" edges 窄面	
Construction 建筑级	1/32" x 12"	1/16" x 12" back 背面 1/16" x 24" edges 窄面	
Standard 标准级	1/16" x 12"	1/16" x 4' back 背面 1/16" x 4' edges 窄面	2 maximum skips per 12' or equiv. 每12英尺两个达到最大允许值的漏刨，或等效

If the skip is only 1/2 width, it may be twice as long.
如果漏刨仅为宽度的1/2，则其长度可以为规定的两倍。

For Hit and Miss, the skip may be up to 4' long with a surfaced area (hit) equal to 2" x 1/2 width. Pieces must have a minimum of two surfaced areas (hits).
对于间隔漏刨，漏刨最多可为4英尺长，同时含2英寸 x 1/2宽度的刨光部分。一片板材中最少要有两块刨光部分。

Where skips on opposing faces occur, the total scantness is considered against the allowance.
当漏刨出现在反面时，全部短尺都被视为不符合允许值。

Skips are permitted on the surfaced face of resawn boards as limited in the rules for the various grades, independent of the variation of the thickness permitted in resawn boards.
允许在细锯板材的刨光面中出现漏刨，在不同的等级中的限制程度不同，但不受细锯板材厚度变异(允许值范围内)影响。

Wane
钝棱

Wane may be equivalent on the face and back for width and length only. Maximum wane across the face is equal to the basic wane allowance (for the face width) in the next lower grade, provided the amount of wane is equivalent in effect.
在正面和背面，钝棱只可以为宽度和长度的等效。某等级横跨表面的最大钝棱值等同与下一个等级的基本钝棱允许值(相同表面宽度)，条件是两者的影响必须等效。

The depth of wane stated for the edge may not be exceeded.
窄面上钝棱深度的规定不可以超过。

Standard may have maximum Utility face wane (1/4 W x Full Length or 1/2 W x 1/2 Length) on the back but the maximum Utility wane for the edge is not permitted (maximum 3/4 thickness on back of Standard).
在标准级的背面可以含有如实用级正面允许的钝棱(1/4 宽度 x 全长 或 1/2 宽度 x 1/2 全长)，但标准级窄面上不允许出现实用级侧面所允许的最大钝棱(标准级背面最大钝棱，3/4厚度)。

Wane on the back of Utility could be completely across the face (as is permitted on the face of Economy) but could not exceed the Utility skip allowance (1/16") for more than 1/2 the width.
实用级背面的钝棱可以横跨整个宽面(正如经济级表面所允许的那样)，但超过实用级漏刨深度允许值(1/16英寸)的部分不能大于1/2宽度。

Wane may be completely through the edge in Utility if the areas that are through can be equivalent to the holes permitted.
在实用级中，允许钝棱横跨整个窄面，条件是它所横跨的区域可以等效于规则允许的孔洞。

Grub and Teredo Holes
虫孔和海虫孔

Grub and Teredo holes are permitted as equivalent to knot holes, 12 - 1/4" holes per 1" of knot hole allowed.
虫孔和海虫孔可以作为节孔的等效缺陷而被允许，每1英寸的节孔可以等效为12个1/4英寸的虫孔和海虫孔。

These holes may not be concentrated like pin holes, therefore, the worst concentrated area of these holes will determine the grade. Holes are counted over the worst 6' for Construction and Standard and the worst foot for Utility.
这些孔洞不可以像针孔虫眼一样集中出现，因此，孔洞集中情况最严重的区域往往决定了该块板材的等级。在建筑级和标准级中，以最严重的6英尺来计算孔洞数量；而在实用级中以最严重的1英尺来计算孔洞数量。

Example: 1 x 8 - 14'
示例：1 x 8 - 14英尺

Construction permits 1 1/4" of hole every 6'
建筑级每6英尺允许总直径为1 1/4英寸的孔洞

1 1/4" hole permitted every 6' 每6英尺允许1 1/4英寸的孔洞	x	12 grub/teredo holes per inch of hole 每1英寸节孔可等效12个虫孔	=	maximum 15 grub/teredo holes in worst 6' 最差6英尺区域最多15个虫孔

Utility permits 2 1/2" of hole every 1'
实用级每1英尺允许总直径为2 1/2英寸的孔洞

2 1/2" hole permitted every 1' 每1英尺允许2 1/2英寸的孔洞	x	12 grub/teredo holes per inch of hole 每1英寸节孔可等效12个虫孔	=	maximum 30 grub/teredo holes in worst foot 最差1英尺区域最多30个虫孔

Shallow holes must be counted but long channels are considered as one hole.
浅孔也须计算，但长孔槽也同样计为一个孔。

Grub/Teredo holes are counted on the wide faces only (edges are part of the reverse face) and be taken as an average of 1/4" per hole.
只在正面计算虫孔和海虫孔(窄面视为反面的一部分)，每个平均视为一个1/4英寸孔洞。

Grub/Teredo holes are taken as equivalent to knot holes. Where knot holes and Grub/Teredo holes are found in the same piece, the total number of Grub/Teredo holes must be reduced proportionally.
虫孔和海虫孔可等效视为节孔。如果一块板材中节孔、虫孔和海虫孔同时出现，则虫孔和海虫孔的总数量应按比例降低。

Shake
轮裂

The highest grade allowing Shake is Construction, where it is permitted on the back only.
允许出现轮裂的最高等级是建筑级，但仅允许在背面出现。

Shake in boards is measured for length on the face that it appears and may be up to 1/4 length. Shake through the edge is restricted no differently than through shake in the middle of the piece.
板材上的轮裂以它在出现的面上的长度来度量，最长可以为长度的1/4。贯通窄面的轮裂和贯通板材中间的轮裂受到同样的限制

'Not Serious' for Utility should be interpreted as any amount of tight shake where the piece is usable full length.
‘不严重’对于实用级可以解释为，含任意量的紧实轮裂，但全长均可以使用。

'Not Serious' for Economy should be interpreted as any amount of Shake where the piece is holding together.
‘不严重’对于经济级可以解释为，含任意量的轮裂，但整块板材仍没有散开。

White Speck, Honeycomb, Peck and Unsound Wood
白斑朽、蜂窝朽、袋状朽及腐朽

White Specks are permitted 1/3 the Face area in Standard. Construction would permit White Specks on the back and edges.
在标准级中，允许1/3表面积的白斑朽。建筑级中允许白斑朽出现在背面和窄面。

Areas of Soft Honeycomb would be permitted on the face of Utility (back of Standard) if those areas are equivalent to the unsound wood permitted.
在实用级的正面(标准级的背面)允许有软蜂窝朽，但其面积仅限定等效于允许的木材腐朽。

Peck in Western Red Cedar and Yellow Cedar is considered as Unsound Wood in boards.
西部红柏和黄柏中的袋状朽视同板材中的木材腐朽。

Spots of Unsound Wood are permitted no higher than the face of Utility (back of Standard). A spot is allowed as an Area equivalent to 1 1/2" x the nominal width of the piece but is not restricted to 1/3 the width like light framing. Maximum size spots of unsound wood could occur without width limit every 2' or smaller spots could occur more frequently if equivalent. Consider worst 2' area first.
木材腐朽斑块最高可出现于实用级的表面(标准级的背面)。腐朽斑块的允许面积为1 1/2英寸 x 该板材的名义宽度，但像轻型框架等级一样，在板宽1/3内不限。在每2英尺长度范围内可以出现一个不限宽度、面积可为最大允许值的腐朽；如果斑块较小，则允许等效地、更频繁地出现。首先考虑最差的2英尺。

If only One Spot of Unsound Wood exists in the piece, then it may be larger than the basic spot described above, but if it is larger it may not be over 1/3 actual width or over 1/10 length.
如果板材中只有一个腐朽斑块，那么它可以大于如上所述的尺寸，但不可以大于实际宽度的1/3或长度的1/10。

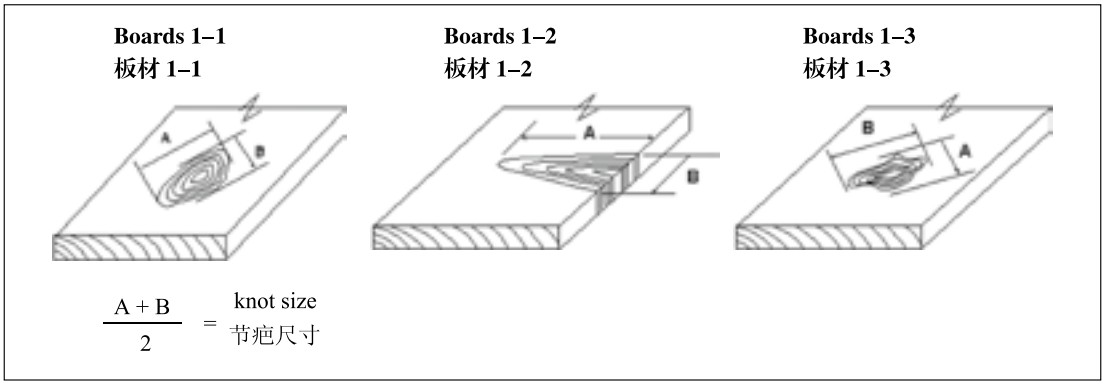
In Economy, scattered spots of Unsound Wood may be up to 75% of the width (measured by its cross-section only) and up to 2' long.
在经济级中，分散分布的腐朽斑块最多可为宽度的75%(仅测量其横切面)，最长为2英尺。

Areas of Unsound Wood may exceed 75% of the cross-section if the waste clause can be applied
如果可以应用废料条款的话，腐朽斑块的面积可以超过横切面的75%。

Waste Clause
废料条款

In Economy, twenty-five percent Waste is permitted in pieces over 6' long (i.e. 7' and longer), if the Waste is 2' or more from the end.
在经济级中，如果板材长度在6英尺以上(例如7英尺及以上)、而且废料离端头2英尺及以上，则允许有25%的废料。

Knots
节疤



Knots are measured as the average of their largest and smallest diameter and the size is determined for each face separately (Fig. Boards 1-1). In Economy, knots are measured by their cross-section only.
节疤尺寸以它们的最大和最小直径的平均值测定，每个面分别计算来确定(图板材1-1)。在经济级中，仅在横切面上测量节疤尺寸。

Spike Knots are measured by the average of their length and width (taken across the knot's widest point) to be considered equivalent to face knots (Fig Boards 1-2). Irregular shaped knots as in Fig Boards 1-3 are measured as the average dimension of the smallest rectangle which will box in the knot.
条状节以其长度和宽度(节疤的最宽处)的平均值量得，并被视为等效的表面节疤(图板材1-2)。不规则的节疤以能够将其包围的最小平行四边形的平均值作为其尺寸。

Knot quality is important in board grades. A smooth round knot which is not partially intergrown on one face will fall out as the piece dries. This type of knot must be considered NFF even if it appears tight in green lumber.
在板材中，节疤质量很重要。一个光滑的、在任一面都没有部分连生的圆节会在板材干燥过程中脱落。尽管在湿材时看起来为紧固的，这类节疤也应当被视为松动节。

Any number of Unsound or NFF knots are permitted as long as the size of each conforms to the size allowed for the grade.
只要它们符合相应等级的尺寸要求，允许任何数量的腐朽节或松动节。

Holes
孔洞

Holes other than slough knots (and pin holes) are not permitted in Select Merchantable. Slough knots are limited to one 1" hole for each 12' of board.
除了边缘脱节(和针孔虫眼)，优选商品级不允许出现孔洞。边缘脱节限定为每12英尺长度允许一个1英寸的孔洞。

Holes are measured the same as knots in all grades of boards. Permissible holes are allowed anywhere on the piece and may be concentrated in one area.
在所有板材等级中，孔洞的测量与节疤相同。规则允许的孔洞可以分布在板材的任何位置，也可以在某一区域集中出现。

Individual holes are restricted to a maximum size.
单个孔洞限为最大允许尺寸。

Construction and Standard limit holes to one every six feet or one every foot in Utility or allow smaller holes if equivalent in total size, i.e. one 1/4" and two 3/8" knot holes are the same as one 1" knot hole.
建筑级和标准级限制每6英尺内只能有一个孔洞，实用级限制每1英尺内只能有一个孔洞；也可以允许总尺寸等效、但单个尺寸较小的孔洞。例如，1个1/4英寸和2个3/8英寸的节孔等效于1个1英寸的节孔。

Any number of smaller holes whose combined size does not exceed the sum of the maximum number of full size holes permitted are allowed.
只要它们的总尺寸不超过允许孔洞的总尺寸，可以允许任何数量的小孔洞。

	CONSTRUCTION 建筑级		
	Maximum Size Hole 最大孔洞尺寸	Total Amount of Holes Permitted 允许孔洞总量	Grub Holes Permitted 虫孔允许量
1 x 3 – 8'	5/8英寸	1 3/16英寸	10
1 x 4 – 8'	7/8英寸	1 3/16英寸	14
1 x 6 – 8'	1英寸	1 5/16英寸	16
1 x 8 – 8'	1 1/4英寸	1 11/16英寸	20

	STANDARD 标准级		
	Maximum Size Hole **最大孔洞尺寸**	**Total Amount of Holes Permitted** **允许孔洞总量**	**Grub Holes Permitted** **虫孔允许量**
1 x 3 – 8'	1英寸	1 5/16英寸	16
1 x 4 – 8'	1 1/4英寸	1 11/16英寸	20
1 x 6 – 8'	1 1/2英寸	2英寸	24
1 x 8 – 8'	1 3/4英寸	2 5/16英寸	28

The following examples show how this is calculated:
下列例子演示了它们是如何计算出来的：

Assume a **1 x 6 - 12'**
假定一块1 x 6 - 12英尺的板材

1) Construction permits a maximum size Hole of **1"**, and such 2 Holes every 12' (or one every 6') or equivalent smaller. **A 12英尺** piece permits:
建筑级允许最大尺寸为1英寸的孔洞，也就是12英尺中可以有2个这样的孔洞(即每6英尺允许1个)，或等效但较小的孔洞。一块12英尺的板材允许：

$$\frac{\text{12' (Board Length) 12英尺(板材长度)}}{\text{6' (length for each hole) 6英尺(长度/每个孔洞)}} \times \frac{\text{1"}}{\text{(Hole permitted in 1x6 Construction) (1x6建筑级允许的孔洞)}} = \frac{\text{2"}}{\text{Total Holes permitted 允许孔洞总数}}$$

Any number of holes whose combined size did not exceed 2" would be acceptable for Construction grade **1 x 6 - 12'** providing none of the individual holes exceeded **1"**.
对于建筑级1 x 6 - 12英尺的板材，只要总的孔洞尺寸不超过2英寸、单个孔洞的尺寸不超过1英寸，允许任何数量的孔洞。

2) Utility permits a 2" hole, 1 hole every foot or equivalent smaller. **A 12'** piece permits:
实用级允许2英寸的孔洞，每英尺允许1个孔洞，或等效但较小的孔洞。一块12英尺的板材允许：

$$\frac{\text{12' (Board Length) 12英尺(板材长度)}}{\text{1' (length for each hole) 1英尺(长度/每个孔洞)}} \times \frac{\text{2"}}{\text{(Hole permitted in 1x6 Construction) (1x6建筑级允许的孔洞)}} = \frac{\text{24"}}{\text{Total Holes permitted 允许孔洞总数}}$$

Any number of Holes whose combined size did not exceed 24" would be acceptable for Utility grade **1 x 6 - 12'** providing none of the individual holes exceeded 2".

对于实用级1 x 6 - 12英尺的板材，只要总的孔洞尺寸不超过24英寸、单个孔洞的尺寸不超过2英寸，允许任何数量的孔洞。

Splits
劈裂

Maximum Splits are permitted on each end. The length of a Split is its length on the face it occurs (not average penetration on both faces). The allowance is based on nominal size.
在端头，允许劈裂以最大数量出现。劈裂的长度以它在发生面上的长度计算(不是在两个面上延伸长度的平均值)。允许值是基于名义尺寸界定的。

Broken Tongue or Lap
破碎榫头或搭头

An allowance for the length of Broken (or missing) Tongue or Lap on tongue and groove or shiplap is suggested as follows:
在中央企口式和船式搭接板材中，建议给予破碎(或缺损)榫头或搭头长度以下列允许值：

Select Merchantable = 6" 优选商用级 = 6英寸	Construction = 12" 建筑级 = 12英寸
Standard = 24" 标准级 = 24英寸	Utility = 36" 实用级 = 36英寸

This allowance would be in addition to the undersize (skip) that is permitted on the Tongue or Lap.
在中央企口式和船式搭接板材中，这一允许值是附加性的，不包括在短尺(漏刨)允许值之内。

NLGA DIMENSION LUMBER
NLGA 规格锯材(简称规格材)

NLGA Para 121 Stud
NLGA 121 款 墙柱

NLGA Para 122 Light Framing
NLGA 122 款 轻型框架

NLGA Para 124 Structural Light Framing and Structural Joists and Planks
NLGA 124 款 结构轻型框架和结构托梁及平铺木板

Purpose Intended and Evaluation for Grade
分级目的及等级的评定

Pieces in these categories are graded for strength and the grades have been assigned stress ratings for engineering purpose. The characteristics on all four faces and both ends must by evaluated before establishing the grade.
这些类型中的锯材是以强度进行分级的，所有的等级都规定了工程应力等级。在确定等级时，所有四个面和两端的缺陷都必须考虑。

All pieces failing to meet Utility/No 3/Stud will be evaluated as Economy. Pieces failing the requirements of Economy are "Reject".
所有没有达到实用级/3级/墙柱级的锯材均被评为经济级。经济级的要求也无法达到的锯材为“等外品”。

Shake
轮裂

Shake is not considered continuous if there is any wood separating the shakes.
如果在轮裂之间有木材组织隔开它们，则这些轮裂不被视为连贯性的。

1 Face Shake — Not Through Shake
1面轮裂 — 非贯通轮裂

- A surface shake is not permitted to extend into an adjacent or opposite face. (Fig. 1)
  表面轮裂不允许延伸至相邻或相对的面。(图 1)

- Through shake or checks on the ends is treated as a split.
  位于端头的贯通轮裂或贯通干裂被视为劈裂。

- Through shake and through checks are not permitted in Select Structural/No 1/Construction.
  优选结构级/1级/建筑级中不允许贯通轮裂和贯通干裂。

- In No 2/Standard a shake not through can be 3' long or 1/4 the length whichever is greater.
  在2级/标准级中，非贯通轮裂的允许尺寸为3英尺长或全长的1/4(之中的较大者)。

- No 3/Utility/Stud shake not through can be full length.
  在3级/实用级/墙柱级中，非贯通轮裂可以为全长。

2 Face Shake — Through Shake
2面轮裂 — 贯通轮裂

- In No 2/Standard a shake showing on only one wide face extending into the edge shall be limited to a depth of 3/4 the thickness and a length of 2'. (Fig. 2)
  在2级/标准级中，仅在一个宽面出现并延伸到窄面的轮裂，其深度限制为深度的3/4、长度不超过2英尺。(图 2)

- Through shake and checks extend from one surface of the piece to an opposite or adjoining surface. Shakes (and checks) which extend through the piece from one face to the opposite face are measured for length as the average of both faces.
  贯通轮裂从锯材的一个面延伸至相邻或相对的面。贯通轮裂(和贯通干裂)的尺寸是其两个面上长度的平均值。

3 Face Shake — Through Shake
3面轮裂 — 贯通轮裂

- Shake through from one wide face to the other and breaking completely through the edge becomes an automatic No 3/Utility/Stud or worse. This type of shake must break completely through the edge before it is limited to 1/6 the length. (Fig. 3)
  从一个宽面延伸至另一个宽面、并使窄面完全裂开的轮裂将使该锯材自动降为3级/实用级/墙柱级或更差等级。在使用贯通轮裂只能为长度1/6的条款前，必须先确定该轮裂完全贯通锯材侧面。(图3)

- If this shake forms an edge split, it is restricted in length as a split (1/6 L in Utility/No 3 and 1/3 the length in Stud) and measured by its average length on both wide faces starting from its point of furthest origin on the edge. (Figs. 2 & 3) This type of shake is very serious.
  如果这种轮裂形成窄面上的劈裂，对其长度的限制与劈裂一致(在实用级/3级中为长度的1/6，在墙柱中为长度的1/3)。其测量方法是，从其起源的最远处量起，取其在两个宽面上长度的平均值(图 2、3)。这类轮裂是一种很严重的类型。

- The distance the shake penetrates across the worst wide face may not be greater than the hole size permitted.
  在最差面上，轮裂横向穿过宽面的距离不能大于允许的孔洞直径。

- In No 3/Utility a shake that spirals from the wide face into the edge past 3/4 the depth, but not completely through the narrow face, is restricted to 1/3 the length. If it breaks completely through the narrow face, it is restricted to 1/6 the length. Both are measured from origin to origin along the length of the piece. (Figs. 2 & 3)
  在3级/实用级/墙柱级中，如果一个轮裂从宽面上螺旋状延伸至深度的3/4，但没有完全贯通窄面，其起最大允许值为长度的1/3。如果它完全贯通窄面，限制为1/6板长。两者均是沿板材长度方向、从轮裂两端的起始处量起。

Shake Tolerances in Structural Grades
结构等级中轮裂的允许值

Select Structural/No 1/Constuction
优选结构级/1级/建筑级

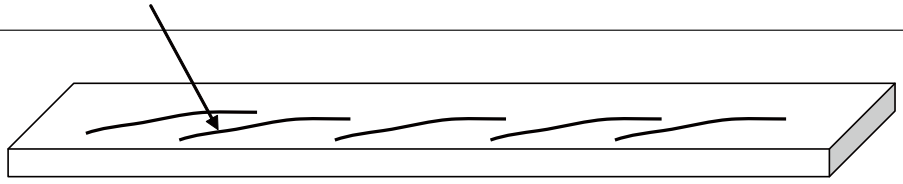
- Surface Shake (one face only) .
  表面轮裂(仅在一面)。

- These are separate shakes.
  它们为分离式轮裂。

- Each could be a maximum of 2" long.
  每个最大可以为2英寸长。

- Separation between shakes.
  轮裂之间是隔离的。

Fig. 图1

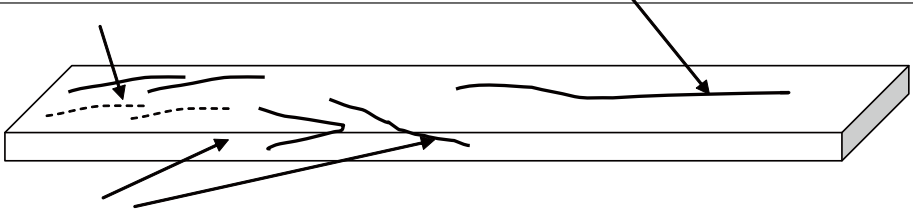


No 2/Standard
2级/标准级

- Permits through Shake (two faces only)
  允许贯通轮裂(仅在两面)。
  Note: If not through, a single shake can be up to 3' in length.
  注意: 如果为非贯通，单个轮裂长度可为3英尺。

- These are separate shakes.
  它们为分离式轮裂。
  Average measurement can be a maximum of 2' long.
  平均尺寸最大为长2英尺。

Fig. 图2



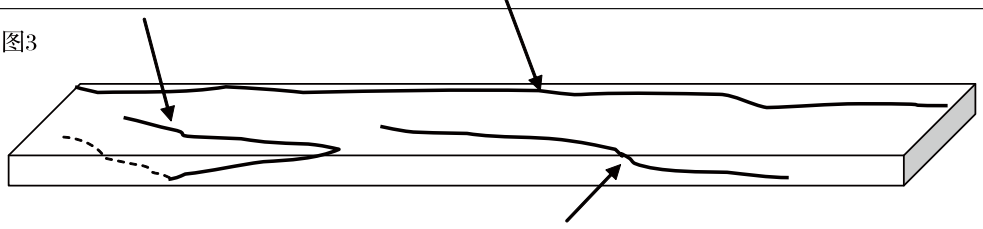
- Shake extending into the narrow edge cannot penetrate more than 3/4 T.
  延伸至窄面的轮裂深度不能超过3/4厚度。

No 3/Utility/Stud
3级/实用级/墙柱级

- Permits through Shake (three faces).
  允许贯通轮裂(三面)。
  Note: If not through, a single shake can be full length of the piece.
  注意: 如果为非贯通，单个轮裂可为锯材的全长。

- This type of 3-faced shake is averaged for length.
  这种轮裂以其平均值为其长度值。
  Penetration into the wide face is limited to the maximum hole size on the worst side.
  在最差面上，穿入宽面上的轮裂不能超过允许的最大孔洞尺寸。

Fig. 图3

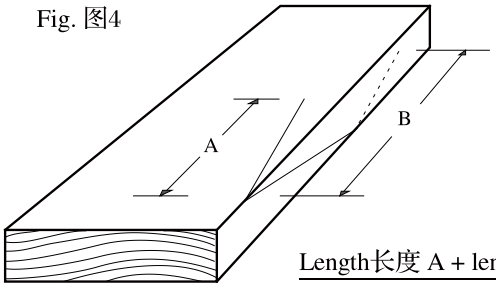


- Through Shake can be 1/3 of the length if only on the face and edge.
  如果仅在一个宽面和一个窄面，允许这种贯通轮裂为全长的1/3。

- Three Face Shake can extend 1/6 the length in No 3 or Utility, and 1/3 the length for Stud.
  在3级/实用级中，三面贯通轮裂可为全长的1/6；在墙柱级中可为全长的1/3。

Shake Measurement
轮裂测量

Fig. 图4



$$\frac{\text{Length长度 A + length长度 B}}{2}$$

Fig. 图5

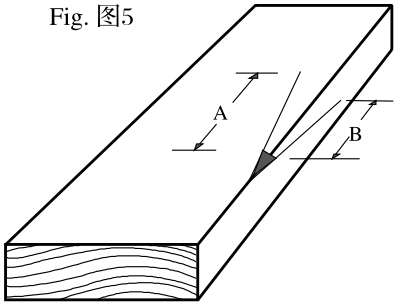
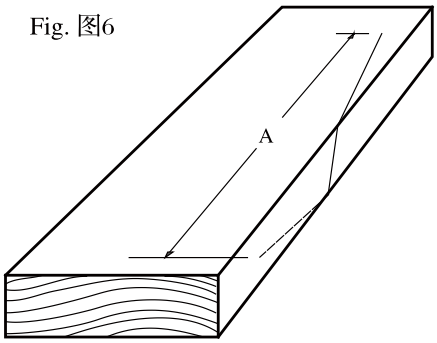
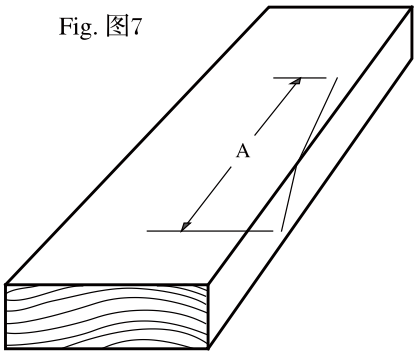


Fig. 图6



Length 长度 A

Fig. 图7



Length 长度 A

Skips in Dressing and Scantness
刨光中的漏刨和短尺

Skips may appear on opposite faces provided that the total scantness does not exceed the depth permitted.
如果短尺量的总数没有超过允许值，允许漏刨在背面出现。

Hit and Miss skips — implies a series of skips where individual skips may be up to 4' long and requires a surfaced area (a hit) between each skip of at least 2" x 1/2 W. Each piece must have a minimum of two hits. Measure a skip's length from C "hit" to "hit".
间隔漏刨 — 表明有一系列的漏刨，其中单块漏刨的最大长度为4英尺，而且要求在漏刨之间有至少2英寸 x 1/2宽度的刨光区段。每片锯材上最少有两块刨光区段。漏刨的长度从两个刨光区段间量得。

Select Structural/No 1/Construction will allow Hit and Miss Skip.
优选结构级/1级/建筑级中允许间隔漏刨。

No 2/Standard will permit Hit or Miss or a Heavy Skip for 2' long but not both. A piece with hit and miss could have one 4' skip that dips 1/8" deep for 2', i.e.. Hit and Miss and Heavy Skip. Use the eased edge as a guide when on the job and you encounter skip. If you have skip and you can still see some eased edge, your skip is generally 1/16" or less in depth. If you cannot see the eased edge at the skip area, then your skip is greater than 1/16" in depth.
在2级/标准级中，允许连漏或连刨、或一个长度为2英尺的严重漏刨，但不允许两者同时出现。一块有间隔漏刨的锯材可以有4英尺长的漏刨、其中深度为1/8英寸的部分可为2英尺，即间隔漏刨和严重漏刨。在评级中遇到漏刨时，使用加工钝角作为参考。如果在漏刨的地方你仍然可以看到一部分加工钝角，漏刨的深度通常小于1/16英寸。如果在漏刨的地方你看不到加工钝角，漏刨的深度通常大于1/16英寸。

In No 3/Utility, Hit or Miss is permitted and One dimension (thickness or width not both) may have a heavy skip (1/8" deep) full length.
在3级/实用级中，允许连刨或连漏，而且在一个方向上(厚度或宽度，不能两者都有)可以有一个全长的严重漏刨(1/8英寸深)。

Skips in Stud grade are similar to No 3 except the allowance for heavy skip is limited to the wide face only. Stud width may not be more than 1/16" scant.
墙柱级中的漏刨与3级中的规定相似，但严重漏刨只允许出现在宽面上。墙柱级在宽度上的短尺不能大于1/16英寸。

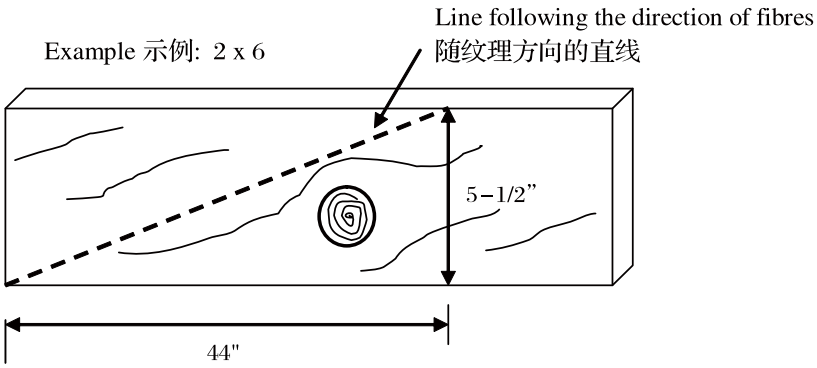
Splits
劈裂

The Split allowance is based on Nominal width. Splits are measured as the average length on both faces.
劈裂的允许值基于名义宽度。劈裂以两个面上的平均值测定。

Maximum Splits can occur at both ends. Where more than one Split occurs on the same end, only the worst Split occurring at an end is considered for its size on that end (use judgment).
尺寸为最大允许值的劈裂可以出现在两个端头。当同一个端头上出现多个劈裂时，仅计算该端头上最大劈裂的尺寸(运用判断力)。

Slope of Grain
纹理斜度

Fig. 图8



1) ***Measured distance = 44"***
   测得距离 = 44英寸
2) ***Distance from edge to dotted line = 5 1/2"***
   从边到虚线的距离 = 5 1/2英寸
3) ***Slope of Grain = 5 1/2" or 5.5" in 44 or 1 in 8"***
   纹理斜度 = 5 1/2英寸 或 5.5英寸 除以 44英寸 或 1 /8

Slope of Grain is the deviation of the wood fibre from a line parallel to the edges of a piece. The deviation is expressed as a ratio such as a Slope of Grain of 1 in 12 (Select Structural), 1 in 10 (No 1), 1 in 8 (No 2), 1 in 6 (Construction), or 1 in 4 (Standard, Utility, No 3 and Stud.).
纹理斜度是木材纤维与一块锯材边缘平行线的偏离程度。该偏离程度用比率来表示，如纹理斜度为1/12(优选结构级)、1/10(1级)、1/8(2级)、1/6(建筑级级)、1/4(标准级、实用级、3级和墙柱级)。

In lumber 2" nominal and thicker and 4" nominal and wider, slope of grain is measured over a sufficient length and area to be representative of the slope of the fibres. Local deviations around knots and elsewhere are disregarded in the slope measurement.

在名义厚度2英寸及以上和名义宽度4英寸及以上的锯材中，为了较好地代表纤维的斜度，纹理斜度应在一段足够长、面积足够大的区域中量取。在斜度测量中，应忽略节疤周围或其它局部纹理偏斜。

Slope of Grain on narrow faces of 2" in nominal thickness and thicker shall be measured on the same basis as on wide faces.
在名义厚度为2英寸及以上的锯材的侧面，纹理斜度的测量应与宽面上的方法相同。

Local deviations must be considered in small sizes. If a local deviation occurs in a piece less than 4" nominal in width or on the narrow face of a piece less than 2" nominal in thickness, and is not associated with a permissible knot in the piece, the measurement of slope shall include the local deviation.
在小尺寸锯材中应考虑局部纹理偏斜。如果局部偏斜发生在名义宽度小于4英寸 、或在名义厚度小于2英寸的锯材的侧面，而且不是由于允许节疤所引起的，对斜度的测量应包含局部偏斜。

Wane
钝棱

Although the grading rules state the fraction of the face which may contain Wane, it is more practical to measure the amount of wood remaining. Thus, if the grade permits Wane 1/3 thickness, then 2/3 of the edge must remain Wane free. The allowances are based on the actual width and thickness.
虽然在规则中表述的是钝棱在表面上的比例，但通常是测量剩余木材的量。因此，如果规则允许有1/3厚度的钝棱，那么窄面的2/3必须没有钝棱。钝棱的允许值是基于实际宽度和厚度。

Each face is evaluated separately for Wane.
每面的钝棱分别测算

Fig. 图9

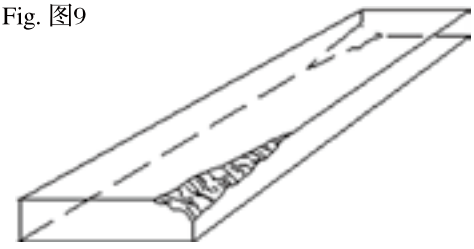
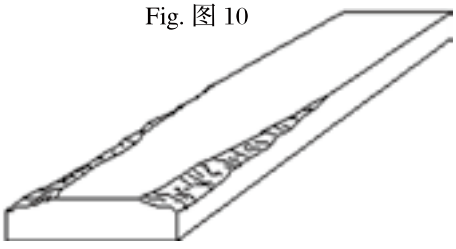


Fig. 图 10



Each face may have the maximum allowance permitted without reference to any other face.
每面都可以含有其允许范围内的最大钝棱，各个面不互相影响。

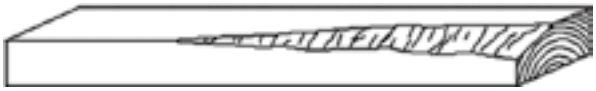
Wane in Light Framing, Structural Light Framing and Joist and Planks is permitted full length in the amount considered basic Wane. (Fig. 11) The rule makes allowance for Wane to be deeper or wider for the respective grades, but the total Wane on any piece must be equivalent to the basic full length Wane allowance. (Figs. 12, 13 and 14)
轻型框架、结构轻型框架和结构托梁及平铺木板类型的锯材中，如果是基本尺寸的钝棱，允许在锯材的全长内出现(图 11)。规则允许一些等级的钝棱可以深一些、或宽一些，但任何一块锯材上的钝棱必须可以等效换算为全长基本钝棱的允许值(图 12、13、14)。

Wane Examples - Thickness for No 2 / Standard Grade
钝棱示例 - 厚度对应2级/标准级

Fig. 图11

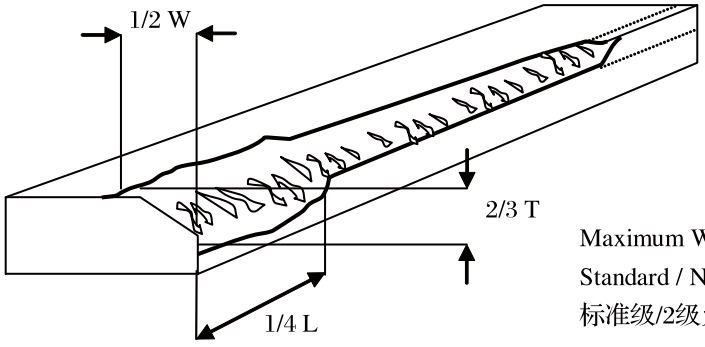
Fig. 图12

Fig. 图13



Any Wane that extends to the maximum depth or width is controlled to 1/4 the length.
任何尺寸达到最大厚度或宽度的钝棱，其长度不能超过锯材长度的1/4。

Fig. 图14



Maximum Wane permitted for Standard / No 2.
标准级/2级允许的最大钝棱

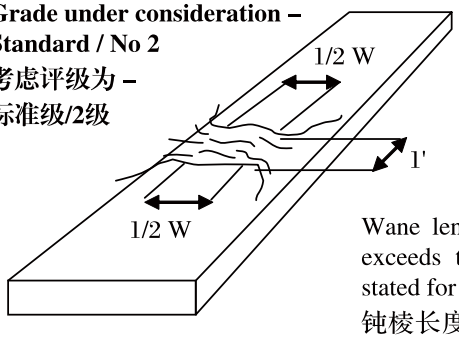
Wane Dips
局部深棱

In NLGA structural lumber there is an allowance for small (short, shallow) "Wane Dips" which exceed the maximum stated. (NLGA Para 750)
在NLGA结构材中，允许出现小块(短或浅)的、超出规则最大值的局部深棱。(NLGA 750款)

Wane away from ends, extending partially or completely across the wide or narrow face, is permitted for one foot if no more serious than skips in dressing allowed. Limited to one occurrence per piece.
如果有离开端头的、延伸至整个宽面或窄面的钝棱，其严重程度不超过规则允许的漏刨，则允许其长度最大为1英尺。但每片锯材中限出现一次。

Fig. 图15

Grade under consideration –
Standard / No 2
考虑评级为 –
标准级/2级

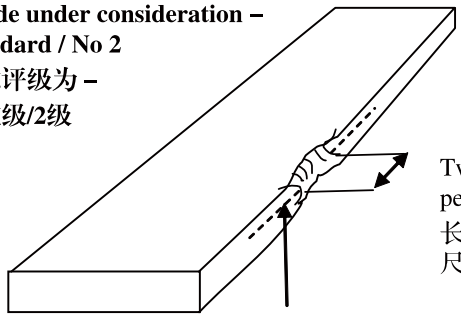


Wane length is maximum 1" measured at the point that it exceeds the basic maximum width or thickness provision stated for the grade under consideration.
钝棱长度最大为1英寸，在其超过待评等级所允许的最大基本宽度或厚度的那一处测量。

Wane equivalent to a hole is permitted across a narrow face only if no more damaging than the knot hole allowed (not to exceed in length twice the diameter of the maximum knot hole allowed in the grade) and is limited to one occurrence in each piece.
等效于孔洞的钝棱、如果其破坏性影响不超过所允许的节孔，可以允许其横跨窄面(该钝棱的长度不能超过该等级所允许的节孔直径的两倍)，而且每片锯材中限出现一次。

Fig. 图16

Grade under consideration –
Standard / No 2
考虑评级为 –
标准级/2级



Twice the diameter of the max. knot hole permitted. (Or use skip equivalence for 1')
长度为允许节孔直径的两倍(或采用等效于1英尺的漏刨)

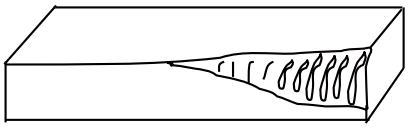
A Strategy for Evaluating Wane
钝棱评估策略

1. Determine which face has the most Wane.
   确定最大的钝棱在哪一面。

2. Does the maximum Wane occur directly on either end of the piece?
   最大的钝棱有无直接出现在锯材的任意一端？

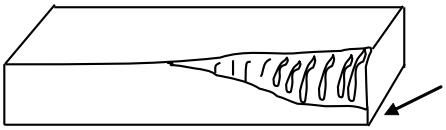
3. If the Wane occurs directly on the end of the piece, measure the least amount of good wood.
   如果钝棱直接出现在锯材的任意一端，测量残留木材最小处的量。

Fig. 图 17



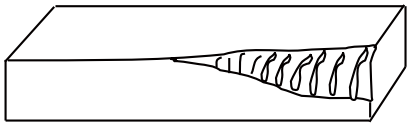
The edge has the most Wane
窄面的钝棱最大

Fig. 图 18



The Wane occurs on the end of the piece
钝棱出现在端头
i.e. Look for the least amount of good wood (1/2")
即，测量残留木材最小处的量(1/2英寸)

Fig. 图 19



Least amount of good wood (1/2" = Standard)
残留木材最小处(1/2英寸= 标准级)
Equivalent to Standard basic wane (1/3 full length)
等效于标准级的基本钝棱(全长的1/3)
The grade of the piece is Standard
该块锯材为标准级

4. If the Wane occurs away from the end of the wide face, and is more than that allowed as maximum, it is called a Wane Dip and it may be permitted as a skip equivalent.
如果钝棱在离开端头的地方出现、而且是在宽面上，并且大于最大允许值，就称为局部深棱。对于这种钝棱，可以作为等效的漏刨处理。

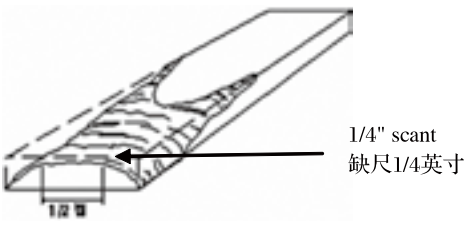
5. If the Wane occurs away from the end on the narrow face, and is more than that allowed as maximum, it is called a Wane Dip and it may be permitted as a skip equivalent or a hole equivalent. (NLGA Para 750)
如果钝棱在离开端头的地方、并且在窄面上出现，并且大于最大允许值，它被称为局部深棱。对于这种钝棱，可以作为等效的漏刨或孔洞处理(NLGA 750款)。

Economy Wane
经济级中的钝棱

3/4 the width, full length
3/4 板宽，全长

through portion
贯通部分

If through the edge, (2' in length) then equate to allowable knot hole
如果贯通窄面(2英尺长度)，等同于可允许的节孔



1/4" scant
缺尺1/4英寸

May be completely across the face for 1/3 the length if not more than 1/4" scant for more than 1/2 width
完全横跨宽面的钝棱，如果缺尺小于1/4英寸的部分超过宽度的1/2，则可以为锯材长度的1/3

Example of Economy Wane:
示例，经济级中的钝棱：

Economy permits a hole 75% of the cross-section. In 2 x 10, this is equivalent to a 7 1/8" hole (9 1/2 x .75) so wane could be through for a 1/2" and 14" long or some other equivalent averaging 7 1/8". 经济级允许占横切面达75%的孔洞。在2 x 10中，这等效于一个7 1/8英寸的孔洞(9 1/2 x .75)，所以该贯通钝棱的尺寸可以为一个1/2英寸宽14英寸长、或其它等效于7 1/8英寸的尺寸。

Wane in 4 x 4, take the worst face and call it the edge. 在4 x 4锯材上的钝棱，以最差面作为边。

Pin Holes
针孔虫眼

Pin holes are usually caused by Ambrosia Beetle or Post Powder Beetle but any hole whose diameter is 1/16" or so is considered as a Pin Hole. Pin Holes are handled on an "equivalent smaller basis". They are permitted as 48 Pin Holes per 1" of knot hole allowed.
针孔虫眼通常是由于安布柔思虫或者木蠹虫所引起的，但一般将任何原因引起的、直径在1/16英寸左右的孔洞都称为针孔虫眼。针孔虫眼通常被作为其它缺陷的“较小的等效缺陷”处理。每允许一个1"的节孔可以等效换算为允许48个针孔虫眼。

The poorest wide face shall determine the grade.
以最差宽面确定等级。

To determine the amount of pin holes permitted on a piece; determine the amount of knot holes permitted and multiply by 48.
要确定一块锯材可以允许多少针孔虫眼，先确认节孔的允许数，然后乘以48。

CMSA grade tables have simplified this calculation by indicating the number of Pin Holes per lineal foot. Multiply this number by the length of the piece under consideration (in feet) to determine the number of pin holes permitted.
CMSA的等级表中已将这一计算进行了简化，即以每英尺长度允许的针孔虫眼数表示。使用时，将这一数字乘以待评级锯材的英尺数，即可确定所允许的针孔虫眼数。

Example of Pin Hole Calculations:
示例：针孔虫眼的计算：

2 x 4 - 12' No 1 permits a 1 inch hole every 3 lineal feet. (12' / 3'= 4) 2 x 4 - 12英尺 的1级材每3英尺允许一个1英寸的孔洞。(12英尺 / 3英尺= 4)
1 x 4 x 48 = 192
192 Pin Holes are permitted on the poorest face. 在最差面允许192个针孔虫眼。

2 x 6 - 10' No 2 permits a 1 1/2 inch hole every 2 lineal foot. (10' / 2' = 5) 2 x 6 - 10英尺的2级材每2英尺允许一个 1 1/2英寸的孔洞。(10英尺 / 2英尺 = 5)
1 1/2 x 5 x 48 = 360
360 Pin Holes are permitted on the poorest face. 在最差面允许360个针孔虫眼。

Whenever pin holes are present in the piece, the grader should inspect the piece for Unsound Wood. The boring insect may have carried in a fungi or provided an entry point for fungal attack.
当一块锯材中出现针孔虫眼时，分级员应注意检查该块锯材中有无腐朽。因为钻孔的昆虫可能带入了某种真菌或为真菌的侵染提供了通道。

Grub and Teredo Holes
虫孔和海虫孔

Grub and Teredo Holes are permitted as 12 - holes per inch of knot hole allowed. The size of the hole is not considered. The Grub and Teredo restrictions are primarily for appearance.
虫孔和海虫孔的允许值为：每允许1英寸节孔可等效允许12个虫孔。此处不考虑虫孔的大小。对虫孔和海虫孔的限制主要是出于外观目的。

The poorest face shall determine the grade.
以最差面确定等级。

To determine the amount of Grub and Teredo Holes permitted on a piece; determine the amount of knot hole permitted and multiply by 12.
要确定一块锯材可以允许多少针孔虫眼，先确认节孔的允许值，然后乘以12。

Examples:
示例：

2 x 6 - 8' No 2 permits a 1 1/2 inch hole for every 2 lineal feet. (8' / 2' = 4) 2 x 6 - 8英尺的2级材每2英尺允许一个 1 1/2英寸的孔洞。(8英尺 / 2英尺= 4)
1 1/2 x 4 x 12 = 72
72 Grub Holes are permitted on the poorest face. 在最差面允许72个虫眼。

2 x 10 - 8' No 3 permits a 3 inch hole every lineal foot. (8' / 1'= 8) 2 x 10 - 8英尺 的3级材每1英尺允许一个 3英寸的孔洞。(8英尺 / 1英尺= 8)
3 x 8 x 12 = 288
288 Grub Holes are permitted on the poorest face. 在最差面允许288个虫眼。

White Speck — Standard / No 2
白斑朽 — 标准级/2级

- Not allowed in Construction/Select Structural, No 1 Structural.
  在建筑级/优选结构材/1级结构材中不允许。

- In Standard/No 2, White Specks are permitted to occupy 1/3 the volume, or equivalent. Equivalent means White Speck could appear on the full width of the face for 1/3 the length or could cover 1/3 the width of the face for the full length.
  在标准级/2级，白斑朽限于为体积的1/3，或等效。等效的意思是，长度为全长1/3的白斑朽可以横跨整个宽度，或宽度为全宽1/3的白斑朽可以横跨整个锯材长度。

- Utility/No 3/Stud allow white specks for 100% of the volume.
  实用级/3级/墙柱级允许白斑朽占锯材100%的体积。

Honeycomb, Peck and Unsound Wood in Standard/ No 2
标准级/2级中的蜂窝朽、袋状朽和腐朽

- Firm Honeycomb infers that it will not crumble readily under thumb pressure and cannot easily be picked out. Areas of soft Honeycomb may be taken as equivalent to Unsound Wood permitted.
  坚实的蜂窝朽是指在手指压力下不会轻易破碎的蜂窝朽。软蜂窝朽的面积可以等效为允许的腐朽木材处理。

- Firm Honeycomb and Peck are permitted 1/6 the width in the following grades: Standard Light Framing (all thicknesses). In No 2 Structural Light Framing, and Joists and Planks - nominal 2" thickness only (not permitted in thicknesses over 2").
  在下列等级中可以允许1/6宽度的坚实蜂窝朽和袋状朽：轻型框架中的标准级(所有厚度)，结构轻型框架和托梁及平铺木板中的2级(仅在名义厚度为2英寸的锯材中允许，厚度大于2英寸的锯材中不允许)。

- Any other Unsound Wood is limited to a spot (1 spot) 1/12 the width and 2" in length or equivalent smaller. If the Unsound Wood appears on the narrow face (edge), the allowable spot is restricted to 1/12 the narrow face (edge). Permitted in 2" nominal thickness only (Standard and No 2).
  任何其它木材腐朽限一块，大小为1/12片宽，长度为2英寸，或等效较小者。如果腐朽出现在侧面，则它不可大于厚度的1/12，而且仅在名义厚度为2英寸的锯材中允许(标准级和2级)。

Unsound Wood / Peck — Utility / No 3 and Stud
腐朽/袋状朽 — 实用级/3级和墙柱级

In Utility/No 3 and Stud - Unsound Wood is held to 1/3 the cross-section, the through portion will be controlled to 1/6 the length.
在实用级/3级和墙柱级中，腐朽限于横切面的1/3，贯通部分限于锯材长度的1/6。

In Utility/No 3 and Stud, spots or streaks of soft decay occurring on one face shall not be limited in length. If through the two wide faces, each streak may be up to 1/6 the length of the piece. (Measurement shall be taken in the through portion).

在实用级/3级和墙柱级中，如果软腐朽斑块或条纹仅出现在一面，则不限制长度。如果贯通两个宽面，每个腐朽条纹最多只能为锯材长度的1/6。(测量须在贯通的部位进行)。

NOTE: Unsound Wood is very difficult to assess by the cross-section method if away from the end because one cannot predict the exact depth penetration. It is much safer to assess Unsound Wood by a fraction of the width.
注意：腐朽木材如果不在端头则很难通过横切面的方法来评估，因为无法估计它的延伸深度。通过与宽度的比例来评估则可靠得多。

On edges it must not destroy the nailing edge. For the decay to not destroy the nailing edge, it must meet the following requirements:
出现在侧面上时，腐朽不可以破坏着钉面。要腐朽不破坏着钉面，它必须满足下列要求：

If not completely through the edge (in streak form) it must occupy no more of the narrow face (edge) than the maximum allowable wane (7/8 the thickness in Utility/No 3, 1/2 the thickness in Stud).
如果没有完全贯通窄面(条纹状腐朽)，它在窄面上占据的尺寸不能超过钝棱的最大允许值(在实用级/3级中为厚度的7/8，墙柱级中为厚度的1/2)。

If completely through the narrow face, it must not occupy more than twice the length of the allowable knot hole size.
如果完全横跨窄面，则其长度不能超过允许节孔尺寸的两倍。

Unsound Wood in Economy may have scattered spots 2' long by 3/4 the cross-section.
在经济级中允许有散布的、长度为2英尺、宽度为横切面3/4的腐朽斑块。

In 4 x 4, treat each face as a wide face.
在4 x 4中，每一面均被视为宽面处理。

Knot Holes
节孔

Unless otherwise specified, Knot Holes are measured the same as knots, between lines parallel to the edges of the piece on both wide faces and averaged. Where Holes penetrate the narrow face (like 3 face or 4 face knots) the amount of the edge displaced must be considered. Unless otherwise specified, Holes are measured the same as Knots.
除非另有说明，节孔的测量方法与节疤相同，即在两个宽面上测量平行于锯材边缘的平行线间的距离，再取平均值。如果节孔穿透窄面(就象3面或4面节疤一样)，则窄面上节孔占据的体积则必须纳入考虑之中。除非另有说明，孔洞的测量方法与节疤相同。

Knot Holes are restricted to an individual maximum size Hole and to any number of smaller Holes where the sum total size of these smaller Holes does not exceed the individual Hole size permitted (as equivalent smaller). The number of Knot Holes is regulated by the sizes of the individual Holes and number of maximum size Holes permitted in the piece. Example: if a grade permits a 2" Hole every 2' then a piece could contain 'one 2" Hole' or 'one 1" Hole and two 1/2" Holes' or some other equivalent for every 2' of length. A common expression for this condition is "The grade permits two inches of Hole for every two feet of length". All the allowable Knot Holes may be concentrated in one section of the piece without affecting the grade.

节孔是用单个最大允许尺寸的方法加以限制的。当孔洞较小时，只要它们的总尺寸不超过规定的单个节孔尺寸，就可以换算为任何数量的小节孔(此谓等效对应小缺陷)。一块锯材中可出现节孔的数量取决于规则中所允许的单个节孔尺寸及其数量。例如：如果一个等级允许每2英尺含一个2英寸的节孔，则该块锯材可以含一个2英寸的节孔、或一个1英寸的节孔和两个1/2英寸的节孔、或其它等效的组合。对于这种情况，一个通常的说法就是“ 等级允许每2英尺长度内有两英寸的节孔 ”。所有可允许的节孔可以集中出现在锯材的某一区域而不影响等级。

Examples of Hole Calculations:
示例，孔洞的计算：

2 x 6 No1 permits one 1 1/4" Hole every 3' or equivalent.
2 x 6 1级，每3英尺长度允许一个 1 1/4英寸的孔洞、或等效。

A piece 12' long would permit:
一块12英尺长的锯材将允许：

(length ÷ lineal per Hole) x (Hole size) = Total Hole size permitted.
(锯材长度 ÷ 每允许一个孔的锯材长度) x (孔洞尺寸) = 允许的总孔洞尺寸
(12 ÷ 3) x 1 1 / 4" = 5"

This is equivalent to:
这相当于：

Four - 1 1/4" Holes, or
四个 - 1 1/4英寸孔洞，或

Two - 1 1/4", two 3/4", and four 1/4" holes, or
两个 - 1 1/4英寸, 两个 3/4英寸, 和四个1/4英寸孔洞，或

Ten - 1/2" Holes, etc.
10个 - 1/2英寸孔洞，等等。

A piece 18' long would permit:
一块18英尺长的锯材将允许：

(18 ÷ 3) x 1 1/4 = 7 1/2 "inches of Hole"
(18 ÷ 3) x 1 1/4 = 7 1/2 “ 英寸的孔洞 ”

This is equivalent to:
这相当于：

Four 1 1/4" Holes and four 5/8" Holes or fifteen 1/2" Holes.
四个 1 1/4英寸的孔洞和四个5/8英寸的孔洞、或15个1/2英寸的孔洞。

NOTE: no Hole may exceed the maximum size for the grade.
注意：所有孔洞均不可以超过该等级允许的最大尺寸。

Manufactured Holes
加工孔洞

Manufactured Holes are holes and damage which occur during the manufacturing process. The following are guides to dealing with manufactured Holes which extend through the narrow face of the piece. These guidelines will not be needed for regular grading classes.
加工孔洞是加工过程中产生的孔洞或损伤。下列原则是用于处理在窄面上延伸的加工孔洞。对于通常的等级，不需要使用这些原则。

Manufactured Holes are limited in area to the Knot Hole size permitted and in number to 1 Hole in pieces 12' and shorter and 2 holes in pieces over 12'. The length of the Manufactured Hole is further restricted to:
在面积上，对加工孔洞的限制与允许的节孔尺寸相同；在数量上，长度在12英尺以下的锯材限一个，长度在12英尺以上的锯材限两个。加工孔洞的长度受到如下进一步限制：

Length of Hole Permitted **允许节疤长度**	**Maximum Grade** **最高等级**
Knot Hole diameter 节孔直径	Select Structural 优选结构级
1 1/2 x Knot Hole diameter 1 1/2 x节孔直径	Construction/ No 1 建筑级/1级
Width of the piece 锯材宽度	Standard/ No 2 标准级/2级
1 1/2 x width ofthe piece 1 1/2 x 锯材宽度	Utility / No 3 / Stud 实用级/3级/墙柱级

Cannot combine Manufactured Holes and manufactured wane together. One or the other only is permitted.
加工孔洞和加工缺边不可以同时出现。两者只能允许一种。

Sawcuts
锯缝

Sawcuts are generally not permitted in Select Structural/No 1.
在优选结构级/1级中，通常不允许锯缝出现。

In Light Framing sawcuts are compared to the allowable round knot size and in Structural Joists & Planks grades they are compared to the allowable Edge Knot Size.
在轻型框架等级中，以允许的最大圆节尺寸来评估锯缝；在结构轻型框架和托梁及平铺木板等级中，以允许的边缘节疤来评估锯缝。

Sawcuts through the thickness are measured between lines parallel to the edges on the side of greatest penetration and are limited to 1/2 the allowable Edge Knot Size.
穿过厚度方向的锯缝是在其最大透入深度处、与边缘平行的直线之间测量的，最大允许值为边缘节疤允许尺寸的1/2。

Sawcuts across the face are calculated as equivalent to a Round Knot the same as Spike Knots and are permitted up to 1/2 the allowable Edge Knot Size.
穿过宽面方向的锯缝，与条状节相似、作为圆节的等效来评估，最大允许为边缘节疤允许尺寸的1/2。

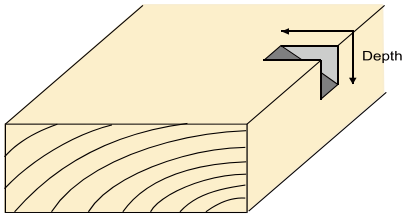
Occurrence Restrictions
出现方式的限制

Sawcuts can occur in three possible forms
锯缝可以有三位置类型：

Partially thru the face and edge
部分透过宽面和窄面

- measured for displacement, like a simple Spike Knot of the same dimensions.
  与相同尺寸的条状节一样，测量其占据的位置。
- ie for dimension lumber depth x width x 1/3. Sawcut displacement cannot exceed 1/2 the allowable Edge Knot Size.
  即，在规格材中为：深度 x 宽度 x 1/3。锯缝占据的位置不能超过边缘节疤允许尺寸的1/2。

Fig. 图 27

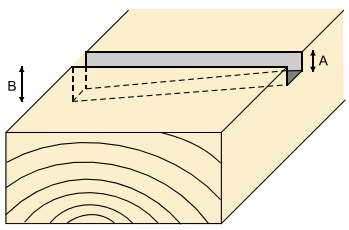


Entirely thru the wide face
穿过整个宽面的锯缝

- measured for, like a "through" Spike Knot of the same dimensions.
  与相同尺寸的“贯通条状节”一样，测量其占据的面积。

- ie for dimension lumber (A + B) x width of piece x 1/3. Sawcut displacement cannot exceed 1/2 the allowable Edge Knot Size.
  即，在规格材中为：(A+B) x 宽度 x 1/3。锯缝占据的位置不能超过边缘节疤允许尺寸的1/2。

Fig. 图 28

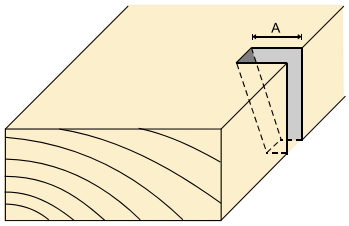


Entirely thru the edge
穿过整个厚度的锯缝

- measure the face of worst penetration only.
  在情况最严重的面上测量。

- this measurement cannot exceed 1/2 the allowable Edge Knot Size.
  测量值不能超过边缘节疤允许尺寸的1/2。

Fig. 图 29



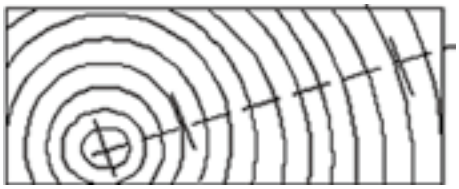
Rate of Growth
生长率

In NLGA Dimension Lumber, Rate of Growth specifications apply only to Douglas Fir (W. Larch). The highest Rate of Growth specification required in these grades is "medium". "Medium" Rate of Growth means an average of 4 rings per inch on the best end for pieces averaging less than 4 rings per inch are accepted if the annual ring is 1/3 or more summerwood - the dark portion of the annual ring. Since the specification is easy to meet and applies only to one species group, it rarely determines the grade in dimension lumber. Second growth timber should be watched closely.
在NLGA规格材中，关于生长率的规定仅用于花旗松(和西部落叶松)。在这些等级中，对生长率的最高规定为“中等”。“中等”生长率意味着在最好一端每英寸有4个年轮，如果少于3个年轮，只要其年轮中晚材(年轮中较暗的部分)的比率超过1/3，则也可以接受。由于这一规定很宽松、而且仅针对一个树种组合，所以在规格材评级中很少起决定性作用。但对于来自次生林的木材应仔细观察。

Rate of Growth is determined by counting the number of rings in a three (3) inch line which is perpendicular to the annual growth rings (also called a radial line) and dividing by three. If the result of the calculation is 3.9, the Rate of Growth is less than 4 rings per inch.
计算生长率的方法是，在垂直于年轮的直线上(又称半径线)，计算3英寸范围内的年轮数，再除以3。如果计算结果为3.9，则生长率小于4。

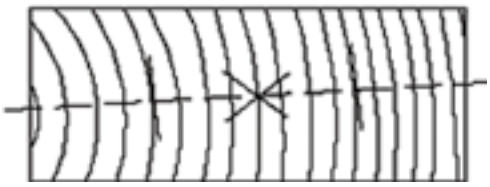
If the piece is free of heart centre (FOHC), the line must by "centrally located" which means that the midpoint of the line should be at the centre of the end section (Fig. 31). If this "centrally located" line is less than three inches, then the ring count is made over the length available (Fig. 32). Divide the count by the line length.
如果一块锯材是不含树心的(FOHC)，则该直线必须“位于中间位置”，即该线条的中间点应当位于端头的中心(图31)。如果该“位于中间位置”的线条不足3英寸，则在可能的长度内计算年轮(图32)。将该数字除以线条的长度。

Fig. 图30



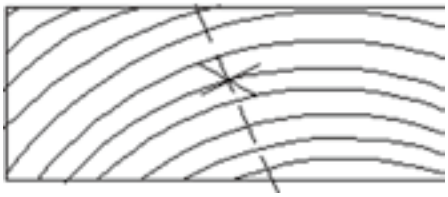
Exclude 1/4 of the least dimension, count the annual rings over a 3" radial line. Divide the count by 3.
去除尺寸最小的1/4部分(近髓部分)，数一下3英寸半径线内的年轮数。再除以3。

Fig. 图31



Count the number of annual rings over a 3" radial line, the line must have its mid-point at the centre of the piece. Divide the count by 3.
数一下3英寸半径线内的年轮数。该线条的中间点应当位于端头的中心。再除以3。

Fig. 图32



Count the annual rings over the longest radial line whose mid-point is the centre of the piece. Divide the count by the length of the line (in inches).
数一下最长半径线内的年轮数，该线条的中间点应当位于端头的中心。将该数字除以线条的长度(英寸数)。

Examples of Rate of Growth Calculations:
示例，生长率的计算：

A 4 x 4 has a ring count of 25 on a 3" radial line which is centrally located. Rate of Growth equals 25/3 or 8.3 rings per inch.
一块 4 x 4 锯材，在3英寸长的半径线上有25个年轮。其生长率为25/3，即每英寸 8.3个年轮。

A flat grain 2 x 6 has a ring count of 12 over a 1 3/4" centrally located radial line. Rate of Growth equals 12 / 1.75 or 6.8 rings per inch.
一块平纹的2 x 6 锯材，在1 3/4英寸的处于中间位置的半径线上有12个年轮。其生长率为 12 / 1.75，即每英寸 6.8 年轮。

If the piece contains the pith (or heart centre), measure any radial line (up to 3" long) starting 1/4 of the thickness (least dimension) away from the pith (Fig. 30). The radial line can be chosen to best advantage.
如果一块锯材含有髓心(树心)，在始于距髓心1/4厚度以上的任意半径线(最长3英寸)上测量(图 30)。可以选择最有利的半径线。

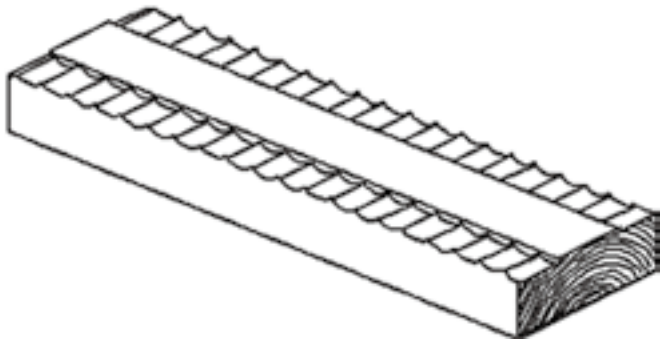
Compare the Rate Of Growth on the best end to the allowance for the grade. If the best end is 4.1 and the worst end is 3.8, the piece meets the specification of "medium".
将最好端的生长率与该等级的允许值相比。如果最好端为4.1而最差端为3.8，则该块锯材符合“中等”生长率的规定。

Chip-n-Saw Channels and Saw Step (Rabbeted edge)
边缘锯陷和阶梯状偏锯

Is limited on a basis of wane except in those instances in which the depth or width of the cut exceeds the full length wane provisions, the limitation shall be on a basis of equivalent loss of wood from maximum natural wane.
除非其宽度和深度超过钝棱的规定，对边缘锯陷和阶梯状偏锯按钝棱进行限制，其限制以等效于自然钝棱的木材缺失量为依据。

In rough lumber, such channels, tracking or stepping marks must not exceed 1/16" variation from the intended line of cut. Deeper channels shall not exceed the equivalent of either the wane or skip permitted, and shall be limited to occasional pieces. Channels which are equivalent to the full length wane provisions of a given grade shall be dropped to the next lower grade and limited to occasional pieces.
在毛面锯材中，这类锯陷、锯痕或阶梯状偏锯的痕迹离规定的锯线必须小于1/16英寸。更深的锯陷也不可超过规定允许的等效的钝棱或漏刨，而且只限于偶尔出现。等效于某等级全长钝棱的锯陷应该降为其下面的一个等级，而且只限于偶尔出现。

Fig. 图33



Compression Wood and Timber Breaks
应压木和木材断裂

Separations resulting from seasoning which occur in allowable bands of compression wood shall not be evaluated as timber breaks or compression failures.
在应压木周围允许的范围内、由干燥引起的木材分离不应被当成木材断裂和应力缺陷。

Compression wood shall be limited in effect to other appearance or strength reducing characteristics permitted in the grade. Compression failures and timber breaks are permitted only in the grades of Standard, No 3, Utility and Stud. They are limited to the size of the allowable knot hole.

与某等级中其它影响外观和降低强度的缺陷一样，对应压木的限制以其效果确定。应力缺陷和木材断裂仅允许在标准级、3级、实用级和墙柱级中出现，其限制程度相当与可允许节孔的尺寸。

Planer Tears
刨刀撕伤

Planer or chipper tears are permitted in Standard/No 2 and higher grades provided they are not more than the width of the piece in length and not more than 1/4" in depth. In Utility, No 3 and Stud grades, Tears shall not exceed the allowable hole size in depth, nor the permissible split in length.

刨刀撕伤可以允许在标准级/2级及更高等级中出现，但它的长度不能超过该块锯材的宽度、深度不能超过1/4英寸。在实用级、3级和墙柱级中，撕伤深度不能超过允许的节孔尺寸、长度不能超过允许的劈裂长度。

Waste Clause
废料条款

Economy allows "waste" to be included in pieces over 8' long. The amount of waste allowed cannot exceed 25% of the length of the piece and it must be located at least 2' from the ends. In other words defect in excess of that permitted is allowed if it can be cut out (as waste) by the end user.

经济级中允许在8英尺以上的材料中出现废料。废料的长度不能超过该块锯材长度的25%，而且距端头必须在2英尺以上。换句话说，超过允许值的缺陷是可以出现的，假定用户可以将它们当作废料锯除。

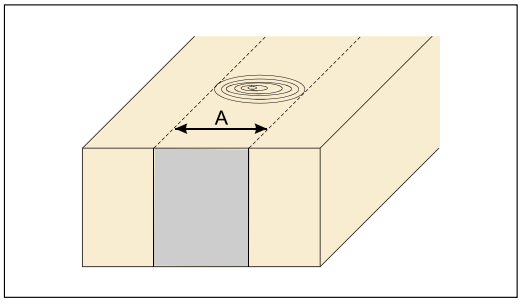
KNOT MEASUREMENT
节疤测量

Knots in Dimension Lumber (Stress Grades)
规格材(应力等级)中的节疤

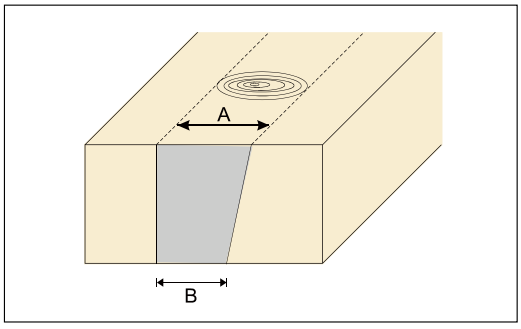
Knots on the wide face are measured between lines parallel to the edge of the piece and the knot size is the average of the measurement on both wide faces. Bark occurring around knots (other than pockets and wane) must be included in the measurement when determining the knot size.
锯材宽面的节疤从与锯材边缘平行的节疤边线之间的距离测得。节疤尺寸是两个宽面上测量值的平均数。在确定节疤尺寸时，必须将节疤周围的树皮(树脂囊和钝棱除外)包括在内。

Knot Measurement Formula — The Knot Measurement Formula used for measuring round knots in dimension lumber is (A + B) / 2. Three easy steps will determine the accurate size of the knot.
节疤测量公式 — 测量规格材圆节的节疤测量公式为(A + B) / 2。通过三步简单的步骤就可以精确地确定节疤的尺寸。

Step 1 — Measure Side A
第一步 — 测量A面



Step 2 — Measure Size B
第二步 — 测量B面



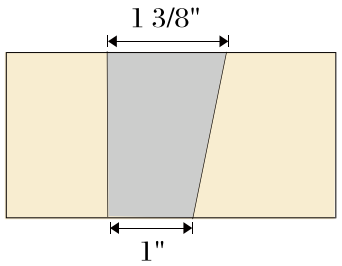
Step 3 — Divide the sum of measurements by 2
第三步 — 将两测定值之和除以2

- The result will be the average knot size
- **该数值即为节疤的平均尺寸**

$$\text{Knot Size 节疤尺寸} = \frac{A + B}{2}$$

Example Calculation: If A = 1 3/8" and B = 1" then,
示例计算：如果 A = 1 3/8英寸， B = 1英寸， 则：

Fig. 图1



$$\frac{1\ 3/8" + 1"}{2} = \frac{2\ 3/8"}{2} = 1\ 3/16"$$

Fig. 图2

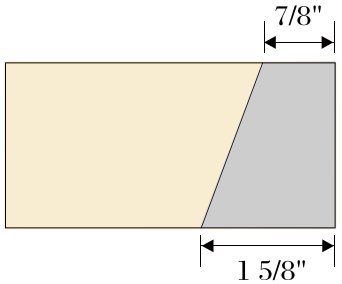


Fig. 2 Calculation:
图2 计算：

(A + B) / 2 = Average Knot Size
(A + B)/ 2 = 平均值节疤尺寸
A = 7/8"
B = 1 5/8" = 13/8"

Therefore
因此:

$$\frac{7"}{8} + \frac{13"}{8} = \frac{20}{\frac{8}{2}} = 1\ 1/4"\ \text{knot 节疤}$$

Spike or Narrow Face Knots (Round Knot Equivalents)
条状节疤或窄面节疤(与圆节等效)

Spike knots, or narrow face knots, usually appear on one or both narrow faces and may appear on the wide face too. In dimension lumber, spike knots are measured as "equivalent to round knot size".
条状节、或窄面上的节疤，通常出现在一个或两个窄面上，也可能会出现在宽面上。在规格材中，条状节被作为等效圆节测量。

The equivalent round knot size of the spike knot in Fig. 3 can be calculated by using the universal spike knot conversion formula.
图3中条状节的等效圆节的尺寸可以使用通用的条状节换算公式。

The universal spike knot conversion formula is
通用的条状节换算公式为：

L / 2 x (C + D) / T

- Where L = length of the knot
  其中 L = 节疤长度

- Where T = thickness of the piece
  其中 T = 该块锯材的厚度

- Where C and D = size of the knot on each edge
  其中 C 和 D = 节疤在每个窄面上的尺寸

This formula calculates the average size (length) of the spike knot on the wide faces (L/2) and the fraction of the edge(s) occupied by the knot ((C+D)/T).
这一公式计算条状节在宽面(L/2)上的平均尺寸(长度)和该节疤在窄面上占据的比例((C+D)/T)。

But for North American dimension lumber, the formula can be simplified as follows:
然而对于北美的规格材，该公式可以简化为：

Width of knot x Thickness of knot x 1/3 or W x T x 1/3
节疤宽度 X 节疤厚度 X 1/3 或：W x T x 1/3

Fig.3 - One Edge Spike Knot - 2 x 4
图3 - 仅在一个窄面的条状节 - 2 x 4

Fig. 图3

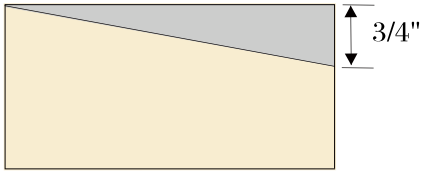


Fig.3 Calculations:
图3 计算：

W x T x 1/3 = Equivalent to Round Knot Size
W x T x 1/3 = **等效圆节尺寸**

W = 3 1/2"
T = 3/4"

$$3\ 1/2 \times \frac{3"}{4} \times \frac{1}{3} = \frac{7"}{2} \times \frac{3"}{4} \times \frac{1}{3} = \frac{21"}{24} = \frac{7"}{8}$$ Equivalent round knot
等效圆节

Fig.4 - Two-Edge Spike Knot - 2 x 4
图4 - 在两个窄面上的条状节 - 2 x 4

The spike knot in Fig. 4 appears on both narrow faces. The total of both edges must be included in T (the total thickness of the knot).
图 4中的条状节出现在两个窄面上。两个窄面都必须包括在T之中(节疤的总厚度)。

Fig. 图4

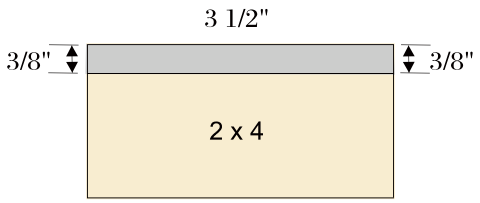


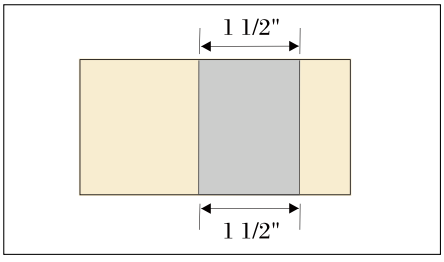
Fig.4 Calculation:
图4 计算

W x T x 1/3 = Equivalent to Round Knot Size
W x T x 1/3 = 等效圆节尺寸
W = 3 1/2"
T = (3/8" + 3/8") = 3/4"

Therefore
因此

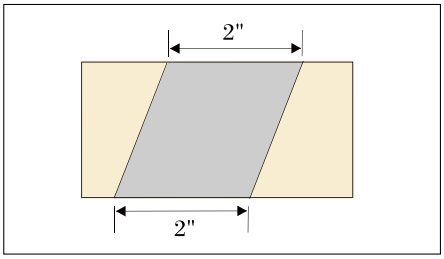
3 1/2" x (3/8" + 3/8") x 1/3 = 7/2 x 3/4 x 1/3 = 21/24 or 7/8 equivalent round knot size 等效圆节尺寸

Round Knot Equivalent Displacements — in Light Framing
与圆节等效的占据位置 — 轻型框架



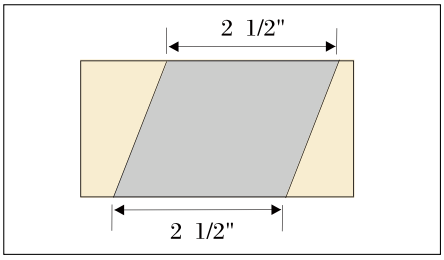
Construction Knot - 1 1/2"
建筑级节疤 - 1 1/2英寸

Displacement - 43%
占据位置 - 43%



Standard Knot - 2"
标准级节疤 - 2英寸

Displacement - 57%
占据位置 - 57%

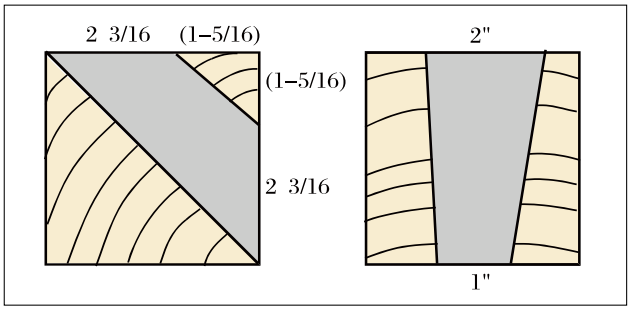


Utility Kno - 2 1/2"
实用级 - 2 1/2英寸

Displacement - 71%
占据位置 - 71%

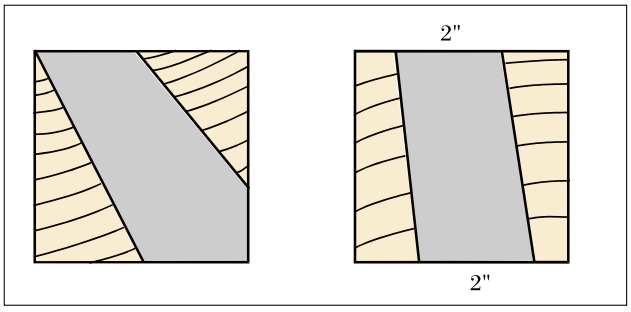
Knots in Squares — Example Displacements
方材中的节疤 — 示例占据位置

The examples below illustrate maximum size knots that would make the grades of Construction, Standard and Utility in a 4 x 4.
以下的图例展示了4 x 4 锯材的建筑级、标准级、和实用级中所能允许的最大节疤尺寸。



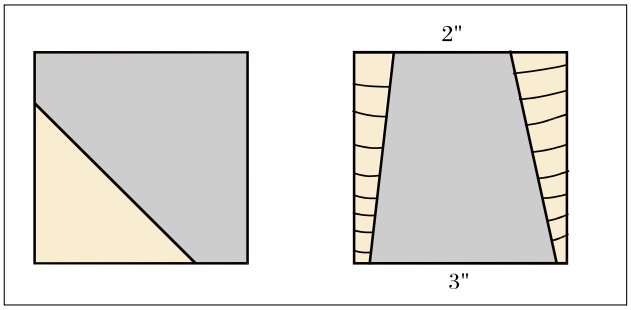
Construction - 1 1/2"
建筑级 - 1 1/2英寸

Displacement - 43%
占据位置 - 43%



Standard - 2"
标准级 - 2英寸

Displacement - 57%
占据位置 - 57%

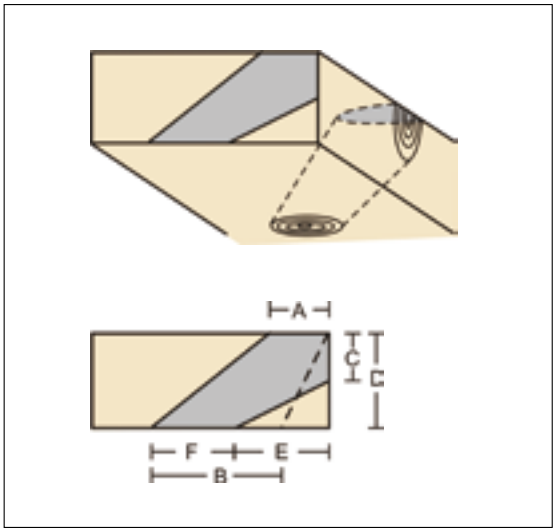


Utility - 2 1/2"
实用级 - 2 1/2英寸

Displacement - 71%
占据位置 - 71%

Three and Four Face Knots in Dimension Lumber
规格材中的三面和四面节疤

Three Face Knots are on both wide faces and occupies a fraction of the narrow face. They are evaluated by making them geometrically equivalent to Wide-Face-Only-Knots.
三面节疤出现在两个宽面和一个窄面上。在对三面节疤进行评定时，是将它们换算成几何上等效的、仅出现在宽面上的节疤。

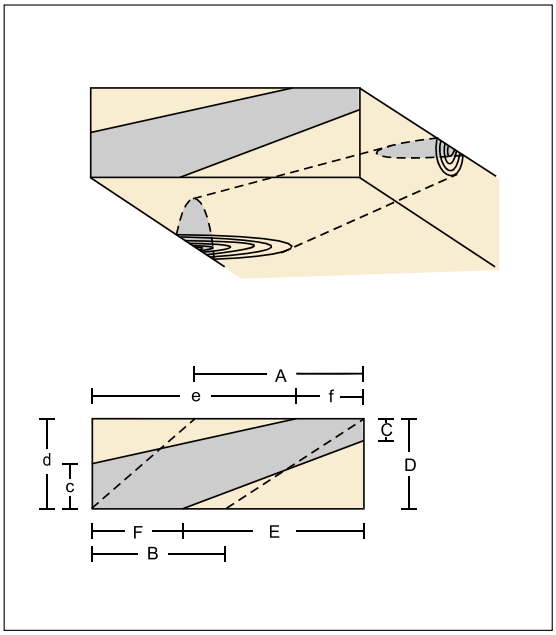


Three Face Knot
三面节疤

Formula
公式

Knot Size = A + B / 2
节疤尺寸 = A + B / 2

Where B = ((C/D) x E) + F
其中 B = ((C/D) x E) + F



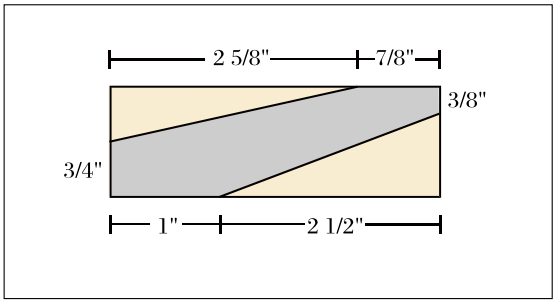
Four Face Knot
四面节疤

Formula
公式

Knot Size = A + B / 2
节疤尺寸 = A + B / 2

Where B = ((C/D) x E) + F
其中 B = ((C/D) x E) + F

Sample Calculation
计算示例

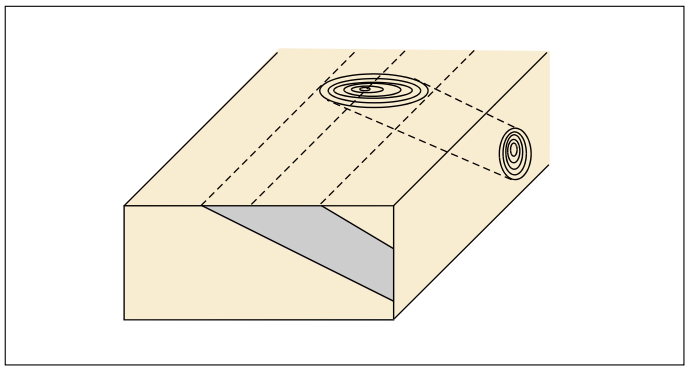


A = ((3/4" / 1 1/2") x 2 5/8") + 7/8"
= (1/2" x 2 5/8") + 7/8"
= 2 3/16"

B = ((3/8" / 1 1/2") x 2 1/2") + 1"
= (1/4" x 2 1/2") + 1"
= 4/8" + 1"
= 1 5/8"

Knot Size = A + B / 2 = 2 3/16" + 1 5/8" / 2 = 3 13/16" / 2 = 1 29/32"
节疤尺寸 = A + B / 2 = 2 3/16" + 1 5/8" / 2 = 3 13/16" / 2 = 1 29/32"

Adjacent Face Knots - in dimension lumber
规格材中相邻表面的节疤

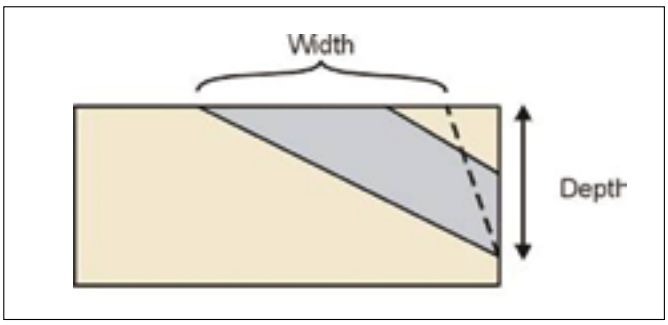


Method
方法

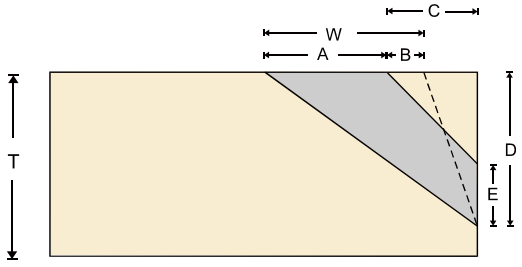
1. Assess the proportion of the edge face occupied by the knot.
评估节疤在窄面上占据的比例。

2. Increase knot measure on face by taking the same proportion (determined in Step 1) of the good wood remaining and adding on to the existing face knot measurements.
在宽面剩余正常木材中，取相同比例(由步骤1确定)作为侧面节疤的换算值，再加上宽面上现有节疤尺寸的测量值。

3. Then use the standard spike knot formula for dimension lumber: Depth x Width x 1/3 where width has been increased as per Step 2. Depth = full depth of the spike knot
然后按规格材标准条状节计算公式求得节疤尺寸：深度 X 宽度 X 1/3，其中宽度已按照步骤2进行调整。深度 = 条状节的全部深度。



Expressed Algebraically
代数表达式



Knot Size = D x W x 1/3
节疤尺寸 = D x W x 1/3

Where W = (E/D x C) + A
其中 W = (E/D x C) + A

If A = 1", B = 1/4", C = 3/4", D = 1 1/4"
如果A = 1**英寸**, B = 1/4**英寸**, C = 3/4**英寸**, D = 1 1/4**英寸**

and E = 1/2" and W = 1.3
而且E = 1/2**英寸** and W = 1.3

Therefore W = 1" + 1/4" = 1 1/4"
那么W = 1**英寸** + 1/4**英寸** = 1 1/4**英寸**

W = 1 1/4 D = 1 1/4

Knot Size = W x D x 1/3
节疤尺寸= W x D x 1/3

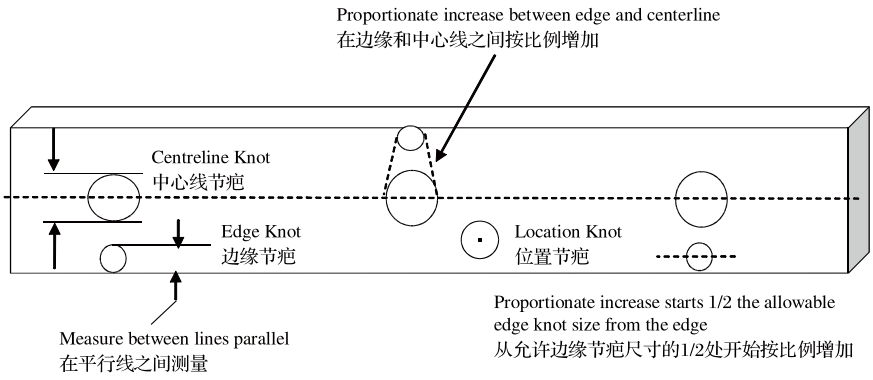
Knot Size = 0.52" (just over 1/2")
节疤尺寸 = 0.52**英寸** (**略超过**1/2**英寸**)

Knots in Structural Light Framing, Joists & Planks and Stud
结构轻型框架、托梁及平铺木板和墙柱等级中的节疤

Knot sizes are specified for the Edge of the wide face and for the Centreline. For knots between the edge and the centerline called Location Knots, a proportionate increase must be calculated, based on the location of the knot. (Fig. 5)

节疤尺寸是依据宽面的边缘和中心线确定的。位于边缘和中心线之间的节疤被称为位置节疤，根据节疤的位置，允许的结疤尺寸按比例增加。(图5)

Fig. 图5



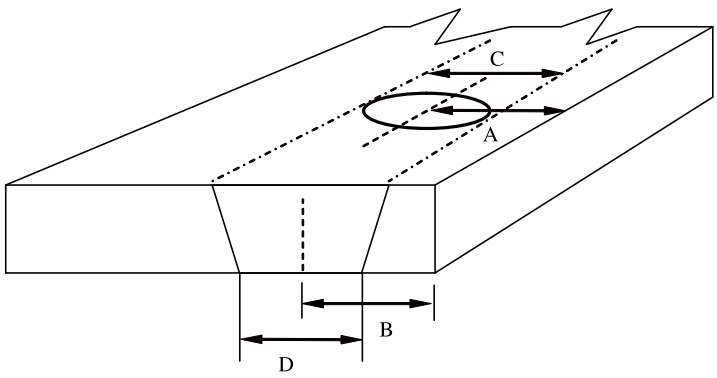
Knot Location
节疤位置

Wide face knots appearing away from the edge may increase proportionately from the size permitted at the edge of the wide face to the size permitted along the centreline. The increase shall start at a distance from the edge equal to 1/2 the diameter of the allowable edge knot.

在锯材的宽面，从边缘到中心线，允许的节疤尺寸可以按比例增加。这种增加从距边缘相当于可允许节疤直径的1/2处开始。

Location Knot
位置节疤

Fig. 图6



Location Knot Calculation
位置节疤的计算

A knot's location is considered as the average distance that the pith of the knot is away from the edge on both wide faces. (Fig. 6)
在锯材的两个宽面上，节疤的髓心距边缘的平均距离(图6)为节疤的位置。

To determine the grade of a piece of lumber with a Location Knot in it, the first step is to find the average location of a knot in the cross section of the piece by doing the following:
要评定一块有位置节疤的锯材的等级，第一步是通过以下步骤找出锯材横切面上节疤的平均位置：

1. Measure from the edge of wide face nearest the knot to the geographical centre of the knot (not the pith). (A)
   量出从最接近节疤的宽面边缘到节疤的几何中心(不是髓心)的距离。(A)

2. Do the same on the reverse side from the same edge. (B)
   在锯材反面的同一边缘用同样方法测量。(B)

3. Add the two measurements together and divide the sum by 2.
   将A和B相加再除以2。

4. This will give the approximate mean location of the knot for the allowable size increase between the edge and centreline.
   这将得出节疤的大约平均位置，据此可得出边缘和中心线之间的可允许增加的结疤尺寸。

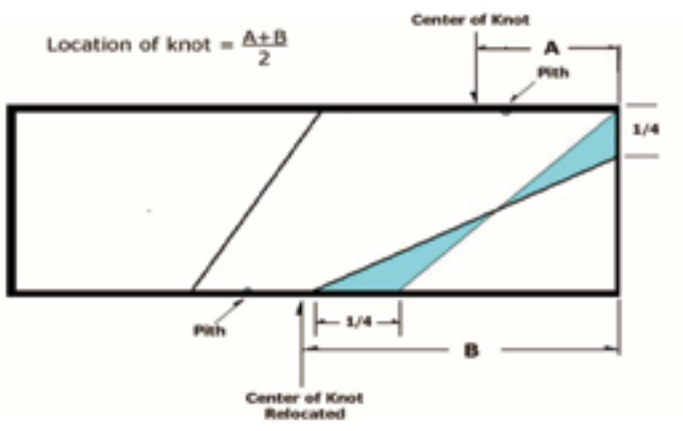
5. The next step is to determine the average knot size
   下一步是确定平均节疤尺寸。

6. Measure knot between lines parallel to edges of both faces (C & D) and divide by 2.
   以平行于锯材边缘的节疤边线为准，从锯材两面(C和D)量出节疤尺寸再除以2。

To find the average location of a 3-face knot:
三面节疤平均位置的确定：

Fig. 图7

2 x 8



1. Measure the knot size using the 3-face knot measurement method, by taking the proportion of the knot that laps over onto the narrow face and adding an equivalent proportion of the clear wood to the knot on the wide face. (See Fig. 7).
   用三面节疤的测定方法测出节疤的尺寸，即求出节疤在窄面上所占的比例、然后在宽面节疤上加上等效比例的无节疤木材。(图7)

2. To relocate the knot, measure the location of the centre of the knot on both faces, (not the pith, but the centre of the knot), and average it (A + B divided by 2). When determining the centre of the knot, you have to consider the actual knot size plus the added clear wood from the portion of the knot that overlaps the edge.
   要重新确定节疤位置，在两个宽面上测量节疤中心的位置(不是髓心，而是节疤中心)，求它们的平均值(A + B 然后除以2)。在确定节疤中心时，需要考虑节疤的实际尺寸、加上根据节疤在窄面上所占比例而换算出占据住置。

Edge Knots
边缘节疤

The following are to be considered as Edge Knots:
以下被认为是边缘节疤：

- round knots situated right on the edge
  刚好位于边缘的圆节疤

- spike knots (all)
  条状节(所有)

- 3-face knots where the knot occupies more than 1/2 of the edge
  节疤占有超过1/2边缘的三面节疤

- 4- face knots (all)
  四面节疤(所有)

Large Spike Knots in Structural Light Framing, Joists & Planks & Stud
在结构轻型框架、托梁及平铺木板和墙柱中的大型条状节疤

Convert the spike knot to a round knot, and use the "Edge Knot Size" to determine the grade of the piece of lumber. Use formulas for a 1-edge or 2-edge spike knot to convert to a round knot.
将条状节转换成圆节疤，使用“边缘节疤尺寸”决定某块锯材的等级。

Spacing of Knots in Structural and Stud Grades
结构等级和墙柱等级中节疤的间隔

Knots in clusters (Para 718s) are measured as one large knot.
丛节(718s款)当着一个大节疤度量。

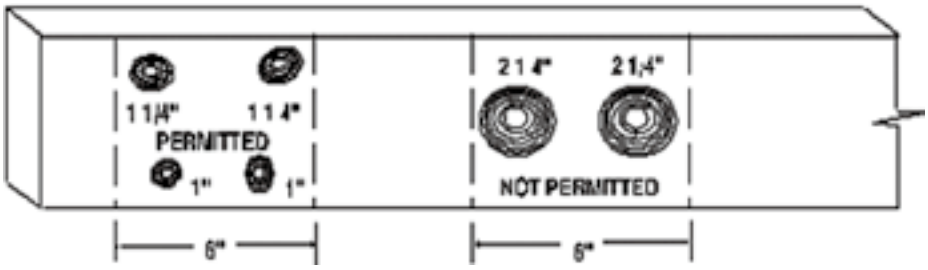
Knots must be "well-spaced" (see Para 718v) in the structural grades. The spacing of knots refers to the combinations of knot sizes in any 6" length.
在结构等级中节疤必须有“良好的空间分布”(718v款)。节疤的分布是指任意6英寸长度内上节疤尺寸的总和。

These rules apply to well spaced knots:
这些规则适用于空间分布良好的节疤：

1) The sum of the sizes of all knots occurring in any 6" length must not exceed twice the size of the centerline knot permitted
   在任意6英寸长度的所有节疤的尺寸总和必须不超过中心线可允许节疤尺寸的两倍。

2) Two centerline knots of the maximum size are not permitted in the same 6" of length A practically impossible condition.
   最大尺寸的两个中心线节疤不允许出现在同一个6英寸长度范围内。这是一个实际上不可能发生的情况。

Example 2 x 8 Structural
示例 2 x 8 结构材

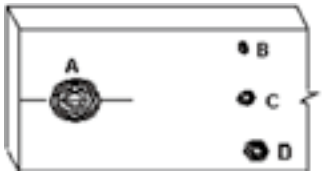


Knots in the Same Cross-Section (Opposite Knots)
同一横切面上的节疤(对应节疤)

The sum of the sizes of all knots in the same cross-section must be less than or equal to the "centerline knot size" permitted (Fig. 8). Knots are considered to be in the same cross-section, if the edges of the smaller knot(s) are within the cross-section bounded by the edges of the largest knot (Fig. 9). N.L.G.A. refers to a "serious" combination of knots. This is interpreted as knots in the same cross-section whose combined size is greater than the centerline knot permitted.

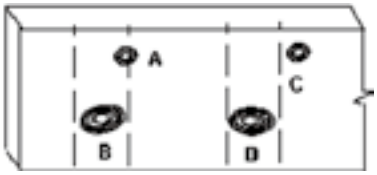
同一横切面上的所有节疤尺寸总和必须少于或等于可允许的“中心线节疤尺寸”(图8)。如果较小节疤的边缘位于以较大节疤的边缘线构成的切面之中，这些节疤被认为处于同一切面之中(图9)。N.L.G.A.把这种情况定义为“严重的”节疤组合现象。这可解释为位于同一切面的节疤的组合尺寸大于可允许的中心线节疤。

Fig. 图8



A - maximum centerline knot
A-最大中心线节疤

Fig.图9

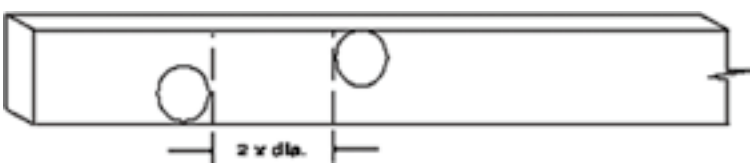


A/B directly opposite (within same cross section)
A/B直接对应(位于同一切面)
C/D not in same cross section
C/D不在同一切面

If two knots on opposite edges are both of maximum diameter, the lengthwise space between them must be at least two times their diameter (Fig. 10 below).

如果两个相对的边缘节疤都为最大允许直径，它们之间在长度方向上的距离至少为它们直径的两倍。(图10)

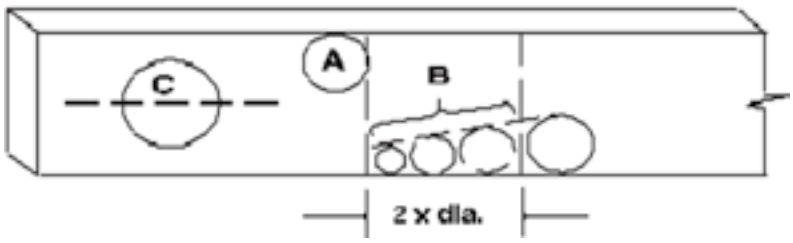
Fig. 图10



Where two knots are on opposite edges and one is the maximum size, the permissible size of the other knot if directly opposite is limited by rule (3). If the other knot is not directly opposite, it may take a proportional increase equal to it's lengthwise displacement from directly opposite to two diameters apart as stated in rule (4). (Fig. 11).

在两个相对边缘节疤中，如果一个为最大允许直径，另一个与它直接相对，则该节疤的允许尺寸由规则(3)决定。如果另一个节疤不直接相对，它的尺寸可以按比例增加，规则(4)规定其增加的量等于其在长度方向上离开正对位置与两倍直径的比例(图11)。

Fig. 图11



When A + B > C and one or both are less than maximum size, then the maximum size of B may increase proportionately depending on the lengthwise spacing from size permitted if directly opposite to the size permitted if two diameters apart.

当 A + B > C，而且一个、或两者均小于最大允许尺寸，则B的最大允许尺寸可以按比例增加，其增加值取决于其长度方向上离开正对位置与两倍直径的比例。

NLGA WESTERN RED CEDAR GRADE RULES
NLGA 西部红柏等级规则

2" & Thinner, 2" & Wider
厚度2英寸及以下，宽度2英寸及以上

Para 200 Finish, Panelling, Ceiling, & Drop Siding
200 款 饰面板、内墙板、天花板、外墙挂板

Para 201 Clear Bevel Siding
201 款 清材斜坡型外墙板

Para 204 Knotty Panelling and Siding
204 款 有节型内墙板和外墙板

Para 205 Knotty Bevel Siding
205 款 有节斜坡型外墙板

Para 126 Patio Decking
126 款 露台板

Finish, Panelling, Ceiling, and Drop Siding
饰面板、内墙板、天花板、外墙挂板

Grade names
等级名称

Clear Heart
无缺陷(清材)心材级

A
A级

B
B级

Evaluation for Grade and General Notes
等级的评估和概要说明

Western Red Cedar Finish, Panelling, Ceiling and Drop siding are customarily shipped kiln dried and surfaced four sides. Pieces of Panelling, Ceiling, and Drop Siding may also be run to pattern and have a partially surfaced, hollow, or scratched back. Pieces of Clear Panelling and Ceiling shall be graded from the face (dressed pattern) side.

西部红柏饰面板、内墙板、天花板、外墙挂板通常以窑干和四面刨光的形式出售。内墙板、天花板、及外墙挂板也可能会加工为表面造型的、部分刨光的、中空的、或背面粗糙的形式。清材内墙板和天花板以表面(刨光造型面)为评级面。

Most Western Red Cedar products are also available in a rough Saw Texture finish. The same grade rules apply, except that the product must be graded from the textured (rather than the smooth) face.
大部分的西部红柏产品也可以粗糙、锯纹、毛面的形式供应。此时的等级规则相同，但产品从粗糙表面(而不是光滑面)评级。

Pieces are graded from the best face, the reverse face may be one grade lower, except for certain characteristics in Clear Heart, A & B where the allowance for the back is specified.
产品以最好面评级，反面可以相应低一个等级。然而在无缺陷心材级、A级和B级中，对某些背面缺陷的允许值有明确规定。

In pieces 5" and narrower, the best face includes both edges.
在宽度5英寸及以下的产品中，最好面包括两个窄面。

In pieces 6" and wider, the best face includes one edge.
在宽度6英寸及以上的产品中，最好面包括一个窄面。

(The grader may combine the face with the edge which yields the highest grade, i.e. best face and worst edge).
(分级员可选择相应的宽面和窄面作为评级面，以获得最高的等级，例如：最好宽面和最差窄面结合)。

The face includes the edge(s) according to the above rules and characteristics on the edge(s) are counted as occurring on the wide face except where noted.
根据上述规则确定相应的宽面和窄面为评级面后，除非特别注明，窄面上的缺陷作为出现在宽面上缺陷对待。

Basic Size
基本尺寸

The characteristics permitted in these grade rules are based on a Basic Size piece. Basic Sizes are:
这些等级所允许的缺陷是基于基本尺寸的锯材而确定的。基本尺寸为：

- Finish & Panelling 8" wide by 12" long
  饰面板及内墙板8英寸宽12英寸长

- Ceiling & Drop Siding 4" wide by 12" long
  天花板及外墙板4英寸宽12英寸长

Checks
干裂

Checks must be considered for size and number on the dressed faces of these grades. The B grade permits medium Checks (1/32 x 10) and an occasional Check 50% longer (1/32 x 15) on the face. Checks on the back of B grade may be up to 20" long with no restriction in number.
对于这些等级而言，干裂的尺寸和数量都必须考虑。在B级的表面，允许中等干裂(1/32英寸 x 10

英寸)、可以偶尔含尺寸大于50% (1/32英寸 x 15英寸) 的干裂。B级的背面可以含长度至20英寸的干裂，而且数量不限。

Holes
孔洞

Holes can be from any cause and are permitted only in B grade. Any number of Holes may be taken as equivalent smaller provided the size of each Hole is not more than that permitted and the sum of the Holes does not exceed the sum total allowed. (eg four 1/4" Holes would be accepted as equivalent to two 1/2" on the back of B grade). A Hole over 1/2" is only accepted as a Cut-Out.
孔洞可以是任何原因引起的，但仅允许在B级中出现。只要每个孔洞的尺寸不超过允许值、孔洞尺寸的总和不超过允许的总和，任何数量的孔洞均可以被当作较小等效孔洞处理。(例如在B级的背面，可以允许将4个1/4英寸的孔洞被作为2个1/2英寸孔洞的等效孔洞处理)。超过1/2英寸的孔洞只允许在废料部分出现。

Knots
节疤

Knots are restricted in these grades to quality, size and number.
在这些等级中，对节疤的质量、尺寸和数量均有限制。

Round and Oval knots are measured by averaging the largest and smallest diameters on the face they occur. Spike shaped Knots are measured as the average of their length and widest width. Irregular Knots are measured as the average dimension of the smallest rectangle which will enclose the knot. See page 157 for an illustration of knot measurement.
圆节和椭圆节以它们在出露面上的最大和最小直径的平均值来度量。条状节以它们的长度和最大宽度的平均值来度量。不规则的节疤以能包围它们的最小四边形的平均值来度量。见157页的节疤测量示例。

Example knot allowances:
节疤允许值示例：

Based on a Basic Size piece.
基于基本尺寸的锯材。

In Clear Heart no knots are permitted on the face.
在无缺陷心材等级的表面，不允许任何节疤。

In A" grade, 3 knots whose combined size does not exceed 1 1/2" are permitted, providing no knot is greater than 3/4". These knots must be sound and tight.
在A级中，允许有3个节疤，其总尺寸不能超过1 1/2英寸，单个节疤的尺寸不能超过3/4英寸。这些节疤必须为健全紧实节。

The face of a B grade permits up to 8 knots whose combined size does not exceed 4", no one of which exceed 1". These knots may be unsound, but they must be fixed (moveable under pressure, but will not come out).

B级的表面最多可允许8个节疤，其尺寸总和不能超过 4英寸、单个节疤的尺寸不能超过1英寸。这些节疤可以是腐朽节，但必须是紧固的(在压力下可移动，但不会脱落)。

The back of B grade permits characteristics 25% larger or more numerous and thus the grade permits up to 10 knots, none over 1 1/4", whose combined size is not over 5 inches.
B级的背面允许缺陷尺寸或数量大25%，因此该等级允许10个节疤，但尺寸均不能超过1 1/4英寸，其尺寸总和不能超过5英寸。

Hint: If there is one characteristic too many or one too large and the piece is 12' or longer, try using the Cut-Out clause (see Cut-Out below).
提示：如果某一个缺陷的数量过多或尺寸过大，而且该块锯材的长度为12英尺或更长，可以使用废料条款(见下文废料部分)。

Pin Holes
针孔虫眼

The first grade to allow Pin Holes is B grade. B grade allows "limited" pinholes which is defined as approximately 30 per square foot. The square foot area can be calculated using the nominal width on the wide face of the piece. In a concentrated area 50% more pin holes are permitted as long as the balance of the piece is better (overall piece can not exceed 30 per square foot).
可以允许针孔虫眼的最高等级为B级。B级可以允许数量有限的针孔虫眼，即大约每平方英尺30个。在宽面上，可以使用名义宽度来计算平方英尺面积。在锯材上某处虫眼集中的区域，可以允许虫眼数达到规定数量的50%，条件是该锯材的其余部分较好，整片平均值不可超过每平方英尺30个。

Skips
漏刨

Skips are restricted as follows:
对漏刨的限制如下:

No skips on the face of Clear Heart.
无缺陷心材等级的表面不允许有漏刨。

Skips on back of Clear Heart - 1/64" x 6" 20% of the face area (very light)
无缺陷心材等级背面的漏刨- 1/64英寸 x 6英寸，表面积的20%(很轻)。

Skips on back and edge of A grade - 1/32 x 12" 20% of face area (light)
A级背面和窄面的漏刨- 1/32 x 12英寸，表面积的20%(轻度)。

Skips on face and back B grade - hit an miss 1/8" scant on edge full length.
B级表面和背面的漏刨 - 间隔漏刨，可全长内缺尺1/8英寸。

Note: A grade will not accept B grade skips on the back because the grade stipulates the amount of skip permitted on the back.

注：A级的背面不允许出现B级程度的漏刨，因为该等级中已规定了其背面漏刨的程度。

If the skips above are 1/2 width accept them twice as long.
如果上述漏刨仅为规定宽度的1/2，则其长度可为规定的2倍。

Raised Grain — Raised grain must be evaluated by feel. Evaluate the finish of surfaced products by running your hand over the entire surface of the piece.
凹凸纹理 — 须根据手感评价。评定时用手指在锯材们的整个刨光表面抚摸。

Torn Grain — Torn Grain is evaluated by visually judging the depth which the grain is torn.
撕破纹理 — 通过目视判断纹理被撕破的深度。

Machine Burn
机械灼焦

Machine Burn would be acceptable providing it is no deeper than the torn grain permitted in the grade and the discoloration does not exceed the following conditions:
机械灼焦在下列情况下可以接受：深度不大于等级的允许值、而且变色没有超过下列条件：

Clear Heart barely visible. Can be removed with a light sanding to be suitable for a natural finish.
无缺陷心材 几乎不可见。经轻微砂光即可去除，适合使用为自然外观。

"A" color is not controlled. Only slightly felt depth which is suitable for paint finishes.
A级 对颜色没有限制。仅可以轻微感觉到其深度，适宜使用为油漆表面。

"B" color is not controlled. Depth can be readily felt.
B级 对颜色没有限制。可以明显感觉到其深度。

Wane
钝棱

Wane on the face and the edge of B Finish is evaluated separately. B Finish Wane on the face may be equivalent for width and length (total area governing). Do not exceed the thickness allowance unless the Wane will be accepted for the back.
B级饰面板表面和窄面的钝棱是分别评定的。B级饰面板表面的钝棱可以按长度和宽度等效换算(以总面积为准)。钝棱的厚度允许值不可超过，除非它可以被当作背面钝棱处理。

50% more Wane on the back of B Finish means a full 50% increase in allowable Wane in face area (width & length combined) or an equivalent combination of smaller Wane increases in both width and length.
B级饰面板背面钝棱可以比其正面的允许值高整整50%(宽度和长度综合)，或较小但更长、或更宽的等效钝棱。

Wane allowance is calculated on the actual thickness and width of the piece.
钝棱允许值的计算是基于锯材的实际厚度和宽度进行的。

Splits
劈裂

Only the B grade permits Splits. B grade permits a short Split. A short Split is equal in length to the width (nominal) of the piece. Splits are measured on the face they occur (not the average of both wide faces). Longer Splits reject the piece.

仅B级中允许劈裂。B级中允许有一个小劈裂。小劈裂的长度等于该块锯材的名义宽度。劈裂是在其出现的面上测量而不是其在两个宽面上的平均值。含超过允许值长度的劈裂的锯材将被降级。

Cut-Out
废料

In pieces 12 feet or longer, excessive or oversize characteristics may be permitted in B Finish as a small area of waste to be Cut-Out by the end user. The Cut-Out must be 3' or more from the end of the piece and no more than 3 inches long.

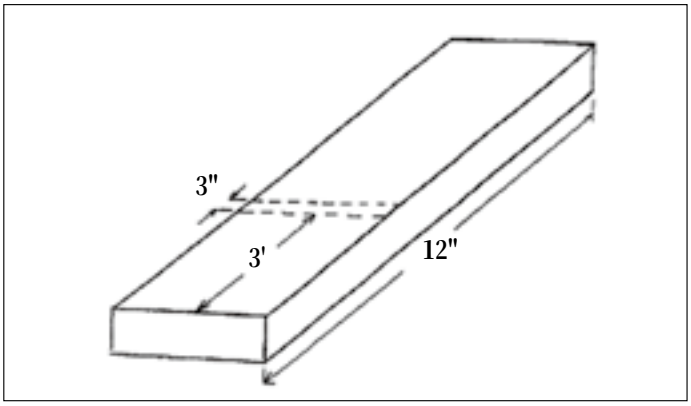
如果长度为12英尺或更长，B级饰面板中允许在小块区域出现过量或过大的缺陷，由最终用户将它作为废料锯除。废料必须距两二端3英尺以上、而且长度不能大于3寸。

If a three inch Cut-Out does not completely remove the characteristic, the remaining amount of the characteristic must be allowable in the B grade.

如果3英寸的废料锯除后仍不能完全去除缺陷，所残留缺陷的大小必须B级中所允许的。

This clause can be applied to eliminate or reduce a single oversize characteristic or to reduce the total number of characteristics to that allowed.

这一条款可用来去除或减轻单个过大的缺陷、或用来减少缺陷的总数量。



Before applying the Cut-Out, measure the length of the piece.

在使用废料条款之前先测量锯材的长度。

Tongue or Lap
榫接或搭接

Panelling - standard tongue width is 3/8"

内墙板 - 标准的榫接宽度为3/8英寸。

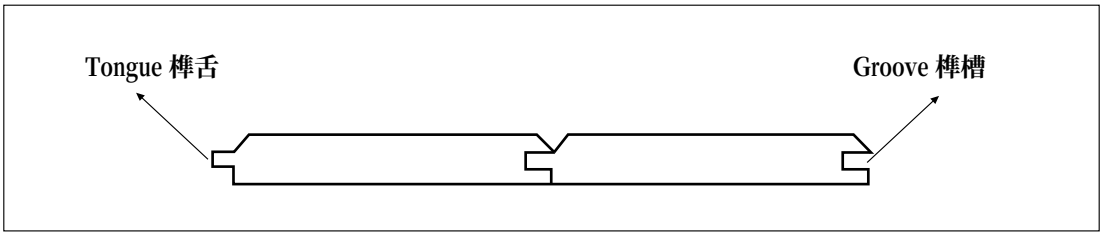
Ceiling - standard tongue width is usually 1/4", but occasionally is 3/16"
天花板 - 标准的榫接宽度为1/4英寸，但偶尔为3/16英寸。

In Clear Heart and A Panelling and Ceiling the tongue may be maximum 1/16" scant full length.
在内墙板和天花板的无缺陷心材级和A级中，榫舌的缺尺可以为全长范围内1/16英寸。

In B Panelling and Ceiling the tongue may show 1/16" or more wide full length.
在B级内墙板和天花板的中，榫舌的缺尺可以为全长范围内1/16英寸或更大。

Groove Edge
榫槽边

Groove edge may permit Hit and Miss Skips in B Panelling and Ceiling
在B级内墙板和天花板中，榫槽的边可以允许有连续漏刨。



Sapwood
边材

Sapwood is not permitted on the face of Clear Heart.
无缺陷心材级的表面不允许出现边材。

Sapwood is unlimited in A and B grades.
A级和B级中不限制边材。

Sapwood can be identified in that it is a pure, creamy white color and when planed may have a slight fuzzy appearance, due to its higher moisture content.
边材的鉴别特征是纯净的奶白色。由于其水分含量较高，刨光后会出现微微起毛的外观。

NLGA CLEAR BEVEL SIDING
NLGA 无缺陷(清材)斜坡型外墙板

Grade names
等级名称

Clear VG Heart (vertical grain)
无缺陷直纹心材级(垂直纹)

A
A级

B
B级

Rustic
乡村级

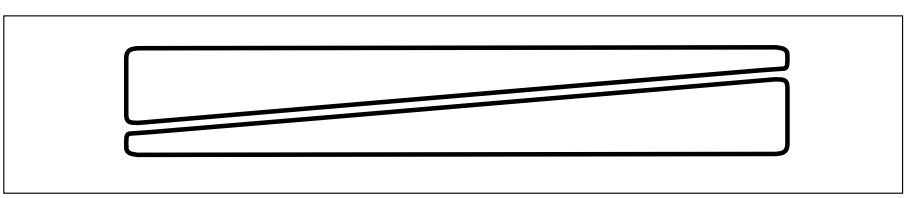
C
C级

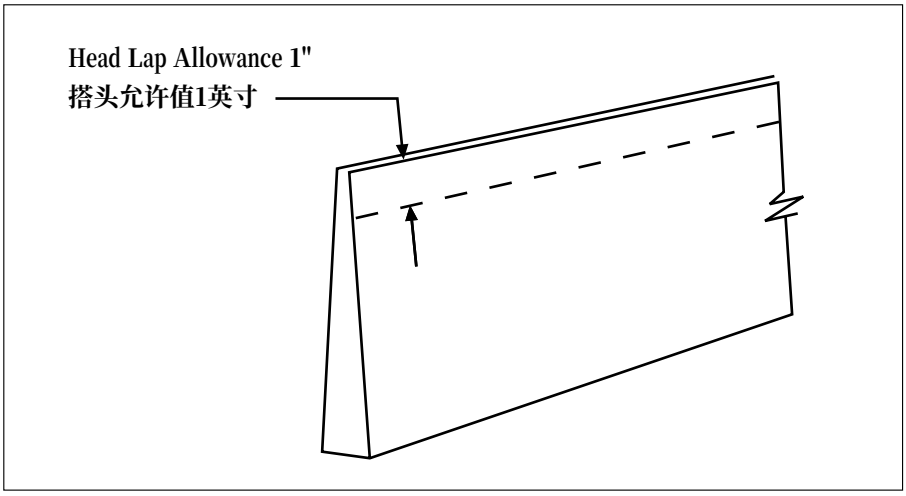
Evaluation for Grade and General Notes
等级的评估及概要说明

Western Red Cedar Clear Bevel Siding is produced by resawing kiln dried clear surfaced lumber on a bevel to produce two pieces, each of which is thicker on one edge than the other and is most commonly used as exterior siding on a variety of structures.
西部红柏清材级斜坡型外墙板是通过将窑干、表面刨光过的一块锯材以对角斜坡型细锯成两块的方式生产的，每块板都有一侧厚于另一侧，它们多数被作各种建筑结构的外墙挂板。

Head Lap
搭头

When in place, a portion of the thin edge will be covered by the thick edge of the neighboring piece and should not be given the same consideration when determining the final grade as the portion exposed to the weather. This portion of the thin edge may contain characteristics that will be covered when laid and will provide a suitable backing. Normal Head Lap for Clear Bevel Siding is 1" for the full length of the piece.
安装到位后，较薄一侧将有一部分会被相邻一块墙板的较厚一侧所覆盖，因此在评级时这一部分不应与外露的一侧同等对待。较薄一侧中将被覆盖的这一部分可以有一些缺陷，只要它能够提供足够的背衬即可。通常，无缺陷斜坡型外墙板的搭头宽度：全部板长内均为1英寸。





The grade is determined from the face side (surfaced side) except for siding intended for use with the rough or resawn side out. The characteristics and limiting provisions enumerated in the grades apply to the exposed width.

除非使用中将毛面或锯纹表面朝外，通常以刨光面作为评级面。等级中列举的缺陷和限制条款仅适用于使用中露出的部分。

The thick edge permits minor characteristics that do not detract from the appearance of the piece when in use as shown in the various grades.

不同的等级中，较厚一侧仅允许轻微的、在使用中不会对外观产生影响的缺陷。

"Saw Texture" is available in all grades of Western Red Cedar Clear Bevel Siding and is a rough finish put on the face of a piece to give it a textured finish. Material supplied with this finish shall in all ways adhere to the grades, sizes and patterns as specified except that it shall be graded from the textured face. For grading classes consider the surfaced face as the intended face unless notified to the contrary.

西部红柏清材级斜坡型外墙板的各个等级均可以供应锯纹材料。这种材料在使用中，粗糙表面朝外，从而形成一种质感表面。除了它是从质感表面评级外，这种材料也必须遵守相关等级、尺寸、造型的规定。在等级学习课中，除非标明，通常以刨光面作为评级面。

Basic Size
基本尺寸

6" x 12"

For Basic Size examples and formula see Page 73.
关于基本尺寸的例子和公式见73页。

Knots
节疤

Knots are restricted in Clear Bevel Siding to quality, size and number.

在清材级斜坡型外墙板中，对节疤的质量、尺寸、和数量均有所限制。

For measurement and knot allowance examples see Western Red Cedar Panelling and Ceiling. When working knot allowances substitute Clear Bevel Siding knot allowances.
关于节疤测量和允许值的例子请见西部红柏内墙板和天花板部分。涉及节疤允许值时，将之替换为清材级斜坡型外墙板的允许值。

Pin Holes
针孔虫眼

Pin Holes are permitted on the face of A Clear Bevel Siding - 1 per square foot
在A级清材斜坡型外墙板的表面可以允许针孔虫眼 - 每平方英尺1个。

Square Foot area is to be calculated using the nominal width on the face of the piece. Pin Holes may be concentrated in one area as long as the total averages out to 1 per square foot. Pin Holes on the thick edge must be included. Pin Holes on the face of B and Rustic Clear Bevel Siding are permitted to be 25% more numerous in a concentrated area, provided the total number for the piece is not exceeded. The grader should concentrate on the worst square foot to see if the 25% increase is exceeded.
计算平方英尺面积时，使用该块锯材的名义宽度。针孔虫眼可以集中分布在某一区域，只要其总平均值不超过每平方英尺1个。位于较厚一侧窄面上的针孔虫眼必须计入。在B级和乡村级清材斜坡型外墙板的表面，集中分布区的针孔虫眼数量可以高于规定值的25%，只要该块材料的总平均值不超过规定值。评级员应主要察看最差的区域，以确定有没有超过25%的界限。

Hint: if pin worm holes exceed the number permitted in a concentrated area and the piece meets requirements — try using the Cut-Out clause.
提示：如果在某锯材针孔虫眼集中分布区域，其数量超过规定值、而其余条件符合等级要求 — 考虑是否可以使用废料条款。

Sapwood
边材

Sapwood is not permitted on the face of Clear VG Heart but is permitted on the thick edge and unexposed thin edge (Head Lap).
无缺陷直纹心材等级的表面不允许出现边材，但在厚边的侧面及不出露的较薄一侧(搭头)可以允许边材。

Sapwood is unlimited in A Clear Bevel Siding but must not be stained.
在A级无缺陷斜坡型外墙板中，对边材没有限制，但必须没有变色。

B and Rustic Clear Bevel Siding permit stained sapwood to any degree.
在B级及乡村级无缺陷斜坡型外墙板中，可允许任何程度的变色边材。

Sapwood can be identified in that it is a pure, creamy white color and when planed may have a slight fuzzy appearance.
边材的鉴别特征是：纯净的奶白色，由于其水分含量较高，刨光后会出现微微起毛的外观。

Skips
漏刨

Skips are not permitted on the face or thick edge of Clear VG Heart.
无缺陷直纹心材等级的表面不允许出现漏刨。

Narrow (skip) allowance is determined by measuring from the thick edge to the thin edge.
窄漏刨允许值取决于从厚边到簿边的距离。

A permits very light (1/64 x 6) skips on the thick edge, but not the face.
A级允许在较厚一侧的边面上有非常轻微的漏刨，正面不允许。

B permits very light (1/64 x 6) skips on the face but not more than 20% of the face area and light (1/32 x 24) on the thick edge.
B级允许正面有非常轻微的漏刨，但不能超过表面积的20%，允许在较厚一侧的边面上有非常轻微的漏刨。

Torn Grain
刨撕

Torn grain is not permitted on the face of Clear VG Heart but is permitted on the thick edge (light).
无缺陷直纹心材等级的表面不允许出现刨撕，但允许在较厚一侧的侧面上出现(轻度)。

A & B Clear Bevel Siding permit torn grain on the face and edge in the same piece.
A级和B级无缺陷斜坡型外墙板中，允许在表面和侧面有刨撕。

As Rustic is graded from the textured face, torn grain is not applicable.
乡村级以质感面(锯纹面)评级，刨撕不适用于该等级。

Raised Grain
凹凸纹理

Raised Grain is not permitted on the face of Clear VG Heart but is permitted on the thick edge (light).
无缺陷直纹心材等级的表面不允许出现凹凸纹理，但允许在较厚一侧的侧面上出现(轻度)。

A & B Clear Bevel Siding permit raised grain on the face and edge in the same piece.
A级和B级无缺陷斜坡型外墙板中，允许在表面和侧面有凹凸纹理。

As Rustic is graded from the textured face, raised grain is not applicable.
乡村级以质感面(锯纹面)评级，凹凸纹理不适用于该等级。

Machine Burn
机械灼焦

A guide to follow - Machine Burn would be acceptable providing it is no deeper than the Torn grain permitted in the grade and the discoloration does not exceed the following conditions:
应遵循的原则 — 在深度不大于凸凹纹理的允许值、而且其变色程度不超过下列条件时，可以允许机械灼焦出现。

Clear Heart **无缺陷心材级**	not permitted **不允许**
A Finish **A级饰面板**	barely visible. Can be removed with a light sanding to be suitable for a natural finish. **几乎不可见，经轻轻砂光即可除去，适用于以自然表面外露。**
B Finish **B级饰面板**	color is not controlled. Only slightly felt depth, suitable for paint finishes. **对颜色没有限制，可轻微感觉到深度，适用于油漆表面。**

Hint: If machine burn exceeds these limits use the Cut-Out clause or turn the piece over and grade as Rustic.
提示：如果机械灼焦超过了这些限制，使用废料条款、或将材料换一个面以乡村级评定。

Cut-Out
废料

This clause can be applied to eliminate or reduce a single oversize characteristic or to reduce the total number of characteristics in a piece.
这一条件款可用来去除或减小超大尺寸的缺陷、或减少一块材料中的缺陷数量。

Cut-Outs are permitted in B Clear Bevel Siding only.
废料仅在B级无缺陷斜坡型外墙板中允许出现。

Waste must not exceed 5% of the length of the piece
废料不能超过该块材料长度的5%。

e.g. 10' piece - 5% waste = 6"
例如 10英尺长材料 - 5% 废料 = 6英寸

No. of Cut-Outs:
废料的数量：

1 in pieces 6' - 9' long
6英尺 - 9英尺长的材料中1块

2 in pieces 10' and longer
10英尺及更长的材料中2块

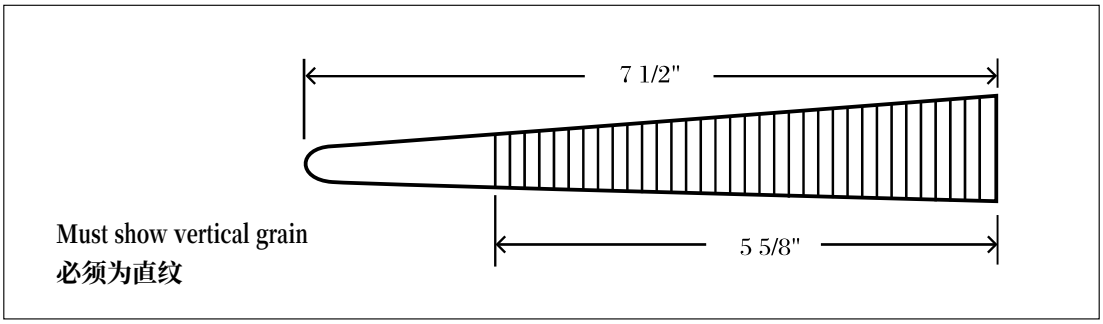
Note: The shortest remaining piece left after applying the Cut-Out must be 18" long. Before attempting to Cut-Out, measure the length of the piece.

注解：应用废料条款时，锯除废料后剩余的长度最短为18英寸长，所以在使用废料条款前，测量一下该块材料的长度。

Angle of Grain
纹理角度

In the grade of Cear VG Heart pieces of all widths must present a vertical grain appearance for 3/4 of the actual width measured from the thick edge.

无缺陷直纹心材等级的各种宽度的材料中，从厚边量起必须有3/4(实际宽度)为直纹。



C Grade
C级

Includes all pieces below B grade because of imperfect manufacture, knots, etc. This grade is especially intended to take stock too thin to dress to standard sizes and could be mostly rough.

包括所有由于加工缺陷和节疤所造成的、低于B级的材料。在这一等级中，特意将那些过薄而不能加工为标准尺寸的材料包括其中。这些材料大部分为毛面。

Hint: If a piece cannot make a grade on the smooth face, try to turn the characteristic down and make the grade of Rustic before going to C.

提示：如果一块材料，根据其光滑面不能被评为某一等级，将缺陷转向朝下，试着能否评乡村级，最后再考虑C级。

Tolerance in Thickness
厚度允许公差

When re-sawing surfaced lumber a maximum tolerance of 1/32" over or under in thickness is permitted in the occasional piece. Ignore sawing tolerances in classes.

将已刨光锯材再细锯时，允许厚度偶尔出现正负为1/32英寸的公差。课堂学习时，暂不考虑锯切公差。

NLGA KNOTTY PANELLING AND KNOTTY SIDING
NLGA 有节型内墙板和有节型外墙板

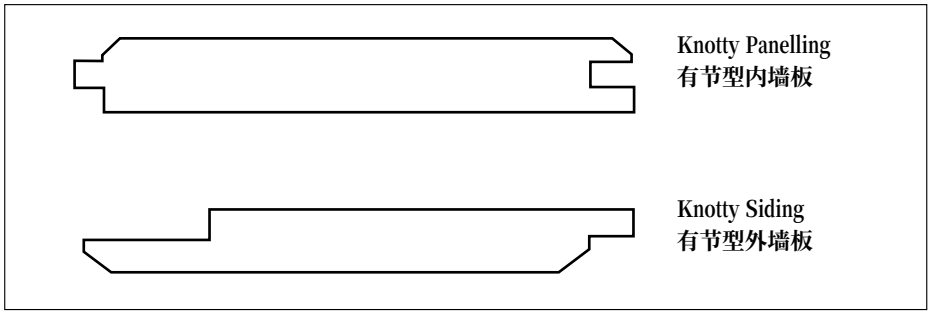
1" & Thicker， 4" & Wider
厚度1英寸及以上，宽度4英寸及以上

Grade names
等级名称

Select Knotty
优选有节型

Quality Knotty
优质有型节型

Patterns
造型



Random Lengths
随机长度
- NLGA para 830c
- NLGA 830c款

Purpose Intended
分级目的
- Knotty Panelling - Appearance
- 有节型内墙板 - 外观
- Knotty Siding - Appearance
- 有节型外墙板 - 外观

Evaluation for Grade and General Notes
等级的评估及概要说明

Western Red Cedar Knotty Panelling and Knotty Siding may be shipped kiln dried, air dried or green. In class consider Knotty Siding green and Knotty Panelling K.D. Knots and other natural markings shall form the major characteristics of these grades.
西部红柏有节型内墙板和有节型外墙板可以窑干、自然干燥、或湿材状态出售。在课堂学习中，将湿材有节型内墙板和有节型外墙板视为窑干。节疤和其它自然缺陷应该是这些等级评判的主要依据。

Knotty Panelling and Knotty Siding are one face grades. For grading class the following conventions apply:
有节型内墙板和有节型外墙板均为以单面评级的等级。在分级课程中，作如下约定：

Knotty Panelling	- graded from the surfaced or patterned side
有节型内墙板	- 以刨光面或造型面评级
Knotty Siding	- graded from the sawn or textured face
有节型外墙板	- 以锯纹面或质感面评级

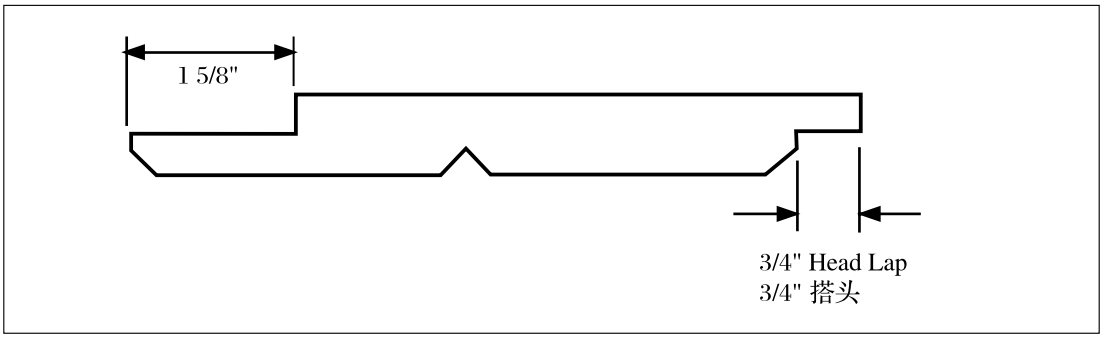
The reverse side may contain any characteristics which do not interfere with the intended use of the piece.
背面可以含任何缺陷只要它们不影响该材料的目标用途

Saw Texture	See NLGA Para 204
锯纹理	见NLGA 204款

Head Lap
搭头

When in place, a portion of the thin edge will be covered by the thick edge of the neighboring piece and should not be given the same consideration when determining the final grade as the portion exposed to the weather. This portion of the thin edge may contain characteristics that will be covered when laid and will provide a suitable backing.
安装到位后，较薄一侧将有一部分会被相邻一块墙极板的较厚一侧所覆盖，因此在评级时这一部分不应与外露的一侧同等对待。较薄一侧中将被覆盖的这一部分可以有一些缺陷，只要它能够提供足够的背衬即可。

Normal Head Lap for Knotty Channel Siding is 3/4" for the full length of the piece.
对有节型沟槽式外墙板而言，搭头通常为：材料全长内均为3/4英寸。



The characteristics and limiting provisions enumerated in the grades apply to the exposed width.
等级中列出的缺陷和限制条款仅适用于使用中出露的部分。

Basic Size
基本尺寸

There is no Basic Size for Knotty Panelling and Knotty Siding.
有节型内墙板和有节型外墙板评级中不存在基本尺寸。

Checks
干裂

Checks are considered for size only. Any number of checks are permitted. Checks must not be thru in Select Knotty. An occasional check may be through in Quality Knotty.
对于干裂，只考虑其大小，数量不限。在优选级有节型中，干裂不可以为贯通的；在优质级有节型中，允许偶尔出现贯通干裂。

Knots
节疤

Knots are restricted to quality in grades of Knotty Panelling and Knotty Channel Siding.
有节型内墙板和有节型沟槽外墙板的等级中，对节疤的质量有所限制。

Any number and any size of Sound &Tight knots are permitted.
允许任何数量和大小的健全紧实节。

Star-Checked knots due to seasoning and knots chipped out due to dressing are permitted in any size and any number.
对由于干燥引起的星裂节和由于刨光而被铲起的节疤，数量和大小均不限。

NFF and / or Unsound Knots are restricted to size and number: 2 per 12' or equivalent smaller. Measured average diameter.
对松动节和/或腐朽节的大小和数量有所限制：每12英尺长度内2个或等效较小节疤。以平均直径测定。

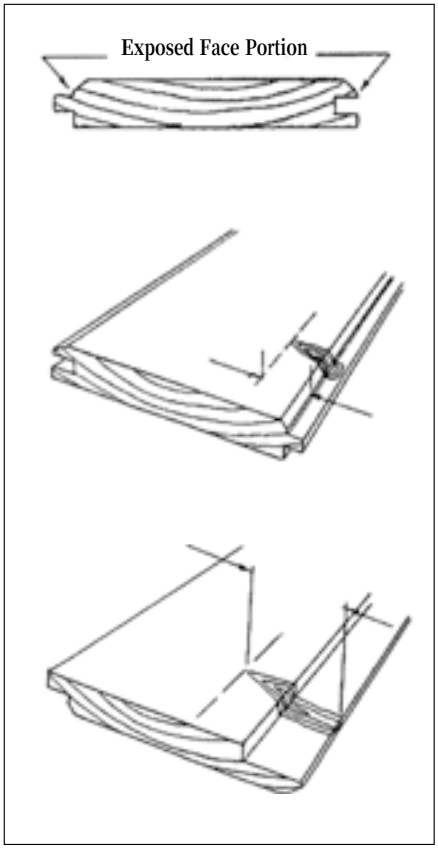
Spike Knots
条状节

Spike knots in Select Knotty Panelling are restricted to approximately - of the actual width of the exposed face.
有优选级有节型内墙板中，对条状节的限制为：大约为表面出露宽度的一半。

If the actual width of the exposed face is 5", a 2 1/2" spike knot is permitted and is measured between lines parallel to the edges. That portion of the knot showing on the tongue should not be considered when determining the final size of the knot.
如果出露表面的实际宽度为5英寸，则允许有一个 2 1/2 英寸的条状节(测量平行于边缘的直线之间的距离)。图中出现在榫舌部分的节疤，不应计入最终的节疤尺寸中。

Spike knots in Select Knotty Siding are restricted to approximately 1/2 of the actual width of the piece measured between lines parallel to the edges.
在优选级有节型外墙板中的条状节，对它的限制为：大约为材料实际宽度的一半(测量平行于边缘的直线之间的距离)。

In Quality Knotty (both items) spike knots may be any size.
在优质级有节型中(两种产品)的条状节可以为任何尺寸。



Pin Holes
针孔虫眼

Pin Holes are permitted on the face of Select Knotty Panelling and Select Knotty Siding - 1 per square foot
在优选级内墙板和优选级外墙板的表面可以允许针孔虫眼 - 每平方英尺1个。

Square foot area is to be calculated using the nominal width on the wide face of the piece.
计算平方英尺面积时，使用该块材料宽面的名义宽度。

Pin Holes may be concentrated in one area as long as the total averages out to 1 per square foot
针孔虫眼可以集中分布在某一区域，只要其总平均值不超过每平方英尺1个。

Pin Holes on the face of Quality Knotty (both items) are permitted to be 25% more in a concentrated area, provided the total number for the piece is not exceeded. The grader should concentrate on the worst square foot to see if the 25% increase is exceeded.
在优质级有节型中(两种产品)的表面，集中分布区的针孔虫眼数量可以高于规定值的25%，只要该块材料的总平均值不超过规定值。评级员应主要察看最差的区域，以确定有没有超过25%的界限。

Pin holes occurring on the Head Lap of Knotty Siding should not be included. Pin holes occurring on the tongue of Knotty Panelling should not be included.
有节型外墙板搭头部分出现的针孔虫眼应该不包括在内。有节型内墙板榫舌部分出现的针孔虫眼也应该不包括在内。

Grub or Teredo holes occurring on the Head Lap Knotty Siding should not be included.
有节型外墙板搭头部分出现的虫孔或海虫孔应该不包括在内。

Shake
轮裂

Permitted in Quality Knotty (both items) are restricted as equivalent to checks with occasional thru.
在优质级有节型中(两种产品)允许，但限制其等效于干裂，可偶尔有贯通性的。

Skips
漏刨

Skips are not permitted on the face of Select Knotty Panelling.
在优选级有节型内墙板的表面不允许。

Quality Knotty Panelling permits very light skips on the face.
在优质级有节型内墙板的表面，允许轻度漏刨。

Splits
劈裂

Splits are measured on the face they occur (not the average of both wide faces) and are permitted the nominal width of the piece in all grades. Longer splits reject the piece.

劈裂在其出现的表面测量(而不是在两个宽面上的平均值)，在所有等级中，允许其长度为该块材料的名义宽度。超长的劈裂将使该材料降级。

Torn Grain
刨撕

Torn Grain is evaluated by visually judging the depth which the grain is torn.
刨撕通过目视来判断纹理被撕破的深度。

Raised Grain
凹凸纹理

Raised grain must be evaluated by feel. Evaluate the finish of surfaced products by running your hand over the entire surface of the piece.
凹凸纹理必须通过感觉来判断。评估产品刨光表面时，将手在整个材料的表面抚摸。

Cut-Out
废料

Permitted only in Quality Knotty (both items). 20% of the pieces in a shipment may have a 3" Cut-Out 3' or more from either end in pieces 12' and longer.
仅在优质级有节型中(两种产品)允许。在一批货物中，总片数20%的材料中可以有3英寸的废料(距端头3英尺以长，出现废料的材料长度必须为12英尺以上)。

NLGA KNOTTY BEVEL SIDING
NLGA 有节斜坡型外墙板

1" & thicker，4" & wider
厚度1英寸及以上，宽度4英寸及以上

Grade names
等级名称

Select Knotty
优选有节型

Quality Knotty
优质有型节型

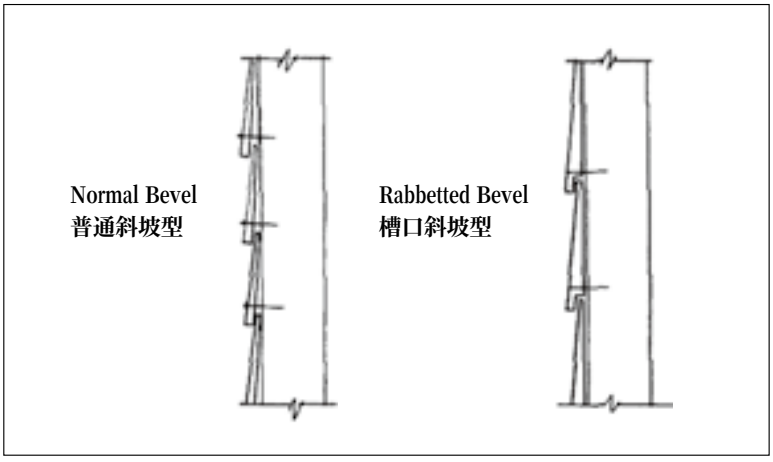
NLGA para 205
NLGA 205 款

Purpose Intended	weather resisting qualities and appearance
评级目的	抗气候侵蚀性能和外观

Evaluation for Grade and General Notes
等级的评估及概要说明

For grading classes consider the resawn face the intended face unless stock is a rabbetted pattern. Stock may be green or K.D.
在分级课程中，以细锯表面作为目标表面，除非该材料是槽口搭头形式的材料。这类材料可以是湿材或窑干材。

For rabbetted pattern stock, the rabbet determines face graded and Head Lap allowance.
对于槽口搭头形式的材料，槽口决定了哪一面为评级面和搭头允许值。



Head Lap
搭头

In classes, the grade is determined from the resawn (rough) face. The characteristics and limiting provisions enumerated in the grades apply to the exposed width.
在分级课程中，以细锯(毛面)表面作为目标表面。等级中列出的缺陷和限制条款仅适用于使用中出露的部分。

Basic Size
基本尺寸

There is no Basic Size for Knotty Bevel Siding.
有节斜坡型外墙板评级中不存在基本尺寸。

Checks
干裂

If through must be tight.
如果贯通，则必须紧实(搬起时未分离)。

Holes
孔洞

Holes from any cause are restricted to size and number in Quality Knotty - 1/4" - 1 per lineal foot.
在优质有节型等级中，对任何原因造成的孔洞的大小和数量均有所限制 - 1/4英寸 - 每英尺长度1个。

Holes may be concentrated in one area as long as the total averages out to 1 per lineal foot.
孔洞可以集中分布在某一区域，只要其总平均值不超过每英尺长度1个。

Hint: If holes exceed permitted allowance try using the Cut-Out clause.
提示：如果孔洞超过允许值，尽量使用废料条款。

Pin Holes
针孔虫眼

Pin holes on the face of Quality Knotty are permitted to be 25% more in a concentrated area, provided the total number for the piece is not exceeded. The grader should concentrate on the worst square foot to see if the 25% increase is exceeded.
在优质级有节型的表面，集中分布区的针孔虫眼数量可以高于规定值的25%，只要该块材料的总平均值不超过规定值。评级员应主要察看最差的区域，以确定有没有超过25%的界限。

Square Foot area is to be calculated using the nominal width on the wide face of the piece.
计算平方英尺面积时，使用该块材料宽面的名义宽度。

Pin holes occurring on the Head Lap should not be included.
有节型外墙板搭头部分出现的针孔虫眼应该不包括在内。

Shake
轮裂

Permitted in Quality Knotty only - tight through
仅在优质级有节型中允许 - 紧实、贯通。

Sapwood
边材

Bright Sapwood is permitted on the face of Select Knotty Bevel siding.
优选级有节斜坡型外墙板的表面中允许光洁的边材。

Quality Knotty permits stained sapwood.
优质级有节型中允许变色的边材。

Splits
劈裂

Splits are measured on the face under consideration (not the average of both wide faces) and are permitted the nominal width of the piece in all grades. Longer Splits reject the piece.
劈裂在其评级的表面测量(而不是在两个宽面上的平均值)，在所有等级中，允许其长度为该块材料的名义宽度。超长的劈裂将使该材料降级。

Tolerance in Sawing
锯切公差

Applies to the entire length of the piece and may not exceed 1/16" scant in both grades. Ignore sawing tolerances in classes.
材料全长范围内适用，在两个等级中缺尺均不可超过1/16英寸。在课程学习中，暂时忽略。

Torn Grain
刨撕

Applies to siding intended for use with the smooth side out.
适用于以光滑面朝外使用的外墙板。

Torn Grain is evaluated by visually judging the depth which the grain is torn.
刨撕通过目视来判断纹理被撕破的深度。

Raised Grain
凹凸纹理

Applies to siding intended for use with the smooth side out.
适用于以光滑面朝外使用的外墙板。

Raised grain must be evaluated by feel. Evaluate the finish of surfaced products by running your hand over the entire surface of the piece.
凹凸纹理必须通过感觉来判断。评估产品刨光表面时，将手在整个材料的表面抚摸。

Machine Burn
机械灼焦

Applies to siding intended for use with the smooth side out.
适用于以光滑面朝外使用的外墙板。

In Select Knotty and Quality Knotty color is not controlled and depth can be readily felt.
在优选有节型和优质有节型中，不限制颜色，深度容易感觉。

Knots
节疤

Knots are restricted to size and quality in grades of Knotty Bevel Siding.
在有节斜坡型外墙板的等级中，对节疤的大小和数量均有限制。

Size - Select Knotty: 2" in 6" widths .
尺寸 - 优选有节型： 宽度为6英寸的材料上可以为2英寸

Add 1/2" for knot size for each 2"
材料宽度每增加2英寸时，节疤尺寸可以增加1/2英寸

increase in width to 3 - 1/2" in 12" widths
在12英寸宽的材料中，节疤宽度增加到3 - 1/2英寸

Star-checked knots, due to seasoning and knots chipped out due to resawing or dressing are permitted in both grades.
对由于干燥引起的星裂节和由于刨光而被铲起的节疤，数量和大小均不限。

Spike Knots
条状节

Spike knots in Select Knotty Bevel Siding are restricted to approximately 1/2 of the actual width of the piece and measured between lines parallel to the edges.
有优选级有节斜坡型外墙板中，对条状节的限制为：大约为材料实际宽度的一半，测量平行于边缘的直线之间的距离。

Cut-Out
废料

Cut-Outs are permitted in Quality Knotty Bevel Siding only.
仅在优质级有节斜坡型外墙板中允许有废料。

Waste must not exceed 10% of the length of the piece.
废料不可以超过材料长度的10%。

eg 10' piece - 10% waste = 12"
例如 10英尺的材料 - 10%废料 = 12英寸

Number of Cut-Outs:
废料的块数：

1 in pieces	6' - 9' long
1块	**6英尺 - 9英尺长材料**
2 in pieces	10' - 16' long
2块	**10英尺 - 16英尺长材料**
3 in pieces	over 16' long
3块	**16英尺以上材料**

Note: The shortest remaining piece left after applying the Cut-Out must be 30" long. Before attempting a Cut-Out, measure the length of the piece.
注意：使用过废料条款后剩余部分的最小长度为30英寸。在使用废料条款前，先量一下材料的长度。

NLGA EXTERIOR PATIO DECKING
NLGA 户外露台板

Grade names
等级名称

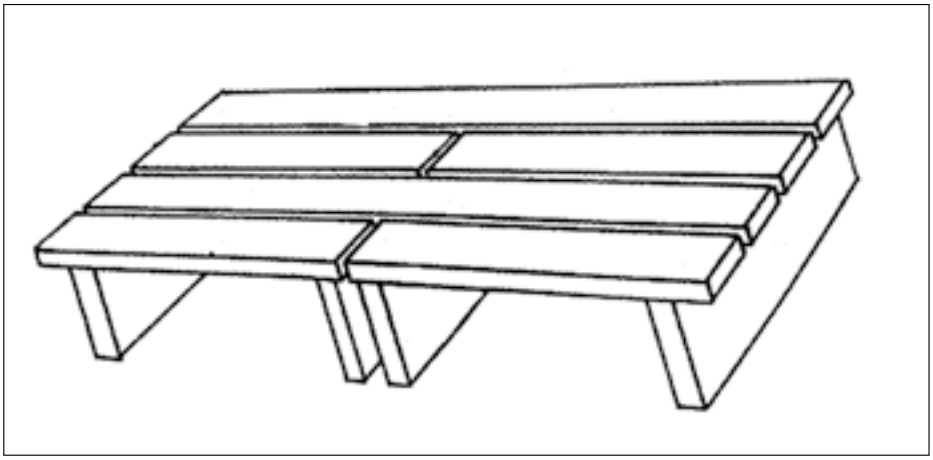
Select Patio
优选级露台板

Commercial Patio
商业级露台板

NLGA para 126
NLGA 126 款

5/4" to 2" Thickness，4" & Wider
厚度5/4英寸至2英寸，宽度4英寸及以上

Standard Sizes 标准尺寸	- NLGA Para 820b - NLGA 820b 款
Random Lengths 随机长度	- NLGA Para 830a - NLGA 830a 款
Purpose Intended 评级目的	- Strength and appearance - 抗气候侵蚀性能和外观
Use 使用方式	- For flatwise load application - 以平躺承担载荷方式使用



Evaluation for Grade and General Notes
等级的评估及概要说明

Patio decking is customarily shipped green and surfaced four sides. Pieces are graded from the best face unless otherwise specified, characteristics may be one grade lower on the back. Edges are considered part of the back.
露台板习惯上以湿材四面刨光的形式出售。除非特别明，一般以最好面评级。背面的缺陷可以比正面低一个等级，侧面视为背面的一部分。

Pockets
树囊

Restricted to medium in Select Patio
在优选级露台板中限定为中等树囊

Restricted to large in Commercial Patio
在商业级露台板中限定为大树囊

To measure a large pocket multiply the width by the length.
测定大树囊：宽度乘以长度。

Skips
漏刨

Skips are restricted as follows:
对漏刨的限制如下：

Select Patio 优选级露台板	face 1/64" x 12" 正面1/64英寸 x 12英寸
	- 1 per 12' - 每12英尺一个
	- back & edges 1/32" x 12" - 背面及侧面1/32英寸 x 12英寸
	- any number - 任何数量
Commercial Patio 商业级露台板	- face 1/32" x 12" - 正面1/32英寸 x 12英寸
	- 2 per 12' - 每12英尺2个
	- back H&M - not over 1/32" - 背面，间隔漏锯 - 不超过1/32英寸

Splits
劈裂

Split allowance is based on nominal width. Splits are measured as the average length on both faces.
劈裂的允许值是以名义宽度为基础的。劈裂是以其在两个宽面上的平均值。

Maximum splits can occur at both ends where more than one split occurs on the same end, only the worst split on that end is considered.
最大的劈裂可能发生在两个端头，而且每个端头可能有多个劈裂，各个端头中只考虑最差的劈裂。

Sapstain
边材变色

Will affect the pure, creamy white colored sapwood only.
边材变色仅对纯净、奶白色的边材部分有影响。

Medium stained sapwood sometimes affects its usefulness for natural finishes but not for paint finishes.
中等边材度变色有时会影响材料自然表面的外观，但不会对油漆外观产生影响。

Wane
钝棱

The grading rules state the fraction of the face which may contain wane. However, it is more practical to measure the amount of wood remaining.
规则中规定了材料表面可以出现钝棱的比例，但是在评级中，测量残留木材的数量更为方便。

Example
示例

If the grade permits wane 1/3 thickness, then 2/3 of the edge must be wane free. Allowances are based on the actual width and thickness. The wane chart gives requirements of wood remaining for fractions of common widths and thicknesses.
如果等级允许1/3厚度的钝棱，那么边缘的2/3应该没有钝棱。允许值是基于实际宽度和厚度的。钝棱表列出了常见木材宽度和厚度中应残留木材的比例。

NLGA Wane Table
NLGA 钝棱表

For Dimension Lumber
适用于规格材

The table below indicates the amount of wood that must remain wane free to be acceptable for the corresponding fraction of the face. This table is based on the standard finished dressed sizes for S-Grn dimension (NLGA Para 820b).
下表列出了相应表面中所应残留的无钝棱木材的比例。该表基于标准刨光潮湿规格材(NLGA 820b 款)。

Surfaced Green
刨光湿材

WIDTH 宽度	1/3	1/2	2/3
4英寸	2–3/8英寸	1–3/4英寸	
6英寸	3–3/4英寸	2–13/16英寸	
8英寸	4–15/16英寸	3–11/16英寸	
10英寸	6–1/4英寸	4–11/16英寸	
12英寸	7–9/16英寸	5–11/16英寸	
EDGE 窄面	2英寸	3/4英寸	1/2英寸

Note: This chart is not technically precise. The figures are rounded to the nearest 1/16th of an inch.
注释： 这一表格不是绝对精确。这些数字均进位到1/16英尺。

Pin Holes
针孔虫眼

Any hole whose diameter is 1/16" or less can be considered as a pin hole not just Ambrosia Beetle holes.
不仅是安布柔思虫孔，任何直径等于或小于1/16"的孔均被视为针孔虫眼。

Powder worm holes are also considered as pin holes.
木粉蠕虫的孔也被视为针孔虫眼。

In Select Patio, pin holes are restricted to "limited" or 30 per square foot.
在优选级露台板中，针孔虫眼被限定为“数量有限”或每平方尺30个。

Count pin holes on the worst square foot on the best wide face.
注意在最好宽面上、重点察看最差的区域。

Finding Square Footage
计算平方英尺

One Square Foot = 144 Sq.In.
一平方英尺 = 144 平方英寸

Nominal Width 名义宽度	Length 长度	Multiplied by 乘以	Nominal Width 名义宽度	= Square Footage = 平方英尺数
2 x 4	36"	x	4"	= 144 Sq. In.平方英寸
2 x 6	24"	x	6"	= 144 Sq. In.平方英寸
2 x 8	18"	x	8"	= 144 Sq. In.平方英寸
2 x 10	14.4"	x	10"	= 144 Sq. In.平方英寸
2 x 12	12"	x	12"	= 144 Sq. In.平方英寸

Grub and Teredo Holes
虫孔及海虫孔

Grub and Teredo holes are handled on an "equivalent smaller basis". For the purpose of grading classes, these holes should be taken as an average of 1/4" per hole. In practice, (not in classes) smaller holes could be more numerous and larger holes more restricted.
虫孔及海虫孔被当作“等效小缺陷”处理。在分级课程中，这些孔均被视为平均直径为1/4英寸的孔。在实际中(非课堂中)，允许小孔数量多一些、对大孔数量则限制严一些。

Grub and Teredo holes are permitted as 12 - 1/4" holes per 1" of knot hole allowed. The Grub and Teredo restrictions are primarily for appearance.
虫孔及海虫孔的允许值为：每允许一个1英寸的节孔则可以等效允许12个1/4英寸的虫孔。虫孔及海虫孔的限制主要是为了外观。

The best face shall determine the grade.
以最好面的情况评定等级。

To determine the amount of Grub and Teredo holes permitted on a piece; determine the amount of hole permitted and multiply by 12.
要确定一块材料上虫孔及海虫孔的允许值，先找出该材料中节孔的允许值，再乘以l2。

Examples:
示例：

2 x 4 - 12' Commercial patio permits 1-3/4" hole 2 x 4 - 12英尺 商业级露台板允许1个3/4英寸的孔洞
3/4 x 12 = 9

9 Grub or teredo holes are permitted on the best face **最好面限制最多有9个虫孔及海虫孔**

2 x 8 - 12' Commercial patio permits 1 1-1/2" hole 2 x 8 - 12 英尺 商业级露台板允许1个1-1/2英寸的孔洞
1 1/2 x 12 = 18
18 Grub or teredo holes are permitted on the best face **最好面限制最多有18个虫孔及海虫孔**

White Specks
白斑朽

Volume is a restriction which means that white specks in Commercial Patio could appear on the full width of the face, full thickness, for 1/3 the length or 1/3 width, full thickness, full length.
限制体积，即在商业级露台板中，允许出现全宽、全厚、长度为1/3的白斑朽，或1/3宽度、全厚、全长的白斑朽。

Honeycomb
蜂窝朽

In Commercial Patio, honeycomb is restricted to 1/6 of the actual width and is not restricted in length.
在商业级露台板中，限制蜂窝朽为实际宽度的1/6，长度不限。

Peck
袋状朽

In Select Patio, peck is restricted to 1/6 of the actual width and is not restricted in length.
在优选级露台板中，限制袋状朽为实际宽度的1/6，长度不限。

In Commercial Patio, peck is restricted to 1/3 of the actual width and is not restricted in length.
在商业级露台板中，限制袋状朽为实际宽度的1/3，长度不限。

Knots
节疤

The number of knots generally have no bearing on the grade.
节疤的数量通常对等级没有影响。

Be concerned with: - size and quality
应关注： - 尺寸和质量

Measurement: 测量：	- Round, Oval, irregular knots - 圆节、椭圆节、不规则节
	- Spike knots, equivalent to round knots - 条状节，等效于圆节
Select Patio: 优选级露台板:	- knots may be one grade lower on reverse face - 背面的节疤可以低一个等级
Example 示例	- best face 2 x 8 S 3" - 最好面 2 x 8为3英寸
	- reverse face 2 x 8 S 3 1/2" - 背面 2 x 8为3 1/2英寸
Commercial Patio： 商业级露台板:	- knots may be 25% larger on reverse face - 背面的节疤可以大25%
Example 示例	- best face 2 x 8 S 3 1/2" - 最好面 2 x 8为3 1/2英寸
	- reverse face 25% larger, 2 x 8 S 4 3/8" - 背面的节疤可以大25%，2 x 8为4 3/8英寸
Chipped knots - Select Patio: 刨啃节疤 - 优选级露台板:	not to exceed 1/3" thickness in depth. Limited to two chipped knots per 12'. No equivalent smaller chipped knots permitted. 深度不超过1/3英寸。每12英尺长度2个刨啃节疤。不允许等效小刨啃节疤。
Example 示例	Thickness of standard green dressed 2" material per NLGA Para 820b is 1 9/16". Maximum depth a knot could be chipped out would be 1/2". 根据NLGA 820b 款，标准刨光湿材厚度为2英寸的材料，实际厚度为1 9/16英寸。节疤的最大刨啃深度为1/2英寸。

Holes
孔洞

Number and size of holes are restricted.
对孔洞的数量和大小有限制。

Holes are permitted anywhere in the piece and may be concentrated in one area.
孔洞可用出现在材料的任何位置，也可以集中出现在一个区域。

Any number of smaller holes whose combined size does not exceed the sum of the maximum full size hole is permitted.
允许任何数量的小孔洞，只要它们的总尺寸不超过允许最大尺寸孔洞的总和。

Select Patio：
优选级露台板:

- no holes permitted on best face
- **最好面不允许孔洞**

Commercial Decking：
商业级露台板:

- 1 maximum hole per 12' piece is permitted
- **每12英尺 长度允许一个最大直径的孔洞**

- equivalent smaller 2 x 8 S 1 S 1 1/2" or 2 S 3/4"
- **等效小孔洞 2 x 8为1个1 1/2英寸或2个3/4英寸**

- in pieces shorter than 12' the hole size shall decrease proportionality.
- **在长度小于12英尺的材料中，孔洞的尺寸按比例减小。**

Shake
轮裂

Shake is not continuous if there is any wood separating the shakes.
如果轮裂之间有木材将它们分隔开，它们就不被视为连续性轮裂。

Through shake on the ends is treated as a split.
端头的贯通轮裂作为劈裂处理。

Shake in Select Patio is permitted on the back of the piece and is limited to 2' in length (measure the longest shake).
允许优选级露台板的背面有轮裂，最大长度限为2英尺(以最长的轮裂测定)。

Shake in Commercial Patio is permitted on the back of the piece and is limited to 1/4 length (measure the longest shake).
允许商业级露台板的背面有轮裂，最大为材料长度的1/4(以最长的轮裂测定)。

Shake on the back of Select Patio and Commercial Patio, running from the wide face onto the edge is restricted to a maximum depth of 3/4 of the thickness and restricted in length to the allowance for the grade (Select 2'/Commercial S1/4L).
在优选级露台板和商业级露台板的背面，如果轮裂从宽面延伸向侧面，则限制其最大深度不得超过厚度的3/4，而且也会依等级限制其长度(优选级为2英尺/商业级为1/4长度)。

The angle which the shake penetrates the wide face may not exceed the slope of grain allowance for the grade under consideration.
轮裂穿过宽度面上的角度不可以超过待评等级纹理斜度的允许值。

The maximum distance the shake penetrates across the wide face may not be more that the hole size permitted for Commercial Patio. This allowance applies to both grades.
轮裂横向穿越宽面的最大距离不可超过商业级露台板允许的孔洞尺寸。这一允许值两个等级都适用。

Shake through from one wide face beyond 3/4 of the thickness and/or breaking completely through the edge to the other face (3 face shake) makes the piece an automatic reject.
如果轮裂从宽面向侧面延伸、超过厚度的3/4、或完全断开侧面至另一面(3面轮裂)，将使该材料自动降级。

If the shake spirals from the wide face through to the edge but does not penetrate beyond 3/4 of the thickness, it is restricted to the length of shake permitted for the grade (Select S 2'/Commercial S 1/4L). This Shake is measured along the length of the piece from beginning to end.
如果轮裂从宽面螺旋状延伸向侧面，其穿透深度不超过厚度的3/4，则依等级限制其长度(优选级为2英尺/商业级为1/4长度)。测量方法是，在宽面上从该轮裂的起点量至终点。

Ring Shake is evaluated the same as other shake. Judgment must be used.
环状轮裂与其它轮裂同样评估。注意运用判断力。

LUMBER REMANUFACTURING & GRADE RECOVERY
锯材生产和等级出材率

The following are technical guidelines and considerations, to help lumber re-manufacturers realize the maximum possible value recovery from their raw material lumber. These strategies apply to the secondary manufacturing and/or finishing of rough cuts, cants and blanks intended for further manufacture in addition to factory / shop type grades of lumber.

以下内容为一些技术要领和考虑事项，目的是帮助锯材再加工生产商能够从作为原材料的锯材中获得尽可能大的价值。这些策略适用于对粗锯料、木方和坯料进行再加工和/或修整，以生产再加工用材(除了工厂/车间等级之外)。

When remanufacturing lumber we use the following primary terms to describe the type of sawing process intended.

在锯材再加工中，我们使用下列术语来表述所需要的锯切过程。

Ripping or edging
纵锯或轧边

Ripping lumber refers to sawing lumber along its length to reduce its width, or to split it into two or more pieces. The sawing equipment used to perform this function is called an edger. Edgers commonly use circular saws.

纵锯意指沿锯材长度方向锯切，以降低其宽度、或将其剖开为两块或多块。用来进行这一锯切过程的设备被称为轧边机。轧边机通常使用圆形锯。

Ripping, edging or re - edging may be done to remove excess wane or defects from one or both sides (edges) of the wide face of a piece of lumber.

纵锯、轧边、或再轧边通常可以用来去除一块锯材的宽面上一侧或两侧的多余钝棱或其它缺陷。

For Example: a waney 6" wide piece may be ripped or edged to create a wane-free 4" wide piece, or two 3" wide pieces (one waney, one wane free, or both waney).

例如：一块含钝棱的6英寸宽的材料，可以经纵锯或轧边后生成一块无钝棱4英寸宽的材料、或两块3英寸宽的材料(一块有钝棱、一块无钝棱、或两块均有钝棱)。

Resawing
细(再)锯

This term refers to sawing lumber along its length to reduce its thickness, or to split it into one or more thinner pieces. The equipment used to perform this function is called a re-saw. Re-saws commonly use band saws (thinner kerf).

该术语是指沿锯材长度方向锯切，以减小其厚度、或将之剖开为两块或多块较薄的材料。用来进行这一锯切过程的设备被称为细锯机。细锯机通节使用带状锯(锯路较薄)。

For Example; a waney 4" thick piece may be resawn to recover a wane-free 2" thick piece, leaving the wane on the remaining 2" thick piece.

例如：一块含钝棱的4英寸厚的材料，可以经细锯得到一块无钝棱2英寸厚的材料，而将钝棱全部控制在残留的另一块2英寸厚的材料上。

Trimming and cross-cutting
截锯和横锯

Trimming is a term is used to describe sawing lumber across its width. This is usually done to achieve the desired piece length, and to make the ends square. It may also be done to remove grade-lowering defects which exist on the ends of the piece, or to create two pieces of shorter length.

截锯是一个用来描述在宽度方向上横切的术语。它经常是用来将材料锯切到指定长度、或将端头截为方形，也被用来去除材料端头上会使等级降低的缺陷、或将材料锯为较短的两块。

Cross-cutting is the term used to describe sawing lumber across its width to chop it into two or more shorter pieces. Factory / Shop lumber requires cross-cutting to recover the short blocks of clear lumber.

横锯是一个用来描述在宽度方向上横切、将材料锯为两块或多块较短材料的术语。工厂级/车间级锯材需要进行横锯以得到较短的清材锯块。

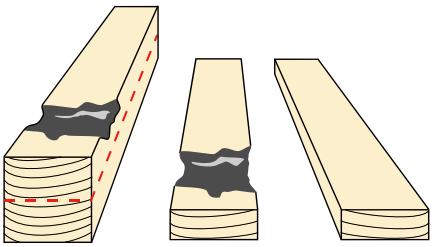
Rules of remanufacture
再加工规则

Remanufacturing and re-handling both have a cost in terms of time and money. Before remanufacturing a piece of lumber careful consideration should be given to the following:

再加工和再处理都需要花费时间和金钱。在对一块锯材进行再加工之前，应认真考虑下列事项：

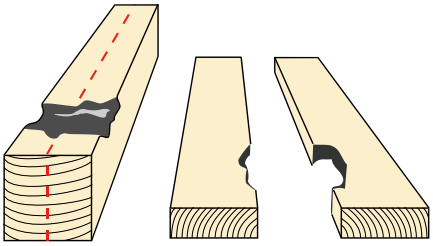
1. Never rip or split the defect into two pieces. Saw to isolate the defect in one piece of low grade, leaving the other piece as a high grade or remove an edge defect to obtain a narrower piece of higher grade.

   不可将一个缺陷纵锯或剖开到两块材料上。将缺陷集中锯切到一块低等级材料上，使另一块成为高等级材料，或将边缘上的缺陷锯除以得到一块较窄但等级较高的材料。



2. Never remanufacture or re-handle lumber where the final products will not represent a gain in value. Sometimes a longer wider piece of low grade lumber is more valuable (when remanufacturing costs are factored in) than multiple shorter and narrower pieces. In addition to the resulting piece values remember that two pieces are more costly to handle than one.

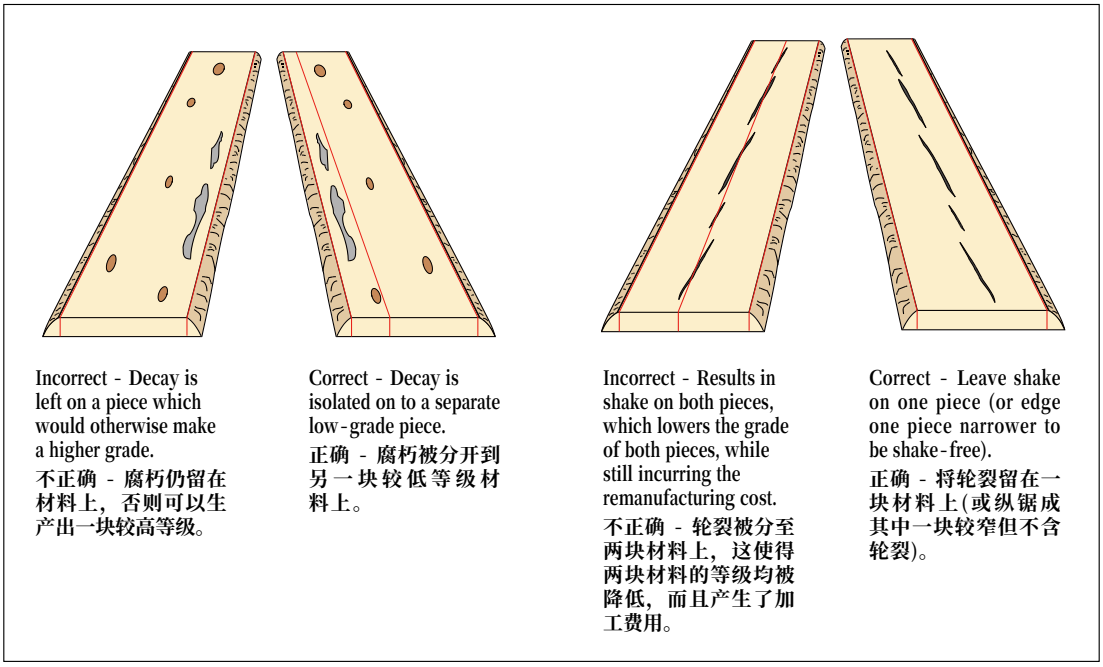
   如果最终产品的价值没有增加，不要对锯材进行再加工。有时一块较长、而且较宽的低等级锯材比多块较短、较窄的锯材更有价值(如果将加工成本考虑进去的话)。除了最终产品的价值，还应记住，加工两块材料的成本要比一块高。



A common mistake is to resaw a piece of lumber the wrong way. This can happen when the dimensions of the raw material are very close in size (eg 3x4). Close attention must be paid in orienting the piece correctly

as it is fed into the resaw. Orienting the piece incorrectly will result in resawing pieces to thickness that should been ripped to width or vice versa. This will result in value loss in addition to requiring further remanufacturing and handling to correct.

一个常见的错误是，以错误的方式将锯材细锯。这种情况可能会发生在原料两个方向的尺寸很相近时(如3x4)。在将材料放入锯中时，要特别留意材料的方向。放错方向会导致将应按宽度纵锯的材料按厚度方向细锯了，或者与上述情况相反。这会导致价值损失，而且还需要额外的加工和处理来纠正。



Incorrect - Decay is left on a piece which would otherwise make a higher grade.

不正确 - 腐朽仍留在材料上，否则可以生产出一块较高等级。

Correct - Decay is isolated on to a separate low-grade piece.

正确 - 腐朽被分开到另一块较低等级材料上。

Incorrect - Results in shake on both pieces, which lowers the grade of both pieces, while still incurring the remanufacturing cost.

不正确 - 轮裂被分至两块材料上，这使得两块材料的等级均被降低，而且产生了加工费用。

Correct - Leave shake on one piece (or edge one piece narrower to be shake-free).

正确 - 将轮裂留在一块材料上(或纵锯成其中一块较窄但不含轮裂)。

Edging
轧边(纵锯)

Edging, is carried out according to the product objectives. Usually this requires a target product list which takes into consideration the value of products and sizes desired. In order for the best value recovery to be achieved accurate and up-to-date prices must be known and factored in.

轧边是根据产品目标而进行的。通过这需要一个目标产品清单，该清单已考虑了产品的价值和需要们的尺寸。为了获得最大价值，准确而及时的价格信息应该被考虑在内。

Edging in a mill may involve reducing larger cants and flitches to required widths. In this case the edger operator requires a good working knowledge of products, grades, and how the resulting piece will be further broken down in the mill.

在一个锯材厂，轧边包括将大木方或大料，锯成规定的宽度。在这种情况下，轧边机操作员必须对产品、等级以及材料在下一步的生产中如何进一步锯切有良好了解。

In addition, much of the edging process in remanufacturing is done on pieces which are already sawn to thickness. The edging objective here is to get the most value out of each board. The operator will be required to make decisions on wane removal, desirable widths and values, and grade values versus recovery loss. A good knowledge of products and values is therefore necessary.

另外，再加工中的轧边过程大部分是在已锯切至相关厚度的材料上进行的。轧边的目标是从每一块材料上获得最高价值。操作员必须在去除钝棱、要求的宽度和价值、等级价值及出材率损失等方面做出决定。所以对产品和其价格具有良好了解是必须的。

Edging objectives
轧边目标

The objectives for edging, generally include:
轧边的目的通常包括：

- To remove any waney and defective edges.
  去除有钝棱或缺陷的边缘。

- Isolate defects or separate grades within a cant or flitch.
  在木方或大料中隔离缺陷或分隔等级。

- Produce lumber of narrower width.
  生产出宽度较窄的锯材。

The edger operator's duties are to cut lumber from cants to sizes and grades that are desired according to the order file. The operator must also be able to separate the grades that are in the cants. In order to accomplish this, it is necessary to completely familiar with the orders and have a good knowledge of resulting lumber grades.
轧边机操作员的任务就是，根据定单的要求将木方锯成需要的尺寸和等级。操作员必须能够从木方中区分出不同的等级，为了达到这一点，他必须完全熟悉该订单，而且对最终的等级也有非常好的了解。

Edging and resawing
轧边和再(细)锯

In order to maximize edging efficiency and value, the edger and re-saw must always be kept in perfect working order. If all the rollers, arbor, table, saws, etc. are not in good working condition, and proper alignment or level, it may result in off-size, machine damaged, or crooked lumber.
为了使轧边的效率和价值最大，轧边机和细锯必须总是保持在良好的工作状态。如果滚筒、转轴、机台、锯片中的任何一个不处于良好的工作状态、或没有对齐、或不水平，就可能会产生尺寸不对、有机器损伤、或变形的锯材。

It is important to check product sizes after saw changes and periodically through the shift. This should take relatively little time and can result in considerable savings, as lumber with excessive sawing variation (off-size or shape) in excess of the tolerance allowed, must be remanufactured to smaller sizes.
每次换锯后、及每个班次中都应定时检查产品的尺寸。这样做只花费相对较少的时间，但可以显著节约成本。因为当锯材的锯切偏差大于允许公差值时(尺寸或形状不对)，它们只能被重新加工为尺寸较小的规格。

When one saw in an edger is out of line the result is two pieces that are off size. The piece on one side of the saw would be undersize while the piece on the other side would be oversize. Both pieces may have to

be remanufactured. This means a reduction in lumber volume, less desirable size, less value and further congestion in the remanufacturing end of the mill.

当轧边机中的一个锯条偏线时，就会同时使两块材料偏尺。锯条一侧的材料可能尺寸不足、另一侧的一块则可能偏大，可能两块都必须重新加工。这意味着锯材材积降低、合乎尺寸要求的材料变少、价值降低、在工厂生产线末端的产品堵塞更加严重。

When lumber cants are intended to be split on a resaw, an allowance must be made for the resaw saw kerf (kerf = width of saw tooth) . For today's saws 1/8 of an inch is usually sufficient. An example of this would be Resawing 4x4's to 2x4's (nominal). The 4x4 would need to be at least approximately 3-5/8". This would allow for 2 pieces of dressed 1-9/16" which totals 3-1/8", adding 1/8" for the saw kerf, this leaves 3/16" for the final dressing on each piece. This size allowance would vary between mills depending on the product seasoning (green vs. dry), resaw kerf and the mills ability to produce accurate sizes.

当需要在细锯上对木方进行分割时，必须为锯路(锯路 = 锯齿的宽度)留下余量。目前的锯床中，1/8英寸已经足够。关于这种情况，可以将4x4英尺细锯为2x4英尺(名义尺寸)为例说明。4x4最小尺寸大约为3-5/8英寸。所获得的两块材料刨光后的厚度为1-9/16英寸 ，两块合计为3-1/8英寸，加上1/8英寸 的锯路，这样最终在两块材料上各留下3/16英寸作为刨光余量。不同工厂中，这一尺寸余量不同，主要取决于产品是否干燥(湿材或干材)、细锯的锯路大小、及该工厂控制尺寸精度的能力。

"Over edging and under edging"
“过度轧边和轧边不足”

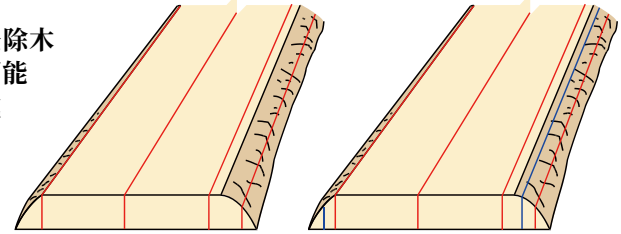
Over edging is a term used for excessive edging resulting in value loss. This could appear as the removal of too much wane (where not necessary) or by placing sawlines where they are not necessary.

过度轧边是一个术语，用来描这轧边过多而导致价值损失。这可以表现为没有必要地去除了太多的钝棱，或在没有必要的地方开锯。

Wane or other edge defect
钝棱和其它边缘缺陷

Value and volume loss occurs when excessive wood fiber is removed when attempting to remove excessive edge wane. The cause may be poor judgment, incomplete knowledge of grade allowance, or poor alignment of guidance systems (eg laser lines, straight edges) or saws.

当试图过多去除边缘的钝棱时，会过多去除木材，从而发生价值和材积的损失。原因可能是判断失误、或对等级允许值不了解、或指示系统(例如激光线、直边线)与锯条不对齐。



Grade separation
等级区分

Extra pieces and extra cost incurred when the resulting pieces represent less value (narrower width pieces), where a wider width piece would be of equal or greater value.

当产出较低价值的材料时(如宽度较窄的材料)，就会产生过多的块数和额外的费用，而较宽的材料则具有相同或更大的价值。

Under edging
轧边不足

Under edging is a term used to describe pieces which have been edged leaving too much wane on a piece. It also refers to pieces without enough defect removal or grade separation.
轧边不足是一个术语，用来描述轧边过小而残留了过多的钝棱在材料上。它也被用来指去除缺陷不足或等级区隔不够。

Straight edge vs. free line edging
直边与自由轧边

Live cants (wane on both edges) should be edged away from the straight edge unless they are perfectly straight and even. By edging a live cant against the straight edge, knots or areas that protrude may hit the pins, causing a whipping action resulting in kinks or dog legs.
在对“活木方”(两边均有钝棱)进行轧边时，应将木材离开锯床上的直边器，除非木方的边非常平直。如果将活木方靠在锯床直边上操作，节疤或其它突出的部分会碰撞到限位钉，从而引起抖动而形成扭结或双向折弯。

Modern edgers generally have a solid straight edge which eliminates the whipping action but it is still nearly impossible to properly align flares, crooked lines, or lines with knot stubs, etc. against any straight edge.
现代的轧边机通常有结实的直边器，它可以消除抖动作用，但依然几乎无法有效对齐喇叭形树桩、弯曲材料、或表面有节疤桩的木方。

On cants with a square edge there are definite advantages to using the edger table straight edge. They are: straight lumber, greater lumber recovery, and less remanufacturing.
如果木方的边均为方形的话，那么使用轧边机台上的直边器就肯定有益处。这些好处包括：通直的锯材、更高的出材率、和较少的加工。

There is a definite advantage to using cants that have been sawn on at least three faces when you are manufacturing large sizes. Any additional cost will soon be made up by the greater recovery. It is nearly impossible to consistently run heavy live cants through an edger without some "running out" due to the natural taper of the log. This will result in additional trimming and remanufacturing of the resulting wedge shaped piece.
当你在生产大尺寸材料时，使用至少三个面被锯平的木方有明确的优势。任何额外的费用都会从高出材率上得到补偿。由于原木的天然锥度，要想在轧边机上持续地加工活木方而不出现“跑偏”几乎是不可能的。这会产生锲形的材料，从而导致额外的截锯和再加工。

To obtain maximum recovery from a cant, the cant must be correctly positioned. To accomplish this, many mills use laser lines as a guide. The laser lines move with the saws. Moveable lines assist the operator in lining up the cant, and determining the exact width of the cant. In addition laser lines enable the operator to visually separate the various grades the cant may contain with a greater degree for accuracy, before a saw touches the piece. Laser lines must be checked frequently for accuracy. If the lines drift out of position they could be misleading to the operator and result in improper edging.
要从木方中获得最大的出材率，木方必须放置正确。要做到这一点，许多锯木厂使用激光线作为引导。激光线随锯条移动。移动的激光线可帮助操作员在木方上对齐及确定木方的准确宽度。此外，在锯条碰到材料前，激光线可以使操作员通过目视较为精确地区分木方中的不同等级。激光线的精度应经常校正，如果激光线偏移位置，会对操作员产生误导，从而形成不适当的轧边。

Grade Separation
等级分隔

Clear recovery
清材出材率

Clear lumber is often worth approximately two to three times as much as construction type lumber. Therefore, the person responsible for edging must always be on the lookout for Clear wood in a cant. As Clear wood is found on the outer part of the log, the place to watch is the outer part of the cant (wings).

清材的价格通常大约为建筑类锯材的2倍到3倍。因此轧边的人员应当总是寻求在木方中锯出清材。由于清材是从原木外层产生的，因此在木方中要关注的地方是其外侧。

On many three sided tapered cants, the wane side should be aligned to the straight edge to achieve long lengths of clear lumber. In other words saw the outermost portions of the log first, and if any off-size lumber or waste shims develop, they will be on the heart side (less clear lumber) of the cant.

在许多三面锯切、自然锥度的木方中，钝棱一侧应与直边器对齐，以获得较长的清材。换句话说，先锯原木最外侧的部分，如果偏尺材料或废料条产生的话，它们会出现在木方中心一侧(较少清材)。

Shake
轮裂

The presence of shake in lumber lowers the grade in both structural and appearance lumber grades. Therefore, the edger operator should attempt to contain the shake in one piece of the smallest size where possible. As there is often shake in the heart of a log, splitting hearts should be avoided, as this may result in more pieces containing shake. In dimension lumber shake occurring on the edge (narrow face) will often result in a low grade lumber such as No3 or Utility.

无论是建筑用材还是外观用材，锯材中出现轮裂都会降低的等级。因此，只要可能，纵锯操作员应尽量将轮裂集中在一块尽可能小的材料上。由于原木的中心经常有轮裂，从中心剖开的做法应尽量避免，因为这将使多块材料含有轮裂。

Large knots
大节疤

When cutting cants with large knots, it is advisable to saw the lumber into the widest widths possible, to minimize knot displacement and maximize the grade. For example 3" knots which occur in 6" wide lumber would make a No 3 structural grade, whereas 3" knots cut into 12" widths would make a No 1 structural grade. In order to maximize the grade of your structural lumber you must be familiar with the knot sizes permitted. For structural lumber knot sizes are determined based on the area of the lumber cross-section that they displace. The following is a guideline to the maximum edge-knot displacements allowed in structural lumber:

在锯切含大节疤的木方时，值得推荐的方法是，尽量将木材锯成最宽、以尽量降低节疤的占据位置、提高锯材等级。例如，在6英寸宽锯材上出现3英寸的节疤可评为3级结构材，而如果在12英寸宽锯材上出现3英寸的节疤，则可评为1级结构材。为了尽量提高结构材等级，必须熟悉各等级允许的节疤尺寸。对结构材而言，节疤尽尺寸取决于其在锯材横切面上所占据的面积。如下所列是结构材中所允许的边缘节疤的最大占据位置：

- Select structural - 20%
  优选结构材 - 20%

- No 1 structural - 25%
  1级结构材 - 25%

- No 2 structural - 33%
  2级结构材 - 33%

- No 3 structural - 50%
  3级结构材 - 50%

When manufacturing dimension lumber (structural), the large knots should be kept away from the edges, as edge knots are more restricted in size, than centerline knots.
在规格材(结构材)制造中，应避免让大节疤出现在边缘，因为对边缘节疤尺寸的限制比对中心线节疤更严。

Wane
钝棱

The amount of wane allowed in most Clear and appearance grades is very limited, or non-existent. However in dimension lumber there is a considerable tolerance for wane. This is particularly so in rough stock where much of the wane will be dressed-off in finishing. As a rough guideline, a No 2 structural grade will allow wane full length if it doesn't exceed 1/3rd of the thickness. Trying to dress-off too much wane when manufacturing dimension lumber will result in an unnecessary recovery loss
在大部分清材等级和外观等级中，对钝棱的允许值很低或不允许。而在规格材中，则允许相当程度的钝棱。这一点在毛面材料中尤其明显，因为很大一部分钝棱将在表面加工中被消除。作为大致的原则，在2级结构材中，只要它不超过厚度的1/3，则钝棱可以为全长。在规格材生产中，试图过多地去除钝棱会造成不必要的出材率损失。

The top grades of Clear lumber must be square edged (wane-free), however, there are lower (less valuable) clear grades which will allow some limited wane. A good knowledge of lumber grades and relative values is therefore essential to make accurate value-based decisions, when assessing wane.
在清材的最高等级中，锯材必须是方边的(无钝棱)。然而有些低等级的清材中(价值相对较低),可以允许有限的钝棱。在评估钝棱时，对等级和相对价值的良好了解有助于在价值的基础上做出准确决策。

Unsound wood & Honeycomb
腐朽木和蜂窝朽

Decays of any sort are not permitted in the top grades of clear lumber. An occasional spot may be acceptable in lower clear grades such as No 4 or D clear, which permit a "Cut-Out".
在清材的最高等级中，任何形式的腐朽都是不允许的。在低等级的清材中，例如4级或D级清材中，可以允许含有一段待锯除的“废料”，所以个别材料上可以有一块腐朽。

The top grade of dimension lumber that allows unsound wood or soft honeycomb is No 3 structural. No 3

structural lumber is generally at least 1/3rd less valuable than No 2 structural lumber. Therefore knowledge of lumber grades, and accurate grade separation is important in dimension lumber and clear lumber manufacturing.

在规格材中，可以允许腐朽或软蜂窝朽的最高等级是3级结构材。通常3级结构材的价值最起码比2级结构材低1/3。因此，在规格材和清材的生产中，对锯材等级的了解、正确的等级区分是非常重要的。

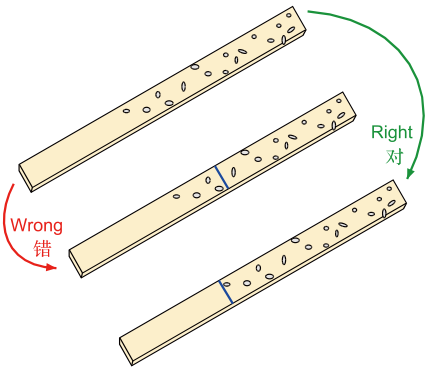
Trimming and crosscutting
截锯和横锯

Trimming objectives
截锯的目的

- To increase the value of lumber by removing end defects.
  通过将端头的缺陷去除来提高锯材价值。

- Increase productivity in downstream processing by removing bad ends (can create jam-ups)
  在下游生产中，通过去除差的端头(可产生跳级)来提高产量。

- Create uniform and desirable lengths, for downstream handling, efficient kiln drying, and product end use.
  为下游加工处理、有效地进行窑干、或产品的最终使用，生产出长度一致或指定长度的产品。

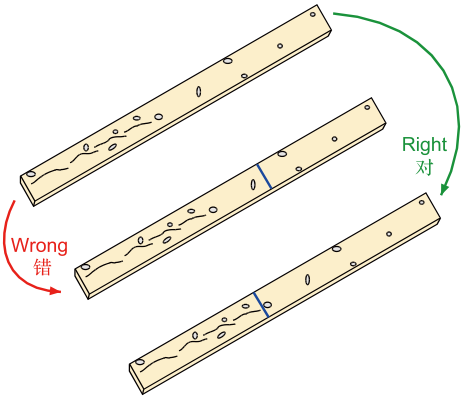


These objectives are achieved by:
这些目标可通过下列过程实现：

Trimming defects to increase the grade of the piece.
截去缺陷，提高等级。

Trimming reasonably square to nominal lengths.
截锯到名义长度，形成合理的方边。

Trimming ends not usable as lumber.
截去锯材中不能使用的端头。

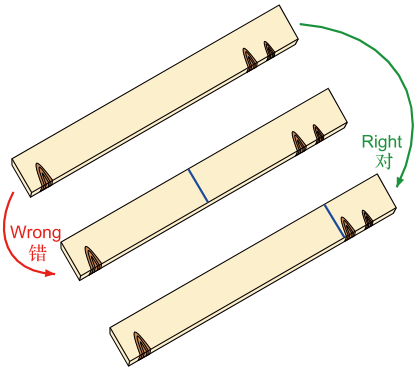


Crosscutting lumber
横锯锯材

Crosscutting objectives
横锯的目的

- Reduce long primary lengths to more desirable lengths for finishing.
  将原始长度降低为最终需要的长度。

- Isolate a higher grade at one end of the piece.
  将高等级集中到材料的一端。



- Isolate one end of a piece requiring further remanufacturing.
  将需要再加工的部分集中在一端。

- Remove defective mid-sections of a long piece.
  在一块长料中，去除中间有缺陷的部分。

- Produce two pieces which are more valuable than the original full-length piece.
  生成两块比原先一整块更有价值的材料。

Grade separation
等级分隔

In order to accurately cross-cut for maximum value, you must understand the grade rule of the product you are manufacturing. Much of successful value maximization comes from accurate grade separation.
为了精确横锯、将价值最大化，你必须了解你所制造产品的分级原则。价值最大化的很大一部来自于精确的等级分隔。

For example many of the "Clear" lumber grades allow some small or infrequent knots. If the lumber is manufactured as a flawless clear, a significant amount of value may be lost.
例如，很多“清材”等级允许一些小的或出现不多的节疤。如果把该锯材生产为毫无缺陷的清材，就会损失很大的价值。

Some grades may only require one face to be clear and knot-free, because the back will not be visible when the product is in use. These types of products (decking, paneling) will therefore allow some defects on the back.
有些等级可能只要求一面为清材或没有节疤，因为该产品在使用时背面不可见。因此，这一类产品(露台板、内墙板)允许背面有一些缺陷。

Trimming factory or shop lumber
工厂级或车间级锯材的截锯

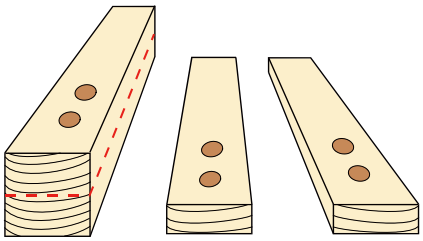
In order to maximize recovery and value when trimming or cross-cutting Factory / Shop type lumber it is advisable to place the saw line in the waste portion being Cut-Out, or as close to a defect as possible. Whenever possible, avoid cutting through a clear cutting. The objective in processing factory / shop grades is to recover as many long clear cuttings as possible.
为了在截锯或横锯工厂级或车间级类型的锯材时能最大地提高出材率和价值，应将锯线放置在将要锯除的废料部分、或尽量靠近缺陷。只要可能，尽量避免在清材锯块中开锯。在处理工厂级或车间级类型的锯材时，主要目标就是获得尽量长的清材锯块。

Flat grain versus Vertical grain
平纹与直纹

When splitting square lumber (equal dimensions) such as 4x4 for vertical grain clear lumber, the vertical grain face must be placed against the line bar.
在剖开方形锯材(等尺寸)，例如4x4，以获得垂直纹清材时，必须将垂直纹面面向对齐横杆放置。

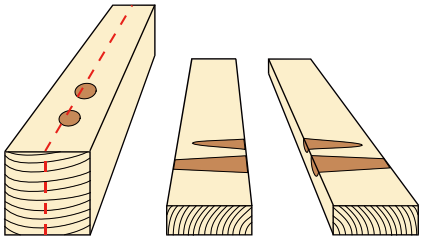
Conversely for construction type lumber, where flat grain is desirable to avoid spike knots, this is accomplished by keeping the fat grain face against the straight edge or line bar.

相反，对于建筑类型的锯材，水平纹可以避免条状节，而因更符合要求。这可以在锯切时，将水平纹面对向直边器或对齐横杆实现。



The resulting lumber is flat grain

得到的锯材为平纹



The resulting lumber is vertical grain

得到的锯材为直纹

Determining clear recovery from factory / shop grades.
计算工厂级或车间级锯材的清材出材率

NLGA Shop
NLGA 车间级

Understanding the grades of shop (factory) type lumber is essential to successfully extracting the value that is expected. All accurately graded shop lumber contains a pre-determined minimum recovery of clear lumber. If the grade recovery through remanufacturing is done properly and the expected yields are not achieved, then the lumber may be off-grade

了解车间级(工厂级)类型的锯材是从中获得期望的价值的基础。所有准确分级的车间级都有一个预定的清材最小出材率。如果在生产过程中的操作适当，但无法得到标明的出材率，则该锯材原料可能达不到等级标准。

The following diagrams demonstrate examples of how to determine the percentage recovery of clear lumber when processing shop lumber of different grades. Most shop lumber grades expect the user to rip (reduce in width) and cross-cut (reduce in length) to recover shorter narrower clear blocks.

下列图示显示了加工不同车间等级时如何计算清材出材率。大部分的车间等级都假定用户将通过纵锯(减小宽度)和横锯(减小长度)来获得较短、较窄的清材锯块。

Size of Cuttings
锯块尺寸

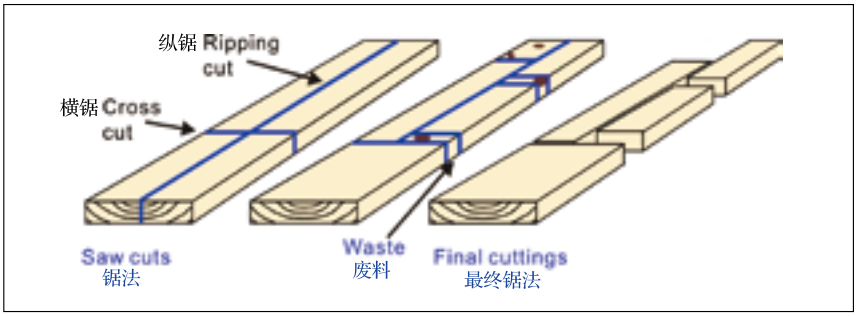
- In lumber which is 9 4/1" or wider, cuttings can be as short as 18".
- **在宽度为9 4/1英寸或更大的锯材中，锯块最短为18英寸。**

- In lumber which is 5" or wider, cuttings must be at least 3' or longer.
- **在宽度为5英寸或更大的锯材中，锯块必须为 3英尺或以上。**

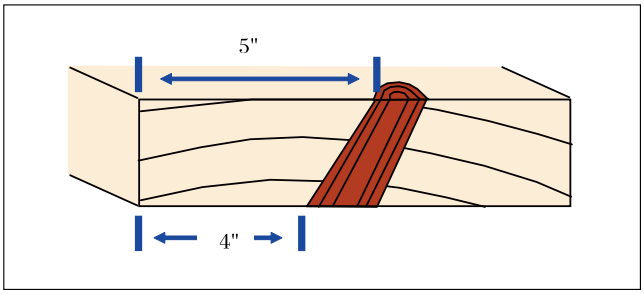
- In narrow lumber (under 5" wide), cuttings must be the full width of the piece and 3' or longer.
- **在窄(宽度为5英寸以下)锯材中，锯块必须为全宽、长度为3英尺或以上。**

- Sash cuttings — (only acceptable in No3 shop) looked for only when higher quality cuttings are insufficient or not found.
- **窗扇锯块 — (仅在车间3级中允许)仅在更高价值锯块不足或没有时使用。**

Shop Cuttings — Cuttings are obtained through a combination of ripping and cross cutting.
车间级锯块 — 通过纵锯和横锯来获得清材锯块。



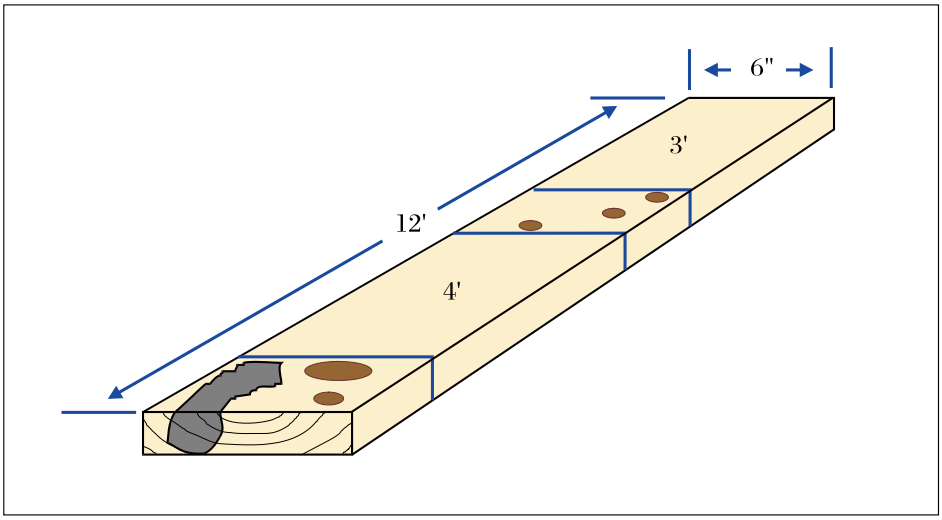
Faces Graded
评级面



Grade (as determined by the proportion of clear cuttings recoverable) is determined by the poorest face, as illustrated above. In this diagram, only a 4" wide cutting is possible on the left side of the knot, even though there appears to be a 5" wide cutting when you look at the top face only.

等级是以较差面评定的(与即将获得的清材锯块部分的评定方式一致)，如上图所示。在该图中，在节疤左侧只能得到一个4英寸宽的锯块，尽管仅从表面观察时似乎可以有一块5英寸宽的锯块。

Factory / Shop Lumber Recovery - Example #1
工厂级/车间级锯材出材率 - 示例 #1



In this example, the cuttings are all full width, therefore the calculations can be performed using lengths only.
在该例中，锯块为全宽，因此计算时只要使用长度即可。

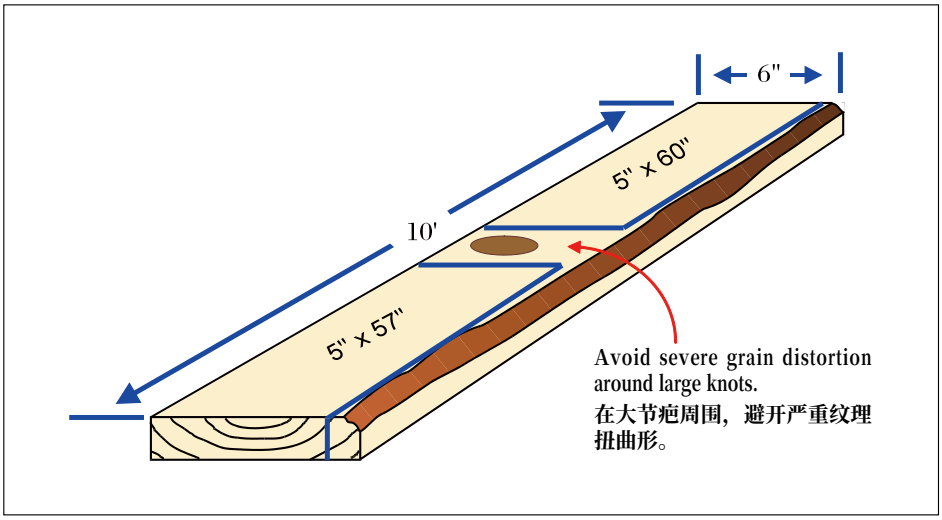
- Cutting lengths:
  锯块长度：

  – 4'
  – 3'

- Recovery:
  出材率：

  – (7' / 12') x 100 = 58.3% Grade is No 1 Shop
  等级为车间 l 级

Factory / Shop Lumber Recovery - Example #2
工厂级/车间级锯材出材率 - 示例 #2



- Area of piece:
  锯材面积：

  – 6" x (10' x 12" per foot) = 720 square inches
    6" x (10' x 12" 每英尺) = 720 平方英寸

- Area of cuttings:
  锯块面积：

  – 5" x 60" = 300 square inches
    5" x 60" = 300 平方英寸

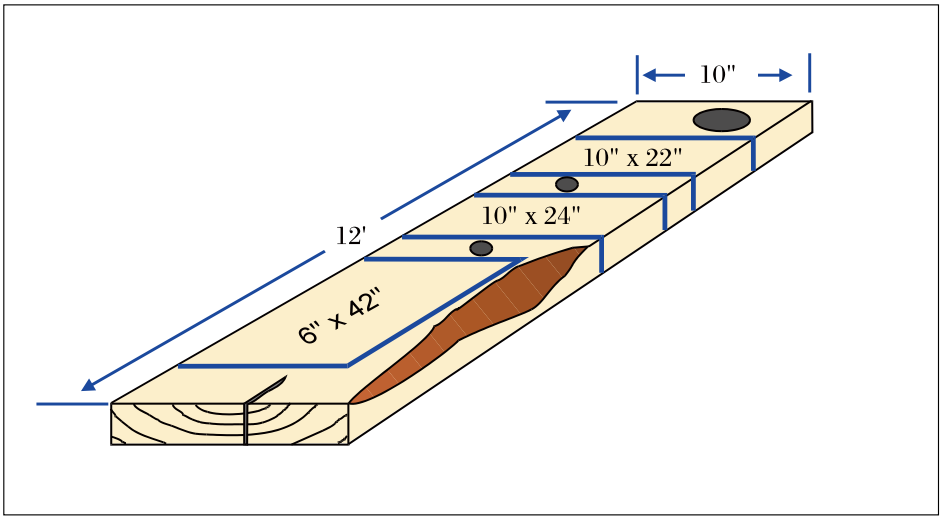
  – 5" x 57" = 285 square inches
    5" x 57" = 285 平方英寸

  – total recovery = 585 square inches
    总出材量 = 585 平方英寸

- Percentage recovery:
  出材率百分比：

  – (585 / 720) x 100 = 81.25% Grade is Select Shop
    等级为优选车间级

Factory / Shop Lumber Recovery - Example #3
工厂级/车间级锯材出材率 - 示例 #3



- Area of piece:
  锯材面积：

  – 10" x (12' x 12" per foot) = 1440 square inches
    10英寸 x (12英尺 x 12英寸 每英尺) = 1440 平方英寸

- Area of cuttings:
  锯块面积：

  – 6" x 42" = 252 square inches
    6英寸 x 42英寸 = 252 平方英寸

  – 10" x 22" = 220 square inches
    10英寸 x 22英寸 = 220 平方英寸

  – 10" x 24" = 240 square inches
    10英寸 x 24英寸 = 240 平方英寸

  – total recovery = 712 square inches
    总出材量 = 712 平方英寸

- Percentage recovery:
  出材率百分比：

  – (712 / 1440) x 100 = 49.44% Grade is #2 Shop
    等级为车间2级

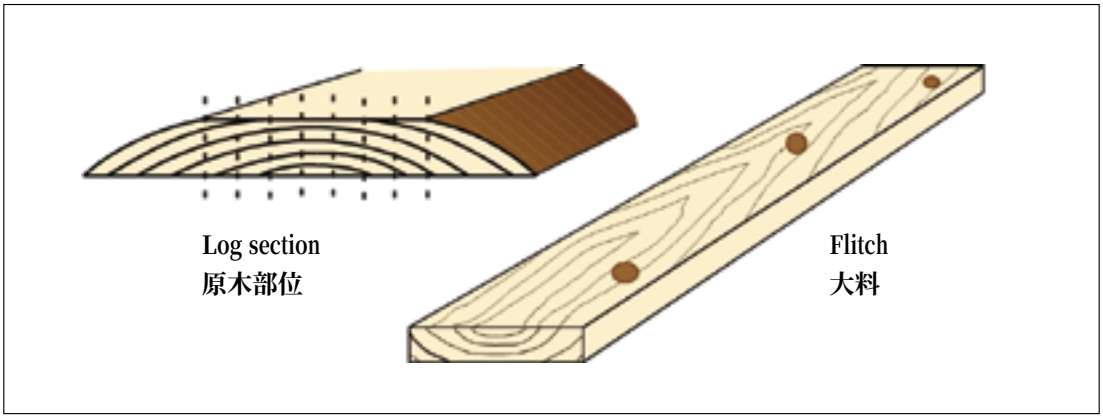
Flitches
大料

Lumber graded under the "Flitch" grade rules, is intended to be re-sawn into clear 1" wide strips. Therefore flitches are generally sawn flat grain from the log to facilitate re-sawing for vertical grain. In addition, the flat grain will have only round knots which will allow for greater clear recovery than, vertical grain which will have spike knots.

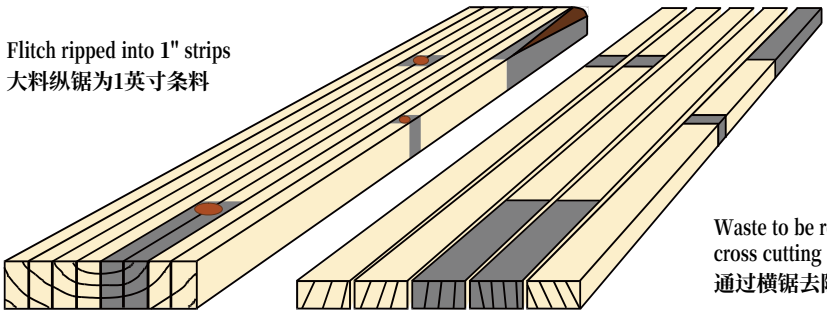
以大料分级规则分级的锯材，预定将被锯切成1英寸宽的条状清材。因此大料级通常以平纹从原木上被锯切下来，以方便再加工时锯成直纹。此外，平纹中只含圆节，这样可以有更高的清材出材率，而直纹则含有条状节。

Flitch grades of lumber, are intended to be further broken down (ripped into 1" strips) through a circular gang-saw. A gang saw is a set of fixed circular saws, which will rip a flitch into 1" strips in one pass. Therefore there is very little ability to orient the piece to best advantage.

大料等级的锯材，预定将通过圆形排锯进一步剖开(纵锯成1英寸宽的条状)。排锯是一组圆形锯，它在一次过锯中将大料锯成1英寸的条料。因此，很难在这一过程中调整方向以获得更好锯切效果。



Cuttings
锯块



Note: 3 full length clear cuttings not shown.
注释：3块全长清材锯块没有在图中显示出来。

- Waste includes all characteristics except clear, fine textured wood. Some examples are:
  废料 包括除清材、良好质地木材之外的所有缺陷。一些例子有：

  – Knots
    节疤

  – holes (of all kinds)
    孔洞(所有类型)

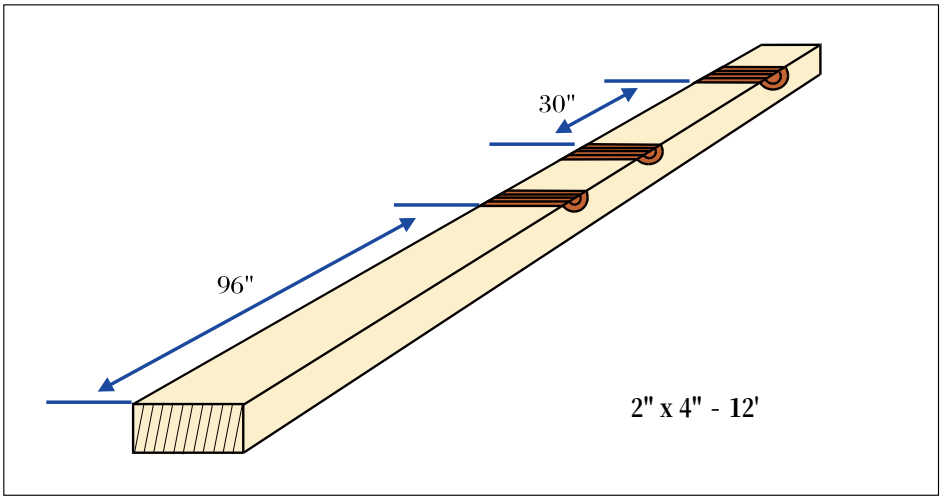
  – bruises
    损伤

  – pockets
    树囊

  – Unsound wood (decay)
    腐朽木(腐朽)

- In order to present a good looking product to the customer, characteristics such as wane, should also be minimized.
  为了向客户展现漂亮的产品外观，钝棱之类的缺陷也应当尽量最小。

Door Stock Clear Recovery - Example #1
门料清材出材率 - 示例 #1



- Stay 1" away from knots when calculating cuttings.
  在计算清材锯块时，距节疤应1英寸。

- 4" - 6" widths must contain a stile in order to make the grades of Factory Select or #1 Shop.
  4英寸 - 6英寸宽度必须含有一块边框料才能达到工厂优选级或车间1级。

- Calculating the recovery in this example:
  该例的出材率计算：

  – Since the cuttings are all full width, only lineal inches are required.
    由于锯块为全宽，只要计算线性长度即可。

  – (12' x 12' per foot) = 144"
    (12英尺 x 12英寸 每英尺) = 144" 英寸

  – Recovery percentages for each grade would be:
    每个等级的出材率百分比为：

    Factory Select 70% (144 x 70% = 100.8 or 101")
    工厂优选级 70% (144 x 70% = 100.8 or 101英寸)

    #1 Shop 50% (144 x 50% = 72")
    车间1级 50% (144 x 50% = 72英寸)

    #2 Shop 331/3% (144 x 331/3% = 47.9 or 48")
    车间2级 331/3% (144 x 331/3% = 47.9 or 48英寸)

- Cuttings found:
  得到的锯块：

  – 1 - 96" stile
    1 - 96英寸边框

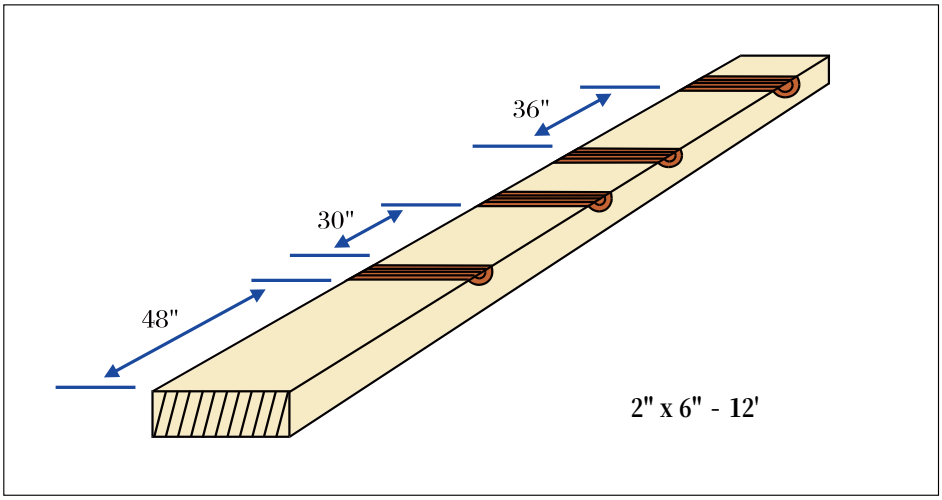
  – 1 - 30" top rail
    1 - 30英寸顶档

- Total recovery is 96"+ 30" = 126"
  总出材量为 96英寸 + 30英寸 = 126英寸

- Percentage recovery is 126" divided by 144" times 100% = 87.5%
  出材百分率为126英寸除以144英寸乘以 100% = 87.5%

- Grade is Factory Select
  等级为工厂优选级

Door Stock Clear Recovery - Example #2
门料清材出材率 - 示例 #2



- Stay 1" away from knots when calculating cuttings.
  在计算清材锯块时，距节疤应1英寸。

- 4" - 6" widths must contain a stile in order to make the grades of Factory Select or #1 Shop.
  4英寸 - 6英寸宽度必须含有一块边框料才能达到工厂优选级或车间1级.

- Calculating the recovery for this example:
  该例的出材率计算：

  – (12' x 12" per foot) = 144"
    (12英尺 x 12英寸 每英尺) = 144英寸

  – Recovery percentages for each grade would be:
    每个等级的出材率百分比为：

    Factory Select 70% (144 x 70% = 100.8 or 101")
    工厂优选级 70% (144 x 70% = 100.8 或 101英寸)

    #1 Shop 50% (144 x 50% = 72")
    车间1级 50% (144 x 50% = 72英寸)

    #2 Shop 331/3% (144 x 331/3% = 47.9 or 48")
    车间2级 331/3% (144 x 331/3% = 47.9或48英寸)

– Cuttings found:
得到的锯块：

no stile
无门边框料

1 - 48" muntin
1 - 48英寸门梃

1 - 30" top rail and 1 - 36" top rail = 66"
1 - 30英寸顶档和 1 - 36英寸顶档 = 66英寸

– Total recovery is 48" + 66" = 114"
总出材量为 48英寸+ 66英寸= 114英寸

– Percentage recovery is 114" divided by 144" times 100% = 79.2%
出材百分率为114英寸除以144英寸乘以 100% = 79.2%

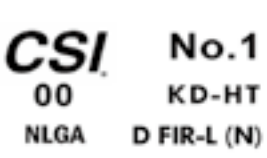
– Grade is #2 Shop (recovery 50% or more, and no stile)
等级为车间2级(出材率50%及以上，无边框)

GRADE STAMP FACSIMILES
等级章样本

Alberta Forest Products Association

Canadian Lumbermen's Association

Canadian Mill Services Association



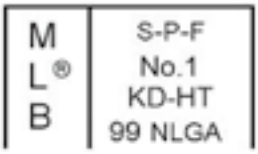
Canadian Softwood Inspection Agency Inc.

Central Forest Products Association Inc.

Council of Forest Industries

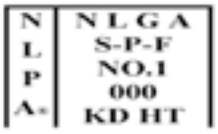
Council of Forest Industries

Macdonald Inspection Services Ltd.

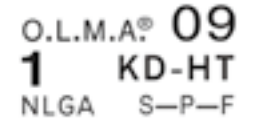


Maritime Lumber Bureau

Northwest Territories Forest Industries Association



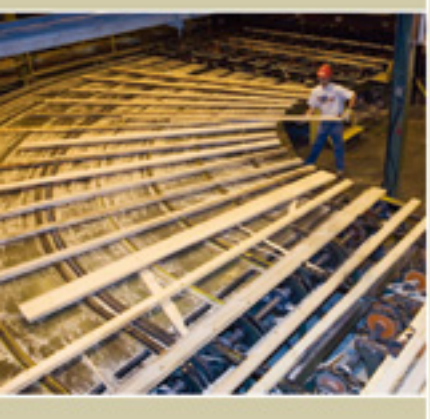
Newfoundland & Labrador Lumber Producers Association



Ontario Lumber Manufactuers' Assocaiton

Pacific Lumber Inspection Bureau

Quebec Forest Industry Council



Canada Wood
加拿大木业协会

上海市浦东新区红枫路425号 梦加园
邮编：201206
电话：021-5030 1126
传真：021-5030 2916
电子邮件：chu@canadawood.cn
网址：www.canadawood.cn

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