

Erickson's
Flooring & Supply Company

Warranty Claims
&
Self Inspection Program

2007

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Introduction

The professional handling of consumer complaints in a timely fashion is integral to the success and profitability of your business and Erickson's. Erickson's recognizes the need for the expedient resolution of warranty claims and; therefore, has assembled this package of materials to assist you, our valued customers, to better service the consumer and mutually benefit all parties involved.

Erickson's believes that claims should be a positive experience that will gain the consumer's confidence, respect, and loyalty. The ultimate goal of complaint management is not to "point fingers", but rather determine if the complaint is a manufacturing defect or the result of external conditions (moisture, installation, etc.), providing a clearly defined resolution and closure for the consumer and all parties involved. Statistics verify that the quicker a product complaint is addressed and resolved, the cost is less and the customer will maintain a positive attitude toward their purchase.

The proper method to follow is to first perform a thorough jobsite inspection using all of the necessary tools as soon as possible, and to document all findings and related information properly. The following guidelines cover some FAQ's, what forms to fill out, who should be involved in the claims process, and how to submit your claim properly to Erickson's. Adherence to these guidelines will ensure the most expedient processing of your claim and the most positive outcome possible for all parties involved; additionally, it will bring an equitable settlement of any legitimate manufacturing issues.

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General Guidelines to Effective Claims Management

Pre Sale Guidelines

1. Establish a written claims policy, similar in content to Erickson's policy that all employees understand and follow.
2. Track and record all complaints in writing, regardless of the problem, status, or outcome.
3. Establish a specified timeline for resolution on all customer complaints.

Sale Guidelines

1. Provide the customer with accurate and comprehensive product information at the point of sale. Establishing realistic customer expectations at the point of sale will eliminate many potential complaints.
2. Know the products you sell. Know their limitations and how they perform under different scenarios. The better you know your products, the better sales person you will be and the fewer complaints you will have.
3. Provide your customer with all warranty and maintenance information at the point of sale. Have the customer sign indicating they received this information. Good record keeping emphasizes your professionalism to your customer. Additionally, a large percentage of complaints are generated from customers not understanding the warranty and / or improper maintenance procedures.

Post Sale Guidelines

1. Respond immediately to a customer complaint, and when possible, respond in person. The consumer must feel confident that this aspect of the sale is just as important.
2. Respond to complaints without bias. Customers want you to hear and see their complaints. A negative attitude, real or perceived, will result in an unhappy customer and potentially more problems. If the customer feels that you have reviewed their complaint with a pre-conceived bias, or that you are not hearing or seeing their problem, they will lose objectivity and view anything you do or say as negative or biased.
3. Have a system to follow up on all complaints (should be a part of your written claims policy).
4. Respond immediately, verbally or in writing, after your initial jobsite inspection. Procrastination will only upset the customer and worsen the situation.

Resources

The National Wood Flooring Association has extensive documentation available to assist you in managing claim related issues. This information is available in printed form or available online via their website at www.nwfa.org. Publications include Water & Wood, Wood Species, and Jobsite Evaluation, Estimating, and Preparation.

Erickson's Flooring & Supply

ILLINOIS INDIANA MICHIGAN OHIO WISCONSIN

Phone 800.225.9663

Fax 888.543.9663

Procedure for Handling Complaints

Consumer's Initial Call

Upon receiving a call from a consumer with a complaint, the first thing to do is **listen** and let the consumer explain their frustrations. This initial interaction will often set the tone of the entire complaint process. After the consumer has had an opportunity to explain their concerns and needs, in a non-threatening manner, ask the consumer the following questions:

- 1) What exactly is the problem? Describe the problem in detail.
- 2) When was the problem noticed – before, during, or after installation?
- 3) Is the problem getting worse or has it stabilized?
- 4) How do they maintain their floor?
- 5) What type of resolution do they expect – in many cases their proposal will cost a lot less than what you were going to suggest.

Jobsite Inspections

If the complaint requires an inspection, schedule an inspection to occur with the following parties present:

- **The Consumer (required)**
- **The Seller (required)**
- The Installer (if applicable)
- The Builder (if applicable)



It is the responsibility of the seller to inspect all complaints before contacting Erickson's. The seller must determine that the product is still under warranty and the problem is **NOT** due to external factors – i.e. improper installation, moisture issues, and/or incorrect maintenance, etc.

Installer accountability must also be maintained. Per manufacturer installation instructions, NOFMA*, and NWFA guidelines, the installer is responsible to examine the material before installation. This is to ensure the correct product was ordered, as well as determine if there are any visible manufacturing defects. If there is any question or doubt, the installer must stop the job immediately and contact the seller with all issues and questions.

* NOFMA is the National Oak Flooring Manufacturers Association. NOFMA sets grading, milling, and other manufacturing standards.

Note: Industry standard, as set forth by NOFMA and NWFA, allows for a 5% waste and/or defect factor during installation for all flooring, prefinished or unfinished. This includes, but is not limited to, finish imperfections, grading discrepancies, milling defects, color, and general cutting waste. Flooring should be evaluated by the installer before installation and discarded, or ‘culled’, if it does not meet the specified grading criteria published by NOFMA.

It is imperative that an inspection be conducted as soon as possible to ensure timely resolution. It is recommended to perform the inspection immediately after receiving the call from the consumer.

When conducting the inspection it is important to listen, remain objective, and not to make any promises or implications regarding any alleged problems, or supposed resolution by the manufacturer.

Inspection & Processing Procedures

Upon performing a jobsite inspection, it is important to have all of the necessary tools. Here is a list of tools Erickson’s recommends for a claim inspection. Erickson’s has moisture meters you can purchase for both concrete and wood (price list attached); all other tools can be purchased at your local hardware store.

- Hygrometer (measures relative humidity)
- Moisture Meter (both concrete and wood)
- Gauges (measure over-wood)
- Kite String (floor level)
- Sample Bottles (finish samples)
- Tape Measure (board width and gapping)
- Note pad (to register all pertinent information and note)
- Calipers (board width and milling)
- Razor Blades (taking samples of urethane)
- Phenolphthalein or Calcium Chloride (indicates concrete moisture)
- Stud Finder (magnetic)

The Inspection Analysis Report must be completed, in it’s entirety, at the time of the inspection if any warranty claim is to be made.

After reviewing the provided documentation on common claim problems and their cures, the manufacturer's warranty installation documentation, and NOFMA and NWFA guidelines, and it is still determined the claim is a result of a manufacturing defect and is under warranty, take the following action:

- **Submit the Claim in Process Form:** This form summarizes all pertinent information, including consumer name, invoice number, product installed, labor amounts, expected resolution, etc.
- **Submit the Inspection Analysis Report:** This should be completed at the time of inspection and ALL information must be filled out, as appropriate.
- **Attach the Carton Label:** This will be on the box and is used for tracking purposes.
- **Submit Samples:** Samples must be submitted for every claim that is determined to be a manufacturing defect; also, samples must show the alleged defect. Samples should be submitted directly to Erickson's claims department, never to the manufacturer. Please do not submit more material than is necessary to adequately show the defect.
- **Repairs: Do not perform any claim related repairs before receiving approval from Erickson's and/or the manufacturer.** Erickson's and/or the manufacturer are not liable for payment on any repairs or work done to the floor without prior written approval.

Note: Labor rates must be within acceptable industry guidelines. For example, the average rate to replace a prefinished floor is \$1 per square foot to tear the old flooring out and \$2 per square foot to install new flooring. There are many different repair options and scenarios, so please contact Erickson's claims department for additional information on acceptable labor rates specific to your warranty claim.

The Claim in Process Form, the Inspection Analysis Report, and all associated documentation should be either:

- Faxed to 888.543.9663 Attn: Claims Dept.
- Mailed to 1013 Orchard St., Ferndale, MI, 48220 Attn: Claims Dept.

All information must be submitted at the same time – incomplete or missing paperwork will delay your warranty claim and may cause your claim to be closed. Samples must be received within 3-5 business days upon receipt of paperwork.

The Next Step

Erickson's Flooring & Supply
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Phone 800.225.9663
Fax 888.543.9663

Upon receipt of your completed paperwork indicating a manufacturing defect, Erickson's claims department will enter your warranty claim into our claims database. An Erickson's claim department representative will contact you and provide a tracking number for your warranty claim within 48 hours*. This tracking number can be used to check on the status of your claim Monday – Friday, 8am – 5pm, by calling 800.225.9663 ext. 1128, or 248.246.5013 direct.

No Inspection Necessary

If your warranty claim does not require a jobsite inspection, your warranty claim will be submitted to the manufacturer within 48 hours. Erickson's claims department will notify you if an inspection is required unless you have already requested an inspection. There are different factors that determine if a jobsite inspection is necessary, and each claim is handled on a case-by-case basis.

Erickson's Inspection

If your warranty claim requires an inspection, you will be contacted within 24 hours by an Erickson's Account Manager to schedule a jobsite inspection. The necessary paperwork will be submitted to the manufacturer within seven business days of the jobsite inspection, if the claim is determined to be a manufacturing defect.

Note: This is dependent upon all required paperwork properly submitted to Erickson's in the time frame indicated - all required paperwork must be filled out and submitted to Erickson's before an Erickson's representative will perform a jobsite inspection.

Note: At no time during the warranty claim process will Erickson's or the manufacturer honor any *verbal* commitments made by any party to the consumer, seller, builder or any other entities involved. All commitments, promises, and inferences as to the status of any warranty claim, the outcome, or resolution must be in writing to be processed. Do not make any verbal commitments.

* 24 hours indicates a business day – if the claim is submitted on a Friday or holiday, a response will be returned the following Monday or next business day.

Manufacturer's Inspection

If an Erickson's representative inspects the warranty claim and determines an additional inspection is needed by the manufacturer, the manufacturer will be contacted within 48 hours and an inspection will be scheduled as soon as possible.

The following parties attendance at all jobsite inspections by Erickson's or the manufacturer are mandatory. **The inspection will not be conducted if not all parties are present:**

- Consumer
- Seller
- Erickson's Representative (if inspection is conducted by the manufacturer)

Warranty Claim Resolution

Erickson's goal is to have a resolution from the manufacturer for all warranty claims within 30 business days after receipt of final inspection paperwork and all required documents. This is predicated on the level of involvement – if the manufacturer is involved then the goal is 30 business days after receipt of inspection paperwork from the manufacturer.

A 30-day turn around time for resolution is a goal Erickson's has set to give you the best customer service possible; due to the dynamic nature of warranty claims, this goal will not always be attainable.

Credits

If the manufacturer approves your warranty claim, Erickson's will issue a credit for the approved amounts of material and/or reasonable labor, as appropriate, in the form of a credit to your Erickson's account. **This credit will be issued within 24 hours after receiving the credit and approval in writing from the manufacturer.**

An Erickson's claim department representative will contact you to notify you of your credit and the status of your claim.

Returns

Material returned to Erickson's that is alleged claim material will be processed per standard Erickson's return policies – i.e. the material must be in full, unopened cartons, in saleable condition, etc. Restocking fees will only be credited if the claim is determined to be a manufacturing defect.

Please do not return material that is loose, opened, partially installed, etc. If your warranty claim is determined to be a manufacturing defect, you will receive credit for this material when the manufacturer approves your claim.

Claim Denials

If it is determined that your warranty claim is not a manufacturing defect, a letter will be provided explaining the reason(s) for denying the claim, along with any recommendation, if applicable. At this time, the claim will be considered closed and no further action will be taken regarding that specific claim.

If the claim is denied, payment will be due on all unpaid claim related invoices immediately (within the parameters of your payment terms).

Independent Inspection Services

If it is determined that your warranty claim is not a manufacturing defect and is turned down, it is your option to request an independent third party inspection service to inspect and evaluate your warranty claim.

The following terms apply if an independent inspection is requested:

- The entity requesting the third party inspection must pay the additional inspection fees in advance before Erickson's claims department can schedule the inspection.
- If the third party inspection service determines there is not a legitimate manufacturing defect per the product warranty, the claim status will not change and will remain closed.
- If the third party inspection service determines that there is a legitimate warranty claim due to manufacturing defects per the product warranty, the claim will be re-opened with the manufacturer.
- Inspection fees will vary depending on the service used, location of the job site, travel involved, etc. Fees are generally between \$250 - \$1000 plus any applicable trip charges, etc. Erickson's claims department will quote inspection fees on a case-by-case basis if requested.
- The consumer or dealer may contract a third party inspection service directly if desired; however, the inspector must be endorsed and certified by the appropriate association and manufacturing authorities for Erickson's to process their analysis and recommendation.

Erickson's Commitment to You

Erickson's is committed to providing exceptional customer service. Erickson's believes the professional and expeditious handling of warranty claims is key to successful business practices in our industry.

Erickson's believes this process will mutually benefit all parties by strengthening our business relationships, and creating opportunities that are more profitable for everyone.

Erickson's Flooring & Supply appreciates your support of these processes, and looks forward to minimizing the number of warranty claims through efficient business procedures and the continuing education of the consumer, installer, and seller.

Contact Information

Toll Free: 800.225.9663 ext. 1128

Direct: 248.246.5013

Attn: Claims Department

Fax: 888.543.9663

Mail: 1013 Orchard St.
Ferndale, MI 48220

Email: claims@efs.bz

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- II. Inspection Analysis Form
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- IV. Moisture Meter Price List
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- VIII. NWFA Hardness & Stability of Species Chart
- IX. NOFMA Grading Standards

Erickson's Flooring & Supply Co.

Inspection Analysis Report

Date : ____/____/____

Information				
Dates:	<u>Purchased</u>	<u>Delivered</u>	<u>Installed</u>	<u>Order/Invoice number</u>
Seller:	_____			
	Company Name	Address		
	City	State	Zip	Phone Number
Installer:	_____			
	Company Name	Address		
	City	State	Zip	Phone Number
Consumer:	_____			
	Name	Address		
	City	State	Zip	Phone Number

Product	
Product/Item: _____	Run date: _____
Mfgr. markings: _____	Quantity purchased/used: _____

Application					
Residential	YES	NO	New construction	YES	NO
Light commercial	YES	NO	Remodel	YES	NO
Heavy commercial	YES	NO	Room/Job size:	_____	

Nail / Staple Down	
Type of fastener : _____	Expansion space : _____
Size of fastener : _____	Where is expansion: _____
Machine used : _____	How expansion checked: _____
Spacing : _____	Glue used: _____
How spacing was checked: _____	How glue was checked: _____

Glue Down	
Type of adhesive: _____	Open time: _____
Amount used: _____	Was floor rolled: YES NO
Notch type/size/spacing: _____	Roller weight: _____

Subfloor					
Thickness: _____	Filler/Topping used: _____	Grade: _____	Above	On	Below
Total subfloor configuration:	Plywood	OSB	Particle Board	Concrete	
Explain: _____					

Construction					
Crawl Space:	YES	NO	Vapor barrier used:	YES	NO
Vented:	YES	NO	What kind: _____		
Joist spacing: _____			How used/Applied: _____		
Basement:	YES	NO	Heating: _____		
Heated:	YES	NO	What type: _____		

Additional Info

Moisture content in finished floor: _____
 Moisture content in subfloor: _____
 Anything noted before install: _____
 Anything noted after install: _____

Moisture content in left over floor: _____

Job Conditions

Dog/Cat: YES NO
 Direct sunlight: YES NO
 Heavy furniture: YES NO
 Humidity: High Average Low
 Weather: Hot Warm Cold
 Dry Damp Wet
 Outside temperature: _____
 Inside temperature: _____

Maintenance products: _____
 Other: _____
 Relative humidity: _____
 Air circulation: Good Fair Poor
 Humidifier: YES NO
 Working: YES NO
 Date last checked: ____/____/____

Sanding Procedure

Papers used: _____
 Screens used: _____
 Machine(s) used: _____

Finishing Procedure

Bleach: YES NO Brand: _____ Times bleached: 1 2 3 ____
 Dry time: _____
 Stain: YES NO Brand: _____ Color: _____
 Coats Applied: 1 2 ____ Dry time: _____
 Application method: Brush Rag Other: _____
 Sealer: YES NO Brand: _____ Coverage: _____ sq ft/gal
 Coats Applied: 1 2 ____ Dry time: _____
 Application method: _____ Times catalyzed: _____
 Top Coats: YES NO Brand: _____ Coverage: _____ sq ft/gal
 Coats Applied: 1 2 ____ Gloss Semi Satin
 Application method: _____
 Dry time: _____ Times catalyzed: _____
 Moisture Meter: Used before coats YES NO Used between coats: YES NO
 Moisture % before: _____ Moisture % between: _____

Seller Comments/Recommendations

Before: _____

 After: _____

 Name (print): _____ Date: ____/____/____

Installer Comments/Recommendations

Before: _____

 After: _____

 Name (print): _____ Date: ____/____/____

Certified Moisture Content Policy

PURPOSE

To properly document moisture content. This will add value and professionalism for Erickson's customers. This will also provide our customers protection on moisture related warranty claims.

MOISTURE CONTENT GUIDELINES

To verify the moisture content in our unfinished flooring all unfinished wood flooring products must be measured with a moisture meter and the results properly recorded on the packing slip or pick ticket.

In the event that the moisture content exceeds N.O.F.M.A. standards for our region (6% to 9%), the warehouse manager will be informed immediately and the appropriate corrective action will be taken.

Note: This guarantee excludes prefinished / factory finished flooring.

RECEIVING MATERIAL FROM THE MANUFACTURER

Check each pallet with a moisture meter. On the packing slip record the moisture reading and initial.

Example:	Reading	Initials
	MC < 6%	JWD
	MC = 6%-8%	JWD

CUSTOMER ORDERS

Check the moisture content with a moisture meter. Record the moisture reading on the pick ticket and initial. Inform the customer what the moisture content is at the time of pick up or delivery. Write the moisture content on the pick ticket next to the bundle count, below the product description. This includes common carrier (LTL) shipments.

TRANSFERS BETWEEN BRANCH LOCATIONS

All unfinished wood flooring products transferred between branch locations must be measured with a moisture meter before leaving the originating branch location and upon arrival at the receiving branch. Record the moisture content on the pick ticket and initial. This includes common carrier (LTL) shipments.

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Moisture Meters

Item #	Manufacturer	Type	Price Each
UTL880	Davis Instruments	Humidity	59.00
PPMM	Protimeter Mini	Wood	179.00
PSM	Protimeter Surveymaster*	Dual	549.00
TCE	Tramex	Concrete	439.00

* The Surveymaster is a dual application moisture meter that uses both a pin probe for wood like the Protimeter Mini and also uses a non-invasive RF (radio frequency) mode for concrete and most other types of floor covering.

Erickson's Flooring & Supply

CHICAGO DETROIT GRAND RAPIDS INDIANAPOLIS

800.225.Wood (9663)

PROBLEMS CAUSES CURES

Designed to help you solve Hardwood Flooring Problems

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Wood Floors:

The Problem, The Cause and The Cure

Introduction:

This publication is prepared for your use by the National Wood Flooring Association to assist you in (1) identifying the problem that you encounter on a wood floor inspection, (2) what probably caused the problem, and (3) how to correct the problem. Experience indicates that a given floor may display more than one difficulty, and that several corrections will be required even though there may be only one cause. For this reason the inspector must be observant, note all details, listen to the parties involved for leads, hints, comments, and keep complete written notes and date them. Develop full history with dates about when delivered, installed, problem first noticed, any other changes, etc.

Our mission in writing is to help make inspections of problem floors easier and more accurate so that the ultimate owner of the floor will be pleased and satisfied with our industry's product. Your promptness and professionalism are required. We will address the more frequent problems. Should you encounter a condition not covered, call us.

IDENTIFICATION:

To properly evaluate a floor, it is necessary to identify the product correctly. (Example: Surface job – applied coating is peeling off – is it a factory waxed pre-finished product?). Our industry produces a myriad of products, so make identification easy by asking the owner, the installer, the material source, etc. If this all fails, follow this checklist:

1. Is the flooring linear (long narrow boards) or parquet (squares).
2. Is the face of the flooring rotary-peeled (plywood) or sawn (solid)?
3. At a floor register opening, stair nosing, floor electric outlet, measure the thickness. Insert a probe to measure. Remove molding at a wall and measure thickness.
4. Can you see that the wood is solid or laminated (layered)? How many layers thick? If solid, is the surface color the same through the thickness?
5. Measure the width of the linear floor. If laminated, measure the length of the boards, or are they random?
6. Measure the length of the slats in parquet.
7. Are there bevels between linear boards? Are there bevels between the ends of linear boards?
8. Are there bevels in the parquet? What size are the squares?
9. With a probe inserted between sides and ends of linear, determine if there is a tongue. Same between parquet squares.
10. Determine species of wood if possible. White Oak is yellow/gray. Red Oak is pink/tan. Is all the wood the same, or is it mixed species.
11. Is the installation glued, nailed or floated over foam, a wood subfloor, a basement, another room, crawl space, or direct over concrete.
12. Note the color of the mastic used.
13. If linear and with pegs, measure the diameter of the pegs. Note peg placement in the boards. Are the pegs wood or plastic?
14. If you can remove a piece of the flooring, on linear note the hollowback and any mill markings. On parquet is there evidence of any backing and is the assembly done with steel, aluminum wire, or plastic.
15. How was the owner instructed to maintain the floor?
16. Moisture content of wood, substrate, moldings. Relative Humidity in airspace. Record and Date information. With all (or most) of this information, you will probably have identified the product involved. If not, contact your normal materials source for assistance or give us a call.

PROBLEM #1

Cupping, or “washboard”. Across the width of one piece of the flooring material, the edges are high, the center is lower. Generally develops gradually.

CAUSE:

Moisture imbalance through the thickness is the only cause. The material was manufactured flat and was flat when installed. Job site or occupant provided moisture is greater on the bottom of the piece than on the top. Prove it with your moisture meter. Find the source of moisture and eliminate it. Common moisture sources and their corrections are:

Airborne (Relative Humidity) – dehumidify air space or (lack of during heating season – humidify air space); wet basement – ventilate, dehumidify; crawlspace – groundcover/vents, add exhaust fan on timer; lot topography – French drain to remove; rain handling provisions – correct to drain away from house; excessive lawn/garden moisture – reduce/waterproof foundation; leaks plumbing, roof, doors – fix; don’t hose patio; maintenance; correct capillary through slab – install barrier, French drain, drain tiles. In kitchen, the dishwasher and icemaker are notorious leakers.

Expansion is also the result of site moisture and may have moved the floor tight to vertical surfaces. If so, remove flooring along the wall, or saw cut, to relieve pressure.

CURE:

Allow time. Time for the corrections to take effect – to permit the floor to improve on its own. It may become acceptable (see problem #2). After stabilized, sand flat and finish. Cost of corrections should be for owner or builder to cover.

PROBLEM #2

“Crowning”, or the center of the piece of flooring (across its width) is high, the edges are lower.

CAUSE:

While moisture imbalance might be the cause (by excessive moisture introduced on the finish side of the floor; i.e. water used in maintenance, plumbing leaks overhead sprinkler system), it is more likely that the floor was cupped (problem #1) and sanded flat thus removing the outer edges, the sanding having been done at the wrong time, i.e. before corrections were made and before the floor flattened on its own.

CURE:

After the floor has stabilized following corrections, sand flat and finish.

Note: Some slight cup and/or crown can and should be tolerated. It is common in wood floors, especially in wider planks. It is, in many cases, seasonal in its occurrence and can be minimized with lighting and furniture placement, by using beveled products and by other than high gloss finish.

PROBLEM #3

“Buckling”, “tented”, “ballooning” floors. Pieces of the flooring are no longer in contact with the substrate.

CAUSE:

Generally an extreme moisture problem. See Problem #1 for sources and corrections. Inadequate expansion space, even “net fix” (installer error) prevents normal expansion. On nailed products, insufficient nailing, incorrect nails, incorrect subfloor construction. On glue down product, incorrect mastic, insufficient mastic, wrong trowel used, inadequate mastic transfer, subfloor separation, subfloor contamination.

CURE:

If caught early, spot repair/replacement may be possible. In many cases, however, pull, correct, and relay/replace is more practical.

PROBLEM #4

Normal cracks, separations between individual flooring pieces. Uniform and general through floor.

CAUSE:

Mother Nature. Dryness. As moisture caused problems 1, 2, & 3, the loss of moisture results in the most frequent reason for shrinkage of individual pieces and cracks. Should a floor have been exposed to problems 1, 2 & 3, then afterwards, “dried out”, cracks will develop. If subjected to extreme moisture, the edges of the wood (a vegetable made up of cells) can crush, and subsequent drying and shrinkage can present larger than normal cracks. Square edge (unbeveled) floors show cracks more than beveled. White, light, pastel finish show cracks more than darker wood-tone finished floors. Most cracks are seasonal – they show in dry months, or the cold season when heating is required, and close during humid periods. This type of separation and closing is considered normal. In solid 2 1/2” wide strip oak floors, dry time cracks may be the width of a dime’s thickness (1/32”). Wider boards will have wider cracks (and the reverse is true).

CURE:

Add moisture to the air space during dry periods. A constant Relative Humidity (RH) of 50% works in concert with the manufacture of wood floors to provide stability in the floor. Live with normal cracks or add humidity – it’s the owners’ choice. Easy ways – boil a pan of water on the stove, turn off bathroom exhaust fan, open dishwasher after rinse cycle, a pan of water in furnace fan compartment, hang laundry to dry in basement. Better yet, install humidifier to furnace controlled by a humidistat set at 50% RH. In dry and warm climates, add moisture (pan or humidifier) and run furnace “fan only”.

PROBLEM #5

Abnormal cracks – larger than normal, cluster or localized, end separation, not uniform and not general throughout, do not close up during humid months.

CAUSE:

Edge crush from prior exposure to extreme moisture, especially solid, flat grain flooring (and may be general throughout). If surface coated (such as polyurethane), edges of some adjacent pieces may be literally “glued” together, or panelized, and shrinkage cracks multiplied at the weakest points. (See note that follows) “Hot Spots” in the undersurface such as poorly insulated heating ducts, hot water plumbing lines, radiant heating system (if so, should be laminated products only), the new “Instant Hot Water” feature, register openings, heat from refrigerator motor, check nail spacing with stud finder. With adhesive applied floors, early foot traffic, incorrect adhesive, amount transferred or used (most noticed in traffic pattern).

 ” thick solid parquet with no return control (cork) in expansion space, generally indicated by center of the field is tight, with gaps around the walls. Note if there is a pattern to the cracks, such as 4’ x 4’ or 4’ x 8’ indicating subfloor changes or weakness. Glued over sheet vinyl may show 6’ cracks from shrinkage or loose vinyl. Does the pattern of cracks convey a relationship with foundation or slab cracks and/or settlement. Check nail spacing on solid products take wood moisture content reading and if it is within normal range for your market and the wood is undersize, drying was improper prior to manufacture. If wood MC is normal and wood is “on size” or over, the wood was wet prior to installation.

CURE:

In addition to obvious corrections suggested under “cause” (i.e., add insulation between heat ducts and subfloor for “hotspots”, pull, add adhesives, relay, adjust parquet, add expansion joint control, add cross bracing under weak subfloor), attempt to elevate the relative humidity in the air space and after sufficient time has passed to confirm that the problem has stabilized, fill the cracks with the appropriate color-matched fill. Re-coat if necessary. Last resort, pull and replace – note however, that if corrections are not made, chances are that replacement will develop the same problem.

NOTE: When a floor shows “panelizing” and a surface coat has been used, you might choose to sand then finish with seal and wax, or if surface finish is required, use a sealer first rather than the stronger finish directly on the new floor.

PROBLEM #6

Quality or “Grade” – knots, heavy color variation, out-of-square, surface defects.

CAUSE:

Consumer expectations, incorrect sampling, incorrect ordering, mistake by supplier, manufacturer, installer error (should not have installed).

CURE:

Pull and replace offending pieces. Review samples with owner.

PROBLEM #7

Excessive and Early wear on finish – scratches, traffic pattern.

CAUSE:

Improper maintenance, grit, water, strong soaps, dog toenails, chair legs.

CURE:

Correct maintenance, especially vacuum, not just broom sweep. Clip dog’s nails, felt chair leg glides, appropriate exterior walk-off mats to prevent grit, area rugs especially in from of kitchen sinks. Re-coat if necessary – owner pays.

PROBLEM #8

Loose, noisy, squeaky floor

CAUSE:

Inadequate nailing, flexing weak subfloor system, nailed over particleboard type subfloor. Check subfloor thickness and joist direction. Insufficient or incorrect adhesive. Subjected to excess moisture, excessive drying.

CURE:

Add face nails, counter-sink & putty. Strengthen subfloor from below. Inject adhesive or pull-add-relay. Lubricate squeaks with graphite, wax, baby powder. Wedge subfloor up from joists.

PROBLEM #9

Color – not right, changed

CAUSE:

Customer expectation, poor sampling, lighting over the floor and room colorings. Incorrect maintenance including residue of cleaners, waxes, etc. Wood itself changes color with age (“Patina”). Extreme hot sunlight through South/West facing windows. Color different under rugs or low furniture from lack of exposure. Bleaching is unpredictable – don’t oversell expected results.

CURE:

Compare with sample. Explain lighting and colors. Remove residue and correct maintenance procedures. Move rugs and colors will even out in time. Shade large windows.

PROBLEM #10

Dents – Yes, wood dents.

CAUSE:

High heels. Dropped heavy objects, metal tips on furniture legs. Unprotected rolling of heavy castered appliances such as refrigerator or freezer.

CURE:

Remove high heels or maintain proper heel-tip protectors. Provide large felt or rubber protectors under heavy furniture legs. Roll heavy casters over plywood protection only. For individual dents where wood fibers are not broken, cover with a dampened cloth and press with an electric iron to draw fibers up. Last resort sand and finish – owner pays.

PROBLEM #11

Stains/discoloration

CAUSE:

Water from spills, water from continual source leading to mildew (black) or decay (brown/white) or alkali (white) or bleeding up of adhesive. Urine (dark) from pets, wet diapers. Unprotected metal chair legs. Improper maintenance with water or harsh chemicals. Traffic pattern wear. Excessive harsh sunlight (wood looks starved near South or West facing windows). Light deprivation under area rugs, large low furniture. Be sure to observe if only one piece of flooring is affected, or does the stain continue across adjacent pieces.

CURE:

Correct water source, let dry. Minimize sunlight. Relocate area rugs. Correct maintenance procedures and products...Dark stains, lightly abraid surface with fine sandpaper, feather out area, dampen cloth with 50/50 household bleach & water and lay on stain for 30 minutes, remove, let dry, re-color if necessary. Waxed floors, clean with renovator or paint thinner (combustible) and re-wax. Whiteness/cloudy surface finish, clean and buff. If all fails, screen and coat, sand and refinish, replace severe boards.

PROBLEM #12

Slivers, Splinters

CAUSE:

Unevenness caused by expansion, cup, sub-floor irregularities, edge crushing from expansion, grain raise from moisture or water maintenance. Damage during installation (associated with nailing – prove with stud finder or magnet). Wind Shake, associated with annual rings only – springwood fracture. Beveled prefinished products. Wirebrushed products.

CURE:

If new floor is producing “fibers” not splinters (especially prefinished and wirebrushed, buff vigorously with commercial electric buffer and nylon polishing pad (accelerate the “break in” period). Slivered bevels, shave with razor knife, re-stain. Expansion, cup, grain raise – correct moisture source. Cut splinters away with razor knife at sound thick end, fill and finish. Wind Shake – if one or a few pieces – remove and replace - if numerous , sand and surface finish. Replace entire floor and contact the manufacturer.

PROBLEM #13

Finish Peeling – bubbles, blister

CAUSE:

Stain not dry. Excessive burnishing. Early coats not dry. Skipped screening between coats. Product incompatibility. Stain not sufficiently wiped leaving heavy pigment on surface (is finish peeling from finish or wood?), improper tack. Surface contaminated such as wax, or other maintenance product.

CURE:

If de-lamination from wood surface, sand and refinish. If surface only, screen and re-coat.

PROBLEM #14

Roughness

CAUSE:

Moisture from maintenance, spills, constant source, condensation causing surface grain raise. Poor sanding, edging, scraping. Contamination in finish during dry time.

CURE:

Correct moisture source. Lightly sand or screen. Re-coat.

PROBLEM #15

“Shell Out” of Springwood – uneven wear between segments of annual ring.

CAUSE:

Heavy traffic, repeated sliding of heavy furniture, hard casters, water in maintenance. Especially seen in laminated or peeled face products under desks with foot shuffle and caster wear.

CURE:

Sand and refinish with surface protection. Use desk mat chair protector. Change casters to wide non-marking gray rubber.

PROBLEM #16

Unevenness – Whole floor, not individual pieces.

CAUSE:

Wood joist system – subfloor warped and loose, joists warped or fractured, support pillars settled, perimeter foundation settlement.

Concrete slab system – slab cracked and settled.

CURE:

Correct, strengthen substructure, repair subfloor, splice joists, add joists. Structural, failure is not the wood floor contractors domain usually. Owner needs a general contractor for repairs prior to wood floor corrections.

PROBLEM #17

Gloss levels uneven in finish

CAUSE:

Insufficient mixing of finish prior to application, dirty contaminated applicator, uneven finish thickness, uneven sanding, uneven lighting illusion.

CURE:

Screen and re-coat. Illusion – view at different time of day, different lighting.

PROBLEM #18

Insects

CAUSE:

Termites, identified by eating corridors beneath surface which when weakened, the fragile surface sags. The bugs are white or cream colored. Subterranean type build sand tubes. Powderpost Beetles identified by 1/16" diameter perfect circle hole in surface of floor. Active infestation will show clean bright wood in holes with fine talcum powder like dust piles around the holes. Inactive holes are darkened, even show stain or finish on walls of the hole. When in doubt, collect sample bugs; consult exterminator, entomologist, or extension service, etc.

CURE:

Structure must first be rid of active termites by professional exterminator. Repair structural damage. Pull and replace damaged floorboards, sand and refinish. Heavy infestation of Powderpost Beetle, handle as above. When Powderpost is occasional, few boards especially in new floors, treat individual openings immediately with insecticide (from hardware or garden shop) injected by syringe into hole, or aerosol insect spray through a straw. Usually will not disturb finish. Have owner watch for new evidence (dust piles) and treat again. After 2-3 months holes may be filled.

Termites will not be associated with the flooring and costs will be the responsibility of the owner. Powderpost may be in new flooring materials. Immediately on first report notify your floor supplier. Prompt action by all will minimize costs involved. Check all surroundings for infected wood molding, furniture (especially bamboo and antiques). If old infestation is in other materials the owner must stand the costs involved in floor repairs.

PROBLEM #19

Maple with cross-grained brown marks

CAUSE:

"Sticker burn", a discoloration caused by "weathering" of the rough sawn maple lumber on stacking strips during the air drying period. Occurs across the width of strips, each mark _ to 1" wide, and about every 20" to 24" down the length of individual strips. Will not sand out.

CURE:

Don't install if marks will be a defect to the owner. Sticker burn is allowed in Second Grade maple, not allowed in First Grade. Clear waterborne finish will show burn more than ambering finish.

PROBLEM #20

Flooded Floors

CAUSE:

Standing water – a little or a lot.

CURE:

Immediate action to stop source, remove surface water, drain water from below if possible (drill subfloor) and elevate temperature, increase air flow (fans) to initiate immediately a drying environment. Dry from below in basement houses. Exhaust fans in crawl space homes. And wait. Make no repairs until moisture meter reading (top and bottom) is at the usual level for your area. If flooding was of long duration on surface finish floor, rough sanding removing the finish will accelerate drying.

When flooring is “stabilized” – not before!

1. If flat, fill if necessary, screen and re-coat or re-wax.
2. If cupped, sand flat, fill and finish.
3. If “tented”, loose from subfloor, repair areas or replace entirely.

Note that when floor construction is “plywood over concrete” as the subfloor, it is unlikely that the plywood will dry out, or the concrete below will dry out in any reasonable time and to a safe level for reinstallation or repair. Full removal to concrete is usually best, allowing the slab to dry, then replace.

One further note: Usually an insurance repair is involved with both an unknowledgeable agent or inspector/adjustor, and the owner pushing for a “quick-fix”. Don’t succumb to their pressure. Walk away from the job. Or get a full release for future responsibility.

PROBLEM #21

THE VACANT HOUSE – “Greenhouse Effect”

CAUSE:

Security conscious vacationers, a homebuilder’s unsold inventory, whenever a wood floor is deprived of an airflow in the environment, it can and will misbehave. Sunlight through windows generates heat, lowers humidity, moisture vapor enters to balance, nights cool off, humidity builds and wood floors cup. Thermostats set at 60 degrees and outside, winter howls, heating system runs constantly with no moisture added, and floors shrink

CURE:

Avoid problems by leaving windows “ajar”, have neighbor air the house out occasionally. Treat floors as discussed under cupped, tented, or shrinkage cracks – and only after environment returns to normal. Owner to pay.

APPENDIX

Tool and Equipment required for inspections:

Moisture meter (with 1/8” pins) calibrated for wood
Moisture meter (with 1 1/8” insulated pins), calibrated for wood
Sling psychrometer, or other for relative humidity
Tape measure
Pocket knife
Flashlight
Magnetic Stud Finder
Hammer
Blade Screwdriver
Phillips Screwdriver
1” Wood Chisel
Selection of 4d to 8d Finish Nails
Thin “feeler gauge”

BUILDER'S CHECKLIST

PRE-INSTALLATION EVALUATION OF THE JOBSITE

Job name _____
 Job address _____
 City _____ State _____ Zip _____
 Job telephone _____
 Jobsite superintendent _____
 I verify the jobsite is ready for wood flooring installation _____
 Date _____ (signature of jobsite superintendent)

UNTIL THE FOLLOWING GUIDELINES HAVE BEEN MET, THE JOBSITE IS NOT READY FOR A WOOD FLOORING INSTALLATION.

EXTERIOR CONDITIONS

Gutters and downspouts are properly placed to drain water away from the structure.

Yes _____

Soil surrounding the structure is graded properly to drain water away from the site.

Yes _____

INTERIOR CONDITIONS

All wet trades (drywall, plaster, paint, ceramic tile, etc.) have completed their work.

Yes _____

Air conditioning, heating and ventilation are complete and operating.

Yes _____

The building is enclosed and weather-tight, including all doors and windows in place.

Yes _____

The temperature and relative humidity within the structure are at "normal living conditions" — that is, temperature is between 60 and 80 degrees Fahrenheit and between 30 and 50 percent relative humidity.

Yes _____

Six-mil polyethylene (preferably black) has been installed and covers the entire ground area in the crawl space.

Yes _____

CONCRETE SLAB CONDITIONS

Concrete has been installed for at least 30 days.

Yes _____

If wood flooring is to be installed over a slab, the concrete is flat per specifications.

Yes _____

A vapor barrier has been installed under the slab.

Yes _____

Verified by _____

DELIVERY AND WORKING CONDITIONS

Proper electrical power is available.

120V _____ 220V _____

Driveway and sidewalks are paved.

Yes _____

MOISTURE CONDITIONS

Moisture content of the wood subfloor is no more than 4 percentage points above or below the finish flooring and is within regional moisture content guidelines.

Yes _____

Moisture testing of concrete slab began no sooner than 30 days after the slab was poured. Test results indicate that it is safe for wood flooring installation to begin.

Yes _____

What type of test was used? _____

What were the test results? _____

JOBSITE CHECKLIST

I. GENERAL INFORMATION

Owner's Name _____ Date _____
 Address _____
 Home phone _____
 Husband's work phone _____ Wife's work phone _____
 Cellular/car phone _____ Pager _____
 Jobsite address _____
 Jobsite visit appointment date _____ Time _____

II. TYPE OF JOB

Residential _____ Commercial _____
 New _____ Remodel _____

III. RESIDENTIAL USE INFORMATION

Traffic High _____ Average _____ Low _____
 Any special or unique use _____
 Project rooms/areas _____
 Project budget _____

IV. COMMERCIAL USE INFORMATION

Retail store _____ Restaurant _____ Office _____
 Bar _____ Other _____
 Traffic High _____ Average _____ Low _____
 High-rise Yes _____ No _____
 Freight elevator Yes _____ No _____
 Passenger elevator Yes _____ No _____
 Hours of access _____
 Power access _____
 Maintenance _____
 Maintenance company _____
 Phone _____
 Proximity of parking _____
 Cost of parking _____

V. INTERIOR

Relative humidity in air-space:
 Hygrometer ___% Sling psychrometer ___%
 HVAC units operable Yes _____ No _____
 If no, date to be operating _____
 Type of heat:
 Radiant _____ Baseboard _____ Radiator _____
 Forced air _____ Electric _____ Gas _____
 Wood-burning stove Heat ducts _____
 Overhead _____ Under floor _____

Insulated Yes _____ No _____

Humidity controls Yes _____ No _____

Thermostat setting
 First unit _____ F Second unit _____ F

Air conditioning Yes _____ No _____

Large window/sliding glass doors facing:
 East _____ South _____ West _____

Drapes Yes _____ No _____

Tinted glass Yes _____ No _____

Double-glazed/
 storm windows Yes _____ No _____

KITCHEN:

Instant hot water Yes _____ No _____

Refrigerator Yes _____ No _____

Icemaker Yes _____ No _____

Food freezer Yes _____ No _____

Dishwasher Yes _____ No _____

Other _____

MUD ROOM/LAUNDRY ROOM:

Clothes dryer
 vented outside Yes _____ No _____

Plumbing leaks _____

Ceiling stains _____

BATHROOM:

Bathroom exhaust Yes _____ No _____

Heated exhaust Yes _____ No _____

BASEMENT

Walls cracked Yes _____ No _____

Paint peeling Yes _____ No _____

Floor stained Yes _____ No _____

Damp Yes _____ No _____

Vented Yes _____ No _____

Rusty nails Yes _____ No _____

Sump pump Yes _____ No _____
 Condensation on cold-water lines Yes _____ No _____
 Musty smell Yes _____ No _____
 Heated Yes _____ No _____
 Air-conditioned Yes _____ No _____

Relative humidity in air-space:
 Hygrometer ___% Sling psychrometer ___%

VI. EXTERIOR

Building is over
 Basement ___ Crawl space ___ Slab ___

Relation of lot to street
 Above ___ Level ___ Below ___

Lot cut and fill Yes _____ No _____

Relation of lot to neighbor
 Above ___ Level ___ Below ___

Lot drainage away from foundation
 Yes _____ No _____

Shaded lot Yes _____ No _____

Gutters/downspouts Yes _____ No _____

Directed away Yes _____ No _____

Roof overhang Yes _____ No _____

Foundation perimeter:

Waterproof Yes _____ No _____

Soil damp Yes _____ No _____

Window wells-dry Yes _____ No _____

Planterbox Yes _____ No _____

Shrubs/flowers Yes _____ No _____

Comments _____

Yard established Yes _____ No _____

Recent Yes _____ No _____

Sprinklers/irrigation Yes _____ No _____

Excess watering Yes _____ No _____

Entry is:
 Step up ___ Level ___ Down ___

Swimming pool Yes _____ No _____
 In-ground ___ Above-ground ___

Distance from pool to foundation _____ feet

Drains in pool deck and/or patio Yes _____ No _____

Is street curb drain active Yes _____ No _____

CRAWL SPACE:

Distance from soil to subfloor _____

Condensation Yes _____ No _____

Musty smell Yes _____ No _____

Concrete slab Yes _____ No _____

Moisture barrier beneath concrete Yes _____ No _____

Dirt floor Yes _____ No _____

6- or 8-mil black poly cover over dirt Yes _____ No _____

15sf open vent per 1,000sf floor area Yes _____ No _____

Vents open Yes _____ No _____

Cross-ventilation Yes _____ No _____

VII. SUBFLOOR INFORMATION

(Reference NWFA Installation Guidelines, Section 2, Chapters 2-7 for approved subfloor.)

Existing wood type:

3/4-inch CDX plywood _____
 5/8-inch CDX plywood _____
 23/32-inch OSB underlayment grade _____
 Solid board _____
 Other _____

Renail Yes _____ No _____

Sand Yes _____ No _____

Damage Yes _____ No _____

Pet stains Yes _____ No _____

Rot Yes _____ No _____

Other subfloor repair _____

Average moisture content in flooring _____%

Average moisture content in subfloor _____%

Average moisture content in sleepers _____%

Average moisture content in joists _____%

In areas or seasons of extreme moisture conditions, check moisture content in:

Adjacent baseboard _____%
 Door trim _____%
 Wood threshold _____%

Paint/finish lines exposed Yes _____ No _____

Trim pieces dislodged Yes _____ No _____

SLAB:

Relate elevation of slab surface to exterior soil line +/- _____ inches

Slab tested for moisture before install
 Yes _____ No _____

What test _____

Results _____

New slab _____ Date poured _____

Existing slab _____ Age _____

Float/grind slab Yes _____ No _____

Install wood subfloor Yes _____ No _____

Moisture membrane Yes _____ No _____

VIII. FLOORING TYPES

Unfinished _____ Prefinished _____

Species _____

Size of flooring desired _____

Solid _____ Engineered _____ Floating floor _____

Strip _____ Plank _____ Parquet _____

INSTALLATION:

Glued _____ Stapled _____ Nailed _____

Stain color _____

Sealer _____

Finish _____

Number of coats _____

Trim and moldings _____

Special layout Yes _____ No _____

If yes, type _____

IX. SPECIAL REQUIREMENTS

NEW CONSTRUCTION:

Power 110 _____ 220 _____

Distance to pole _____

Booster Yes _____ No _____

Time schedule for installation _____

Other trades _____

Wet work completion _____

REMODEL:

Move furniture Yes _____ No _____

Special needs

Piano _____ Antiques _____ Appliances _____

Toilet _____ Other _____

(Note: Gas and water lines must be disconnected by customer or qualified personnel.)

Company responsible _____

Phone _____

Existing floor covering

Carpet _____ Sheet vinyl _____

Vinyl tile _____ Ceramic tile _____

Wood _____ Other _____

Do existing wall moldings

need to be removed Yes _____ No _____

Does the existing floor covering need

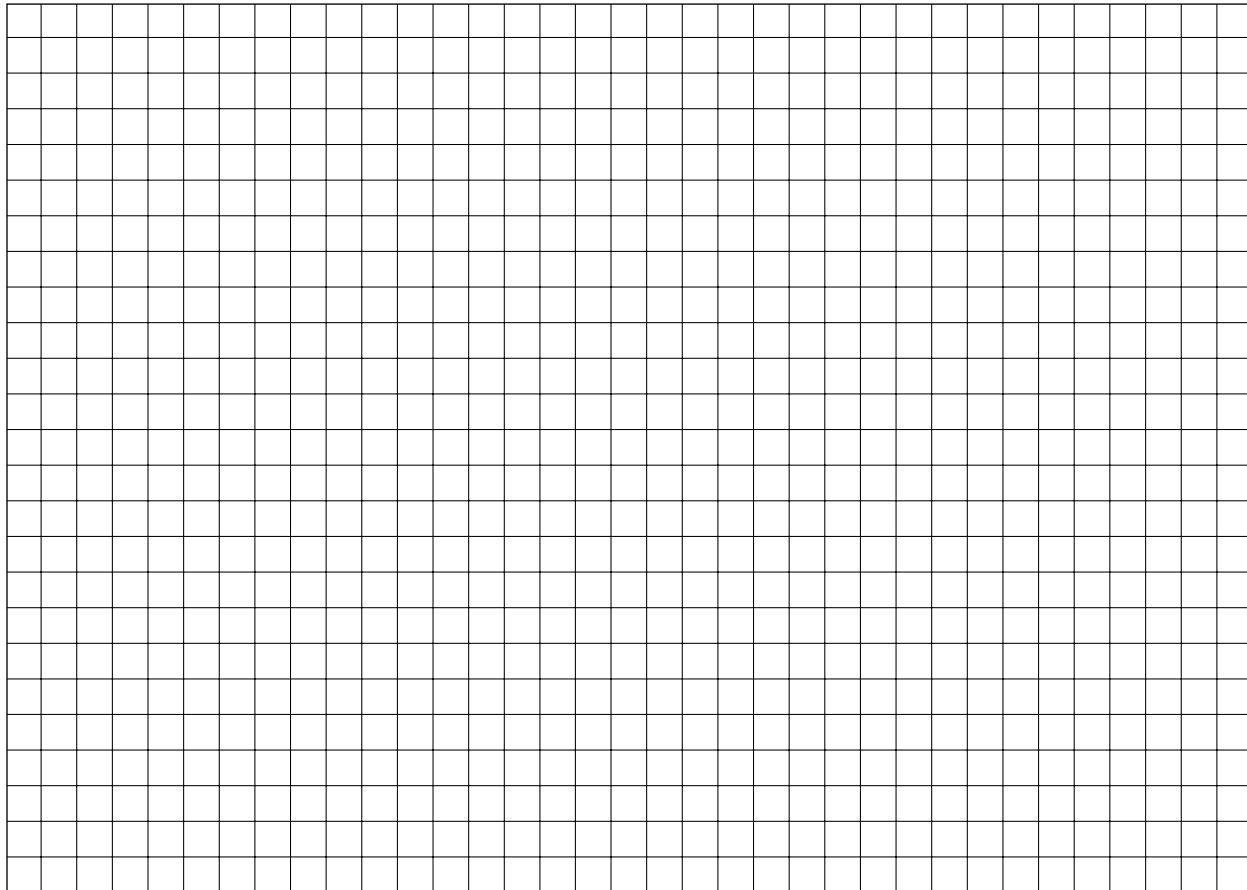
to be removed Yes _____ No _____

Note: If it appears that floor covering could contain asbestos, check with the dealer/contractor company for proper abatement procedures.

Who is responsible for removal of existing floor covering? _____

Who is responsible for trash disposal? _____

Use graph paper like that below to sketch the dimensions of the installation to scale.

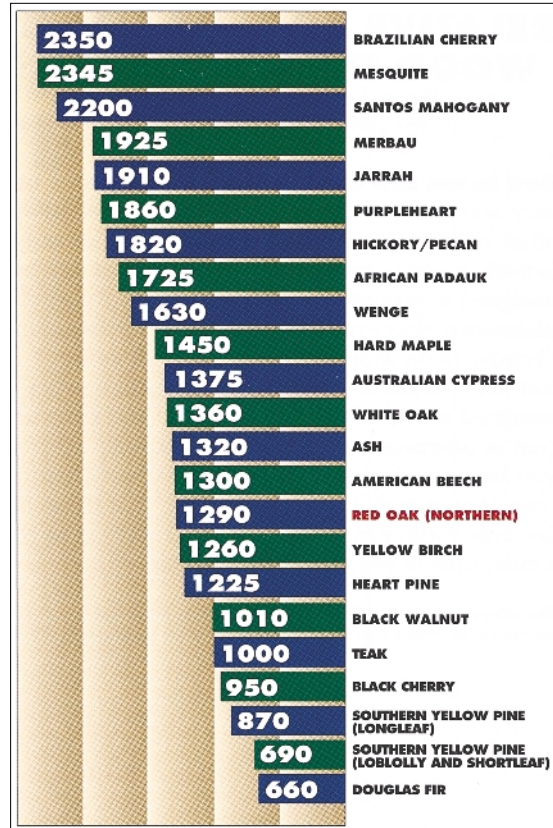


RELATIVE HARDNESS OF SELECTED WOOD FLOORING SPECIES

(Ranked by Janka hardness rating)

The Janka (or side) hardness test measures the force required to embed a .444-inch steel ball to half its diameter in wood. It is one of the best measures of the ability of a wood species to withstand denting and wear. By the same token, it is also a good indicator of how hard or easy a species is to saw or nail. Northern red oak, for example, has a Janka hardness rating of 1290. Brazilian cherry, with a rating of 2350, is nearly twice as hard. If you're accustomed to working with red oak and decide to tackle a job with Brazilian cherry, you can expect it to be much harder to cut and nail.

- Source: Hardness ratings for most species taken from Wood Handbook: Wood as an Engineering Material (Agriculture Handbook 72, Forest Products Laboratory, Forest Service, U.S. Department of Agriculture; revised 1987), except for Australian cypress, wenge, African padauk, merbau and Santos mahogany, which were provided by International Hardwood Flooring; heart pine by Mountain Lumber, and mesquite by Mesquite Products of Texas.
- Douglas fir rating is an average of ratings for Coast, Interior West and Interior North species.



RELATIVE STABILITY OF SELECTED WOOD FLOORING SPECIES

(Ranked by dimensional change coefficient)

The numbers in the chart reflect the dimensional change coefficient for the various species, measured as tangential shrinkage or swelling within normal moisture content limits of 6-14 percent. Tangential change values will normally reflect changes in plainsawn wood. Quartersawn wood will usually be more dimensionally stable than plainsawn.

The dimensional change coefficient can be used to calculate expected shrinkage or swelling. Simply multiply the change in moisture content by the change coefficient, then multiply by the width of the board.

Example: A mesquite (change coefficient = .00129) board 5 inches wide experiences a moisture content change from 6 to 9 percent — a change of 3 percentage points.

Calculation: $3 \times .00129 = .00387 \times 5 = .019$ inches.

In actual practice, however, change would be diminished in a complete floor, as the boards' proximity to each other tends to restrain movement.

The chart is best used for comparison.

* Although some tropical woods such as Australian cypress, Brazilian cherry, merbau and wenge appear in this chart to have excellent moisture stability compared to domestic oak, actual installations of many of these woods have demonstrated significant movement in use. To avoid problems later, extra care should be taken to inform potential users of these tendencies prior to purchase.



• Source: Stability ratings taken from Wood Handbook: Wood as an Engineering Material (Agriculture Handbook 72, Forest Products Laboratory, Forest Service, U.S. Department of Agriculture; revised 1987).

SECTION V

APPENDIX BA

GUIDE TO HARDWOOD FLOORING GRADES

OAK FLOORING GRADING RULES

NOFMA Clear Oak

A flooring product of mostly heartwood with a minimum number of character marks and discoloration, providing a uniform appearance while allowing for all heartwood natural color variations.

Will admit the following:

3/8" bright sapwood entire length of strip or equivalent if not extending further than 1" for 1/3 length of piece; small burls and fine pin worm holes; and equivalent characters such as small tight checks; in the absence of these, one thin brown streak 3" long to be allowed every 6".

Standard Packaging - Bundles to be 1-1/4' and longer; Average length, bundled or nested, 3-3/4'.

Shorter Packaging - Average length for 7' and shorter packages, nested or otherwise, 3-1/2'.

NOFMA Select Oak

A flooring product with coloration variations produced by differences of natural heartwood and sapwood, along with characters described.

The face may contain:

unlimited sound sapwood; slight imperfections in milling; a small tight knot every 3'; pin worm holes; burls and a reasonable amount of slightly open checks. Brown streaks should not extend the entire length of a piece. Two flag worm holes to every 8' are permitted. Slight imperfections in face work (torn grain) admitted. An intermittent, brown machine burn across the face not exceeding 1/4" width admitted. Also, a slight quantity of bark on the back or sides admitted. Will admit pieces with 1/2 tongue. Spot filling is generally required for open characters.

Standard Packaging - Bundles to be 1-1/4' and longer; Average length, bundled or nested, 3-1/4'.

Shorter Packaging - Average length for 7" and shorter packages, nested or otherwise, 3'.

NOFMA No. 1 Common Oak

A flooring product which contains prominent variations in coloration and varying characters.

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The following are not admitted:

broken knots over 1/2" in diameter, large grub worm holes, and splits extending through the piece. Open characters such as checks and knot holes are admitted, but must be sound and readily fill. Not more than 20" scant stock in thickness allowed to every 5'. Minor imperfections in machining permitted. Shall admit sticker stain; varying wood characteristics, such as flag worm holes, heavy streaks, checks, and worm holes; and as occasional dark machine burn across the face not exceeding 1/2" wide, 1/64" deep and not more than two each 3' 1/4 tongue allowed. Extremely dark pieces are not to be included.

Standard Packaging - Bundles to be 1-1/4' and longer; Average length, bundled or nested, 2-3/4'.

Shorter Packaging - Average length for 7' and shorter packages, nested or otherwise, 2-1/2'.

NOFMA No. 2 Common Oak

May contain sound natural variations of the forest product and manufacturing imperfections. The purpose of this grade is to furnish a floor suitable for homes, general utility use, or where character marks and contrasting appearance is desired.

The following are not admitted:

shattered or rotten ends, large broken knots, excessive bad millwork, shake, advanced rot, and similar unsound defects. Dark machine burns exceeding 3/64" deep not admitted. Knot holes and open characters which will readily fill are admitted. A limited number of pieces with no tongue which may be face nailed are admitted.

Standard Packaging - Bundles to be 1-1/4' and longer; Average length, bundled or nested, 2-1/4'.

Shorter Packaging - Average length for 7' and shorter packages, nested or otherwise, 2'.

NOFMA 1-1/4' ft. SHORTS OAK

Pieces 9" to 18" long are to be bundled together and designated as 1-1/4' Shorts. Pieces graded NO. 1 COMMON, SELECT and CLEAR to be bundled together and designated NO. 1 COMMON & BETTER with pieces grading NO. 2 COMMON bundled separately and designated as such. Although pieces 6" under and only 3" over the nominal length of the bundle may be included, the pieces must average 1-1/4' which is achieved through the natural preponderance of longer lengths.

BEECH (*Fagus grandifolia*)

BIRCH (*Betula alleghaniensis* B. *lenta*)

& HARD MAPLE (*Acer saccharum*)

GRADING RULES

Appendix BA, Guide to Hardwood Flooring Grades

NOFMA recognizes 3/4", 25/32" and 33/32" as standard thickness for the manufacturer of Hard Maple, Beech, and Birch flooring. NOFMA members may, at their option, produce either 25/32" or 3/4" thick Hard Maple, Beech and Birch flooring.

NOFMA Select and better Beech, Birch & Hard Maple

Shall have the face practically free of all defects, but the natural color of the wood shall not be considered a defect. The highest standard grade, combines appearance and durability.

Will admit the following:

variations in the Natural Color of the wood (with use of some finishes, slight shadows and color variation may appear); an occasional small, firm Pin Knot, not over 1/8" in diameter, provided it does not occur on edges or ends of strips; occasional dark Green or Black Spots or Streaks not over 1/4" wide and 3" long (or its equivalent) which may contain a tight check not over 1/2" long, provided it is boxed within the piece; Bird's Eyes and small Burls; slightly Torn Grain or similar defect which can be readily removed by the ordinary method of sanding the floor after it is laid; slightly Shallow Place not over 12" long on underside of the flooring if it does not extend to either end of the piece. Pieces with 1/2 Tongue for no more than 25% of the length are allowed. The wood must be sound and free of Shake. Bark Streaks shall not be permitted.

Bundles shall be 1-1/4' and longer through 7' or 8' as the stock will produce. Not over 55% of the total footage shall be in bundles under 4'; Not more than 25% of the total footage shall be in 2' bundles, and not more than 10% of the footage shall be in 1-1/4' bundles.

Nested bundles: Maximum average number of pieces under 1-1/4' shall be 8 pieces. Average length is 3'.

NOFMA No. 1 common Beech, Birch & Hard Maple

A floor with varying wood characteristics and colors to include distinct color variations, numerous Streaks, stained Sapwood, sound Knots, and Checks. All defects must readily fill.

Will admit the following:

sound tight Knots, provided they do not occur on edges or ends of strips; slight Imperfections in machining; distinct Color Variations; Sticker Stain/Shadow; numerous dark Green or Black Spots or Streaks, provided they do not occur in combination with predominantly dark heartwood; slight Checks not exceeding 3" in length (may be slightly open) and running parallel with and well inside the edges and ends of the strips; dark Spots or Streaks with slight Checks in center; small Rough Spots (Torn Grain) which

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cannot be wholly removed by ordinary method of sanding the floor after it is laid; slightly Torn Edges; Short Tongue if sufficient to hold properly in the floor; Shallow or Wane Back, if piece has sufficient bearing of full thickness to support it in the floor; small bark Streaks where bark is as sound as surrounding wood; and slight variation in Angle of End Matching. The face shall be free of Shake and wood must be sound.

Bundles shall be 1-1/4' and longer through 7' or 8', as the stock will produce. Not over 60% of the total footage shall be in bundles under 4'; not more than 27% of the total footage shall be in 2' bundles; and not more than 15% of the footage shall be in 1-1/4' bundles.

Nested bundles: Maximum average number of pieces under 1-1/4' shall be 12 pieces. Average length is 2-3/4'.

NOFMA No. 2 common Beech, Birch & Hard Maple

Must be of such character as will lay and give a good serviceable floor. The wood must be firm, serviceable and may contain all defects common to Maple. Pieces with 1-1/4' full Tongue admitted.

Third Grade will not admit:

Knot Holes over 3/8" in diameter or unsound Knots where the unsound portion is over 1" in diameter; Voids on Ends or Edges; or Shake, Heart Checks, badly Split Ends and Imperfections in Manufacture which would materially impair the serviceability of the floor.

Bundles shall be 1-1/4' and longer through 7' or 8', as the stock will produce. Not over 85% of the total footage shall be in bundles under 4'; and not more than 55% of the total footage shall be 1-1/4' bundles.

Nested bundles: Maximum average number of pieces under 1-1/4' shall be 42. Average length 2-1/4'.

NOFMA No. 1 common and better Beech, Birch & Hard Maple

A combination of FIRST GRADE and SECOND GRADE developing from the production run. The lowest grade pieces admissible shall not be less than SECOND GRADE.

Bundles shall be 1-1/4' and longer through 7' or 8' as the stock will produce. Not over 60% of the total footage shall be in bundles under 4'. Not more than 27% of the total footage shall be in 2' bundles; and Not more than 15% of the footage shall be 1-1/4' bundles.

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Nested bundles: Maximum average number of pieces under 1-1/4' shall be 12 pieces. Average length 2-3/4'.

NOFMA No. 2 common and better Beech, Birch & Hard Maple

A combination FIRST GRADE, SECOND GRADE, and THIRD GRADE developing from the production run. The lowest grade pieces admissible shall not be less than THIRD GRADE.

Bundles shall be 1-1/4' and longer through 7' or 8', as the stock will produce. Not over 60% of the total footage shall be in bundles under 4'.

Nested bundles: Maximum average number of pieces under 1-1/4' shall be 42. Average length 2-1/4'.

SPECIAL GRADES FOR BEECH, BIRCH & HARD MAPLE

NOFMA Clear White Maple Hard Maple

Is special stock, selected for uniformity of color. It is almost ivory white and is the finest grade of Hard Maple flooring that can be produced. Sapwood/Heartwood pieces must have 95% Sapwood on the face. Strips must be free from stain and Heartwood portion must be nearly white. All FIRST GRADE rules apply.

EXCEPTIONS: Streaks- should be light brown or light green, not over 1/4" wide and 3" long (or equivalent), one per 3'. Black Spots, Sticker Stain/Shadow, not admitted.

NOFMA Clear Red Beech & Birch

Are special grades produced from all red faced stock, and are specially selected for color. The color is rich, being a soft tint which lends these two woods an individuality found in no other species. Strips must have 95% red faced characteristics. All FIRST GRADE rules apply.

EXCEPTIONS: Streaks- should be light brown, Black Spots, Sticker Stain/Shadow, not admitted.

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HICKORY/PECAN GRADING RULES

NOFMA Select and better

Hickory / Pecan

Shall have the face practically free of all defects, but the natural color of the wood shall not be considered a defect. The highest standard grade, combines a nearly uniform appearance with exceptional durability.

The following characters are admitted:

variations in the Natural Color of the wood, Heartwood and Sapwood; an occasional small, firm Pin Knot or Bird Peck, not over 1/8" in diameter, provided it does not occur on edges or ends of strips; dark Streaks not over 1/4" wide and 3" long (or its equivalent one for every 3 ft. in length); slight Checks not over 1/2" long, provided Check is boxed within the piece; small Burls; slight Torn Grain or slight intermittent Machine Burn, or similar defect which can be readily removed by the ordinary method of sanding the floor after it is laid; A slightly Shallow Place not over 12" long on underside of the flooring if it does not extend to either end of the piece. Pieces with 1/2 tongue for no more than 25% of the length are allowed. The wood must be free of Shake. Bark Streaks shall not be permitted.

Packaging: 8' or shorter, Nested or Bundled. Pieces/Bundles shall be 1-1/4' and longer through 7' or 8' as the stock will produce (9" Minimum, 102" Maximum). Average length 3 1/4'. Average length for 7' and shorter packages, nested or otherwise - 3'.

NOFMA No. 1 common

Hickory / Pecan

A floor with varying wood characteristics and colors to include heavy Streaks, stained Sapwood, sound Knots, Checks and small Splits. All defects must readily fill and be sound.

The following characteristics are admitted:

Broken Knots up to 1/2" in diameter; distinct Color Variations (predominantly dark, discolored pieces not allowed); Sticker Stain/Shadow; numerous dark Streaks or black spots; Checks to 1/16" not exceeding 3" in length, and running parallel and well inside the strip edges; small End Split 1/16" x 1/2" showing no movement; Bird Pecks to 1/2" where bark is sound and as hard as surrounding wood.

Minor imperfections in machining permitted; Torn Grain (less than 1/16" deep and 3" long for full width); slightly Torn Edges; and an occasional dark Machine Burn 1/2" in width (1 per 3').

Will admit pieces with 1/2 full Tongue entire length of piece.

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Packaging: 8' or shorter, Nested or Bundled. Pieces/Bundles shall be 1-1/4' and longer through 7' or 8' as the stock will produce (9" Minimum, 102" Maximum). Average length 2-3/4'. Average length for 7' and shorter packages, nested or otherwise- 2-1/2'.

NOFMA No. 1 common and better Hickory / Pecan

A combination of FIRST GRADE and SECOND GRADE developing from the production run. The lowest grade pieces allowed are SECOND GRADE.

Packaging: 8' or shorter, Nested or bundled. Pieces/Bundles shall be 1-1/4' and longer through 7' or 8' as the stock will produce (9" Minimum, 102" Maximum). Average length 2-3/4'. Average length for 7' and shorter packages, nested or otherwise-2-1/2'.

NOFMA No. 2 common Hickory / Pecan

Must be of such character as will lay and give a good serviceable floor. The wood must be firm, and may contain defects of every character. This grade is intended to give a "rustic" appearance.

The following defects are not allowed:

Knot Holes over 3/8" in diameter or unsound Knots where the unsound portion is over 1" in diameter (the unsound portion can not extend through piece); Shake, Soft Rot, Splits and open defects which extend through piece or show movement; Torn Grain more than 1/4" deep; Edge Splinters; and Imperfections in Manufacture which would materially impair the serviceability of the floor.

Knot Holes, Bird Pecks, Worm Holes, and the like which will readily fill are admitted. Pieces with 1/4 full tongue admitted.

Packaging: 8' or shorter, Nested or bundled. Pieces/Bundles shall be 1-1/4' and longer through 7' or 8' as the stock will produce (9" Minimum, 102" Maximum). Average length 2-1/4'. Average length 7' and shorter packages, nested or otherwise-2'.

NOFMA No. 2 common and better Hickory / Pecan

A combination of FIRST GRADE, SECOND GRADE, and THIRD GRADE developing from the production run. The lowest graded pieces allowed are THIRD GRADE.

Packaging: 8' or shorter, Nested or bundled. Pieces/Bundles shall be 1-1/4' and longer through 7' or 8' as the stock will produce (9" Minimum, 102" Maximum). Average length 2-1/4'. Average length for 7' and shorter packages, nested or otherwise-2'.

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SPECIAL GRADES

Hickory / Pecan

NOFMA Clear Red

Hickory / Pecan

Is a special stock selected for its deep red/brown color with the minimal contrast of lighter Sapwood.

Face of pieces shall be Heartwood (95%).All First Grade Rules apply.

NOFMA Clear White

Hickory / Pecan

Is special stock selected for its creamy color with the minimal contrast of the darker Heartwood. The face of pieces shall be bright Sapwood (95%). All First Grade Rules apply.

EXCEPTIONS: Streaks should be light brown not over 1/4" wide and 3" long (or equivalent) one per 3'. Black Spots not allowed,Sticker Stain/Shadow none allowed.

NOFMA No. 1 common red

Hickory / Pecan

Is special stock selected for minimal contrasting lighter Sapwood. The face of pieces shall be Heartwood (85%).All Second Grade rules apply.

ASH GRADING RULES

NOFMA CLEAR ASH

The face shall be practically free of defects

The following characters are admitted:

Small burls (less than 1/8" diameter; Fine pin worm holes with no discoloration (1 for every 3' in length); or in the absence of these,one (1) thin light brown streak (3' long to be allowed for every 6' of length or equivalent

Brown Heartwood is allowed as follows: 3/8" entire length or one 1" for one-third the length of the strip

Clear Ash is usually chosen for it's light color. Bundles to be 1-1/4' and up. Average length (Standard Packaging) 3-3/4'. Average length for shorter packaging, nested or otherwise, 3-1/2'.

NOFMA SELECT ASH

The face shall contain mostly Sapwood, unstained.

The following characters are admitted:

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Narrow streaks not running entire length of the strip; Pin worm holes (up to 3 every 3' in length); Imperfections in milling (Torn grain) which will sand out; One (1) small tight knot (1/4' in diameter) to every 3' in length; Small pith fleck (less than 1/4" diameter); An intermittent brown machine burn across the face not exceeding 1/4" in width; and Unlimited cambium miners.

Brown Heartwood is allowed as follows: 3/8" entire length or 1" for one-third the length of the strip.

Will admit pieces with 1/2 tongue. Most defects are lost sight of after the floor is laid and finished, giving a good appearance

Bundles to be 1-1/4' and up. Average length (Standard Packaging) 3-1/4'. Average length for Shorter Packaging, nested or otherwise, 3'.

NOFMA NO. 1 COMMON ASH

A floor with varying wood characteristics such as Heavy streaks, Stained sapwood, and Sound knots typical of this grade. All defects must readily fill and be sound

The following characters are admitted:

Broken knots up to 1/2" in diameter; Pith flecks less than 3/16" in diameter; Worm holes up to 3/16" in diameter; Checks and End splits less than 1/16" in depth wide and not extending through the piece and Sticker stain

Minor imperfections in machining permitted Torn grain (not over one-fourth (1/4) of the surface, less than 1/16" in depth); One (1) dark machine burn across the face for every 3' of length not exceeding 1/2" in width, 1/64" in depth.

Will admit pieces with 1/4 tongue. Bundles to be 1-1/4' and up. Average length (Standard Packaging) 2-3/4'. Average length for Shorter Packaging, nested or otherwise, 2-1/2'.

NOFMA NO. 2 COMMON ASH

Defects of every character admitted, but should lay a serviceable floor.

The following defects are NOT allowed:

Soft rot; Broken knots where the unsound portion extends through the piece; Torn grain over 3/16" in depth; Splits and Open defects extending through the piece; Shake and Pith flecks that are soft if over 1/4" in diameter.

Knot holes and defects which will readily fill are admitted.

A limited number of pieces with no tongue and limited number of pieces that are thin (scant) in thickness but will End Match admitted. Bundles to be 1-1/4' and up Average length (Standard Packaging) 2-1/4'. Average length for Shorter Packaging, nested or otherwise, 2'.

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PREFINISHED SOLID OAK FLOORING GRADING RULES

White Oak and Red Oak in STANDARD & BETTER Grades with a natural coloration to be separated. All other colors and grades may be mixed Red Oak and White Oak. Grades are established after the flooring has been sanded and finished.

NOFMA PRIME PREFINISHED OAK

This is the top grade and the overall appearance shall be good. The face of strips shall be selected for appearance after finishing. This grade includes characteristics found in the unfinished grades of CLEAR and SELECT.

The following characters are admitted:

Unlimited Sapwood and the natural variations of color; Occasional small Burls; Light brown Streaks not more than 1/8" in width and 6" in length or the equivalent; an occasional very small tight 1/8" Knot; and limited 1/32" fine Pinworm Holes may be included in any one piece when properly filled. Will not admit pieces with less than 3/4 full tongue.

Minimum average length 3-1/4'. Bundles 1-1/4' and up.

NOFMA STANDARD PREFINISHED OAK

The face of strips may contain sound wood characteristics which are even and smooth after filling and finishing. This grade includes some characteristics found in the unfinished grades: SELECT, NO. 1 COMMON, and NO. 2 COMMON.

The following characters are admitted:

Worm holes; Season and Kiln Checks, Broken Knots up to 3/8" in diameter; minor imperfections in machining; Tom Grain and Burns. Other characters will be admitted if they do not impair the soundness of the floor. All larger admitted open characters are to be properly filled and finished. Limited unfinished/unfilled small open grade characters permitted.

Large Grub Worm Holes, Splits extending through the piece, Shake and similar unsound defects not admitted.

For naturally finished coloration- All the varying color characteristics of the wood admitted to include: Sticker Stain, and Dark Streaks up to 3/8" in width not to exceed 1" in length for each lineal foot.

For stained finishes- All varying colorations and streaks permitted, predominantly dark boards not permitted.

Minimum average length 2-1/2'. Bundles 1-1/4' and up.

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NOFMA STANDARD & BETTER PREFINISHED OAK

A combination of PRIME and STANDARD grade developing from the production run.

Minimum average length 2-1/2'. Bundles 1-1/4' and up.

NOFMA TAVERN PREFINISHED OAK

Should lay a serviceable floor.

A limited amount of unfilled/unfinished open characters admitted. A limited amount of pieces with finish irregularities such as bubbles, small skips, lines, stain/color variation, surface handling scratches, minor trash, and the like are allowed.

The following characters are NOT admitted: Mis-manufactured boards; Shattered or Rotten ends; large open knots and other unsound defects of a similar nature; Pieces with less than 1/4 full tongue.

Minimum average length 2'. Bundles 1-1/4' and up.

NOFMA TAVERN & BETTER PREFINISHED OAK

A combination of PRIME, STANDARD, and TAVERN grades developing from the production run.

Minimum average length 2'.