Tecnite

SPECIALIZED THERMAL MANAGEMENT SOLUTIONS

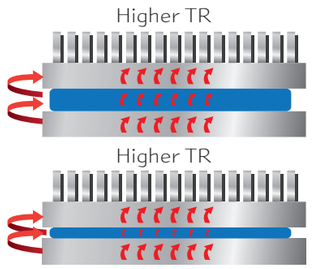
FOR TODAY'S DEMANDING ELECTRONICS ASSEMBLY APPLICATIONS

CRITICAL *TIM* PROPERTIES

Effective thermale resistance of a device, R_{TIM}.

$$R_{TIM} = \frac{BLT}{k_{TIM}} + R_{c1} + R_{c2}$$

- BLT = Bond Line Thickness
- k_{TIM} = Thermal Conductivity
- Rc = Contact Resistance between the TIM and the two surfaces



Bulk conductivity and contact resistance being equal, a thinner bond line will result in lower thermal resistance.

Key Goal Minimize R_{TIM}

- Increase TIM thermal conductivity *(k_{TIM})*
- Reduce Bond Line Thickness *(BLT)*
- Reduce contact resistances *(Rc)*

THERMAL INTERFACE MATERIALS

Thermal management is a critical issue in the design of electronic systems. As the complexity of the devices continues to grow, designers and manufacturers require improved technologies to effectively remove the generated heat. While fans, heat sinks and thermoelectric devices can be used to provide enough cooling power, the problem remains to get the heat from the hot components into the cooling hardware. Thermal Interface Materials (TIMs) are designed to fill in air gaps and microscopic irregularities, resulting in dramatically lower thermal resistance and thus better cooling.

Tecnite thermal pads, insulators, compounds, tape and graphite sheets can be used in a variety of electronic applications and industries including computers, laptops, tablet PCs, smart phones, routers, LEDs, solar, medical device, power supplies, wireless devices and the automotive industry.

PRODUCT RANGE

Type	Tecnite	Description	Thermal conductivity W/mK	Test Method
Pad	UDT10	Fiberglass reinforced good thermal conductivity pad, thickness: 0.5 - 10 mm	1.0	ISO 22007-2
	UDT20	Fiberglass reinforced good thermal conductivity pad, thickness: 0.7 - 6.5 mm	2.0	ISO 22007-2
	DT08	Ultra soft, general purpose thermal conductivity pad, thickness: 0.5 - 12 mm	0.8	ASTM E1461
	DT12	Ultra soft and highly conformable thermal conductivity pad, thickness: 0.5 -12 mm	1.2	ASTM E1461
	DT15	Good thermal conductivity thermal pad with nylon mesh, thickness: 0.5 - 12 mm	1.5	ASTM E1461
	DT20	Good performance thermal conductivity pad, thickness: 0.5 - 6 mm	2.0	ASTM E1461
	DT25	High performance conductivity pad w/ hardened side, thickness: 0.5 - 5 mm	2.5	ASTM E1461
	DT30	High performance conductivity pad with nylon mesh, thickness: 0.5 - 5 mm	3.0	ASTM E1461
	DT40	High performance conductivity pad with nylon mesh, thickness: 0.5 - 3.0 mm	4.0	ISO 22007-2
	DT50	Extremely high performance heat conductivity pad, thickness: 1 - 12 mm	5.0	ASTM D5470
	DT60	Extremely high performance heat conductivity pad, thickness: 1 - 10 mm	6.0	ISO 22007-2
	DT70	Extremely high performance heat conductivity pad, thickness: 1 - 10 mm	7.0	SO 22007-2
Insulator	DTI23G	Thermal conductivity insulator, thickness 0.23 mm	0.8	ASTM E1461
	DTI30G	Thermal conductivity insulator, thickness 0.30 mm	0.8	ASTM E1461
	DTI45G	Thermal conductivity insulator, thickness 0.45 mm	0.8	ASTM E1461
	DTI90S	Fiberglass reinforced thermal conductivity insulator pad, thickness 0.23 mm	1.6	ASTM E1461
	DTI120	High performance thermal conductivity insulator, thickness 0.23 mm	1.8	ASTM D5470
Graphite sheet	DTGS	Extremely high performance graphite sheet, thickness 0.025 - 0.07 mm	1000-1500	ASTM D5470
	DTGTF	Extremely high performance graphite sheet, thickness 0.03 - 0.15 mm	700-1200	ASTM D5470
Compound	DTC30	High performance thermal conductivity thermal compound	3.0	ASTM D5470
	DTC50	Highest performance thermal conductivity compound	5.0	ASTM D5470
Tape	DTT60	Thermal conductivity tape	0.6	ASTM D5470
	DTT12	Good performance thermal conductivity tape	1.2	ASTM D5470

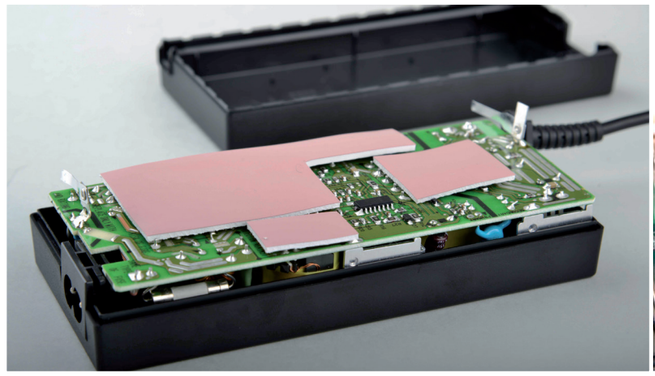
Most Tecnite products are UL, RoHS and REACH compliant

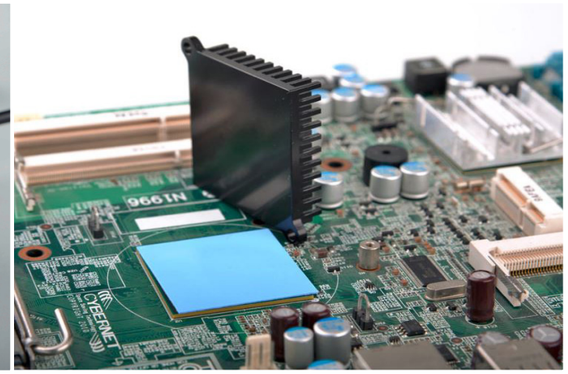
THERMAL PADS

Tecnite pads are constructed from an innovative and advanced silicone rubber with high thermal conductivity and exceptional dielectric strength. They are available in thicknesses from 0.5 to 12 mm, and this universally applicable material can be used in an unlimited number of thermal management configurations. The pads provide great conformability, easy application and can be die-cut to fit most applications. They are available as dry pads, or with an optional pressure sensitive adhesive tape for attachment.

Specifications and benefits

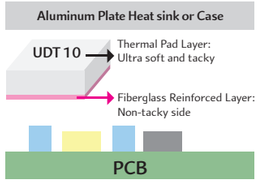
- Thermal conductivity: Max. 7.0 W/mK
- Cost effective solution at competitive price
- Custom die-cut parts: custom configurations available
- Soft and naturally sticky
- Electrically insulating
- No drying out, bleeding oil or hidden air (like thermal paste)
- Long life time
- Optional 3M tape on one or both sides
- UL94 V-0 (up to 150 C°), RoHS and REACH compliant

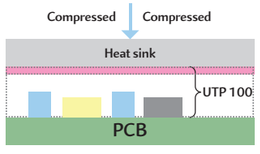




TECNITE THERMAL PADS

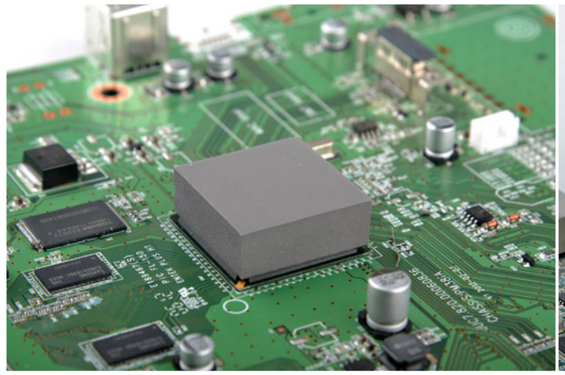
Properties	Unit	UDT10	UDT20	DT08	DT12	DT15	DT20		DT25	DT30	DT40	DT50	DT60	DT70	Test Method
Composition		Silicone & fiberglas			Silicone & ceramic filled						Silicone & ceramic filled				
Colour		Pink/white	Gray/reddish/brown	Grey	Pink	Dark grey	Dark grey		Light yellow	Light blue	Purple	Dark green	Orange	Light blue	
Thickness range	mm	0.5 - 10	0.7-6.5	0.5 - 12.0	0.5 - 12.0	0.5 - 12.0	0.5 - 6.0		0.5 - 5.0	0.5 - 5.0	0.5-3.0	1.0-12.0	1.0-10.0	1.0-10.0	
Hardness	Shore	10-30 (C)	35 (00)	18 or 35 (C)	15 (C)	25 (C)	25 (C)		25 (C)	25 (C)	55 ±5 (00)	50 ±5 (00)	50 ±5 (00)	35 ±5 (00)	ASTM D2240
Density	g/ml	2	2.8	2	2.3	2.5	2.79		2.93	2.7	3.15	3.20	3.285	3.3	ASTM D792
Elongation	%	60	-	1.35	70	70	78		72	64	-	22	80 %	-	ASTM D412
Temperature range	°C	-40 to +150	-40 to +150	-40 to +150	-40 to +150	-40 to +150	-40 to +150		-40 to +150	-40 to +150	-40 to +150	-40 to +200	-40 to +150	-40 to +150	
Breakdown voltage	kV/mm	≥10.0	≥10.0	≥4.0	≥6.5	≥5.0	≥6.0		≥5.0	≥5.0	≥5.0	≥6.0	>5.0	>6.0	ASTM D149
Volume impedance	Ω·m	$6.2*10^{15}$	$8.5*10^{13}$	$1.7*10^{16}$	$3.5*10^{12}$	$8.0*10^{15}$	$1.1*10^{16}$		$3.2*10^{16}$	$1.1*10^{16}$	$0.7*10^{14}$	$1.47*10^{10}$	10^{12}	10^{12}	ASTM D257
Tensile strength	kN/m	1.95	-	1.3	1	0.5	0.33		0.4	0.3	-	0.10	-	-	ASTM D412
Dielectric constant	@ 1 MHz	5.7	5.6	4.51	3.87	5.75	5.75		6.3	7.15	-	7.4	7.9	7.1	ASTM D150
Weight damnify	%	≤1	≤1	≤1	≤1	≤0.3	≤0.3		≤0.5	≤0.3	≤1.0	≤1.0	≤1.0	≤1.0	@ 150 °C 240H
Thermal conductivity	W/mK	1.0	2.0	0.8	1.2	1.5	2.0		2.5	3.0	4.0	5.0 ±3	6.0	7.0	ASTM E1461 ISO 22007-2 (UDT10, UDT20, DT40, DT50, DT60, DT70)
Thermal Resistance	°C-in²/W	40 psi: 1.267 @ 0.5 mm 1.907 @ 1.0 mm	1.012	40 psi: DT08/H18: 0.968 @ 0.5 mm DT08/H35: 1.483 @ 0.5 mm DT08/H18: 1.713 @ 1.0 mm DT08/H35: 2.324 @ 1.0 mm	40 psi: 1.118 @ 1.0 mm	40 psi: 0.681 @ 0.5 mm 1.099 @ 1.0 mm	40 psi: 0.425 @ 0.5 mm 0.824 @ 1.0 mm		40 psi: 0.355 @ 0.5 mm 0.542 @ 1.0 mm	40 psi: 0.291 @ 0.5 mm 0.417 @ 1.0 mm	10 psi: 0.30 @ 0.5 mm 50 psi: 0.28 @ 0.5 mm	0.31	20 psi: 0.138 @ 1.0 mm	20 psi: 0.13 @ 1.0 mm	ASTM D5470 (UDT20, DT40, DT50, DT60)
Compliances		UL 94 V-0, RoHS, REACH									UL 94 V-0, RoHS, REACH				
Sheet sizes		Standard: 200*400 mm	Standard: 200*400 mm	Standard: 200*400 mm 330*330 mm	Standard: 200*400 mm	Standard: 200*400 mm	Standard: 200*400 mm 330*330 mm		Standard: 200*400 mm 330*330 mm	Standard: 200*400 mm 330*330 mm	Standard: 200*400 mm	Standard: 200*400 mm	Standard: 200*400 mm	Standard: 200*400 mm	
Custom configurations			Custom die-cut parts available. Available with acrylic PSA tape for improved application on one or both sides: • 3M Double Coated Tape 9448HK (will make the pad 0.15 mm thicker on both sides) • 3M Transfer Tape 3M467 (will make the pad 0.06 mm thicker on both sides)						Custom die-cut parts available. Available with acrylic PSA tape for improved application on one or both sides: • 3M Double Coated Tape 9448HK (will make the pad 0.15 mm thicker on both sides) • 3M Transfer Tape 3M467 (will make the pad 0.06 mm thicker on both sides)					

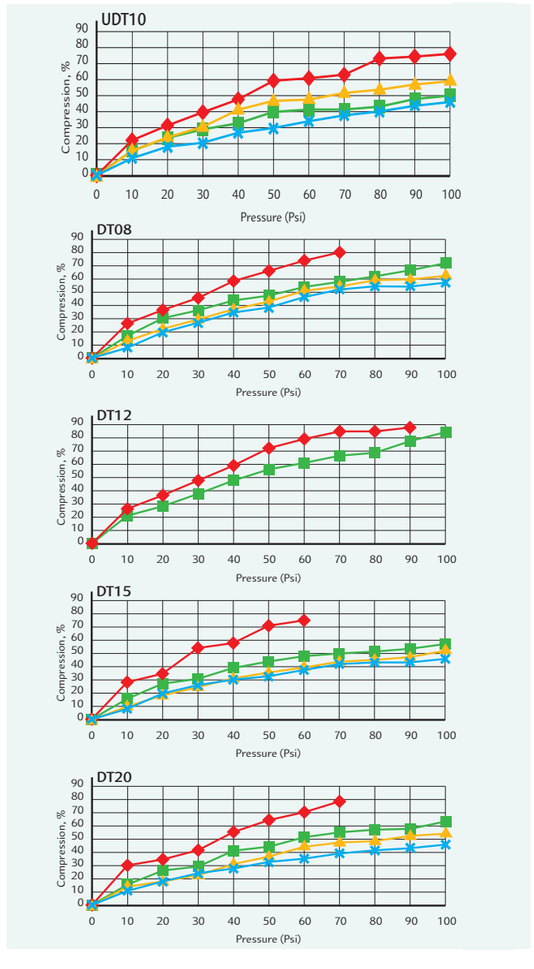


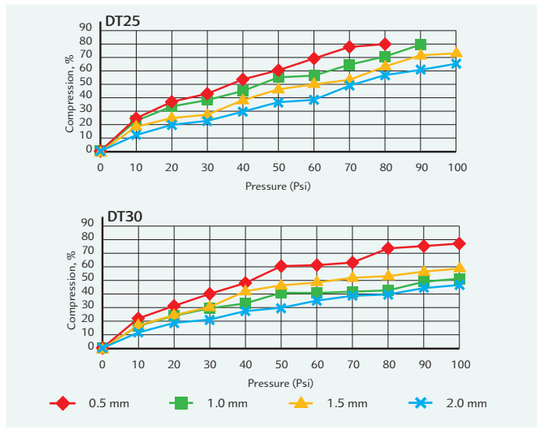


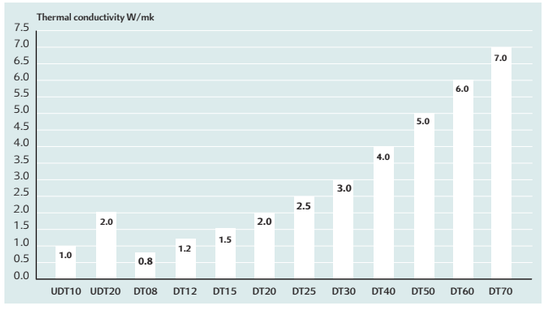
Fiberglass reinforcement on one side. Extremely soft and naturally tacky on unreinforced side that very easily conforms in and around protrusions and depressions on components to make complete, reliable physical contact.

THERMAL PADS



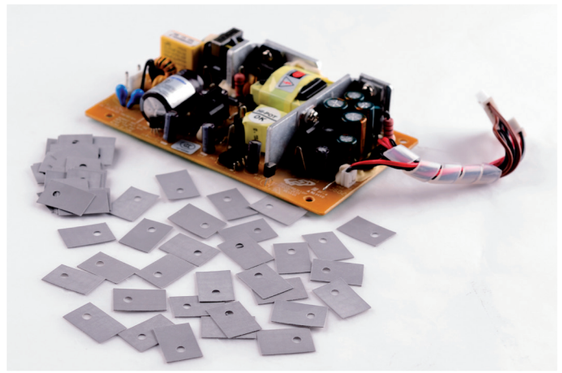






THERMAL INSULATORS

Tecnite thermal insulators are extra thin thermally conductive, electrically insulating pads. They are designed for a wide range of applications which require high performance of heat transfer and electrical insulation. These products provide a more consistent breakdown voltage over other insulation constructions.



Specifications and benefits

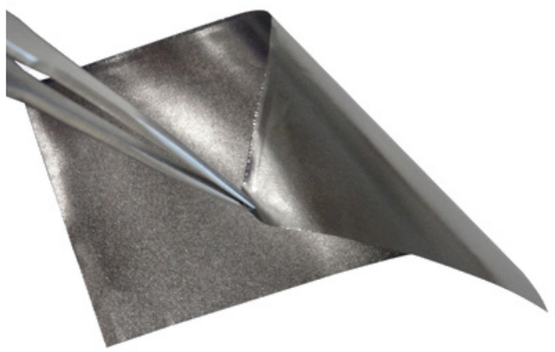
- Thermal conductivity: Max. 1.8 W/mK
- Resistant to tears and punctures
- Cost effective solutions at competitive price
- Custom die-cut parts: custom configurations available
- High dielectric breakdown of up to 6.0 kV/mm
- UL94 V-0 and RoHS compliant

TECNITE THERMAL INSULATORS

Properties	Unit	DTI23G	DTI30G	DTI45G	DTI90S	DTI120	Test Method
Composition		silicone & fiberglass	silicone & fiberglas	silicone & fiberglas	silicone & fiberglas	silicone & fiberglas	
Colour		Grey	Grey	Grey	Brown red	Grey	
Thickness range	mm	0.23 (± 0.03)	0.30 (±0.03)	0.45 (±0.05)	0.23 (±0.3)	0.23 (±0.03)	
Hardness	Shore A	25 (±5)	25 (±5)	25 (±5)	75 (±5)	80	ASTM D2240
Density	g/ml	1.7	1.7	1.7	2.5	2.5	ASTM D792
Elongation	%	30	30	30	-	-	ASTM D412
Temperature range	°C	-40 to 150	-40 to +150	-40 to +150	-40 to +150	-40 to +150	EN344
Breakdown voltage	kV/mm	≥4.0	≥4.0	≥4.0	≥5.0	≥6.0	ASTMD149
Volume impedance	Ω·cm	$1.0*10^{11}$	$1.0*10^{11}$	$1.0*10^{11}$	$1.7*10^{16}$	$1.7*10^{16}$	ASTM D257
Weight damnify	%	≥1	≥1	≥1	≥1	≥1	@ 150 °C 240H
Thermal conductivity	W/mK	0.8	0.8	0.8	1.6	1.8	ASTM E1461 DTI120: ASTM D5470
Thermal impedance	°C-in²/W	Please contact us for details			0.663 @ 10 psi 0.620 @ 25 psi 0.568 @ 50 psi 0.526 @ 100 psi	0.710 @ 10 psi 0.620 @ 25 psi 0.530 @ 50 psi 0.470 @ 100 psi	
Compliances		UL 94 V-0, RoHS			UL 94 V-0	UL 94 V-0	
Sheet sizes		Standard: Die-cut rolls: width: 300 mm * lenght: 50 m					
Custom configurations		Custom die-cut parts available					

THERMAL GRAPHITE SHEETS

Tecnite GS is a series of thermal graphite sheets with ultra high thermal conductivity. They combine different important functionalities like high thermal management, light weight, high flexibility, temperature stability with possibility of application on a wide range of substrates and low weight applications.

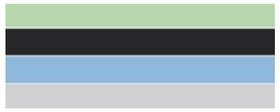


Specifications and benefits

- Thermal conductivity: Max. 1500 W/mK
- Cost effective solution at competitive price
- High temperature stability: -40 til +400 ℃
- Long life time
- Resistant to liquids and gas
- Flexible and low weight
- UL94 V-0, RoHS and REACH compliant

TECNITE THERMAL GRAPHITE SHEETS

Properties	Unit	DTGS			DTGTF					Test Method
Composition		Graphene			Graphene					
Colour		Black			Black					
Thickness range	mm	0.025	0.04	0.07	0.03	0.05	0.07	0.1	0.15	ASTM D374
Proportion	g/cm^3	1.9	1.78	1.61	1.78	1.7	1.65	1.6	1.6	ASTM D792
Thermal diffusivity	m^2/s	860	801	720	550	500	450	450	400	ASTM D5470
Temperature range	°C	+400			-40 to +400					EN344
Flexural properties	(R5/1800) times	> 30000			> 20000					-
Specific heat	°C J/g/K	0.85			0.7					ASTM D792
Thermal conductivity horizontal direction	W/mK	1500	1300	1000	1200	1100	900	700	700	ASTM D5470
Thermal conductivity vertical direction	W/mK	15	13	10	11	10	9	8	8	ASTM D5470
Electric conductivity	S/m (2.0X1010^6S/m)	20000			1300					ASTM D149
Tensile strength horizontal direction		30	22	19	20	15	10	10	10	ASTM F-152
Tensile strength vertical direction		0.1	0.4	0.4	0.1	0.15	0.2	0.25	0.3	ASTM F-152
Compliances		UL 94 V-0, RoHS, REACH								
Sheet sizes		Standard: 600 mm*100 m (0.03 - 0.07 mm), 1000 mm*100 m (≥0.1 mm)								
Custom configurations		Adhesive, film, die-cutting may depend on the request								



→ Single sided adhesive
→ Graphite sheet
→ Double sided adhesive
→ Release film

THERMAL COMPOUNDS

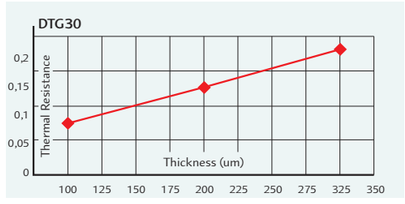
Tecnite thermal compounds are formulated to eliminate pump-out, ensuring long-lasting thermal management and effective heat transfer. They provide high thermal conductivity, minimum bond line thickness and superior surface wetting.

Specifications and benefits

- Thermal conductivity: Max. 5.0 W/mK
- Lowest thermal resistance
- High conformability and cost effective
- Short production
- Long reliability
- UL94 V-0 and RoHS compliant

TECNITE THERMAL COMPOUND

Properties	Unit	DTC30	DTC50	Test Method
Composition		Silicone & thermal fillers	Silicone & thermal fillers	
Colour		Grey	Grey	
Density	g/ml	2.85 (±0.1)	2.85 (± 0.1)	ASTM D374
Temperature range	°C	-60 to +200	-60 to +200	EN344
Breakdown voltage	kV/mm	5	5	ASTM D149
Volume impedance	Ω·cm	1.7*10^{16}	1.7*10^{16}	ASTM D257
Dielectric constant	@ 1 KHz	0.4	0.4	ASTM D150
Thermal conductivity	W/mK	3	5	ASTM D5470
Thermal Resistance @ 50 psi	°C-in^2/W	0.06	0.06	ASTM D5470
Compliances		UL 94 V-0, RoHS, (REACH pending)		
Packaging		Standard: 1 kg, 2 kg containers, Special spec. available		



THERMAL TAPE

Tecnite thermal tape offers efficient thermal transfer for a wide range of applications requiring a thermal management solution. The tape combines acrylic adhesive with highly conductive ceramic fillers for an extremely reliable and user-friendly thermal interface. The tape is soft and able to wet to many surfaces, allowing it to conform well to non-flat substrates, provide high adhesion and act as a good thermal interface.

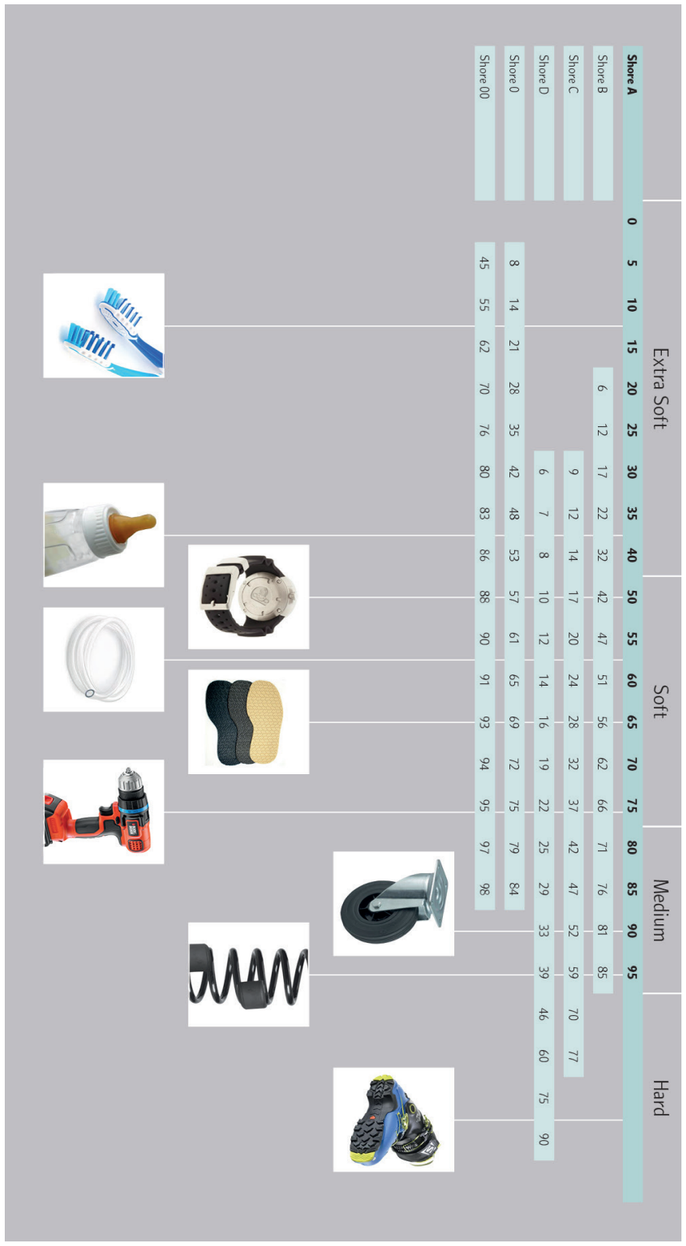
Specifications and benefits

- Thermal conductivity: Max. 1.2 W/mK
- High conformability and cost effective
- Double-sided and pressure sensitive
- Electrically insulating

TECNITE THERMAL TAPE

Properties	Unit	DTT60				DTT12	Test Method
Colour		White				White	
Adhesive type		Acrylic Polymer				Acrylic Polymer	
Filler		Ceramic powder				Ceramic powder	
Carrier	mm	Fiberglass				0.15 & 0.20: none 0.25: fiberglass	
Thickness range	mm	0.15	0.20	0.25	0.30	0.15, 0.20, 0.25	ASTM D3652
Hardness	Shore A	45				45	ASTM D2240
Density	g/ml	-				1.3	
Adhesive strength	N25/mm	10.2	12	14	16.3	-	
Tensile strength	lbs./in	180				-	ASTM D3759
Elongation	%	5				5	ASTM D3759
Temperature range	°C	-20 to +100				-40 to +150 (short time) 90 (long time)	
Insulation Strength	volt/mm	≥2.0	≥2.5	≥3.5	≥4.0	>3000	ASTM D149
Static Shear Adhesion	1kg/0.5in²	-				22 °C: pass, 70 °C: pass	ASTM D3654
Thermal conductivity	W/mK	0.6				1.2	ASTM D5470
Thermal impedance	°C-in²/W	0.71	0.82	0.91	0.98	-	ASTM D5470
Compliances		-				-	

SHORE A HARDNESS CONVERSION CHART



Tecnite

DISTRIBUTORS GROUP EUROPE B.V.

Distributors Group Europe (DGE) was established in 1996 by several European based specialty chemical distributors. DGE is based in the Netherlands however the market we serve is Europe.

For our members we provide a central marketing and sales support for the introduction of new products while also functioning as a knowledge reference center for the group. For our suppliers we provide a single platform whereby our partners can market their products through a network of specialty chemical distributors.

Local sales teams

DGE's members are independently owned technically oriented distributors. Each local member is focused on making specialty chemical products simple to use and understand in their home market while meeting their customer's ever changing product performance needs.

Local market knowledge

DGE celebrated it's 20th anniversary in 2016. Our members have been serving their local markets on average >50 years. This local market presence allows us to offer our partners an extensive customer base per market; one whose product application needs are met through our experienced local sales organizations. And we do this in more than 20 European countries.

DISTRIBUTORS GROUP EUROPE

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V2. 26.01.17