

July 14, 2022

*Property:* **Crescent Beach Condominium Association, Inc.**  
*Property Address:* **100 N. Collier Boulevard**  
**Marco Island, Florida 34145**  
*Attn:* **Pamela Carey**

## **RE: WEIGHT ANALYSIS & HARD SURFACE FLOORING RESEARCH**

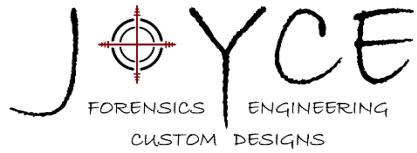
### **SCOPE OF WORK**

At the request of Mrs. Pamela Carey with Crescent Beach Condominium Association (client), Joyce Engineering, LLC was retained to provide professional engineering consulting to work with flooring industry representatives to research and review underlayment systems for alternative hard-surfaced floor coverings (i.e., wood & laminate flooring and porcelain/ceramic tiles) in lieu of the currently carpeted areas. More specifically, we were asked to research and review alternative flooring systems and their “sound dampening” capabilities. Acoustic testing within the subject building was outside the scope of this assignment and was not performed. Therefore, the information and opinions presented within this document are based on our review of the received documentation for the subject building, and research of industry leading test data complying with national standards.

Additionally, Joyce Engineering was requested to perform a load (weight) analysis for the structural adequacy of the building if the carpeted areas of the building were replaced with a hard-surfaced floor covering, similar to ceramic floor tiles on thin-set mortar over an acoustic dampening underlayment (weighing up to approximately 7 lb/ft<sup>2</sup>).

This report was prepared for the scope of work indicated herein, and for the client indicated above. Any and all usage or reliance upon this document by parties other than the client is expressly prohibited.

*JOYCE ENGINEERING, LLC*



## GENERAL DISCUSSION

Excess or unwanted sound is defined as *noise*. Depending on the source, type, and properties of the sound, in conjunction with the materials used within the building, noise can have a significant negative impact on the occupants within the building. Sound is created from numerous sources within a building. In general, there are two primary types of sound paths: **airborne sound** and **impact sound**.

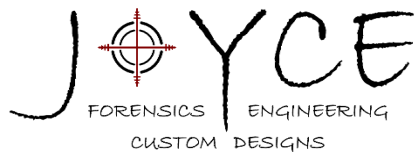
**Airborne sound** (both interior and exterior) radiate from the source (interior and exterior) into the air. Examples of airborne sounds created by *interior* sources include: voices, music, mechanical equipment, etc. Examples of airborne sounds created by *exterior* sources include: vehicular traffic, aircrafts, construction activities, etc.

**Impact sound**, commonly referred to as “structure-borne sound” is sound that travels through solid building materials. Examples of impact sounds include: foot traffic on floors (footsteps) with hard-soled shoes, movement of furniture, dropped objects, furniture, door knocks or slams, washers and dryers, mechanical and plumbing equipment vibrations, exercise equipment/activities, etc.

There is some commonality among factors that influence the attenuation of airborne sound and impact sound; however, impact sound is by far the more complicated to measure, rate, and control. Acoustic ratings are measures of sound transmission in building assemblies and materials. The two types of acoustic ratings that are of particular interest in this study are **sound transmission class (STC)** and **impact insulation class (IIC)**.

**Sound transmission class (STC)** is a measure (in decibels) of how much airborne sound a floor or wall assembly blocks. Studies indicate that an increase of 10 in the STC translates roughly to a decrease in the perceived noise by one-half. In general, adding mass to the assembly improves the STC rating. The following tables give typical STC ratings for various wall and roof/ceiling assemblies.

JOYCE ENGINEERING, LLC



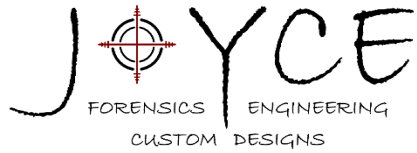
Wall Assembly	STC (dB)*
Wood stud wall (2 × 4 in. studs spaced at 16 in. on center with ½ in. gypsum board on each face screwed to the studs)	34
Metal stud wall (3 <sup>5</sup> / <sub>8</sub> in., 25 gauge studs spaced 24 in. on center with a single layer of 5/8 in. gypsum board on each face screwed to the studs)	39
8 × 8 × 16 in. lightweight CMU (28 lbs/block)	45
Common brick mortared together with ½ in. gypsum/sand plaster	50
6 in. normal-weight concrete wall (75 psf)	55

Roof/Floor Assembly	STC (dB)
0.036-in.-thick corrugated galvanized steel roof deck	23*
2 × 10 wood joists spaced 16 in. on center with 5/8 in. subfloor glued to joists and nailed 12 in. on center, ¼ in. particle board glued to plywood, ½ in. parquet wood flooring glued to particle board, and ½ in. gypsum board ceiling screwed to joists 12 in. on center	42†
8 in. lightweight hollow core concrete slab (57 psf)	50†
6 in. normal-weight concrete slab (75 psf)	55†

**Impact insulation class (IIC)** ratings measures how much structure-borne sound is blocked in the floor/ceiling assemblies. IIC ratings are greatly influenced by the surfaces and areas under the floor and the IIC rating can be significantly enhanced by the addition of underlayment, insulation, or by floating the floor. The “loudest” floor is stone or tile laid directly over concrete. Basically, the higher the IIC value, the better the floor/ceiling assembly is at blocking or dampening the impact noise. IIC is greatly influenced by the surfaces and areas under the floor and the IIC rating can be significantly enhanced by the addition of underlayment, insulation, or by floating the floor. The “loudest” floor is stone or tile laid directly over concrete. The following table provides typical IIC values for various roof/ceiling assemblies.

Floor/Ceiling Assembly	IIC (dB)*
8 in. lightweight hollow core concrete slab (57 psf)	28
6 in. normal-weight concrete slab (75 psf)	34
2 × 10 wood joists spaced 16 in. on center with 5/8 in. subfloor glued to joists and nailed 12 in. on center, ¼ in. particle board glued to plywood, ½ in. parquet wood flooring glued to particle board, and ½ in. gypsum board ceiling screwed to joists 12 in. on center	37
6 in. normal-weight concrete slab (75 psf) with ½ -in.-thick wood fiber board, carpet, and padding	81

JOYCE ENGINEERING, LLC



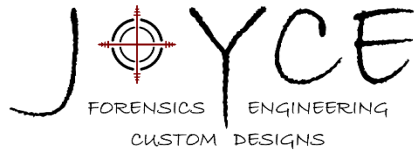
In general, an **IIC 50 or less** has the least impact sound absorption quality. While this may be appropriate for ground floors, it would be unsatisfactory for most on a high floor without a great deal of insulation in the area between the floor and the ceiling below. Most stone and tile floorings will fall into this category. **IIC 60** indicates a “medium” impact sound absorption quality and encompasses floorings such as wood, laminates, and some vinyl coverings. However, “newer” acoustical underlayments, such as ACI-125™ manufactured by Leggett & Platt, indicates their underlayment product can provide an IIC 63 for ceramic/porcelain floor tiles. **IIC 65** is a “high level” of impact sound transmission absorption and includes superior sound reduction materials, such as carpet and cork.

### **FLORIDA BUILDING CODE REQUIREMENTS**

*Section 1207 – Sound Transmission* in the 2020 Florida Building Code, 7<sup>th</sup> edition provides the following requirements for airborne sound (*Section 1207.2*) and structure-borne sound (*Section 1207.3*):

**1207.2 Airborne sound.** *Walls, partitions and floor/ceiling assemblies separating dwelling units and sleeping units from each other or from public or service areas shall have a sound transmission class (STC) of not less than 50, or not less than 45 if field tested, for airborne noise when tested in accordance with ASTM E90. Alternatively, the sound transmission class of walls, partitions and floor/ceiling assemblies shall be established by engineering analysis based on a comparison of walls, partitions and floor/ceiling assemblies having sound transmission class ratings as determined by the test procedures set forth in ASTM E90. Penetrations or openings in construction assemblies for piping; electrical devices; recessed cabinets; bathtubs; soffits; or heating, ventilating or exhaust ducts shall be sealed, lined, insulated or otherwise treated to maintain the required ratings. This requirement shall not apply to entrance doors; however, such doors shall be tight fitting to the frame and sill.*

JOYCE ENGINEERING, LLC



**1207.3 Structure-borne sound.** Floor/ceiling assemblies between dwelling units and sleeping units or between a dwelling unit or sleeping unit and a public or service area within the structure shall have an **impact insulation class (IIC) rating of not less than 50, or not less than 45 if field tested**, when tested in accordance with ASTM E492. Alternatively, the impact insulation class of floor/ceiling assemblies shall be established by engineering analysis based on a comparison of floor/ceiling assemblies having impact insulation class ratings as determined by the test procedures set forth in ASTM E492.

### **PRODUCT RESEARCH**

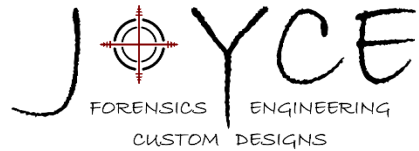
Based on our conversations with flooring industry professionals and manufacturer's our research and review has identified the following acoustical underlayment materials with the highest IIC ratings for hard-surfaced floor coverings:

<b>Floor Application</b>	<b>Product</b>	<b>Manufacturer</b>	<b>Thickness</b>	<b>IIC Rating</b>	<b>STC Rating</b>
Ceramic & Porcelain Tile	Whisper Mat® CS	Protecto Wrap	2.8 mm (0.11")	50	55
Ceramic & Porcelain Tile	ACI-125™	Legget & Pratt Flooring Products	1.33 mm (0.051")	63	64
EWP & Laminate	Whisper Step®	Legget & Pratt Flooring Products	1.42 mm (0.056")	66	63
EWP & Laminate	Quietcure™ Ultraseal	Floor Muffler®	2 mm (0.078")	71	66

\*LVT – Luxury Vinyl Tile

\*EWP – Engineered Wood Products

JOYCE ENGINEERING, LLC

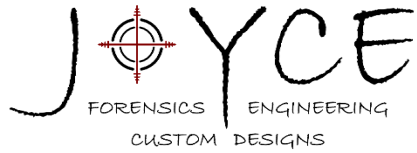


## CONCLUSIONS

Based on our, review of the available documentation, original Architectural & Structural Plans, research and review of industry leading testing data, Joyce Engineering provides the following professional opinions related to an alternative hard-surfaced floor covering (engineered wood, laminate, ceramic & porcelain tile) at the currently carpeted areas:

- 1) **The building is structurally adequate to receive the additional dead loads imposed on the building by replacing with the currently carpeted areas with a hard-surfaced flooring covering weighing up to approximately 7 lb/ft<sup>2</sup> (similar to ceramic tile with underlayment, cementitious grout, and thin-set mortar). We do not recommend using natural stone tile, such as granite or marble, due to the significant differences in weight.**
- 2) Impact sounds or noise will *increase to some degree* at the adjacent units if carpeted areas are replaced with an alternative hard-surfaced floor covering given that the hard-surfaced floor coverings will have lower IIC and STC values as opposed to carpeted floors due to the absorption of sound and impact energy.
- 3) We do not recommend replacing any carpeted areas unless a minimum IIC value of 60 or greater can be achieved for occupant comfort. *Section 1207 of the 2020 FBC, 7<sup>th</sup> edition* requires minimum STC and IIC ratings of 50, or not less than 45 if field tested.
- 4) *Acceptable* noise levels (strictly dependent on occupant's personal comfort level) at the adjacent units *may* be achievable with the installation of an acoustical underlayment between the hard-surfaced floor covering and the underlying concrete slab in strict accordance with the manufacturer's installation instructions and requirements.
- 5) If alternative hard-surfaced floor coverings are to be utilized at the previously carpeted areas, we strongly recommend installing sample areas/rooms at different locations within the building to ensure occupant comfort and satisfaction prior to performing a large-scale replacement of the existing floor finishes.

JOYCE ENGINEERING, LLC



## LIMITATIONS

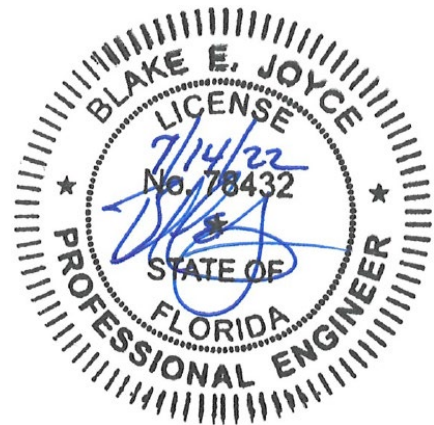
The opinions presented herein are based on the observed conditions at the site, measurements recorded, verbal and/or written documentation, prior experience and professional engineering judgment. It should be noted that the scope of work was limited to providing professional engineering opinions related to research and review of acoustical underlayment to be used with alternative hard-surfaced floor coverings (engineered wood, laminate, ceramic & porcelain tile) and to determine the structural adequacy of the building to withstand the additional dead load imposed due to an approximate 5 – 7 psf difference from the presently carpeted areas. Joyce Engineering did not perform acoustic testing at the subject property and was outside the scope of this assignment. Therefore, the information and opinions presented within this document are based on research and review of industry leading testing data, review of the available information for the building, professional engineering judgment and analysis.

This document has been prepared for exclusive use of the client and/or owners indicated above. No unauthorized distribution, reproduction or re-use of this document, or portions of this document, shall be permitted without prior written consent by Joyce Engineering, LLC. In the event that additional information becomes available that could affect the conclusions reached and/or opinions presented herein, Joyce Engineering, LLC reserves the right to review all new information, and, if required, revise, and/or amend some, or all, of the statements presented herein. Please feel free to contact me with any questions.

Respectfully submitted,

A handwritten signature in blue ink, appearing to read "B. Joyce", is written over a circular stamp.

Blake E. Joyce, P.E., LEED AP  
*Principal Owner & Professional Engineer*



**JOYCE ENGINEERING, LLC**

*"YOUR SWISS ARMY KNIFE OF ENGINEERS!"*

Jupiter, Florida 33478  
*direct* 561.510.4580  
*email* [bjoyce@Joyce-Eng.com](mailto:bjoyce@Joyce-Eng.com)  
FL P.E. License # 78432 (valid thru 02/28/2023)

**JOYCE ENGINEERING, LLC**

# ACOUSTICAL UNDERLAYMENT

## SPECIFICATIONS

	ACOUSTICAL UNDERLAYMENT									AREA RUG PAD	
	ACI-125™		Whisper Step®		Sound Master™ Plus	Quiet Elegance®	Silent Guardian®		Firm Grip™		
Ceramic and Porcelain Tile LVT/Rigid Composite/WPC Laminate, Engineered/Solid Hardwood	√ √ √		√ √		√	√	√		Area Rug		
Composition	Extreme-Density Synthetic Rubber		High-Density Synthetic Rubber		Synthetic Rubber	Bonded Foam		Synthetic Fiber		Synthetic Fiber and Rubber	
Density (lbs/ft³)	66		62		37	10		12		12.5	
Ounce Weight (oz/yd²)	40		42		44	15		18		45	
Thickness	0.051"/1.30 mm		0.056"/1.42 mm		0.100"	0.125"		0.125"		0.300"	
Product Code	BM0087	BM0088	BM0042	BM0040	BM0022	BM0008	BM0009	BM0037	BM0038	6E0441	6E0429
Dimensions	36" x 33.33'	54" x 44.44'	36" x 33.33'	54" x 44.4'	4.5' x 48'	6' x 20'	6' x 60'	3' x 100'	6' x 60'	6' x 60'	12' x 60'
Ft²/Roll	100	200	100	200	216	120	360	300	360	360	720
Yd²/Roll	11.11	22.22	11.11	22.22	24	13.33	40	33.33	40	40	80
Color	Tan		Green		Beige	Black with blue film		Gray		Gray	
Robinson Test	Heavy Commercial***		N/A		N/A	N/A		N/A		N/A	
Crack Resistance	High Performance		N/A		N/A	N/A		N/A		N/A	
Castor Wheel Test	25,000 Cycle Test*		25,000 Cycle Test*		N/A	N/A		N/A		N/A	
R-Value	0.02		0.02		0.10	0.58		0.50		2.12	

## ACOUSTICAL PROPERTIES

Impact Insulation Class (IIC)**	63	66	70	70	58	N/A	
ΔIIC	17	22	20	21	NA	N/A	
Sound Transmission Class (STC)**	64	63	66	65	54	N/A	

## FLAMMABILITY

Pill Test	Passes	Passes	Passes	Passes	Passes	Passes	
-----------	--------	--------	--------	--------	--------	--------	--

## PROTECTION

California Section 01350 Compliant	Yes	Yes	Yes	Yes	Yes	N/A	
Antimicrobial	Yes	Yes	Yes	Yes	N/A	N/A	
Warranty	Limited	Limited	Limited	Limited	Limited	10 Year	

\* Passes Castor Durability Test for 25,000 cycles when tested under minimum of 3 mm double-glued luxury vinyl plank and minimum 3.2 mm floating-click

\*\* When tested with floor-ceiling assembly

\*\*\* When tested using thin-set above and below ACI on slab foundation



*Innovations* for a Quieter Home®

Visit [LPFlooringProducts.com](http://LPFlooringProducts.com) for more information.



- ▶ Made of **EXTREME-DENSITY SYNTHETIC RUBBER**
- ▶ For use under **Ceramic** and **Porcelain Tile**
- ▶ Also for use under **Luxury Vinyl Tile/Plank, Rigid Composite, WPC, Laminate, Engineered Wood, and Solid Hardwood**

Leggett & Platt® Flooring Products

# ACI-125™

## Acoustical Crack Isolation Membrane

- Extreme density for unmatched support under today's popular ceramic and porcelain tile
- Pliable rubber composition allows movement to reduce stress transmission from the concrete slab to the tile installation to help prevent tiles from cracking
- Protects against horizontal, in-plane, slab substrate cracks up to 1/8"
- Helps reduce sound transference between floors and retains acoustic properties over time
- Can be used above or below grade and installs quickly
- For use over in-floor heating and is recommended by the Radiant Professionals Alliance as an excellent choice
- Fresh Dimension® antimicrobial helps to inhibit the growth of mold, mildew, and odor-causing bacteria
- Passes California Section 01350 for low VOC emissions

# ACI-125™ Acoustical Crack Isolation Membrane

## SPECIFICATIONS

Composition:	Made of Extreme-Density Synthetic Rubber	
Density:	66 lbs/ft <sup>3</sup> or 40 oz/yd <sup>2</sup>	
Thickness:	0.051" (1.3 mm)	
R-Value:	0.02	
Color:	Tan	
Water Vapor Emission:	0.511 lbs/1000 ft <sup>2</sup> /24 hrs	
Permeance*:	2.329	
Product Codes:	BM0087	BM0088
Dimensions:	36" x 33.33'	54" x 44.44'
Ft <sup>2</sup> /Roll:	100	200
Yd <sup>2</sup> /Roll:	11.11	22.22
Roll Weight:	28 lbs	56 lbs

\*Conduct moisture tests in accordance with flooring manufacturer installation guidelines and requirements

## ACOUSTICAL PROPERTIES

Impact Insulation Class (IIC) (ASTM E989)**	63
ΔIIC (ASTM E2179)	17
Sound Transmission Class (STC) (ASTM E413)**	64

\*\*When tested with floor-ceiling assembly

## PERFORMANCE PROPERTIES

Standard	Test	Subfloor	Installation***	Tile	Cycles	Description of Requirement	Result
ANSI A118.12	System Crack Resistance	-	-	-	-	>0.125 (1/8") for High Performance	Pass
1 ASTM C627-18	Robinson Test	Concrete	Thin-set	Ceramic	1-12	Heavy Commercial, Light Commercial, Residential	Pass
2 ASTM C627-18	Robinson Test		Multipurpose Adhesive	Ceramic	1-6	Light Commercial, Residential	Pass
3 ASTM C627-18	Robinson Test		Spray-Lock Adhesive	Ceramic	1-6	Light Commercial, Residential	Pass
4 ASTM C627-18	Robinson Test		Pressure-sensitive Adhesive	Ceramic	1-3	Residential	Pass
5 ASTM C627-18	Robinson Test	15/32" Plywood Over 23/32" Tongue and Groove Plywood Over 16" On Center joist	Thin-set	Porcelain	1-6	Light Commercial, Residential	Pass
6 ASTM C627-18	Robinson Test		Multipurpose Adhesive	Porcelain	1-12	Heavy Commercial, Light Commercial, Residential	Pass

\*\*\*Installation describes the adhesive type used to attach ACI to the subfloor.

## PROTECTION

Indoor Air Quality:	Passes California Section 01350 for low VOC emissions
Antimicrobial:	Fresh Dimension®
Warranty:	Limited

## LIFE-OF-THE-FLOOR UNDER WHICH IT IS INSTALLED WARRANTY

Please visit [LPFlooringProducts.com/ACI-125](http://LPFlooringProducts.com/ACI-125) for detailed warranty information.



**WHISPER MAT** CS  
FOR THIN-SET TILE APPLICATIONS



## PROTECTO WRAP FLOORING UNDERLAYMENTS

PEEL & STICK SOUND REDUCTION  
& CRACK ISOLATION MEMBRANE  
FOR THIN-SET TILE APPLICATIONS

Premium Building Products That Protect

| RESIDENTIAL · COMMERCIAL |

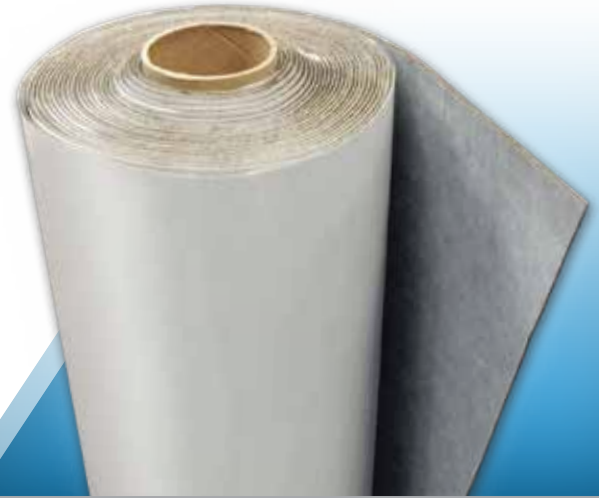
# WHISPER MAT<sup>®</sup> CS

FOR THIN-SET TILE APPLICATIONS

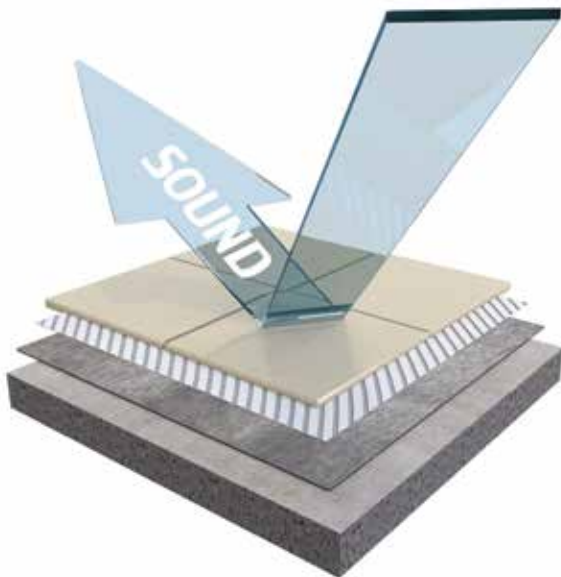
PEEL & STICK SOUND REDUCTION  
& CRACK ISOLATION MEMBRANE FOR  
THIN-SET TILE APPLICATIONS FOR:

**WHISPER MAT<sup>®</sup> CS** is a peel & stick sheet membrane that reduces impact and airborne sound transmissions, and isolates "finished" flooring from subfloor cracks. Designed for thin-set tile applications where sound reduction is required, specified or desired.

Constructed of a top layer of reinforced polyester mesh fabric with a middle layer of sound reduction material and a bottom layer of aggressive rubberized adhesive with an attached release liner for peel & stick application, Whisper Mat CS also has the flexibility and strength to withstand structural movement and concrete shrinkage cracks up to 3/8" without transferring stress load to finished tile. Additionally, excellent moisture resistant properties make this the most comprehensive underlayment product for thin-set tile applications available.



## PROPERTIES AND ADVANTAGES



- **SOUND REDUCTION RATINGS:**
  - 8" CONCRETE FLOOR WITH A GYPSUM BOARD CEILING ASSEMBLY: IIC 72 STC 72
  - 8" CONCRETE FLOOR: IIC 57 STC 56
  - 6" CONCRETE FLOOR: IIC 50 STC 55
- **SOUND TRANSMISSION REDUCTION:**
  - DELTA IIC 22
- **MOISTURE RESISTANT AND ECONOMICAL**
- **ANTI-FRACTURE RESISTANT TO 3/8"**
- **LIGHT COMMERCIAL LOAD RATING**
- **APPROVED WITH RADIANT HEATED SUBFLOORS**
  - PROVIDES THERMAL BREAK
- **UNIQUELY THIN SYSTEM (110 MIL)**



## WHY SPECIFY PROTECTO WRAP'S FLOORING MEMBRANES?

Protecto Wrap Company has been manufacturing membranes since 1952 and has built a sound reputation for producing the highest quality products available. Our sheet membranes meet or exceed sound properties for almost any job specification. Protecto Wrap's strict quality control combined with committed research and development allows for production of the highest quality products available to the flooring and building industries.

# NEW CONSTRUCTION, REMODELING, RESIDENTIAL & COMMERCIAL CONSTRUCTION

## BASIC USES

Whisper Mat CS is designed to be an underlayment for thin-set tile applications where transmitted or impact sound reduction is required. It may be applied to substrates meeting ANSI A108.01 Requirements including: concrete, plywood substrates meeting ANSI 108.1 gypsum underlayments, precast floor panels, ceramic tile, terrazzo, natural stone, leveling and patching compounds, cement backer board, existing VAT and VCT. Whisper Mat CS is approved with radiant heated floors.

## LIMITATIONS

Do not use solvent based sealants or sealers where contact with membrane may occur as they may deteriorate the product. Whisper Mat CS is not recommended for use on concrete floors when hydrostatic head pressure or excessive water vapor transmission exceeds 4lbs. (tested by "Calcium Chloride Test" method), where constant water vapor transmission is present or a relative humidity level of more than 75% of slab. If these conditions exist, they must be addressed before installation of Whisper Mat CS. Whisper Mat CS is not recommended for use where horizontal floor movement is greater than 3/8". Existing cracks larger than 3/16" should be prepared with proper backing material prior to installation of membrane.

Whisper Mat CS is not recommended to cover joints or cracks larger than 3/8". Membrane does not provide crack isolation properties to mortar beds greater than 3/8" thick. Not recommended for use where vertical floor movement is present. For installation over plywood substrates, follow ANSI 108.01- 3.4 Wood Subfloor Requirements. For concrete expansion joints and movement joints refer to TCNA Detail EJ171. Installation procedures and job site conditions must be in accordance with flooring manufacturer's recommendations and TCNA installation standards. Whisper Mat CS is designed for thin-set applications. Installations requiring more than 3/8" of thin-set mortar need to be raised with a self-leveling compound or a pre-mortar bed and allowed to cure prior to installation of Whisper Mat CS. Use latex-modified thin set mortar meeting the ANSI 118.4. to tile over Whisper Mat CS.

## COMPOSITION AND MATERIALS

Whisper Mat CS is constructed of a top layer of reinforced polyester mesh fabric with a middle layer of sound reduction material and a bottom layer of aggressive rubberized adhesive with an attached release liner for peel & stick application. The membrane is tacky on the bottom providing superior adhesion to properly prepared and approved substrates. The polyester mesh fabric top makes an excellent bonding surface for latex modified thin set mortars. Whisper Mat CS contains no V.O.C's and is environmentally safe which allows it to be used in confined areas. The aggressive rubberized adhesive retains its flexibility throughout the floor's life span and will not dry out or decay with time.

## SIZE

Available in 36" x 40' rolls.



## APPLICATIONS

The sound absorption properties combined with the anti-fracture properties makes Whisper Mat CS an excellent system to enhance ceramic and stone flooring installation performance in:

- **Commercial**
- **Multi-family**
- **Healthcare**
- **Educational**
- **Residential**
- **Hospitality**
- **Municipal**
- **Government**



Apply Primer



Cut to Correct Length



Remove & Press in Place



Apply Latex-Modified Thinset & Install Tile

## INSTALLATION

Follow flooring manufacturer's recommended installation instructions. Installation and substrate requirements must also conform to TCNA standards. Flooring and membrane must acclimate to job site conditions before installation. Substrates must be dry, clean and free of dirt, grease, wax, paint, oil or loose foreign matter that would adversely affect adhesion of the Whisper Mat.

**Substrates must be checked for excessive moisture.** If substrate moisture/vapor is beyond 4lb. emissions or a relative humidity level of more than 75% of slab. If these conditions exist, they must be addressed before installation of Whisper Mat CS (see "Limitations"). Leveling cements must be completely dry before membrane application.

**Priming the substrate:** Always apply the Protecto Wrap #6000 primer or Protecto Universal Water Based Primer™ to the substrate and allow to dry (approx 20-30 min.) before installing the Whisper Mat CS to ensure a good bond.

**Unroll Whisper Mat CS with the release liner side down.** Cut to the appropriate length. Fold back half

of the length of the roll back over the other half of the material. Score through the release liner only, taking care not to cut completely through membrane. Pull release liner away from membrane where scored. As the release liner is pulled away, hand-smooth the membrane to contact the primed substrate. Keep the release liner material close to the floor while pulling away, this will allow for a more controlled application of the membrane. Align membranes in a butt joint fashion making sure not to overlap seams.

**Take note:** There will be an immediate and aggressive bond of the membrane to the primed substrate. Realignment of the membrane can be difficult once adhered to the substrate.

**After Whisper Mat CS is adhered, ceramic or stone tiles can be installed** with a latex modified thin set meeting the ANSI 118.6 standard. Follow mortar manufacturer's recommendations for trowel size and open time. Continue to follow the TCNA's installation recommendations through the remainder of the installation.

## ACCESSORIES

**P.W. #6000** water based interior primer concentrate available in 1 gallon containers. Coverage area of approximately 500 sq. ft. per gallon when diluted 2 parts clean water to 1 part concentrate.



**Protecto Universal Water Based Primer™** available in 1 and 5 gallon containers. Coverage area of approximately 250-350 sq. ft. per gallon, depending on substrate.



## SYSTEM PERFORMANCE

Whisper Mat CS has been tested by the Tile Council of North America (TCNA) for system performance in accordance with ASTM C627 (Robinson Type Floor Tester) and rated for light commercial applications. Sound Control: Protecto Wrap's Whisper Mat CS has been tested by a certified independent acoustical laboratory in compliance with ASTM E90, ASTM E492 and ASTM E2179.

## APPLICATION STANDARDS

**ASTM C482** "Bond Strength of Ceramic Tile to Portland Cement"

**ASTM C627** "Robinson Floor Test"

**ASTM E492** "Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies using the Tapping Machine"

**ASTM E90** "Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements"

## TECHNICAL DATA

<b>Thickness</b>	110 mils
<b>Color</b>	Grey top, black adhesive bottom
<b>Elongation</b>	500% minimum (rubberized adhesive only)
<b>Application Temperature</b>	45° F to 120° F
<b>In Service Temperature</b>	-20° F to 180° F

## WARRANTY

Whisper Mat CS is warranted to be free of defects in manufacture for a period of 10 years. Protecto Wrap assumes no warranty as to the installation of its products.



### PROTECTO WRAP COMPANY

1955 S. Cherokee St.  
Denver, CO 80223  
(800) 759-9727  
www.protectowrap.com  
WHCS-300 (5-20)



Protecto Wrap is a proud member of the following trade organizations:





- ▶ Made of **HIGH-DENSITY SYNTHETIC RUBBER**
- ▶ For use under today's popular **MLF/LVT/Rigid Core with attached back, Laminate, Sheet Vinyl, Engineered, and Solid Hardwood flooring**

Don't get stuck with a noisy floor

Leggett & Platt® Flooring Products

# Whisper Step®

## Acoustical Underlayment

### Xtreme™ Protection



#### Noise Guard

Reduces impact and airborne noise in-room and between floors. Reduces up to 10 decibels of in-room noise and an overall improvement between floors of 25%.



#### Block-out® Moisture Guard

Prevents spills from getting into subfloor and allows moisture vapor to escape from beneath.



#### Mold & Mildew Guard

Fresh Dimension® antimicrobial works to Inhibit the growth of mold, mildew, and odor-causing bacteria.

### Xtreme™ Performance



#### Comfort

Makes hard-surface flooring more enjoyable.



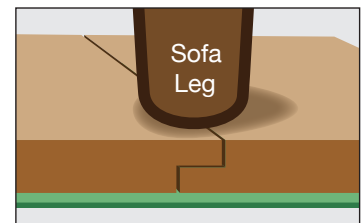
#### Support

The class leading extreme density not only resists compression but will perform for the life of the floor.

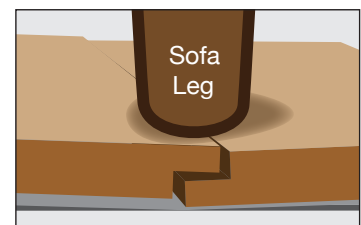


#### Easy Installation

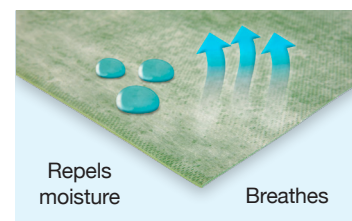
Lays flat and helps mask minor subfloor irregularities; can be used above and below grade.



Flooring over Whisper Step®



Flooring over lightweight underlayment



# Whisper Step®

## Acoustical Underlayment

### SPECIFICATIONS

Composition:	Made of High-Density Synthetic Rubber	
Density:	62 lbs/ft <sup>3</sup> or 42 oz/yd <sup>2</sup>	
Shore A Hardness:	70 ASTM D2240	
Thickness:	0.056" (1.42 mm)	
Color:	Green	
R-Value:	0.02	
Moisture Barrier:	Block-Out® Moisture Guard	
Permeance*:	1.151 ASTM E96	
Water Vapor Emission	0.252 lbs/1000 ft <sup>2</sup> /24 hr ASTM E96	
Castor Durability Test:	Passes 25,000 Cycles**	
Product Codes:	BM0042	BM0040
Dimensions:	36" x 33.33'	54" x 44'
Ft <sup>2</sup> /Roll:	100	200
Yd <sup>2</sup> /Roll:	11.11	22.22
Roll Weight:	29 lbs	58 lbs

### ACOUSTICAL PROPERTIES

Impact Insulation Class (IIC):	66*** ASTM E492 / E989
Δ IIC:	22 ASTM E2179
Sound Transmission Class (STC):	63*** ASTM E90 / E413

### PROTECTION

Indoor Air Quality:	Passes California Section 01350 for low VOC emissions
Antimicrobial:	Yes

### LIMITED WARRANTY

Please visit [LPFlooringProducts.com/whisper-step](http://LPFlooringProducts.com/whisper-step) for detailed warranty information.

\* Conduct moisture tests in accordance with flooring manufacturer installation guidelines and requirements

\*\* Passes Castor Durability Test for 25,000 cycles when tested under minimum of 3 mm double-glued luxury vinyl plank and minimum 3.2 mm floating-click

\*\*\* When tested with floor-ceiling assembly (6" concrete slab)





## Whisper Step® Product Testing

### ACOUSTICAL PERFORMANCE

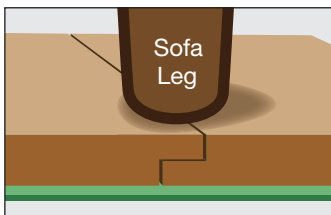
	Flooring Installation	Flooring Type	Thickness	Ceiling	Floor/Ceiling Assembly		Acoustical Performance		
					Subfloor		IIC	Delta IIC	STC
A	Double-Glue	LVP	0.08" (2 mm)	Drop ceiling	6" slab		65	21	63
B	Double-Glue	LVP	0.125" (3 mm)	Drop ceiling	6" slab		65	21	63
C	Floating/Click	LVP	3.2 mm	Drop ceiling	6" slab		67	22	62
D	Floating/Click	LVP	4.0 mm	Drop ceiling	6" slab		66	22	63
E	Floating/Click	LVP	5.0 mm	Drop ceiling	6" slab		68	24	62
F	Floating/Click	LVP	4.0 mm	None	1.5" gypcrete on top of 8" Hollow Core Plank (203 mm)		54	-	52
G	Floating/Click	LVP	4.0 mm	Drop ceiling	1.5" gypcrete over 18" Open Web Wood Truss		54	-	59
H	Floating/Click	LVP	4.0 mm	Drop ceiling	0.75" gypcrete over 18" Open Web Wood Truss		50	-	57
I	Floating/Click	US Floors CoreTec Plus	8 mm	Drop ceiling	6" slab		69	26	61
J	Floated	Laminate	6.82 mm	Drop ceiling	6" slab		69	-	60
K	Double-Glue	Engineered Wood	10.26 mm	None	6" slab		49	21	52
L	Single-Glue	3/4" solid wood	3/4"	Drop ceiling	0.75" gypcrete over 18" Open Web Wood Truss		57	-	60
M	Floating/Click	LVP	4.0 mm	Drop ceiling	8" slab		71	-	62
N	Floating/Click	US Floors CoreTec Plus	12 mm	Drop ceiling	18" Open Web Wood Truss (no gypcrete)		60	-	59

2/24/20

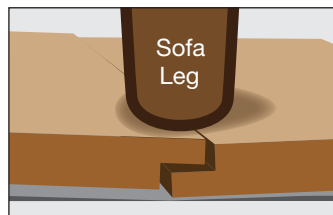
# Why Whisper Step®?

Solving stress, comfort, and noise issues related to luxury vinyl flooring.

With aesthetically pleasing looks and affordability, luxury vinyl tile is one of the most popular flooring options today. Popularity, however, does not equal perfection. When installed directly over the subfloor, LVT may leave the floor cold, hard, and noisy. Additionally, many of the underlayments available are made from lightweight materials which can compress leading to premature wearing of the interlocking joints – reducing the life of the floor. Often times these lightweight underlayments simply collapse under the weight of the floor, thereby losing their acoustical benefits.



Luxury Vinyl Tile over Whisper Step®



Luxury Vinyl Tile over competitor's product

Lightweight flooring products are not designed to withstand the service load required under a hard-surface floor. Offer customers an underlayment with a proven track record of supporting floors and improving acoustics. Whisper Step® features unmatched, high-density support underfoot, provides a significant reduction in impact noise, and can be used over most substrates.

- Supports the floor while helping vinyl feel more comfortable
- Offers substantial support at critical interlocking joints due to highly dense rubber composition
- Industry-leading support – measured using **Shore "A" Hardness\*** and **Indention Force Deflection\*\***
- Retains acoustic properties over time
- Guaranteed not to break down or bottom out for the life of the floor

## \*Shore "A" Hardness

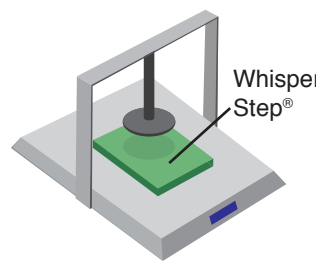
- Measures a material's resistance to compression
- Measured using a durometer
- Lower number indicates less resistance to compression (softer materials)
- Higher number indicates more resistance to compression (harder materials)
- Typical foams achieve 20-30. Some popular crumb rubbers advertise 40



## Whisper Step®

- Shore A Hardness – 70

## \*\*IFD (Indention Force Deflection)



IFD test equipment

**25X  
FIRMER**

- Measures in lbs. a material's ability to resist compression
- Typical foam underlayments achieve 20-65 IFD @ 25%  
50-200 IFD @ 65%
- A popular foam underlayment is 32 IFD @ 25% and 200 IFD @ 65%

## Whisper Step®

- IFD @ 25% – **677.2 lbs**
- IFD @ 65% – Exceeds **5,000 lbs** (exceeds force gauge capabilities)

## Why is this important?

Indicates the support an underlayment will provide, especially at interlocking plank joints

Visit [LPFlooringProducts.com](http://LPFlooringProducts.com) for more information.

*Leggett & Platt*  
FLOORING PRODUCTS