Designation: D 6958 – 03

Standard Test Methods for Evaluating Side-Bonding Potential of Wood Coatings[1]

This standard is issued under the fixed designation D 6958; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 These test methods describe an evaluation procedure for the determination of undesirable side-bonding of coatings for wood flooring. They provide two mechanical properties tests for the quantitative determination of the cohesive strength of wood coatings (tensile and lap shear); they also provide a wood floor simulation test for the qualitative determination of side-bonding potential of wood coatings.

1.2 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*

D 9 Terminology Relating to Wood

D 2370 Test Method for Tensile Properties of Organic Coatings

D 4444 Test Methods for Use and Calibration of Hand-Held Moisture Meters

2.2 *British Standards:*

BS1204 British Standard Test for Synthetic Resin Adhesives[2]

2.3 *Maple Flooring Manufacturers Association (MFMA):*[3]

Guide Specification for Double Plywood Floor System

Guide Specification for Sleeper and Sleeper with Plywood Floor Systems

2.4 *National Oak Flooring Association (NOFMA):*[4]

Cracks in Hardwood Floors

2.5 *National Wood Flooring Association (NWFA):*[5]

Hardwood Floors Trouble Shooting Manual

3. Terminology

3.1 Definitions used in these test methods are in accordance with terminology used in Terminology D 9. A few related terms not covered in these test methods are as follows:

3.1.1 *panelization*—adjacent boards acting as a composite panel instead of individual strips when subjected to changes in temperature and humidity as well as other site conditions.

3.1.2 *panelization failure*—the condition where localized excessive gaps beyond specified limits develop between some strip flooring boards due to panelization.

3.1.3 *percent wood failure*—the rupturing of wood fibers in strength tests on bonded specimens usually expressed as the percentage of total area involved, which shows such failure. The inverse of adhesive failure.

3.1.4 *side-bonding*—the bonding of adjacent strips of wood flooring caused by the floor coating resulting in panelization. This is one possible cause of panelization failure.

3.1.5 *side-bonding wood failure*—the failure of the wood within a strip, as in classic wood failure, when the movement of the strip within the floor is restrained from moisture-related movement by excessive side-bonding. In this situation, the toughness or "work-to-break" of the side-bonding is sufficient to overcome the tensile strength perpendicular to the grain of the wood strip.

3.1.6 *tensile stress (nominal)—as used in Test Method D 2370*, the load per original unit area at which a specimen fails or yields in a tension (pull) test.

SECTION I—MECHANICAL PROPERTIES TESTS

TEST METHOD A—MAPLE BLOCK TENSILE STRENGTH TEST

4. Significance and Use

4.1 This test method was originally designed as a means of quantitatively measuring the level of adhesion of the wood-wood interface caused by a wood coatings system applied to the substrate. The tensile test is useful in measuring bonding strength of coatings, such as gymnasium coatings, in which the wood strip flooring primarily expands or contracts in response to changes across the cross-sectional width of the strip floor.

[1] These test methods are under the jurisdiction of ASTM Committee D07 on Wood and are the direct responsibility of Subcommittee D07.01 on Fundamental Test Methods and Properties.

Current edition approved Oct. 1, 2003. Published December 2003.

[2] British Standards Institute (BSI) 389 Chiswick High Rd., London, W4 4AL, UK.

[3] MFMA, 60 Revere Dr., Suite 500, Northbrook, IL 60062.

[4] NOFMA, P.O. Box 3009, Memphis, TN 38173-0009.

[5] NWFA, 111 Chesterfield Industrial Boulevard, Chesterfield, MO 63005.

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"PANELIZATION"

"Panelization" is a condition where localized excessive cracks develop between some strip flooring boards while adjacent boards remain tightly bonded together with no apparent separations. "Panelization" (or "sidebonding") is definitely not a new problem. It has, however, gained increasing attention as new EPA V.O.C. regulations have begun to affect the availability of traditional oil-based floor finishing products in many areas of the country.

While the development of "panelization" is certainly not limited to one brand of finish or to one particular subfloor design, the problem has been most closely associated with the use of water-based sealers and finishes on raw (untreated) maple strip flooring in areas of the country that experience distinctly different seasonal moisture conditions.

MFMA cautions installers and end-users that the use of some water-based finishes has produced a sidebonding effect that can result in localized excessive and irregular separations ("panelization") between maple flooring strips. We strongly recommend that end-users, project architects and specifiers consult with their flooring installer and finish manufacturer to obtain approved procedures for sealing and finishing a raw maple strip floor with water-based products.

If you have additional questions, please contact MFMA's Technical Director at 847-480-9138.

Rev. February 2005

paneliz.doc

Printable Version

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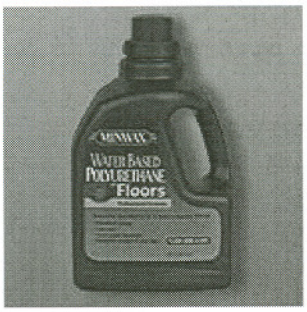

Minwax® Water Based Polyurethane for Floors

A professional, durable protective finish specifically formulated for hardwood floors. It gives long-lasting protection and beauty to floors in a super fast-drying, easy to apply formula that levels to a smooth, even sheen.

Description | Directions | FAQ

Sheens:	Floor Satin, Floor Semi-Gloss, Floor Gloss
Application tool:	Lambswool or synthetic pad applicator, or a natural bristle brush
Location:	Interior wood floors
Recoat:	At least 2 hours
Clean up:	Water
Coverage:	500 - 700 square feet per gallon
Coats:	3
Recommended uses:	Hardwood floors

Minwax® Water Based Polyurethane for Floors provides the superior durability and warm richness of traditional polyurethane. But because it's water-based, it has little odor, dries quickly and cleans up with warm water. Most projects can be completed in one day!

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Minwax® Fast-Drying Polyurethane

Among the most durable of protective coatings, Minwax® Fast-Drying Polyurethane offers exceptionally long-lasting beauty on both finished and unfinished wood.

Description	Directions	FAQ

Sheens:	Gloss, Semi-Gloss, Satin
Application tool:	natural bristle brush, foam brush, or lambswool applicator
Location:	interior wood surfaces
Recoat:	after 4-6 hours
Cleanup:	mineral spirits or paint thinner
Coverage:	125 sq. ft. per quart
Coats:	2-3
Recommended uses:	furniture, doors, cabinets and floors

DESCRIPTION: Minwax® Fast-Drying Polyurethane is a clear, hard finish that dries fast to protect and beautify interior wood surfaces such as furniture, cabinets, molding, and doors. Minwax® Fast-Drying Polyurethane's long-lasting protective finish makes it ideal for use on hardwood, softwood, and parquet. For exterior wood surfaces, we recommend Minwax® Helmsman® Spar Urethane. For floor projects, you may want to consider the added benefits found in Minwax® Super Fast-Drying Polyurethane for Floors.

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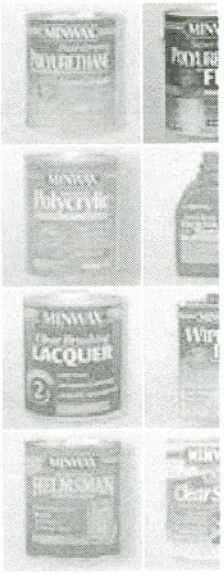
Minwax® Super Fast-Drying Polyurethane for Floors

A durable protective finish specifically formulated for hardwood floors. It gives long-lasting protection and beauty to floors in a super fast-drying, easy to apply formula that levels to a smooth, even sheen. Its optimized drying technology provides a 25% faster dry time than regular polyurethanes, and does not require sanding between coats.



Description	Directions	FAQ

Sheens:	Satin, Semi-Gloss, Gloss
Application tool:	Lambswool or synthetic pad applicator, or a natural bristle brush
Location:	Interior wood floors
Recoat:	After 3-4 hours
Cleanup:	Mineral spirits or paint thinner
Coverage:	Approximately 600-700 sq. ft. per gallon
Coats:	2-3
Recommended uses:	Hardwood floors

Description: Minwax® Super Fast-Drying Polyurethane for Floors is a clear, oil-based, durable protective finish specifically formulated for use on hardwood floors. Its professional formula, designed both for Do-It-Yourselfers and contractors, provides the superior durability for hardwood floors that you expect from polyurethane. Its optimized drying technology provides a 25% faster dry time than regular polyurethanes, and does not require sanding between coats. You can complete your floor top-coating project in just one day! It applies more easily than regular polyurethane on floor surfaces, with an advanced anti-settling formula that needs less stirring and has fewer "highs and lows", resulting in an even sheen across the floor surface.

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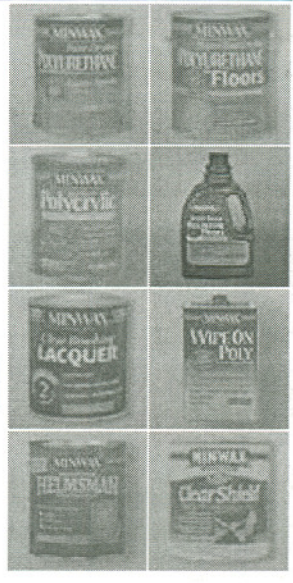
Minwax® Water Based Polyurethane for Floors

A professional, durable protective finish specifically formulated for hardwood floors. It gives long-lasting protection and beauty to floors in a super fast-drying, easy to apply formula that levels to a smooth, even sheen.



Description | Directions | FAQ

Q. How durable is Minwax® Water Based Polyurethane for Floors?

Water Based Polyurethane for Floors provides durability that is comparable to oil-based polyurethanes. It is significantly more durable than most water-based finishes available to consumers. In fact, independent laboratory tests show that Minwax® Water Based Polyurethane for Floors is 2-4 times more durable than leading retail water-based brands.

Q. What is the difference between Minwax® Water Based Polyurethane for Floors and Minwax® Super Fast-Drying Polyurethane for Floors?

While both products provide superior durability for protecting hardwood floors, Water Based Polyurethane for Floors has little odor, dries in 2-3 hours and application tools clean up with warm water.

Q. How do I prepare a floor prior to applying Minwax®Water Based Polyurethane for Floors?

The method for preparing the floor will depend on the condition of the existing finish:

Floors that Need a Complete Refinishing:
If the surface has begun to crack, peel, or chip, or is completely worn away in areas, it must be sanded down to bare wood. Begin sanding with very coarse sandpaper (40-60 grit), working to medium-grade (80 grit) and finishing with fine-grade (100 grit) sandpaper. If the floor is not going to be stained, follow with 120-grit sandpaper. After sanding, remove all sanding dust. Next, the wood must be sealed using one of two methods. If you want to add color, apply Minwax® Wood Finish™. If you do not want to add color, first apply Minwax® Water Based Polyurethane Base Coat. The floor is now ready for Water Based Polyurethane for Floors.

Sand and Recoat:
For previously finished wood in good condition, sand the floor lightly with 120 grit sandpaper, being careful to abrade the surface only. Note: If any bare wood has been exposed, you must apply Minwax® Water Based Polyurethane Base Coat. Remove all sanding dust. The floor is now ready for Water Based Polyurethane for Floors.

New Wood Floors:
Sand lightly with 100-grit sandpaper. If the floor is not going to be

stained, follow with 120-grit sandpaper. Remove all sanding dust. Next, the wood must be sealed using one of two methods. If you want to add color, apply Minwax® Wood Finish™. If you do not want to add color, first apply Minwax® Water Based Polyurethane Base Coat. The floor is now ready for Water Based Polyurethane for Floors.

Q. Can I Sand & Recoat a floor that was previously finished with an oil-based polyurethane?

A. Yes, as long as the floor is prepared following the label directions.

Q. How should Minwax®Water Based Polyurethane for Floors be applied?

A. Invert the container 10-12 times before and occasionally during use to ensure that the product is properly mixed. To avoid creating bubbles in the finish, do not shake the container. Apply a thin coat of Water Based Polyurethane for Floors using a synthetic pad or lambswool applicator. Maintain a wet edge to avoid lap marks. Detailed directions for application are found on the product labels.

Q. How many coats do I need to apply to protect my floor?

A. Three coats of Water Based Polyurethane for Floors are recommended. Additional coats may be applied for added durability.

Q. Is sanding required between coats?

A. Water Based Polyurethane for Floors should be sanded between the last two coats only. This process is common with water-based floor finishes, especially those available to professional contractors. Water-based finishes, such as Minwax®Water Based Polyurethane for Floors, are applied in very thin coats. And, each time you sand, you remove some of the finish. So, sanding is not recommended except before the final coat. And never sand Minwax®Water Based Polyurethane Base Coat.

Q. Can Minwax®Water Based Polyurethane for Floors be used over oil-based Minwax stains?

A. Yes. Water Based Polyurethane for Floors has been formulated to work within the Minwax®system. For best results, we recommend staining with Minwax®Wood Finish™ stain. Make sure that the stain has cured completely before applying Water Based Polyurethane for Floors.

Q. Can Minwax®Water Based Polyurethane for Floors be applied over Minwax®Water Based Stains?

A. Technically yes, but it is not recommended because water-based stains are not well-suited for use on floors. Water-based stains dry very quickly, making them difficult to apply evenly, without lap marks, over large surfaces. For very large surface areas, such as floors, we recommend using an oil-based product such as Minwax®Wood Finish™ stain.