

Firm-Fill[®]
Gypsum Underlayments



03 54 13 – Gypsum Cement Underlayment

Firm-Fill[®]
Sound Control Mats



09 80 00 – Acoustic Treatment



ACOUSTICAL DESIGN GUIDELINES



Hacker
Industries, Inc.

PURPOSE STATEMENT / DISCLAIMER

These guidelines are designed to provide the architectural and building communities with detailed performance data on Hacker Industries, Inc.'s comprehensive portfolio of sound attenuation tests. The tests for the assemblies included in these guidelines were conducted in a laboratory setting per ASTM E90, E492 & E2179. This guideline is not a warranty and should be used as a guideline only. The architects' and general contractors' recommendations supersede these guidelines. Field performance may vary. See warranty on back page.

Note: FIRM-FILL® Brand Gypsum Concretes and FIRM-FILL® SCM Underlayments have been evaluated in a wide range of assemblies. For a custom acoustical evaluation of your floor/ceiling assembly, contact Hacker Industries, Inc. to see if your project qualifies.

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Superior sound control is the sum of its parts. Hacker Industries, Inc.'s products are integral in achieving successful sound improvement with FIRM-FILL[®] SCM Underlayments, a premier line of sound attenuating mats designed to address mid and high frequency issues. When properly installed in well-engineered assemblies, FIRM-FILL[®] Brand Gypsum Concretes and FIRM-FILL[®] SCM Underlayments can help dramatically increase STC and IIC ratings.

According to the International Building Code, assemblies shall meet a minimum 50 STC (Sound Transmission Class) and 50 IIC (Impact Insulation Class). Furthermore, it specifies field test requirements meet a 45 STC and 45 IIC.

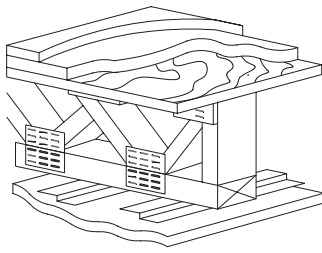
Hacker Industries, Inc. FIRM-FILL[®] SCM (sound control mats) Underlayments paired with FIRM-FILL[®] Brand Gypsum Concretes have undergone rigorous acoustical testing at NVLAP-accredited laboratories. These tests were conducted in conformance with ASTM E90, E492 and E2179. The results of these sound tests are detailed in the following pages. For additional analysis on specific floor/ceiling assemblies, Hacker Industries, Inc. may address sound control concerns by offering a review from an independent acoustical engineer.

Hacker Industries, Inc.'s products meet the rigorous standards required to reduce noise pollution, ensure peace of mind and meet today's high expectations. Our dedication to the building community and our commitment to quality are as strong as the floors our products create.

- FIRM-FILL[®] SCM-125, a low-profile solution at 1/8" (3 mm), achieves both minimum sound and fire code per IBC.
- FIRM-FILL[®] SCM-250, at 1/4" (6 mm), is used to provide additional design flexibility.
- FIRM-FILL[®] SCM-400, at 3/8" (10 mm) provides high-performance sound control in multi-family construction.
- Hacker Sound Mat I (.08" [2 mm]) is a flat, recycled rubber mat for effective sound control and smoother floor transitions.
- Hacker Sound Mat II (1/4" [6 mm]) is a dimpled rubber mat designed to maximize IIC ratings while assisting structures in achieving LEED[®] credit.

Let our products FLOOR you[®]

Sound System 1: No Sound Mat, 3/4" (25 mm) FIRM-FILL® Brand Gypsum Concrete



Subfloor topping: 3/4" (25 mm) FIRM-FILL® Brand Gypsum Concrete
 Subfloor: 3/4" (19 mm) oriented strand board
 Insulation: 3-1/2" (89 mm) unfaced R-13 fiberglass insulation
 Truss: 18" (457 mm) L/360 open web truss
 Ceiling isolation: Clark Dietrich RCSD resilient channel
 Ceiling: 5/8" (16 mm) type C gypsum board

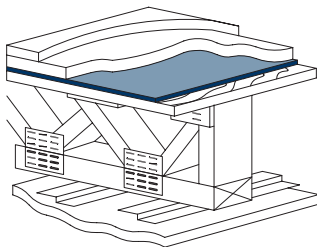
FINISH	STC	IIC	REPORT #	TEST DATE
Bare ¹	54	--	5005002	02/08/2005
Bare	51	--	D6435.29	02/13/2015
Carpet and Pad	52	75	D6435.30	02/13/2015
Engineered Wood with Resilient Backing ²	--	52	7004018	06/10/2004
2 mm Vinyl Sheet ³	--	54	7004025	06/11/2004

¹ Assembly varies from above in the following: Subfloor topping: 1" FIRM-FILL® Brand Gypsum Concrete; Subfloor: 23/32" oriented strand board; Insulation: None

² Assembly varies from above in the following: Subfloor topping: 1" FIRM-FILL® Brand Gypsum Concrete; Subfloor: 23/32" oriented strand board

³ Assembly varies from above in the following: Subfloor topping: 1" FIRM-FILL® Brand Gypsum Concrete; Subfloor: 23/32" oriented strand board; Insulation: 9" (229 mm) fiberglass batt insulation

Sound System 2: FIRM-FILL® SCM-125, 3/4" (19 mm) FIRM-FILL® Brand Gypsum Concrete

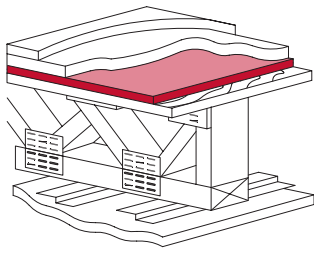


Subfloor topping: 3/4" (19 mm) FIRM-FILL® Brand Gypsum Concrete
 Subfloor isolation: 1/8" (3 mm) FIRM-FILL® SCM-125 Sound Control Mat
 Subfloor: 3/4" (19 mm) oriented strand board
 Insulation: 3-1/2" (89 mm) unfaced R-13 fiberglass insulation
 Truss: 18" (457 mm) L/360 open web truss
 Ceiling isolation: Clark Dietrich RCSD resilient channel
 Ceiling: 5/8" (16 mm) type C gypsum board

FINISH	STC	IIC	REPORT #	TEST DATE
Bare	59	--	D6435.01	11/03/2014
2 mm Vinyl Plank	60	51	D6435.02	11/04/2014
3 mm Vinyl Tile	61	53	D6435.03	11/04/2014
2 mm Vinyl Sheet	58	51	D6435.04	11/04/2014
7 mm Sheet Vinyl with Rubber Backing	59	57	D6435.05	11/04/2014
13 mm Engineered Wood	59	57	D6435.06	11/04/2014

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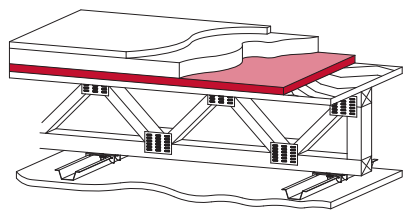
Sound System 3: FIRM-FILL® SCM-250, 1" (25 mm) FIRM-FILL® Brand Gypsum Concrete



Subfloor topping: 1" (25 mm) FIRM-FILL® Brand Gypsum Concrete
 Subfloor isolation: 1/4" (6 mm) FIRM-FILL® SCM-250 Sound Control Mat
 Subfloor: 3/4" (19 mm) oriented strand board
 Insulation: 3-1/2" (89 mm) unfaced R-13 fiberglass insulation
 Truss: 18" (457 mm) L/360 open web truss
 Ceiling isolation: Clark Dietrich RCSD resilient channel
 Ceiling: 5/8" (16 mm) type C gypsum board

FINISH	STC	IIC	REPORT #	TEST DATE
Bare	60	50	D6435.22	01/06/2015
2 mm Vinyl Plank	62	53	D6435.23	01/06/2015
3 mm Vinyl Tile	61	53	D6435.24	01/07/2015
2 mm Vinyl Sheet	61	54	D6435.25	01/07/2015
7 mm Sheet Vinyl with Rubber Backing	59	58	D6435.26	01/06/2015
13 mm Engineered Wood	61	57	D6435.27	01/06/2015
8 mm Ceramic Tile	60	50	D6435.28	01/08/2015

Sound System 4: FIRM-FILL® SCM-250, 1" (25 mm) FIRM-FILL® Brand Gypsum Concrete

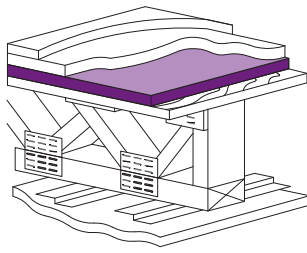


Subfloor topping: 1" (25 mm) FIRM-FILL® Brand Gypsum Concrete
 Subfloor isolation: 1/4" (6 mm) FIRM-FILL® SCM-250 Sound Control Mat
 Subfloor: 3/4" (19 mm) oriented strand board
 Insulation: 3-1/2" (89 mm) unfaced R-13 fiberglass insulation
 Truss: 18" (457 mm) L/360 open web truss
 Ceiling isolation: PAC International RSIC-1 and 7/8" (22 mm) hat channel
 Ceiling: 5/8" (16 mm) type C gypsum board

FINISH	STC	IIC	REPORT #	TEST DATE
Bare	62	53	F4545.01	01/06/2015
2 mm Vinyl Plank	62	56	F4545.02	01/06/2015
3 mm Vinyl Tile	62	56	F4545.03	01/07/2015
2 mm Vinyl Sheet	62	56	F4545.04	01/07/2015
13 mm Engineered Wood	62	60	F4545.05	01/06/2015
8 mm Ceramic Tile	61	57	F4545.06	01/06/2015

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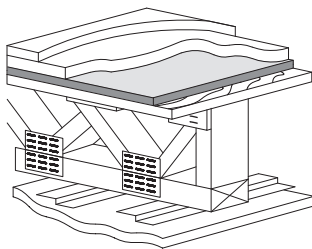
Sound System 5: FIRM-FILL® SCM-400, 1-1/4" (32 mm) FIRM-FILL® Brand Gypsum Concrete




Subfloor topping: 1-1/4" (32 mm) FIRM-FILL® Brand Gypsum Concrete
 Subfloor isolation: 3/8" (10 mm) FIRM-FILL® SCM-400 Sound Control Mat
 Subfloor: 3/4" (19 mm) oriented strand board
 Insulation: 3-1/2" (89 mm) unfaced R-13 fiberglass insulation
 Truss: 18" (457 mm) L/360 open web truss
 Ceiling isolation: Clark Dietrich RCSD resilient channel
 Ceiling: 5/8" (16 mm) type C gypsum board

FINISH	STC	IIC	REPORT #	TEST DATE
Bare	61	50	D6435.15	09/16/2014
2 mm Vinyl Plank	62	53	D6435.16	09/16/2014
3 mm Vinyl Tile	62	54	D6435.17	09/16/2014
2 mm Vinyl Sheet	62	53	D6435.18	09/17/2014
7 mm Sheet Vinyl with Rubber Backing	61	58	D6435.19	09/16/2014
13 mm Engineered Wood	61	58	D6435.20	09/17/2014
8 mm Ceramic Tile	61	--	D6435.21	09/19/2014

Sound System 6: Hacker Sound Mat I, 1" (25 mm) FIRM-FILL® Brand Gypsum Concrete



Subfloor topping: 1" (25 mm) FIRM-FILL® Brand Gypsum Concrete
 Subfloor isolation: .08" (2 mm) Hacker Sound Mat I
 Subfloor: 3/4" (19 mm) oriented strand board
 Insulation: 3-1/2" (89 mm) unfaced R-13 fiberglass insulation
 Truss: 18" (457 mm) L/360 open web truss
 Ceiling isolation: Clark Dietrich RCSD resilient channel
 Ceiling: 5/8" (16 mm) type C gypsum board

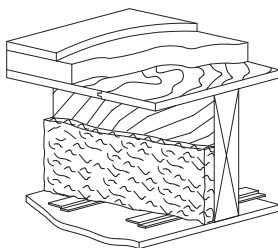
 Contributes points to LEED® certification

FINISH	STC	IIC	REPORT #	TEST DATE
7 mm Laminate	63	53	C7016.01	06/17/2013
3 mm LVT	63	50	C8706.05	07/25/2013
3 mm LVT over Hacker Sound Mat I	63	52	C8706.02	07/25/2013
3 mm LVT over 5 mm Ecore QT4005	63	53	C8706.03	07/25/2013
3 mm LVT over 10 mm Ecore QT4010	63	53	C8706.04	07/25/2013

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NOMINAL WOOD

Sound System 1: No Sound Mat, 3/4" (19 mm) FIRM-FILL® Brand Gypsum Concrete

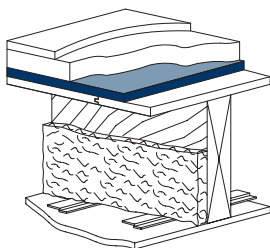


Subfloor topping: 3/4" (19 mm) FIRM-FILL® Brand Gypsum Concrete
 Subfloor: 3/4" (19 mm) oriented strand board
 Insulation: 3-1/2" (89 mm) R-13 fiberglass insulation
 Joist: 9-1/4" (235 mm) 2x10 dimensional lumber
 Ceiling isolation: Clark Dietrich RCSD resilient channel
 Ceiling: 5/8" (16 mm) type C gypsum board

FINISH	STC	IIC	REPORT #	TEST DATE
Bare	56	--	E3149.01	05/22/2015
Carpet and Pad	57	75	E3149.02	05/22/2015
Carpet and Pad ¹	51	76	E4054.01	02/04/2015

¹ Assembly varies from above in the following: Subfloor topping: 1" (25 mm) FIRM-FILL® Brand Gypsum Concrete

Sound System 2: FIRM-FILL® SCM-125, 3/4" (19 mm) FIRM-FILL® Brand Gypsum Concrete

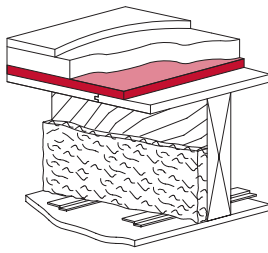


Subfloor topping: 3/4" (19 mm) FIRM-FILL® Brand Gypsum Concrete
 Subfloor isolation: 1/8" (3 mm) FIRM-FILL® SCM-125 Sound Control Mat
 Subfloor: 3/4" (19 mm) oriented strand board
 Insulation: 3-1/2" (89 mm) R-13 fiberglass insulation
 Joist: 9-1/4" (235 mm) 2x10 dimensional lumber
 Ceiling isolation: Clark Dietrich RCSD resilient channel
 Ceiling: 5/8" (16 mm) type C gypsum board

FINISH	STC	IIC	REPORT #	TEST DATE
Bare	59	--	E3145.01	01/20/2015
2 mm Vinyl Plank	61	50	E3145.02	01/21/2015
3 mm Vinyl Tile	61	52	E3145.03	01/21/2015
2 mm Vinyl Sheet	59	53	E3145.04	01/21/2015
7 mm Sheet Vinyl with Rubber Backing	61	54	E3145.05	01/20/2015
13 mm Engineered Wood	61	54	E3145.06	01/20/2015
8 mm Ceramic Tile	61	51	E3145.07	01/22/2015

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Sound System 3: FIRM-FILL® SCM-250, 1" (25 mm) FIRM-FILL® Brand Gypsum Concrete



Subfloor topping: 1" (25 mm) FIRM-FILL® Brand Gypsum Concrete
 Subfloor isolation: 1/4" (6 mm) FIRM-FILL® SCM-250 Sound Control Mat
 Subfloor: 3/4" (19 mm) oriented strand board
 Insulation: 3-1/2" (89 mm) R-13 fiberglass insulation
 Joist: 9-1/4" (235 mm) 2x10 dimensional lumber
 Ceiling isolation: Clark Dietrich RCSD resilient channel
 Ceiling: 5/8" (16 mm) type C gypsum board

FINISH	STC	IIC	REPORT #	TEST DATE
Bare	59	--	E3146.01	01/20/2015
2 mm Vinyl Plank	59	50	E3146.02	01/21/2015
3 mm Vinyl Tile	60	50	E3146.03	01/21/2015
2 mm Vinyl Sheet	59	51	E3146.04	01/21/2015
7 mm Sheet Vinyl with Rubber Backing	58	56	E3146.05	01/20/2015
13 mm Engineered Wood	60	54	E3146.06	01/20/2015
8 mm Ceramic Tile	60	51	E3146.07	01/22/2015
Wood Laminate ¹	59	--	5013115	11/15/2013
Wood Laminate ¹	--	56	7013170	11/15/2013
Carpet and Pad ²	51	--	5013113	11/15/2013
Wood Laminate ²	58	--	5013114	11/15/2013
Wood Laminate ²	--	50	7013168	11/05/2013

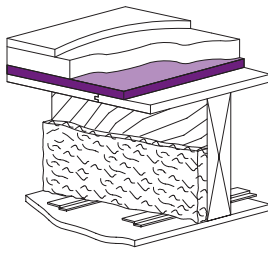
¹ Assembly varies from above in the following: Subfloor: 5/8" (16 mm) oriented strand board

² Assembly varies from above in the following: Subfloor: 5/8" (16 mm) oriented strand board; Ceiling isolation: Cemco RC channel

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NOMINAL WOOD

Sound System 4: FIRM-FILL® SCM-400, 1-1/4" (32 mm) FIRM-FILL® Brand Gypsum Concrete



Subfloor topping: 1-1/4" (32 mm) FIRM-FILL® Brand Gypsum Concrete
 Subfloor isolation: 3/8" (10 mm) FIRM-FILL® SCM-400 Sound Control Mat
 Subfloor: 3/4" (19 mm) oriented strand board
 Insulation: 3-1/2" (89 mm) R-13 fiberglass insulation
 Joist: 9-1/4" (235 mm) 2x10 dimensional lumber
 Ceiling isolation: Clark Dietrich RCSD resilient channel
 Ceiling: 5/8" (16 mm) type C gypsum board

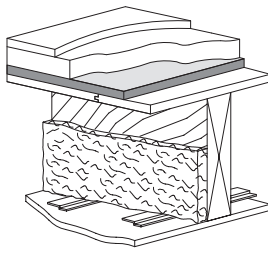
FINISH	STC	IIC	REPORT #	TEST DATE
Bare	59	--	E3147.01	02/09/2015
2 mm Vinyl Plank	61	52	E3147.02	02/10/2015
3 mm Vinyl Tile	61	53	E3147.03	02/10/2015
2 mm Vinyl Sheet	60	53	E3147.04	02/10/2015
7 mm Sheet Vinyl with Rubber Backing	59	58	E3147.05	02/09/2015
13 mm Engineered Wood	59	57	E3147.06	02/09/2015
8 mm Ceramic Tile	59	51	E3147.07	02/11/2015




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NOMINAL WOOD

Sound System 5: Hacker Sound Mat II, 1" (25 mm) FIRM-FILL® Brand Gypsum Concrete



- Subfloor topping: 1" (25 mm) FIRM-FILL® Brand Gypsum Concrete
- Subfloor isolation: 1/4" (6 mm) Hacker Sound Mat II
- Subfloor: 19/32" (15 mm) plywood
- Insulation: 3-1/2" (89 mm) R-13 fiberglass insulation
- Joist: 9-1/4" (235 mm) 2x10 dimensional lumber
- Ceiling isolation: Clark Dietrich RCSD resilient channel
- Ceiling: 5/8" (16 mm) type X gypsum board

 Contributes points to LEED® certification

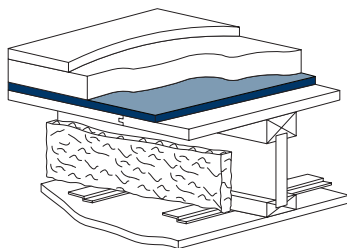
Reinforcing is required for gypsum concrete thicknesses under 1-1/4" over Hacker Sound Mat II.

FINISH	STC	IIC	REPORT #	TEST DATE
Bare	--	52	7003001	08/19/2005
Bare ¹	53	--	7002063	12/30/2002
Stone Tile	57	--	5003001	08/19/2005
Stone Tile	--	51	7003004	08/19/2005
Oak Flooring	--	54	7003002	01/08/2003
2 mm Vinyl Sheet	--	53	7003003	01/09/2003
2 mm Vinyl Sheet over Ecore QT4005 ¹	--	57	7003007	01/22/2003

¹ Assembly differs from above in the following: Ceiling: 2 layers 5/8" (16 mm) type X gypsum board

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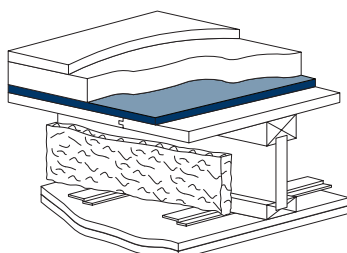
Sound System 1: FIRM-FILL® SCM-125, 3/4" (19 mm) FIRM-FILL® Gypsum Concrete



Subfloor topping: 3/4" (19 mm) FIRM-FILL® Gypsum Concrete
 Subfloor isolation: 1/8" (3 mm) FIRM-FILL® SCM-125 Sound Control Mat
 Subfloor: 3/4" (19 mm) oriented strand board
 Insulation: 3-1/2" (89 mm) R-11 fiberglass insulation
 Joist: 12" (302 mm) Weyerhaeuser Trus Joist® TJI® Joist
 Ceiling isolation: Clark Dietrich RCSD resilient channel
 Ceiling: 1 layer 5/8" (16 mm) type C gypsum board

FINISH	STC	IIC	REPORT #	TEST DATE
Bare	60	--	E7893.01	06/22/2015
3 mm Vinyl Tile	62	51	E7893.03	06/22/2015
7 mm Sheet Vinyl with Rubber Backing	61	55	E7893.05	06/22/2015
8 mm Ceramic Tile	61	--	E7893.07	07/09/2015

Sound System 2: FIRM-FILL® SCM-125, 3/4" (19 mm) FIRM-FILL® Gypsum Concrete

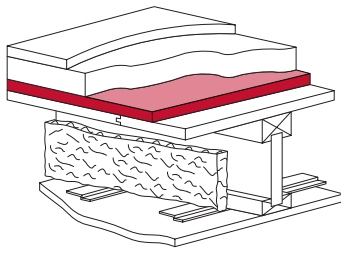


Subfloor topping: 3/4" (19 mm) FIRM-FILL® Brand Gypsum Concrete
 Subfloor isolation: 1/8" (3 mm) FIRM-FILL® SCM-125 Sound Control Mat
 Subfloor: 3/4" (19 mm) oriented strand board
 Insulation: 3-1/2" (89 mm) R-11 fiberglass insulation
 Joist: 12" (302 mm) Weyerhaeuser Trus Joist® TJI® Joist
 Ceiling isolation: Clark Dietrich RCSD resilient channel
 Ceiling: 2 layers 5/8" (16 mm) type C gypsum board

FINISH	STC	IIC	REPORT #	TEST DATE
2 mm Vinyl Plank	61	53	E7893.09	06/22/2015
3 mm Vinyl Tile	--	55	E7893.10	06/22/2015
2 mm Vinyl Sheet	61	54	E7893.11	06/22/2015
7 mm Sheet Vinyl with Rubber Backing	--	59	E7893.12	06/22/2015
13 mm Engineered Wood	61	59	E7893.13	06/22/2015

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Sound System 3: FIRM-FILL® SCM-250, 1" (25 mm) FIRM-FILL® 2010+ Gypsum Concrete

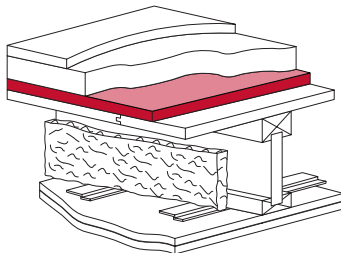


Subfloor topping: 1" (25 mm) FIRM-FILL® 2010+ Gypsum Concrete
 Subfloor isolation: 1/4" (6 mm) FIRM-FILL® SCM-250 Sound Control Mat
 Subfloor: 3/4" (19 mm) oriented strand board
 Insulation: 3-1/2" (89 mm) R-11 fiberglass insulation
 Joist: 12" (302 mm) Weyerhaeuser Trus Joist® TJI® Joist
 Ceiling isolation: Clark Dietrich RCSD resilient channel
 Ceiling: 1 layer 5/8" (16 mm) type C gypsum board

FINISH	STC	IIC	REPORT #	TEST DATE
Bare	58	--	E7891.01	05/20/2015
2 mm Vinyl Plank	61	52	E7891.02	05/20/2015
3 mm Vinyl Tile	62	52	E7891.03	05/20/2015
2 mm Vinyl Sheet	59	54	E7891.04	05/20/2015
7 mm Sheet Vinyl with Rubber Backing	60	57	E7891.05	05/20/2015

Note: Preceding I-Joist with 1 layer gypsum board tests were conducted with increasing compressive strength and density, which may affect sound performance.

Sound System 4: FIRM-FILL® SCM-250, 1" (25 mm) FIRM-FILL® Brand Gypsum Concrete

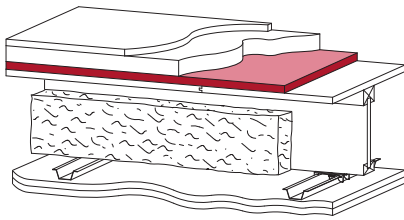


Subfloor topping: 1" (25 mm) FIRM-FILL® Brand Gypsum Concrete
 Subfloor isolation: 1/4" (6 mm) FIRM-FILL® SCM-250 Sound Control Mat
 Subfloor: 3/4" (19 mm) oriented strand board
 Insulation: 3-1/2" (89 mm) R-11 fiberglass insulation
 Joist: 12" (302 mm) Weyerhaeuser Trus Joist® TJI® Joist
 Ceiling isolation: Clark Dietrich RCSD resilient channel
 Ceiling: 2 layers 5/8" (16 mm) type C gypsum board

FINISH	STC	IIC	REPORT #	TEST DATE
2 mm Vinyl Sheet	--	55	E7891.11	05/20/2015
7 mm Sheet Vinyl with Rubber Backing	--	58	E7891.12	05/20/2015
13 mm Engineered Wood	59	57	E7891.13	05/20/2015
8 mm Ceramic Tile	61	53	E7891.14	05/20/2015

These guidelines shall only be a resource and are not a guarantee of performance. FIRM-FILL® SCM Underlayments are only one component in an overall floor/ceiling assembly. Their acoustical performance is affected by every other component. The likelihood of achieving code compliance is contingent upon many other trades including (but not limited to) framers, plumbers and drywall contractors. Developers and general contractors are responsible for building properly and testing field performance as soon as possible in order to ensure the reliability of the project. Laboratory tests are not a guarantee of field performance because of the issues noted above and many other design and/or construction errors that may occur. Please consult a professional acoustical consultant to assure specifications are written correctly and that the floor/ceiling assembly can perform to expectations. Field performance testing shall be done to ensure reliability of design prior to occupancy. © 2/2016 Hacker Industries, Inc. FIRM-FILL®, GYP-SPAN® and the associated logos are the registered trademarks of Hacker Industries, Inc.

Sound System 5: FIRM-FILL® SCM-250, 1" (25 mm) FIRM-FILL® Brand Gypsum Concrete



Subfloor topping: 1" (25 mm) FIRM-FILL® Brand Gypsum Concrete
 Subfloor isolation: 1/4" (6 mm) FIRM-FILL® SCM-250 Sound Control Mat
 Subfloor: 3/4" (19 mm) oriented strand board
 Insulation: 3-1/2" (89 mm) R-13 fiberglass insulation
 Joist: 12" (302 mm) Weyerhaeuser Trus Joist® TJI® Joist
 Ceiling isolation: PAC International RSIC-1 and 7/8" hat channel
 Ceiling: 2 layers 5/8" (16 mm) type C gypsum board

FINISH	STC	IIC	REPORT #	TEST DATE
Bare	62	52	F4543.01	01/06/2015
2 mm Vinyl Plank	63	57	F4543.02	01/06/2015
3 mm Vinyl Tile	63	56	F4543.03	01/07/2015
2 mm Vinyl Sheet	62	57	F4543.04	01/07/2015
13 mm Engineered Wood	62	61	F4543.05	01/06/2015
8 mm Ceramic Tile	63	61	F4543.06	01/06/2015

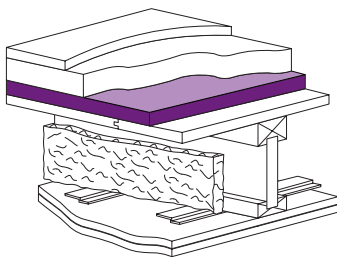
Note: Preceding I-Joist tests were conducted with increasing compressive strength and density, which may affect sound performance.



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I-JOIST

Sound System 6: FIRM-FILL® SCM-400, 1-1/4" (32 mm) FIRM-FILL® 3310 Gypsum Concrete



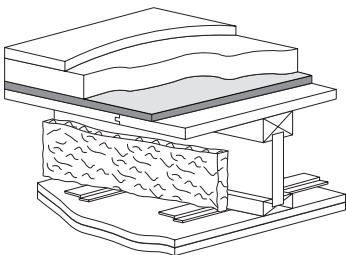
Subfloor topping: 1-1/4" (32 mm) FIRM-FILL® 3310 Gypsum Concrete
 Subfloor isolation: 3/8" (10 mm) FIRM-FILL® SCM-400 Sound Control Mat
 Subfloor: 3/4" (19 mm) oriented strand board
 Insulation: 3-1/2" (89 mm) R-11 fiberglass insulation
 Joist: 12" (302 mm) Weyerhaeuser Trus Joist® TJI® Joist
 Ceiling isolation: Clark Dietrich RCSD resilient channel
 Ceiling: 2 layers 5/8" (16 mm) type C gypsum board

FINISH	STC	IIC	REPORT #	TEST DATE
Bare	61	51	E7892.08	06/08/2015
2 mm Vinyl Plank	62	54	E7892.09	10/20/2015
3 mm Vinyl Tile	62	58	E7892.10	06/08/2015
2 mm Vinyl Sheet	61	54	E7892.11	06/08/2015
7 mm Sheet Vinyl with Rubber Backing	61	58	E7892.12	06/08/2015
13 mm Engineered Wood ¹	62	54	E7892.06	06/08/2015
13 mm Engineered Wood	--	60	E7892.13	06/08/2015
8 mm Ceramic Tile	61	55	E7892.14	06/10/2015

¹ Assembly differs from above in the following: Ceiling: 1 layer 5/8" (16 mm) type C gypsum board

Note: Preceding I-Joist with 1 layer gypsum board tests were conducted with increasing compressive strength and density, which may affect sound performance.

Sound System 7: Hacker Sound Mat II, 1" (25 mm) FIRM-FILL® Brand Gypsum Concrete



Subfloor topping: 1" (25 mm) FIRM-FILL® Brand Gypsum Concrete
 Subfloor isolation: 1/4" (6 mm) Hacker Sound Mat II
 Subfloor: 5/8" (16 mm) plywood & 1 layer 1/2" (13 mm) plywood
 Insulation: 3-1/2" (89 mm) fiberglass insulation
 Joist: 10" I-Joist
 Ceiling isolation: Unimast RC Deluxe resilient furring channel
 Ceiling: 2 layers 5/8" (16 mm) type C gypsum board

Contributes points to LEED® certification

Reinforcing is required for gypsum concrete thicknesses under 1-1/4" over Hacker Sound Mat II.

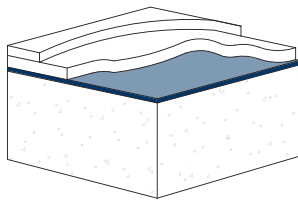
FINISH	STC	IIC	REPORT #	TEST DATE
2 mm Vinyl Sheet	--	53	7003005	01/20/2003
2 mm Vinyl Sheet over Hacker Sound Mat II	--	56	7003006	01/20/2003

Note: Reinforcing is required for gypsum concrete thicknesses under 1-1/4" over Hacker Sound Mat II.

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6" (152 mm) CONCRETE ASSEMBLY

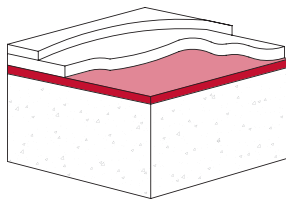
Sound System 1: FIRM-FILL® SCM-125, 3/4" (19 mm) FIRM-FILL® Brand Gypsum Concrete



Subfloor topping: 3/4" (19 mm) FIRM-FILL® Brand Gypsum Concrete
 Subfloor isolation: 1/8" (3 mm) FIRM-FILL® SCM-125 Sound Control Mat
 Subfloor: 6" (152 mm) concrete

FINISH	STC	IIC	REPORT #	TEST DATE
Bare	51	--	5014050	05/16/2014
Bare	--	Δ 20*	7014090	05/16/2014

Sound System 2: FIRM-FILL® SCM-250, 1" (25 mm) FIRM-FILL® Brand Gypsum Concrete



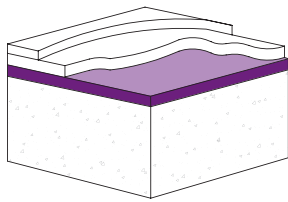
Subfloor topping: 1" (25 mm) FIRM-FILL® Brand Gypsum Concrete
 Subfloor isolation: 1/4" (6 mm) FIRM-FILL® SCM-250 Sound Control Mat
 Subfloor: 6" (152 mm) concrete

FINISH	STC	IIC	REPORT #	TEST DATE
Bare	51	--	5014075	05/23/2014
Bare	--	Δ 20*	7014143	05/23/2014

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6" (152 mm) CONCRETE ASSEMBLY

Sound System 3: FIRM-FILL® SCM-400, 1-1/4" (32 mm) FIRM-FILL® Brand Gypsum Concrete

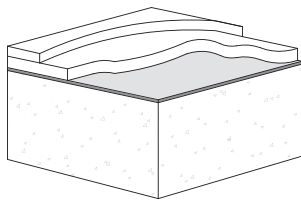


Subfloor topping: 1-1/4" (32 mm) FIRM-FILL® Brand Gypsum Concrete
 Subfloor isolation: 3/8" (10 mm) FIRM-FILL® SCM-400 Sound Control Mat
 Subfloor: 6" (152 mm) concrete


FINISH	STC	IIC	REPORT #	TEST DATE
Bare	52	--	5014051	04/17/2014
Bare	--	50	7014063	04/17/2014
Sheet Vinyl	--	50	7014064	04/17/2014
Bare	--	Δ 23*	7014091	04/14/2014

*Tested in accordance with ASTM E2179 – Standard Test Method for Laboratory Measurement of Effectiveness of Floor Coverings in Reducing Impact Sound Transmission Through Concrete Floors.

Sound System 4: Hacker Sound Mat I, 3/4" (19 mm) FIRM-FILL® Brand Gypsum Concrete



Subfloor topping: 3/4" (19 mm) FIRM-FILL® Brand Gypsum Concrete
 Subfloor isolation: .08" (2 mm) Hacker Sound Mat I
 Subfloor: 6" (152 mm) concrete

 Contributes points to LEED® certification

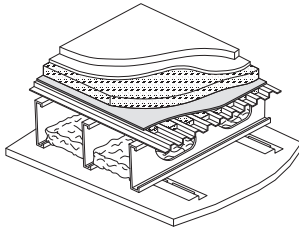
FINISH	STC	IIC	REPORT #	TEST DATE
Bare	53	--	5014076	05/23/2014
Bare	--	Δ 15*	7014144	05/23/2014

*Tested in accordance with ASTM E2179 – Standard Test Method for Laboratory Measurement of Effectiveness of Floor Coverings in Reducing Impact Sound Transmission Through Concrete Floors.

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Corrugated Metal Deck

Sound System 1: Hacker Sound Mat II, 1" (25 mm) FIRM-FILL® CMD Gypsum Concrete



Subfloor topping: 1" (25 mm) FIRM-FILL® CMD Gypsum Concrete
 Subfloor isolation: 1/4" (6 mm) Hacker Sound Mat II
 Subfloor: 14 mm deep 22 msg galvanized corrugated fluting steel decking
 Insulation: 3-1/2" (89 mm) unfaced fiberglass batt insulation
 Joist: Dietrich TradeReady 16 gauge metal C-Rim Boards
 Ceiling isolation: Clark Dietrich RCSD resilient channel
 Ceiling: 1 layer 5/8" (16 mm) type C gypsum board

Contributes points to LEED® certification

FINISH	STC	IIC	REPORT #	TEST DATE
13 mm Quarry Tile Flooring over 10 mm QT4010	61	--	5008041	07/01/2008
13 mm Quarry Tile Flooring over 10 mm QT4010	--	58	7008100	07/01/2008



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Robinson Wheel

EXTRA HEAVY DUTY

Minimum 3/4" (19 mm) of 2000 psi (13.8 MPa) FIRM-FILL® Brand Gypsum Underlayment over 1/8" (3 mm) FIRM-FILL® SCM-125

Minimum 1" (25 mm) of 2000 psi (13.8 MPa) FIRM-FILL® Brand Gypsum Underlayment over 1/4" (6 mm) FIRM-FILL® SCM-250

Minimum 1-1/4" (32 mm) of 2000 psi (13.8 MPa) FIRM-FILL® Brand Gypsum Underlayment over 3/8" (10 mm) FIRM-FILL® SCM-400

LIGHT COMMERCIAL

Minimum 1" (25 mm) of 2500 psi (17.2 MPa) GYP-SPAN® Brand Gypsum Underlayment over 1/4" (6 mm) Hacker Sound Mat II

*Tested in accordance with ASTM C627-10; Standard Test Method for Evaluating Ceramic Tile Installation Systems Using Robinson-Type Floor Tester.

UL Listings

OPEN WEB	L521	L528	L529	L534	L542	L546	L550	L558	L562	L563	L574	L576	L577	L579	L583
	L585	L587	L592	M500	M503	M508									
NOMINAL WOOD	L006	L201	L202	L206	L208	L209	L210	L211	L212	L501	L502	L503	L504	L505	L506
	L507	L508	L509	L510	L511	L512	L513	L514	L515	L516	L517	L519	L520	L522	L523
	L525	L526	L533	L535	L536	L537	L539	L540	L541	L545	L556	L557	L569	L581	L583
	L588	L590	L593	L598	M504	M519									
I-JOIST	L518	L530	L538	L547	L556	L570	L571	L581	L583	L589	M502	M506	M512		
CONCRETE	J917	J919	J920	J924	J927	J931	J957	J991	J994						
STEEL	G230	G516	G524	G553	G561	G565	G566	G568	G587	G594	G595				

Compression Resistance

FIRM-FILL® SCM-125	Force Applied	Retained Thickness (%)	Actual Residual Thickness (in)
	42 lb per ft ²	100.00%	0.191"
	105 lb per ft ²	98.96%	0.189"
	505 lb per ft ²	97.11%	0.182"
FIRM-FILL® SCM-250	Force Applied	Retained Thickness (%)	Actual Residual Thickness (in)
	42 lb per ft ²	100.00%	0.355"
	105 lb per ft ²	99.31%	0.349"
	505 lb per ft ²	99.22%	0.353"
FIRM-FILL® SCM-400	Force Applied	Retained Thickness (%)	Actual Residual Thickness (in)
	42 lb per ft ²	100.00%	0.434"
	105 lb per ft ²	99.50%	0.437"
	505 lb per ft ²	99.13%	0.430"

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Product Update

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WARRANTY

HACKER INDUSTRIES WARRANTS TO ITS LICENSED APPLICATORS WHO EXCLUSIVELY INSTALL ONLY FIRM-FILL® BRAND PRODUCTS AND TO THE OWNER(S) OF THE WORK OF IMPROVEMENT AT THE TIME THE SOUND CONTROL MAT IS INSTALLED THAT THE SOUND CONTROL MATS COVERED BY THIS WARRANTY WILL BE FREE FROM DEFECTS IN MATERIAL AND WORKMANSHIP. IF COVERED SOUND CONTROL MATS FAIL TO PERFORM WITHIN THIS WARRANTY DURING THE TWO-YEAR WARRANTY PERIOD, AND IF THAT FAILURE IS REPORTED PROMPTLY, (BUT IN NO EVENT MORE THAN THIRTY (30) DAYS AFTER DISCOVERY), HACKER INDUSTRIES, INC. WILL, AT ITS SOLE OPTION, REPLACE OR REFUND THE PURCHASE PRICE OF THE DEFECTIVE MATS. HACKER INDUSTRIES, INC. WILL NOT, HOWEVER, PAY COSTS OF LABOR, FREIGHT, FLOOR COVERING MATERIALS, CONSEQUENTIAL OR INCIDENTAL DAMAGES, OR ANY OTHER COSTS OR DAMAGES ASSOCIATED WITH THE REPAIR OR REPLACEMENT.

The preceding paragraph limits the scope of the warranty provided hereunder and the remedies for its breach. This limited warranty replaces and supersedes any and all other express or implied warranties. Except as expressly warranted herein, these FIRM-FILL® SCM Underlayments are sold "as is," without warranty.

FIRM-FILL® SCM Underlayments are one component in an overall floor/ceiling assembly designed to achieve certain sound results. The sound control mat itself has no acoustical value. Its performance is affected by every other component and the likelihood of achieving code compliance is contingent upon many other trades including framers, plumbers, drywall contractors to name a few. Accordingly, Hacker Industries, Inc. makes no warranty or representation concerning IIC or STC ratings or the overall effectiveness of the finished floor/ceiling assembly.

Developers and general contractors are responsible for building properly and testing field performance immediately in order to assure the reliability of the project.

Laboratory tests are not a guarantee of field performance because of the issues noted above and many other design errors that may occur. Please consult a professional acoustical consultant to assure plans are proper and that the floor/ceiling assembly can perform to expectations.

SAFETY FIRST

Follow good safety/industrial practices during installation. Wear appropriate personal protective equipment. Read SDS and literature prior to specification and/or installation.

TRADEMARKS

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