PROFILE OF INNOVATION

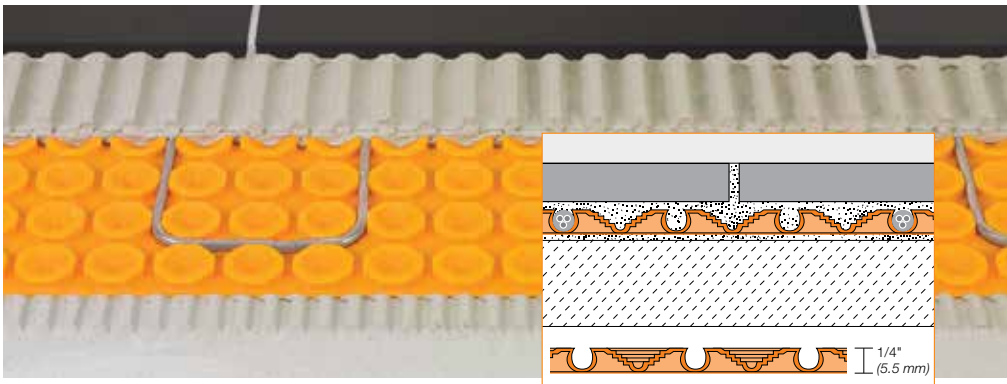
Schluter®-DITRA-HEAT

INNOVATIVE SOLUTIONS FOR CERAMIC AND STONE TILE

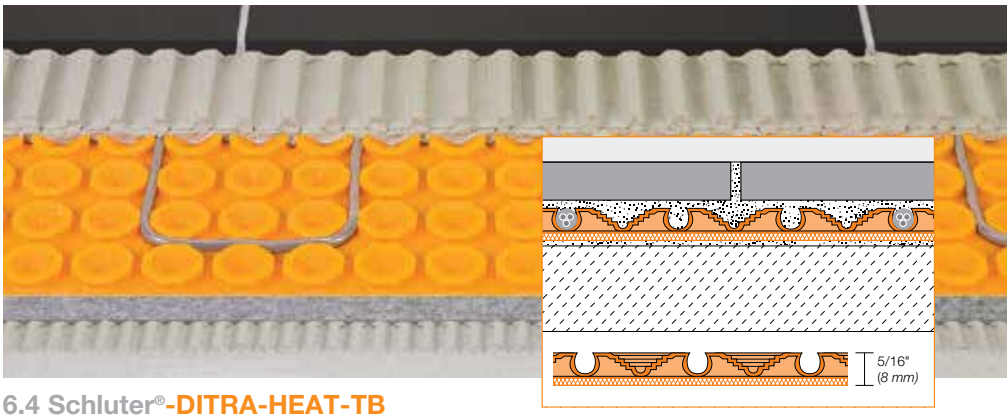
ELECTRIC FLOOR WARMING SYSTEM WITH INTEGRATED UNCOUPLING TECHNOLOGY

Application and Function

6.4 Schluter®-DITRA-HEAT and DITRA-HEAT-TB integrate customizable, comfortable electric floor warming with the functions of DITRA: uncoupling, waterproofing, vapor management and support to ensure a long lasting installation. DITRA-HEAT-TB features an integrated thermal break to reduce heat loss to the substrate and improve floor warming response time.



6.4 Schluter®-DITRA-HEAT



6.4 Schluter®-DITRA-HEAT-TB

Floor Warming

DITRA-HEAT and DITRA-HEAT-TB combine the flexibility of loose heating cables with the ease of installation of mat systems. Cables can be placed wherever heat is desired, without creating height differences in the floor. Self-leveling compounds are not required to encapsulate the cables, significantly reducing installation time and effort.

Uncoupling

Tile has been successfully installed for thousands of years by incorporating an uncoupling layer, or forgiving shear interface, within the tile assembly. DITRA-HEAT and DITRA-HEAT-TB provide uncoupling through their geometric configuration, which allows for in-plane movement that effectively neutralizes the differential movement stresses between the substrate and the tile, thus eliminating the major cause of cracking and delaminating of the tiled surface.

Waterproofing

DITRA-HEAT and DITRA-HEAT-TB provide reliable waterproofing. Their polypropylene composition protects the substrate from moisture penetration, which is particularly important in today's building environment where most substrates are moisture-sensitive.

Vapor Management

The free space on the underside of DITRA-HEAT and DITRA-HEAT-TB provide a route for excess moisture and vapor to escape from the substrate that could otherwise cause damage to the tile covering above. Thus, DITRA-HEAT and DITRA-HEAT-TB effectively manage moisture beneath the tile covering.

Support/load distribution

When placed on a solid foundation, columns or pillars can support tremendous loads. The same physical principle applies to DITRA-HEAT and DITRA-HEAT-TB installations. Column-like mortar structures are formed in and between the studs on the surface of the matting. Loads are transferred from the tile covering through these column-like mortar structures to the substrate. Since DITRA-HEAT and DITRA-HEAT-TB are virtually incompressible within the tile assembly, the advantages of uncoupling are achieved without sacrificing point load distribution capabilities.

Material Properties and Areas of Application

DITRA-HEAT is a polypropylene membrane with a cut-back stud structure and an anchoring fleece laminated to the underside. The thickness of the mat, including the stud structure is 1/4" *(5.5 mm)*. DITRA-HEAT-TB is a polypropylene membrane with a cut-back stud structure and a thermal break anchoring fleece laminated to the underside. The thickness of the mat, including the stud structure and thermal break fleece is 5/16" *(8 mm)*. Polypropylene is not UV-stable in the long term; the product must not be stored in places with prolonged exposure to direct sunlight.

The DITRA-HEAT and DITRA-HEAT-TB mattings do not rot and are inert, non-toxic, and physiologically safe. The material is highly resistant to solutions containing salts, acids, and alkalis, as well as many organic solvents, alcohols, and oils. Resistance to specific stresses can be provided if concentration, temperature, and exposure time are known. DITRA-HEAT and DITRA-HEAT-TB are waterproof and minimize the transmission of vapor.

Schluter®-DITRA-HEAT-TB offers the same functions as the Schluter®-DITRA-HEAT membrane, but also features an integrated thermal break in the form of a thicker bonding fleece. The thermal break reduces heat loss to the substrate and improves the floor warming response time at the standard three stud cable spacing.

In laboratory testing, DITRA-HEAT-TB reduced floor warming response time from 68°F *(20°C)* to 78°F *(25.5°C)* by approximately 80% (90 minutes) compared to DITRA-HEAT over a concrete substrate. Wood substrates act as insulators and typically do not pose the same challenges as concrete substrates. In the same laboratory testing, DITRA-HEAT-TB only reduced floor warming response time from 68°F *(20°C)* to 78°F *(25.5°C)* by approximately 20% (5 minutes) compared to DITRA-HEAT over a plywood substrate. Schluter®-DITRA-HEAT-E-HK heating cables were spaced at three studs in all of the above tests. Results above are based upon laboratory testing. Actual results may vary depending on various factors, including concrete substrate thickness, concrete substrate temperature, room temperature, heat losses, etc.

DITRA-HEAT has been independently tested for VOC emissions per CA 01350. DITRA-HEAT was found to emit 0.003 mg/m^3 total VOCs. Thus, DITRA-HEAT complies with tolerable levels outlined in CA 01350. Products in compliance with the tolerable levels outlined in this specification are specified by many green building standards and rating systems, including:

- LEED v4, IEQ Credit: Low-Emitting Materials
- NAHB National Green Building Standard (ICC 700), 901.7, 901.8: Pollutant Source Control - Hard-Surface flooring, Wall coverings
- Green Globes for New Construction 2014 (v1.3), 3.7.1: Volatile Organic Compounds
- International Green Construction Code (IgCC), 806.4, 806.5: Flooring, Wall Systems
- Standard for the Design of High Performance Green Buildings (ASHRAE 189.1), 8.4.2.3, 8.4.2.6: Floor Covering Materials, Wall Systems
- California Green Building Standards Code (CALGreen), 4.504.2 (Res), 5.504.4 (Non-Res): Finish Material Pollutant Control
- CHPS, EQ2.2: Low-Emitting Materials

DITRA-HEAT-E-HK are twisted pair heating cables designed for integration with the DITRA-HEAT and DITRA-HEAT-TB uncoupling membranes in interior floor warming applications. The cables can be installed without returning to the thermostat and produce virtually zero electromagnetic fields.

DITRA-HEAT-E-RSD is a digital thermostat to control the DITRA-HEAT-E-HK heating cables (either 120 V or 240 V). The thermostat features a 5 mA built-in ground fault circuit interrupter (GFCI) with indicator light. DITRA-HEAT-E-RSD features more than 250 pre-set programs and anticipated start function. A floor temperature sensor is included. Multiple heating cables may be connected to the thermostat, up to the total heating load limit of 15 amps.

DITRA-HEAT-E-RT/-R are digital thermostats to control the DITRA-HEAT-E-HK heating cables (either 120 V or 240 V). The thermostats feature a 5 mA built-in ground fault circuit interrupter (GFCI) with indicator light. The DITRA-HEAT-E-RT programmable thermostat features LCD touchscreen controls and comes with a pre-set schedule, but may be adjusted to fit any schedule. The DITRA-HEAT-E-R non-programmable version features a simple on/off function. Multiple heating cables may be connected to the thermostats, up to the total heating load limit of 15 amps. The DITRA-HEAT-E-RR power module may be used in conjunction with the DITRA-HEAT-E-RT/-R thermostats when the heating load exceeds 15 amps (e.g., in large floor applications). A floor temperature sensor is included.

Two floor temperature sensors are provided – one with the DITRA-HEAT-E-RT/-RSD/-R thermostats and one with the DITRA-HEAT-E-HK heating cables. Both floor temperature sensors are installed within the tile assembly. One sensor is connected to the thermostat, while the other sensor is stored in the thermostat electrical box, but not connected to the thermostat. The second sensor can easily be connected to the thermostat to replace the first sensor in case of damage.

Suitable Substrates

Wood

All wood materials, including OSB, plywood, and framing members, are subject to expansion, contraction, bending, and deflection as a result of changes in moisture content and loading. Further, these deformations fluctuate over the life of the building structure.

Concrete

There are various challenges associated with the installation of hard surface coverings on concrete substrates. To begin, the coefficient of thermal expansion of concrete is close to twice that of ceramic tile. Additionally, tile contractors are often expected to install tile over young concrete (concrete cured less than 28 days). However, rigid surface coverings installed over young concrete are susceptible to damage as a result of shrinkage during curing. Pre-stressed/post-tensioned concrete slabs are also commonplace in today's construction environment. Although pre-stressing is used to help control deflections in concrete structures, these slabs are still subject

to deformations caused by changes in moisture, temperature, and loading. Many concrete slabs on or below grade are subject to moisture migration, which can be problematic. Furthermore, these structures experience the same deformations as stated above.

Gypsum

Bonding ceramic or stone tiles directly to gypsum concrete substrates is generally considered questionable or not recommended. The challenges associated with gypsum-based underlayments include the requirement of an extended drying period before installing tile and continued sensitivity to the reintroduction of moisture throughout the life of the installation. In addition, since the coefficient of thermal expansion of gypsum concrete is substantially greater than that of ceramic tile, shear stresses caused by temperature fluctuations can result in delamination or cracking of the tile covering.

Note: DITRA-HEAT and DITRA-HEAT-TB may be installed over existing vinyl floors (no cushioned or perimeter bonded vinyl). However, various steps must be taken to ensure a successful installation. Please refer to the Schluter®-DITRA-HEAT Installation Handbook for details.

Installation

For complete installation guidelines and warranty criteria, please contact Schluter-Systems (USA: 800-472-4588; Canada: 800-667-8746) to receive a copy of the Schluter®-DITRA-HEAT Installation Handbook. To download a PDF version of the handbook or to view the installation video online, please visit www.schluter.com.

All substrates must be clean, even, and load bearing. Bond inhibiting surfaces must be removed prior to the application of DITRA-HEAT and DITRA-HEAT-TB.

Note: Type, thickness, and format of the tile or stone surface covering must be suitable for the intended application. Minimum tile format is 2" x 2" *(5 cm x 5 cm)*.

Movement Joints

DITRA-HEAT and DITRA-HEAT-TB do not eliminate the need for movement joints, including perimeter joints, within the tiled surface. Please refer to the Schluter®-DITRA-HEAT Installation Handbook for movement joint placement guidelines.

Wood Underlayment

In some applications, adding a layer of plywood or OSB before installing DITRA-HEAT or DITRA-HEAT-TB and the ceramic or stone tile covering is required to reduce deflection and curvature of the sheathing between the joists. Please refer to the Schluter®-DITRA-HEAT Installation Handbook for plywood/OSB underlayment installation guidelines.

Thin-Set Facts

Question: Can ceramic tile, including porcelain tile, be set on DITRA-HEAT or DITRA-HEAT-TB with unmodified thin-set mortar?

Answer: YES. In fact, we recommend it.

Here's why: Portland cement-based unmodified thin-set mortars are dependent upon the presence of moisture for hydration in order to gain strength. Since DITRA-HEAT and DITRA-HEAT-TB are impervious, they do not deprive the mortar of its moisture. This allows the cement to properly hydrate, resulting in a strong, dense bond coat. In fact, after the mortar has reached final set (usually within 24 hours), unmodified thin-set mortars achieve higher strengths when cured in continually moist conditions.

Question: Can ceramic tile, including porcelain tile, be set on DITRA-HEAT and DITRA-HEAT-TB with latex-modified thin-set mortar?

Answer: We DON'T recommend it.

Here's why: Latex-modified mortars must air dry for the polymers to coalesce and form a hard film in order to gain strength. When sandwiched between two impervious materials such as DITRA-HEAT or DITRA-HEAT-TB and ceramic tile, including porcelain tile, drying takes place very slowly through the open joints in the tile covering. [According to the TCNA Handbook for Ceramic, Glass, and Stone Tile Installation, this drying period can fluctuate from 14 days to over 60 days, depending on the geographic location, the climatic conditions, etc.]. Therefore, extended cure times would be required before grouting if using modified thin-set mortars between DITRA-HEAT or DITRA-HEAT-TB and ceramic tile, including porcelain tile. If extended cure times were not observed, the results could be unpredictable.

Additional Notes:

Remember, the type of mortar used to apply DITRA-HEAT or DITRA-HEAT-TB depends on the type of substrate. The mortar must bond to the substrate and mechanically anchor the fleece on the underside of the matting. For example, bonding DITRA-HEAT or DITRA-HEAT-TB to wood requires latex-modified thin-set mortar. Additionally, all mortars (modified and unmodified) have an acceptable temperature range that must be observed during application and curing.

Testing and Certifications

Uncoupling Membrane
The method used to establish the overall performance of a tile assembly under loading is the ASTM C627 “Standard Test Method for Evaluating Ceramic Floor Tile Installation Systems Using the Robinson Type Floor Tester.” The assembly is tested in cycles using a loaded, revolving carriage. Load, wheel hardness, and number of revolutions vary with each cycle. Once a specified level of damage is exceeded, the test is stopped. The TCNA Handbook for Ceramic, Glass, and Stone Tile Installation assigns performance levels to an assembly based on the number of cycles successfully completed. The ratings include residential, light, moderate, heavy, and extra heavy, in order of improving performance.

Report Number	Substrate	Joist Spacing	Tile	Rating
Schluter®-DITRA-HEAT				
TCNA-415-13	OSB	19.2" o.c.	12" x 12" porcelain	Extra Heavy
TCNA-415-13	OSB	24" o.c.	12" x 12" carrara marble	Light
TTMAC-UFT09-2013	Concrete	N/A	12" x 12" porcelain	Moderate
TCNA-415-13	Concrete	N/A	2" x 2" porcelain	Light
Schluter®-DITRA-HEAT-TB				
TCNA-455-15 (1)	Concrete	N/A	12" x 12" porcelain	Light
TCNA-455-15 (2)	Concrete	N/A	2" x 2" porcelain	Light
TNCA-455-15 (3)	Concrete	N/A	12" x 12" marble	Residential
TCNA-455-15 (4)	Plywood	19.2" o.c.	12" x 12" porcelain	Light

Assembly Notes:
1. All plywood and OSB subfloors were 23/32" (3/4" nom.) -thick; 11/32" (3/8" nom.)-thick OSB underlayment added for carrara marble test
2. Modified thin-set mortar (ANSI A118.11) to bond membrane to plywood and OSB
3. Unmodified thin-set mortar (ANSI A118.1) to bond membrane to concrete
4. Unmodified thin-set mortar (ANSI A118.1) to bond tile to membrane
5. High Performance Cement Grout (ANSI A118.7)

Heating Cables
The DITRA-HEAT-E-HK heating cables sets are certified or listed to the following standards and usage:

- CAN/CSA-C22.2 No. 130-03 "Requirements for Electrical Resistance Heating Cables and Heating Device Sets" under usage markings GXW for general use (G) with a wet rating (W), but specifically (X) for floor embedded indoor floor warming applications.
- UL 1673 "Electric Space Heating Cables" for installation in poured masonry floors within enclosed structures.
- ANSI/IEEE 515.1-2005 "IEEE Standard for the Testing, Design, Installation, and Maintenance of Electrical Resistance Heat Tracing for Commercial Applications" for installation Type C embedded floor warming within enclosed structures.

Thermostat

The DITRA-HEAT-E-RSD digital thermostat is:

- Certified to CSA C22.2 No. 24-93 (Reaffirmed 2003) "Temperature-Indicating and Regulating Equipment".
- Listed to UL 873 "Temperature-Indicating and Regulating Equipment" 11th Edition, containing revisions through and including April 18th, 2006.

The DITRA-HEAT-E-RT/-R digital thermostats are UL listed according to the following standards:

- UL 60730-1 "Automatic Electrical Controls for Household and Similar Use – Part 1: General Requirements"
- UL 60730-2-9 "Automatic Electrical Controls for Household and Similar Use – Part 2-9: Particular Requirements for Temperature Sensing Controls"
- CSA E60730-1:13 "Automatic Electrical Controls for Household and Similar Use – Part 1: General Requirements"
- CSA E60730-2-9 "Automatic Electrical Controls for Household and Similar Use – Part 2-9: Particular Requirements for Temperature Sensing Controls"
- UL 943 4th ed. "Ground-Fault Circuit Interrupters"
- CSA C22.2 No. 144.1-06 "Ground-Fault Circuit Interrupters"

Power Module

The DITRA-HEAT-E-RR power module is certified or listed to the following standards:

- Listed to UL 60730-1/ UL 60730-2-9 (Thermostat); 943 4th edition (GFCI)
- Certified to CSA E60730-1/ CSA E60730-2-9 (Thermostat); C22.2 No. 144.4-06 (GFCI)

Membrane

DITRA-HEAT and DITRA-HEAT-TB matting provide reliable waterproofing in interior applications. The products have been found to meet or exceed the requirements of the American National Standard Specifications for Load Bearing, Bonded, Waterproof Membranes for Thin-set Ceramic Tile and Dimension Stone Installation A118.10.

DITRA-HEAT:

- ICC-ES Report No. ESR-2467
- ICC-ES PMG Report No. PMG-1204
- DITRA-HEAT: U.S. Pat. No. 8,950,141, and U.S. DES. PAT. No. D706459 Canada Ⓓ Schluter Systems L.P. and other patents pending

DITRA-HEAT-TB:

- ICC-ES Report No. ESR-2467
- ICC-ES PMG Report No. PMG-1204
- Patent pending

Vapor Management

The free space under the DITRA-HEAT and DITRA-HEAT-TB mattings allow the substrate to breathe, while the material composition provides for a very low water vapor permeance, which prevents any significant vapor intrusion in the tile assembly from below.

Product	Test Method	Performance
Schluter®-DITRA-HEAT	ASTM E96*	0.21 perms
Schluter®-DITRA-HEAT-TB		0.48 perms

*Using the water method at 73ºF *(23ºC)* and 50% RH

DITRA-HEAT and DITRA-HEAT-TB effectively manage vapor and prevent damage to the tile covering as a result.

Product Item Numbers

6.4 Schluter®-DITRA-HEAT — Uncoupling and waterproofing membrane

Item No.	Item	Dimensions
DH5 12M	Roll	3' 3" x 41' 1" = 134.5 ft² *(1 m x 12.5 m = 12.5 m²)*
DH5 MA	Sheet	3' 3" x 2' 7" = 8.6 ft² *(1 m x 0.8 m = 0.8 m²)*

U.S. Pat. No. 8,950,141, and U.S. DES. PAT. No. D706459
Canada Ⓓ Schluter Systems L.P. and other patents pending.

6.4 Schluter®-DITRA-HEAT-TB — Uncoupling and waterproofing membrane with thermal break

Item No.	Item	Dimensions
DHTB810M	Roll	3' 3" x 33' = 108 ft² *(1 m x 10 m = 10 m²)*
DHTB8MA	Sheet	3' 3" x 2' 7" = 8.6 ft² *(1 m x 0.8 m = 0.8 m²)*

Patent pending

6.4 Schluter®-DITRA-HEAT-E-HK — Heating cable

Item No.	Length	Area	Total Power	Average Power (Watts/ft² – Watts/m²)	Current (Amps)
120 V					
DHE HK 120 11	35.3 ft *(10.8 m)*	10.7 ft² *(1.0 m²)*	135 W	12.6 - *135.8*	1.1
DHE HK 120 16	52.9 ft *(16.1 m)*	16.0 ft² *(1.5 m²)*	203 W	12.7 - *136.3*	1.7
DHE HK 120 21	70.5 ft *(21.5 m)*	21.3 ft² *(2.0 m²)*	270 W	12.7 - *136.3*	2.3
DHE HK 120 27	88.2 ft *(26.9 m)*	26.7 ft² *(2.5 m²)*	338 W	12.7 - *136.3*	2.8
DHE HK 120 32	105.8 ft *(32.2 m)*	32.0 ft² *(3.0 m²)*	405 W	12.7 - *136.3*	3.4
DHE HK 120 38	124.1 ft *(37.8 m)*	37.5 ft² *(3.5 m²)*	475 W	12.7 - *136.3*	4.0
DHE HK 120 43	141.1 ft *(43.0 m)*	42.7 ft² *(4.0 m²)*	540 W	12.7 - *136.3*	4.5
DHE HK 120 51	169.8 ft *(51.8 m)*	51.4 ft² *(4.8 m²)*	650 W	12.7 - *136.3*	5.4
DHE HK 120 64	212.9 ft *(64.9 m)*	64.4 ft² *(6.0 m²)*	815 W	12.7 - *136.3*	6.8
DHE HK 120 73	240.2 ft *(73.2 m)*	72.7 ft² *(6.8 m²)*	920 W	12.7 - *136.3*	7.7
DHE HK 120 83	275.5 ft *(84.0 m)*	83.3 ft² *(7.7 m²)*	1055 W	12.7 - *136.3*	8.8
DHE HK 120 92	303.0 ft *(92.4 m)*	91.7 ft² *(8.5 m²)*	1160 W	12.7 - *136.3*	9.7
DHE HK 120 102	336.9 ft *(102.7 m)*	101.9 ft² *(9.5 m²)*	1290 W	12.7 - *136.3*	10.7
DHE HK 120 113	372.2 ft *(113.4 m)*	112.6 ft² *(10.5 m²)*	1425 W	12.7 - *136.3*	11.9
DHE HK 120 134	444.0 ft *(135.3 m)*	134.3 ft² *(12.5 m²)*	1700 W	12.7 - *136.3*	14.2
240 V					
DHE HK 240 11	35.3 ft *(10.8 m)*	10.7 ft² *(1.0 m²)*	135 W	12.6 - *135.8*	0.6
DHE HK 240 16	53.1 ft *(16.2 m)*	16.1 ft² *(1.5 m²)*	203 W	12.6 - *135.8*	0.8
DHE HK 240 21	70.6 ft *(21.5 m)*	21.4 ft² *(2.0 m²)*	270 W	12.7 - *136.3*	1.1
DHE HK 240 27	88.2 ft *(26.9 m)*	26.7 ft² *(2.5 m²)*	338 W	12.7 - *136.3*	1.4
DHE HK 240 32	105.8 ft *(32.2 m)*	32.0 ft² *(3.0 m²)*	405 W	12.7 - *136.3*	1.7
DHE HK 240 38	124.1 ft *(37.8 m)*	37.5 ft² *(3.5 m²)*	475 W	12.7 - *136.3*	2.0
DHE HK 240 43	141.0 ft *(43.0 m)*	42.6 ft² *(4.0 m²)*	540 W	12.7 - *136.3*	2.3
DHE HK 240 53	176.3 ft *(53.7 m)*	53.3 ft² *(5.0 m²)*	675 W	12.7 - *136.3*	2.8
DHE HK 240 64	211.6 ft *(64.5 m)*	64.0 ft² *(5.9 m²)*	810 W	12.7 - *136.3*	3.4
DHE HK 240 75	248.2 ft *(75.7 m)*	75.1 ft² *(7.0 m²)*	950 W	12.7 - *136.3*	4.0
DHE HK 240 85	282.1 ft *(86.0 m)*	85.3 ft² *(7.9 m²)*	1080 W	12.7 - *136.3*	4.5
DHE HK 240 103	339.4 ft *(103.4 m)*	102.7 ft² *(9.5 m²)*	1300 W	12.7 - *136.3*	5.4
DHE HK 240 129	425.8 ft *(129.8 m)*	128.8 ft² *(12.0 m²)*	1630 W	12.7 - *136.3*	6.8
DHE HK 240 145	480.5 ft *(146.5 m)*	145.3 ft² *(13.5 m²)*	1840 W	12.7 - *136.3*	7.7
DHE HK 240 167	551.0 ft *(167.9 m)*	166.7 ft² *(15.5 m²)*	2110 W	12.7 - *136.3*	8.8
DHE HK 240 183	605.9 ft *(184.7 m)*	183.3 ft² *(17.0 m²)*	2320 W	12.7 - *136.3*	9.7
DHE HK 240 204	673.8 ft *(205.4 m)*	203.8 ft² *(18.9 m²)*	2580 W	12.7 - *136.3*	10.7
DHE HK 240 225	744.4 ft *(226.9 m)*	225.2 ft² *(20.9 m²)*	2850 W	12.7 - *136.3*	11.9
DHE HK 240 269	888.0 ft *(270.7 m)*	268.6 ft² *(25.0 m²)*	3400 W	12.7 - *136.3*	14.2

6.4 Schluter®-DITRA-HEAT-E-RT/-RSD/-R — Digital thermostats with remote floor temperature sensors

Item No.	Description
DHE RT 102/BW	Touchscreen programmable thermostat in white with floor temperature sensor
DHE RS D/BW	Programmable thermostat in white with floor temperature sensor
DHE RT 103/BW	Non-programmable thermostat in white with floor temperature sensor

6.4 Schluter®-DITRA-HEAT-E-RR — Power module

Item No.	Description
DHE RR 1/BW	Power module for use with DHE RT thermostats

6.4 Schluter®-DITRA-HEAT-E-KIT

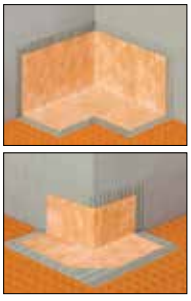
Item No.	DHE K 120 40	DHE K 120 56
Matting	5 sheets – 43.1 ft² *(4.0 m²)*	7 sheets – 60.3 ft² *(5.6 m²)*
Heating cable	88' 3" – 26.7 ft² *(26.9 m – 2.5 m²)*	124' 0" - 37.5 ft² *(37.8 m - 3.5 m²)*
Thermostat	1 – white, programmable	1 – white, programmable

8.1 Schluter®-KERDI-BAND — Waterproofing strips

Item No.	Width	Length	Thickness
KEBA 100/125/5M	5" – *12.5 cm*	16' 5" – *5 m*	4 mil
KEBA 100/125/10M	5" – *12.5 cm*	33' – *10 m*	4 mil
KEBA 100/185/5M	7-1/4" – *18.5 cm*	16' 5" – *5 m*	4 mil
KEBA 100/250/5M	10" – *25 cm*	16' 5" – *5 m*	4 mil
KEBA 100/125	5" – *12.5 cm*	98' 5" – *30 m*	4 mil
KEBA 100/185	7-1/4" – *18.5 cm*	98' 5" – *30 m*	4 mil
KEBA 100/250	10" – *25 cm*	98' 5" – *30 m*	4 mil

8.1 Schluter®-KERDI-FLEX — Waterproofing strips for use above movement joints

Item No.	Width	Length	Thickness
FLEX 125/5M	5" – *12.5 cm*	16' 5" – *5 m*	12 mil
FLEX 250/5M	10" – *25 cm*	16' 5" – *5 m*	12 mil
FLEX 125/30	5" – *12.5 cm*	98' 5" – *30 m*	12 mil
FLEX 250/30	10" – *25 cm*	98' 5" – *30 m*	12 mil



8.1 Schluter®-KERDI-KERECK-F — Waterproofing corners

Item No.	Thickness	Packaging
KERECK / FI 2	4 mil	2 Inside corners
KERECK / FI 10	4 mil	10 Inside corners
KERECK / FA 2	4 mil	2 Outside corners
KERECK / FA 10	4 mil	10 Outside corners

8.3 Schluter®-KERDI-FIX — Adhesive/sealant

Item No.	Description
KERDIFIX / ***color****	Cartridge - 9.81 oz *(290 ml)*

*Color Codes

BW Bright white

G Grey

To complete the item number, add the ***color*** code (e.g., KERDIFIX / **BW**).

Schluter®-DITRA-ROLLER — Used to embed uncoupling membranes in the bond coat

Item No.	Width
DIRO	14-1/2" *(37 cm)*

Schluter®-DITRA-HEAT and Schluter®-DITRA-HEAT-TB 10-Year Limited System Warranty

COVERAGE AND CONDITIONS: Subject to the conditions and limitations as stated hereinafter, **Schluter®-Systems*** warrants that the **Schluter®-DITRA-HEAT system** (the "Products")** will meet all composition and performance criteria for a period of ten (10) years from the date of purchase only when the Products are used and installed in accordance with the terms and conditions of the Schluter®-DITRA-HEAT Installation Handbook and industry standard guidelines that are not in conflict with the Handbook in effect at the time of installation. Further, efflorescence is considered to be a natural occurrence with cementitious materials and is therefore not considered to be a defective condition and is not covered by this warranty. It is the responsibility of the owner/ builder/ installer to ensure the suitability of all building materials and all associated building materials for the owner's intended use. It is recommended that the owner consult with an experienced and professional installer. **This warranty is conditioned and will be considered null and void and Schluter®-Systems will have the right to refuse any claims if:** (a) the Products have been improperly stored or installed, (b) any Schluter product comprising the system has been altered or otherwise modified in any way without the prior written authorization of Schluter®-Systems, (c) the Products are subject to abusive or abnormal use, lack of maintenance, or use other than that for which the Products were manufactured, and (d) the nameplate numbers have been removed or modified from any applicable parts (wire), and **(e) the homeowner/end user fails to return a copy of the completed heating cable tests log with the warranty registration card. Homeowner/end user(s) is responsible to return the warranty registration card with the logs, which may be by mail or www.schluter.com/registerwarranty. (It is AN INSTALLATION REQUIREMENT THAT the heating cable tests log be completed by the installer at time of installation and a copy returned with the registration card. We recommend the original logs be retained by homeowner/end users.)**

RESOLUTION: Upon return of the registration card with the heating cable logs*** and compliance with all the aforementioned conditions, if the Products fail to meet this warranty, then the owner's exclusive remedy and the sole obligation of Schluter®-Systems, at its election, shall be to a) reinstall or replace the failed portion of the floor covering assembly or b) pay an amount not to exceed the original square foot cost of the installation of the floor covering assembly verified to be defective. Floor covering assembly is defined to include all DITRA-HEAT materials (e.g., matting and heating cables), non-reusable flooring surfaces, and the appropriate setting and grouting materials. Further, due to conditions beyond the control of Schluter®-Systems (e.g., color and shade availability, discontinuation, normal wear and tear), Schluter®-Systems cannot guarantee or warrant an exact match to the specific tile, stone, or other flooring materials used in the installation. In such events, substantially similar materials may be substituted. This warranty does not cover scratches, dents, corrosion or discoloration caused by excessive heat, chemical cleaning products and abrasive agents. This warranty does not cover the cost of disconnection or installation.
In the event that the registration card and or heating cable tests log is not completed and returned then the Schluter®-DITRA-HEAT-E-HK heating cable shall be subject to a twenty-five (25) year Limited Product Warranty that each Schluter Heating Cable purchased shall be free from defects in material and workmanship effective on the date of the purchase by or for the original purchaser. The maximum liability of the company is limited to the cost of the original Cable multiplied by the percentage of the warranty period remaining.

DISCLAIMER: THERE ARE NO WARRANTIES BEYOND THIS EXPRESSED WARRANTY AS STATED ABOVE. ALL OTHER WARRANTIES, REPRESENTATIONS OR CONDITIONS, EXPRESSED OR IMPLIED, ARE DISCLAIMED AND EXCLUDED, INCLUDING WARRANTIES, REPRESENTATIONS OR CONDITIONS OF **MERCHANTABILITY** OR FITNESS FOR A PARTICULAR PURPOSE ARISING BY STATUTE OR OTHERWISE BY LAW OR FROM A COURSE OF DEALING OR USAGE OF TRADE. SCHLUTER-SYSTEMS EXCLUDES AND IN NO EVENT SHALL HAVE ANY LIABILITY FOR LOST PROFITS OR ANY OTHER INDIRECT, SPECIAL, INCIDENTAL, PUNITIVE, EXEMPLARY, OR CONSEQUENTIAL DAMAGES, ARISING OUT OF OR OTHERWISE CONNECTED TO FAILURE OF THE PRODUCTS OR FLOORING SYSTEM OF WHICH THEY ARE PART, NOR MISUSE OF THE PRODUCTS OR FLOORING SYSTEM, REGARDLESS OF ANY STRICT LIABILITY, ACTIVE OR PASSIVE NEGLIGENCE OF SCHLUTER SYSTEMS, AND REGARDLESS OF THE LEGAL THEORY (CONTRACT OR TORT OR EXTRA-CONTRACTUAL OR OTHER), NOR FROM ACTS OF WAR, TERRORISM, OVERVOLTAGE, FAULTY AND NEGLIGENT PENETRATION OF THE SYSTEM, FIRES, EXPLOSIONS, ACTS OF GOD, INTENTIONAL ACTS OF DESTRUCTION OR ANY LOSSES DUE TO STRUCTURAL FAILURE OR OTHER CAUSES UNRELATED TO THE PRODUCTS OR DELAYS, OR ANY OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES. THIS WARRANTY IS GIVEN IN LIEU OF ANY OTHER WARRANTY EXPRESSED OR IMPLIED. THE REMEDIES CONTAINED HEREIN ARE THE ONLY REMEDIES AVAILABLE FOR BREACH OF THIS WARRANTY. THIS LIMITED WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS; SOME STATES AND PROVINCES DO NOT ALLOW DISCLAIMERS OR OTHER RESTRICTIONS OF IMPLIED WARRANTIES, SO SOME OF THE ABOVE DISCLAIMERS MAY NOT APPLY TO YOU.

TRANSFERABILITY: This Limited Warranty extends ONLY to the original end user (defined as original intended owner and user of the property/unit in which the installation is incorporated - herein referred to as "Owner") and is not transferable or assignable, unless approved in writing by the Technical Director or an Officer of Schluter®-Systems or otherwise prohibited by specific state or provincial law.

MODIFICATIONS TO WARRANTY: No changes or modification of any terms or conditions of this warranty are allowed unless authorized by written agreement and signed by the Technical Director or an Officer of Schluter®-Systems.

EFFECTIVE DATE: This warranty shall supersede and replace any and all prior oral or written warranties, agreements, or other such representations made by or on behalf of Schluter®-Systems relative to the Products or the application of the Products and shall apply to any installation occurring on or after March 1, 2016.

CLAIMS ON THIS LIMITED WARRANTY: To make a claim under this Limited Warranty, the Owner must provide Schluter®-Systems with written notice within 30 days of any alleged defect in the Products covered by this Limited Warranty, together with date and proof of purchase of the Products, proof of the costs of the original installation and name and address of all installers and completed heating cable tests log, failing which this Limited Warranty shall be of no legal effect. Schluter®-Systems reserves the right at its election and as a condition of this Limited Warranty to inspect the alleged failed and defective condition.

All U.S. Claims shall be sent to:

Schluter Systems L.P.
Attn: Warranty Claims Dept.
194 Pleasant Ridge Road
Plattsburgh, NY 12901

All Canadian Claims shall be sent to:

Schluter Systems (Canada), Inc.
Attn: Warranty Claims Dept.
21100 chemin Ste-Marie
Ste-Anne-de-Bellevue, QC H9X 3Y8

*For the purpose of this warranty **Schluter Systems, L.P.** shall provide the warranty for end users located in the United States, and **Schluter Systems (Canada) Inc.** shall provide the warranty for end users located in Canada. This warranty is limited to sales of the Products made in and intended for use in the United States and Canada.

**Schluter®-DITRA-HEAT System ("the Products"): The products are defined to include Schluter®-DITRA-HEAT and DITRA-HEAT-TB matting and DITRA-HEAT heating cables.

***To qualify for resolution for failure of the Schluter®-DITRA-HEAT-E-HK heating cables within the Schluter®-DITRA-HEAT & Schluter®-DITRA-HEAT-TB Limited System Warranty for ten (10) years, complete "Test 1: Conductor Resistance," "Test 2: Conductor and Ground Braid Continuity," and "Floor Temperature Sensors Test". Completion of "Test 3: Insulation Resistance," in addition to those listed above, will extend the term for resolution for failure of the Schluter®-DITRA-HEAT-E-HK heating cables within the Schluter®-DITRA-HEAT & Schluter®-DITRA-HEAT-TB Limited System Warranty from ten (10) years to fifteen (15) years.

Schluter®-DITRA-HEAT Thermostat 3-Year Limited Warranty

COVERAGE AND CONDITIONS: Subject to the conditions and limitations as stated hereinafter, **Schluter®-Systems*** warrants that the **Schluter®-DITRA-HEAT thermostat** (the "Product")** will be free of manufacturing defects for a period of three (3) years from the date of purchase only when the Product is used and installed in accordance with the terms and conditions of the Schluter®-DITRA-HEAT Thermostat User's Guide or Quick Start Guide and industry standard guidelines that are not in conflict with User's Guide in effect at the time of installation. This warranty is conditioned and will be considered null and void and Schluter®-Systems will have the right to refuse any claims if : (a) resulting from faulty installation or improper storage, (b) any Schluter product comprising the system has been altered or otherwise modified in any way without the prior written authorization of Schluter®-Systems, (c) an abusive or abnormal use, lack of maintenance, improper maintenance or use other than that for which the Product was manufactured. It is the responsibility of the owner/ builder/ installer to ensure the suitability of all building materials and all associated building materials for the owner's intended use. It is recommended that the owner consult with an experienced and professional installer and qualified electrician.

RESOLUTION: If the Product fails to meet this warranty, then the owner's exclusive remedy and the sole obligation of Schluter®-Systems, at its election, shall be to repair or replace the Product, and does not cover the cost of disconnection, transport, and installation.

DISCLAIMER: THERE ARE NO WARRANTIES BEYOND THIS EXPRESSED WARRANTY AS STATED ABOVE. ALL OTHER WARRANTIES, REPRESENTATIONS OR CONDITIONS, EXPRESSED OR IMPLIED, ARE DISCLAIMED AND EXCLUDED, INCLUDING WARRANTIES, REPRESENTATIONS OR CONDITIONS OF **MERCHANTABILITY** OR FITNESS FOR A PARTICULAR PURPOSE ARISING BY STATUTE OR OTHERWISE BY LAW OR FROM A COURSE OF DEALING OR USAGE OF TRADE. SCHLUTER-SYSTEMS EXCLUDES AND IN NO EVENT SHALL HAVE ANY LIABILITY FOR LOST PROFITS OR ANY OTHER INDIRECT, SPECIAL, INCIDENTAL, PUNITIVE, EXEMPLARY, OR CONSEQUENTIAL DAMAGES, ARISING OUT OF OR OTHERWISE CONNECTED TO FAILURE OF THE PRODUCT OR FLOORING SYSTEM OF WHICH THEY ARE PART, NOR MISUSE OF THE PRODUCT OR FLOORING SYSTEM, REGARDLESS OF ANY STRICT LIABILITY, ACTIVE OR PASSIVE NEGLIGENCE OF SCHLUTER SYSTEMS, AND REGARDLESS OF THE LEGAL THEORY (CONTRACT OR TORT OR EXTRA-CONTRACTUAL OR OTHER), NOR FROM ACTS OF WAR, TERRORISM, OVERVOLTAGE, FAULTY AND NEGLIGENT PENETRATION OF THE SYSTEM, FIRES, EXPLOSIONS, ACTS OF GOD, INTENTIONAL ACTS OF DESTRUCTION OR ANY LOSSES DUE TO STRUCTURAL FAILURE OR OTHER CAUSES UNRELATED TO THE PRODUCT OR DELAYS, OR ANY OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES. THIS WARRANTY IS GIVEN IN LIEU OF ANY OTHER WARRANTY EXPRESSED OR IMPLIED. THE REMEDIES CONTAINED HEREIN ARE THE ONLY REMEDIES AVAILABLE FOR BREACH OF THIS WARRANTY. THIS LIMITED WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS; SOME STATES AND PROVINCES DO NOT ALLOW DISCLAIMERS OR OTHER RESTRICTIONS OF IMPLIED WARRANTIES, SO SOME OF THE ABOVE DISCLAIMERS MAY NOT APPLY TO YOU.

TRANSFERABILITY: This Limited Warranty extends ONLY to the original end user (defined as original intended owner and user of the property/unit in which the installation is incorporated - herein referred to as "Owner") and is not transferable or assignable, unless approved in writing by the Technical Director or an Officer of Schluter®-Systems or otherwise prohibited by specific state or provincial law.

MODIFICATIONS TO WARRANTY: No changes or modification of any terms or conditions of this warranty are allowed unless authorized by written agreement and signed by the Technical Director or an Officer of Schluter®-Systems

EFFECTIVE DATE: This warranty shall supersede and replace any and all prior oral or written warranties, agreements, or other such representations made by or on behalf of Schluter®-Systems relative to the Product or the application of the Product and shall apply to any installation occurring on or after March 1, 2016.

CLAIMS ON THIS LIMITED WARRANTY: To make a claim under this Limited Warranty, the Owner must provide Schluter®-Systems with written notice within 30 days of any alleged defect in the Product covered by this Limited Warranty, together with date and proof of purchase of the Product, and name and address of all installers, failing which this Limited Warranty shall be of no legal effect. Schluter®-Systems reserves the right at its election and as a condition of this Limited Warranty to inspect the alleged failed and defective condition.

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Attn: Warranty Claims Dept.
194 Pleasant Ridge Road
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All Canadian Claims shall be sent to:

Schluter Systems (Canada), Inc.
Attn: Warranty Claims Dept.
21100 chemin Ste-Marie
Ste-Anne-de-Bellevue, QC H9X 3Y8

*For the purpose of this warranty **Schluter Systems, L.P.** shall provide the warranty for all products for end users located in the United States, and **Schluter Systems (Canada) Inc.** shall provide the warranty for all products for end users located in Canada. This warranty is limited to sales of the Products made in and intended for use in the United States and Canada.

**Schluter®-DITRA-HEAT Thermostat ("the Product"): The product is defined to be the Touchscreen Programmable (DH E RT 102/BW) Thermostat and/or the Programmable (DH E RS D/BW) Thermostat and/or the Non-Programmable (DH E RT 103/BW) Thermostat and/or the Power Module (DHE RR 1/BW).

Schluter Systems L.P. • 194 Pleasant Ridge Road, Plattsburgh, NY 12901-5841 • Tel.: 800-472-4588 • Fax: 800-477-9783
Schluter Systems (Canada) Inc. • 21100 chemin Ste-Marie, Ste-Anne-de-Bellevue, QC H9X 3Y8 • Tel.: 800-667-8746 • Fax: 877-667-2410

www.schluter.com