

# BOYD

TRUSTED INNOVATION

## Thermal Interface Materials



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## Introduction

Thermal Interface Materials (TIMs) are a critical portion to any effective thermal management system as they transfer heat between solid surfaces. Boyd provides a full array of thermal interface materials, from soft materials like gap fillers, phase change materials, and thermal grease to less compliant materials like thermal rubber pads, films, and thermally conductive hardware. Our broad portfolio contains many options that include electrical isolating properties, adhesives, reinforcements, carriers, and a variety of hardness to meet varying application requirements.

Boyd's engineering team is well-equipped to help you determine the best material to meet your project's needs. We leverage our relationships with suppliers and our TIM expertise, developed from decades of tests and projects, to pick the material best suited for your application.

Boyd's precision converting and assembly expertise can custom fabricate and reapply Thermal Interface Materials on our thermal management solutions like liquid cold plates or heat sinks. By providing complete, ready-to-install thermal management solutions, we help customers reduce assembly time and cost with a complete and integrated thermal solution.



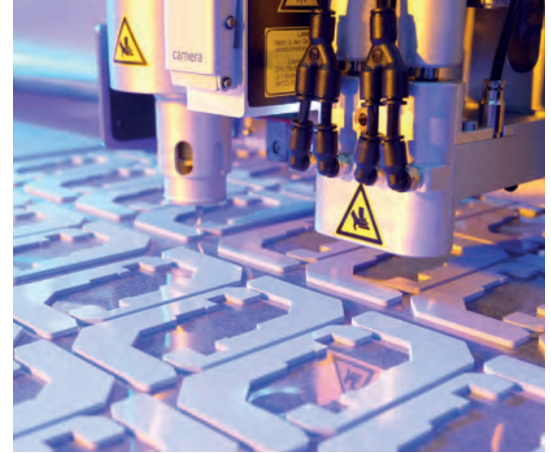
**TRANSTHERM® THERMALLY CONDUCTIVE GAP FILLER**

Transtherm® Thermally Conductive Gap Fillers are soft, malleable interface materials with high thermal conductivity. Gap fillers are ideal for applications with significant distances between the heat source and cooling surface, varying component heights, high tolerance stack up variability, and uneven or rough surfaces.

Gap filler materials are composed of either a silicone or silicone-free gel-like material, free of air gaps and pores similar to a foam. The conformability of gap fillers eliminates air between surfaces with higher conductivity materials to reduce thermal resistance. Since gap fillers are gel-like, volume stays constant and will thin and spread out with applied pressure.

Gap fillers are naturally tacky on at least one side, which improves handling during assembly. Softer materials tend to have higher tackiness.

Thermally conductive gap fillers fall into three groups: silicone gap fillers, silicone-free gap fillers, and putty-type gap fillers. Putty-type gap fillers have an extreme level of wettability and conformability, but do not uncompress to original shape after pressure is removed from the material. Boyd's Gap Fillers conform with REACH and RoHS regulations.



**ORDERING INFORMATION**

Contact your Boyd representative for more information or connect with us through our website: <https://www.boydcorp.com/contact-us.html>

**STRUCTURE TYPES:**

Structures	Illustration	Description
A		Silicone
B		Silicone Rubber With Glass Fiber
		Silicone
C		Silicone Rubber With Glass Fiber
D		Silicone Rubber without Reinforcement
		Silicone
E		Silicone Gap Filler Putty Type With Centered Glass Fiber
F		Silicone Gap Filler Putty Type
G		Silicone Free Gap Filler

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**TRANSTHERM® THERMALLY CONDUCTIVE GAP FILLER**

**MATERIALS PROPERTIES:**

Part Number	Structure Type	Thermal Conductivity (W/mK)
BCTIM-212-1020	A	1.0
BCTIM-212-1073	A	1.2
BCTIM-212-1029	A	1.7
BCTIM-212-1021	A	2.0
BCTIM-212-1027	A	2.0
BCTIM-212-1028	A	2.3
BCTIM-212-1022	A	3.0
BCTIM-212-1023	A	3.0
BCTIM-212-1025	A	3.0
BCTIM-212-1026	A	3.0
BCTIM-212-1031	A	5.0
BCTIM-216-1035	A	7.0
BCTIM-216-1036	A	11.0
BCTIM-216-1037	A	11.0
BCTIM-216-1038	A	13.0
BCTIM-216-1039	A	17.0
BCTIM-213-1023	B	1.0
BCTIM-213-1066	B	1.0
BCTIM-213-1067	B	1.0
BCTIM-214-1028	B	1.0
BCTIM-214-1065	B	1.2
BCTIM-213-1024	B	2.0
BCTIM-213-1068	B	2.0
BCTIM-214-1029	B	2.0

Part Number	Structure Type	Thermal Conductivity (W/mK)
BCTIM-213-1025	B	3.0
BCTIM-214-1030	B	3.0
BCTIM-213-1026	B	4.0
BCTIM-213-1027	B	5.0
BCTIM-215-1031	C	1.0
BCTIM-213-1069	C	1.5
BCTIM-215-1032	C	2.0
BCTIM-215-1064	C	2.0
BCTIM-215-1033	C	3.0
BCTIM-215-1057	C	3.0
BCTIM-215-1058	C	3.0
BCTIM-215-1061	C	3.0
BCTIM-220-1057	C	3.0
BCTIM-215-1063	C	4.0
BCTIM-215-1059	C	5.0
BCTIM-212-1030	D	5.0
BCTIM-218-1045	E	6.0
BCTIM-218-1044	F	6.0
BCTIM-218-1046	F	11.0
BCTIM-218-1047	F	17.0
BCTIM-217-1042	G	1.5
BCTIM-217-1041	G	2.0
BCTIM-217-1043	G	3.0
BCTIM-217-1060	G	3.0

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**TRANSTHERM® THERMALLY CONDUCTIVE GAP FILLER**

**MATERIALS PROPERTIES:**

Properties	BCTIM-211-1014	BCTIM-211-1015	BCTIM-211-1016	BCTIM-211-1017
Material	Silicone Gap Filler	Silicone Gap Filler	Silicone Gap Filler	Silicone Gap Filler
Thermal Conductivity (W/mK)	1	2	3	4
Hardness	55	55	60	60
Shore	OO	OO	OO	OO
Reinforcement	N	N	N	N
Tack	2	2	2	2
Volume Resistivity (Ω cm)	10 <sup>13</sup>	10 <sup>13</sup>	10 <sup>12</sup>	10 <sup>12</sup>
Break Down Voltage (kV/mm)	10	6	6	6
Minimum Temperature (°C)	-50	-50	-50	-50
Maximum Temperature (°C)	200	200	200	200
Flammability	V0	V0	V0	V0
Minimum Thickness (mm)	0.5	0.5	0.5	0.5
Maximum Thickness (mm)	25	25	25	25
Structure	A	A	A	A
Format Type (mm)	Roll, Sheet	Roll, Sheet	Roll, Sheet	Sheet

Properties	BCTIM-211-1018	BCTIM-211-1019 <i>Known as TBE</i>	BCTIM-212-1020	BCTIM-212-1021
Material	Silicone Gap Filler	Silicone Gap Filler	Silicone Gap Filler	Silicone Gap Filler
Thermal Conductivity (W/mK)	5	6	1	2
Hardness	60	60	20	20
Shore	OO	OO	OO	OO
Reinforcement	N	N	N	N
Tack	2	2	2	2
Volume Resistivity (Ω cm)	10 <sup>12</sup>	10 <sup>12</sup>	10 <sup>13</sup>	10 <sup>13</sup>
Break Down Voltage (kV/mm)	6	6	10	6
Minimum Temperature (°C)	-50	-50	-50	-50
Maximum Temperature (°C)	200	200	200	200
Flammability	V0	V0	V0	V0
Minimum Thickness (mm)	0.5	0.5	0.5	0.5
Maximum Thickness (mm)	25	25	6	6
Structure	A	A	A	A
Format Type (mm)	Roll, Sheet	Sheet: 300 x 400	Roll, Sheet	Roll, Sheet

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**TRANSTHERM® THERMALLY CONDUCTIVE GAP FILLER**

**MATERIALS PROPERTIES:**

Properties	BCTIM-212-1022	BCTIM-212-1023	BCTIM-212-1025 <i>Known as TDFBS &amp; KU-TDFBS</i>	BCTIM-212-1026 <i>Known as TDFD &amp; KU-TDFD</i>
Material	Silicone Gap Filler	Silicone Gap Filler With Aluminum Tape	Silicone Gap Filler	Silicone Gap Filler
Thermal Conductivity (W/mK)	3	3	3	3
Hardness	30	30	30	73
Shore	OO	OO	OO	OO
Reinforcement	N	N	N	N
Tack	2	1	2	2
Volume Resistivity (Ω cm)	10 <sup>12</sup>	10 <sup>12</sup>	10 <sup>13</sup>	10 <sup>13</sup>
Break Down Voltage (kV/mm)	6	6	10	10
Minimum Temperature (°C)	-50	-40	-60	-60
Maximum Temperature (°C)	200	200	180	180
Flammability	V0	V0	V0	V0
Minimum Thickness (mm)	0.5	0.25	0.5	0.5
Maximum Thickness (mm)	6	6	4	5
Structure	A	A	A	A
Format Type (mm)	Roll, Sheet	Sheet	Sheet	Sheet

Properties	BCTIM-212-1027 <i>Known as TDFD &amp; KU-TDFD</i>	BCTIM-212-1028 <i>Known as TSoft3</i>	BCTIM-212-1029 <i>Known as TSoft3 ST</i>	BCTIM-212-1030 <i>Known as TXE &amp; KU-TXE</i>
Material	Silicone Gap Filler	Silicone Gap Filler	Silicone Gap Filler	Silicone Gap Filler
Thermal Conductivity (W/mK)	2	2.3	1.7	5
Hardness	28	50	57	74
Shore	OO	OO	OO	OO
Reinforcement	N	N	N	N
Tack	2	2	2	1
Volume Resistivity (Ω cm)	10 <sup>13</sup>	10 <sup>13</sup>	10 <sup>11</sup>	10 <sup>10</sup>
Break Down Voltage (kV/mm)	10	8	4	11
Minimum Temperature (°C)	-60	-60	-40	-60
Maximum Temperature (°C)	180	200	150	180
Flammability	V0	V0	V0	V0
Minimum Thickness (mm)	0.5	0.5	0.5	0.5
Maximum Thickness (mm)	3	2	5	4
Structure	A	A	A	D
Format Type (mm)	Sheet: Min. 450 x 460	Roll	Roll	Sheet

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**TRANSTHERM® THERMALLY CONDUCTIVE GAP FILLER**

**MATERIALS PROPERTIES:**

Properties	BCTIM-212-1031 <i>Known as TXS &amp; KU-TXS</i>	BCTIM-212-1073	BCTIM-213-1023	BCTIM-213-1024
Material	Silicone Gap Filler	Silicone Gap Filler	Silicone Gap Filler	Silicone Gap Filler
Thermal Conductivity (W/mK)	5	1.2	1	2
Hardness	80	27	55	55
Shore	OO	OO	OO	OO
Reinforcement	N	N	Fiberglass	Fiberglass
Tack	2	To Be Determined	1	1
Volume Resistivity (Ω cm)	10 <sup>10</sup>	10 <sup>13</sup>	10 <sup>13</sup>	10 <sup>13</sup>
Break Down Voltage (kV/mm)	8	9.8	10	6
Minimum Temperature (°C)	-60	-40	-50	-50
Maximum Temperature (°C)	180	160	200	200
Flammability	V0	V0	V0	V0
Minimum Thickness (mm)	0.5	0.5	0.5	0.5
Maximum Thickness (mm)	3	5	6	6
Structure	A	A	B	B
Format Type (mm)	Sheet: 300 x 400	To Be Determined	Roll, Sheet	Roll, Sheet

Properties	BCTIM-213-1025	BCTIM-213-1026	BCTIM-213-1027	BCTIM-213-1066
Material	Silicone Gap Filler	Silicone Gap Filler	Silicone Gap Filler	Silicone Gap Filler
Thermal Conductivity (W/mK)	3	4	5	1
Hardness	55	55	55	40
Shore	OO	OO	OO	OO
Reinforcement	Fiberglass	Fiberglass	Fiberglass	Fiberglass
Tack	1	1	1	1
Volume Resistivity (Ω cm)	10 <sup>12</sup>	10 <sup>12</sup>	10 <sup>12</sup>	10 <sup>13</sup>
Break Down Voltage (kV/mm)	6	6	6	10
Minimum Temperature (°C)	-50	-50	-50	-50
Maximum Temperature (°C)	200	200	200	200
Flammability	V0	V0	V0	V0
Minimum Thickness (mm)	0.5	0.5	0.5	0.5
Maximum Thickness (mm)	6	6	6	6
Structure	B	B	B	B
Format Type (mm)	Roll, Sheet	Roll, Sheet	Roll, Sheet	Roll, Sheet

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**TRANSTHERM® THERMALLY CONDUCTIVE GAP FILLER**

**MATERIALS PROPERTIES:**

Properties	BCTIM-213-1067 <i>Known as Tsoft</i>	BCTIM-213-1068 <i>Known as Tsoft3 S</i>	BCTIM-213-1069 <i>Known as Tsoft3 STF</i>	BCTIM-214-1028
Material	Silicone Gap Filler	Silicone Gap Filler	Silicone Gap Filler	Silicone Gap Filler
Thermal Conductivity (W/mK)	1	2	1.5	1
Hardness	60	60	60	5
Shore	OO	OO	OO	OO
Reinforcement	Fiberglass	Fiberglass	Fiberglass	Fiberglass
Tack	1	1	2	1
Volume Resistivity (Ω cm)	10 <sup>13</sup>	10 <sup>14</sup>	10 <sup>12</sup>	10 <sup>13</sup>
Break Down Voltage (kV/mm)	4	7	4.5	10
Minimum Temperature (°C)	-60	-60	-40	-50
Maximum Temperature (°C)	200	200	150	200
Flammability	V0	V0	V0	V0
Minimum Thickness (mm)	0.5	0.5	0.25	0.5
Maximum Thickness (mm)	3	3	2	6
Structure	B	B	C	B
Format Type (mm)	Roll	Roll	Roll	Roll, Sheet

Properties	BCTIM-214-1029 <i>Known as TBF-B</i>	BCTIM-214-1030	BCTIM-214-1065 <i>Known as TBF-A</i>	BCTIM-215-1031
Material	Silicone Gap Filler	Silicone Gap Filler	Silicone Gap Filler	Silicone Gap Filler
Thermal Conductivity (W/mK)	2	3	1.2	1
Hardness	5	5	5	25
Shore	OO	OO	OO	OO
Reinforcement	Fiberglass	Fiberglass	Fiberglass	Fiberglass
Tack	1	1	1	2
Volume Resistivity (Ω cm)	10 <sup>13</sup>	10 <sup>12</sup>	10 <sup>13</sup>	10 <sup>13</sup>
Break Down Voltage (kV/mm)	3	6	3	10
Minimum Temperature (°C)	-50	-50	-50	-50
Maximum Temperature (°C)	200	200	200	200
Flammability	V0	V0	V0	V0
Minimum Thickness (mm)	0.5	0.5	0.5	0.25
Maximum Thickness (mm)	6	6	6	0.75
Structure	B	B	B	C
Format Type (mm)	Roll, Sheet	Roll, Sheet	Sheet: 200 x 300	Roll, Sheet

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**TRANSTHERM® THERMALLY CONDUCTIVE GAP FILLER**

**MATERIALS PROPERTIES:**

Properties	BCTIM-215-1032 <i>Known as TBC-B</i>	BCTIM-215-1033	BCTIM-215-1057	BCTIM-215-1058 <i>Known as TBC-D</i>
Material	Silicone Gap Filler	Silicone Gap Filler	Silicone Gap Filler	Silicone Gap Filler
Thermal Conductivity (W/mK)	2	3	3	3
Hardness	40	40	15	30
Shore	OO	OO	OO	OO
Reinforcement	Fiberglass	Fiberglass	Fiberglass	Fiberglass
Tack	2	2	2	2
Volume Resistivity (Ω cm)	10 <sup>13</sup>	10 <sup>12</sup>	10 <sup>13</sup>	10 <sup>13</sup>
Break Down Voltage (kV/mm)	10	10	10	10
Minimum Temperature (°C)	-50	-50	-50	-50
Maximum Temperature (°C)	200	200	200	200
Flammability	V0	V0	V0	V0
Minimum Thickness (mm)	0.3	0.3	0.3	0.5
Maximum Thickness (mm)	6	1	6	6
Structure	C	C	C	C
Format Type (mm)	Sheet: 200 x 300	Sheet: 200 x 300	Roll, Sheet	Sheet: 200 x 300

Properties	BCTIM-215-1059 <i>Known as TBC-F</i>	BCTIM-215-1061 <i>Known as TBC-C</i>	BCTIM-215-1063	BCTIM-215-1064
Material	Silicone Gap Filler	Silicone Gap Filler	Silicone Gap Filler	Silicone Gap Filler
Thermal Conductivity (W/mK)	5	3	4	2
Hardness	35	5	40	60
Shore	OO	OO	OO	OO
Reinforcement	Fiberglass	Fiberglass	Fiberglass	Fiberglass
Tack	2	2	2	2
Volume Resistivity (Ω cm)	10 <sup>13</sup>	10 <sup>13</sup>	10 <sup>13</sup>	10 <sup>13</sup>
Break Down Voltage (kV/mm)	10	11	10	6
Minimum Temperature (°C)	-50	-50	-50	-50
Maximum Temperature (°C)	200	200	200	200
Flammability	V0	V0	V0	V0
Minimum Thickness (mm)	0.3	0.5	0.3	0.3
Maximum Thickness (mm)	6	3	6	6
Structure	C	C	C	C
Format Type (mm)	Sheet: 200 x 300	Sheet: 200 x 300	Roll, Sheet	Roll, Sheet

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**TRANSTHERM® THERMALLY CONDUCTIVE GAP FILLER**

**MATERIALS PROPERTIES:**

Properties	BCTIM-216-1035 <i>Known as TBG</i>	BCTIM-216-1036 <i>Known as TBL</i>	BCTIM-216-1037 <i>Known as TBS</i>	BCTIM-216-1038 <i>Known as TBH</i>
Material	Silicone Gap Filler	Silicone Gap Filler	Silicone Gap Filler	Silicone Gap Filler
Thermal Conductivity (W/mK)	7	11	11	13
Hardness	70	70	40	75
Shore	00	00	00	00
Reinforcement	N	N	N	N
Tack	2	2	2	2
Volume Resistivity (Ω cm)	10 <sup>12</sup>	10 <sup>12</sup>	10 <sup>12</sup>	10 <sup>12</sup>
Break Down Voltage (kV/mm)	6	6	6	3
Minimum Temperature (°C)	-50	-50	-50	-40
Maximum Temperature (°C)	200	200	200	200
Flammability	V0	V0	V0	V0
Minimum Thickness (mm)	0.5	0.5	0.5	0.5
Maximum Thickness (mm)	6	6	6	3
Structure	A	A	A	A
Format Type (mm)	Sheet: 200 x 300	Sheet: 200 x 300	Sheet: 200 x 300	Sheet: 200 x 300

Properties	BCTIM-216-1039 <i>Known as TBI</i>	BCTIM-216-1041 <i>Known as SFA</i>	BCTIM-217-1042	BCTIM-217-1043
Material	Silicone Gap Filler	Silicone Free Gap Filler	Silicone Free Gap Filler	Silicone Free Gap Filler
Thermal Conductivity (W/mK)	17	2	2	3
Hardness	80	50	38	57
Shore	00	00	00	00
Reinforcement	N	N	Y	Y
Tack	2	1	1	1
Volume Resistivity (Ω cm)	10 <sup>12</sup>	10 <sup>12</sup>	10 <sup>12</sup>	10 <sup>14</sup>
Break Down Voltage (kV/mm)	6	6	To Be Determined	10
Minimum Temperature (°C)	-50	-20	-40	-40
Maximum Temperature (°C)	200	120	125	125
Flammability	V0	V0	V2	V0
Minimum Thickness (mm)	0.5	0.5	0.5	0.3
Maximum Thickness (mm)	8	3	2	2
Structure	A	G	G	G
Format Type (mm)	Sheet: 200 x 300	Roll, Sheet	Roll	Roll

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**TRANSTHERM® THERMALLY CONDUCTIVE GAP FILLER**

**MATERIALS PROPERTIES:**

Properties	BCTIM-217-1060 <i>Known as SFO</i>	BCTIM-218-1044	BCTIM-218-1045
Material	Silicone Free Gap Filler	Putty Gap Filler	Putty Gap Filler
Thermal Conductivity (W/mK)	3	6	6
Hardness	60	N/A	N/A
Shore	OO	OO	OO
Reinforcement	N	N	Fiberglass
Tack	1	2	2
Volume Resistivity (Ω cm)	10 <sup>12</sup>	10 <sup>9</sup>	10 <sup>9</sup>
Break Down Voltage (kV/mm)	6	6	6
Minimum Temperature (°C)	-20	-55	-40
Maximum Temperature (°C)	120	200	200
Flammability	V0	V0	V0
Minimum Thickness (mm)	0.5	1.5	0.2
Maximum Thickness (mm)	3	2	1
Structure	G	F	E
Format Type (mm)	Roll, Sheet	Sheet: 200 x 300	Roll, Sheet

Properties	BCTIM-218-1046	BCTIM-218-1047	BCTIM-220-1057
Material	Putty Gap Filler	Putty Gap Filler	Silicone Gap Filler
Thermal Conductivity (W/mK)	11	17	3
Hardness	N/A	N/A	40
Shore	OO	OO	OO
Reinforcement	N	N	Fiberglass
Tack	2	2	2
Volume Resistivity (Ω cm)	10 <sup>7</sup>	10 <sup>9</sup>	10 <sup>12</sup>
Break Down Voltage (kV/mm)	6	6	6
Minimum Temperature (°C)	-40	-55	-40
Maximum Temperature (°C)	200	200	150
Flammability	V0	V0	V0
Minimum Thickness (mm)	1.5	0.2	0.4
Maximum Thickness (mm)	2	1	1
Structure	F	F	C
Format Type (mm)	Sheet: 200 x 300	Roll, Sheet	Sheet

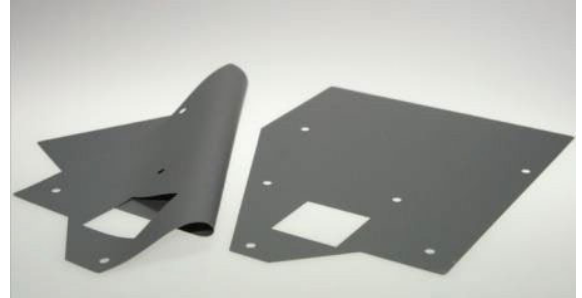
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**TRANSTHERM® THERMALLY CONDUCTIVE SILICONE RUBBER & SILICONE-FREE RUBBER PAD**

Transtherm® Thermally Conductive Silicone Rubber and Silicone-Free Rubber Pads combine high thermal conductivity and electrical isolation into a single component. By integrating aluminum oxide fillers, rubber interface materials benefit from higher thermal conductivity while maintaining high dielectric strength even at high temperatures.

Most silicone rubbers and silicone-free rubbers are available with a mechanical reinforcement option, typically woven fiberglass, for additional mechanical stability. Resolve dry out, cracking, and silicone migration issues by replacing mica and thermal grease applications with cleaner and reproducible rubber materials.

Boyd's Transtherm® Thermally Conductive Silicone Rubber and Silicone-Free Rubber Pads conform with REACH and RoHS regulations.



**ORDERING INFORMATION**

Contact your Boyd representative for more information or connect with us through our website: <https://www.boydcorp.com/contact-us.html>



**STRUCTURE TYPES:**

Structures	Illustration	Description
A		Silicone Rubber With Polyimide
B		Silicone Rubber With Glass Fiber
C		Silicone Rubber With Glass Fiber
		Adhesive Tack
D		Silicone Free Rubber

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**TRANSTHERM® THERMALLY CONDUCTIVE SILICONE RUBBER & SILICONE-FREE RUBBER PAD**

**MATERIALS PROPERTIES:**

PART NUMBER	STRUCTURE TYPE	THERMAL CONDUCTIVITY (W/mK)	PART NUMBER	STRUCTURE TYPE	THERMAL CONDUCTIVITY (W/mK)
BCTIM-210-1081	A	1.80t	BCTIM-210-1080	B/C	1.80
BCTIM-210-1079	B	0.9	BCTIM-210-1078	B/C	1.90
BCTIM-210-1001	B	1.00	BCTIM-210-1005	B	2.00
BCTIM-210-1002	B	1.00	BCTIM-210-1006	B	2.00
BCTIM-210-1007	B	1.30	BCTIM-210-1082	B/C	3.40
BCTIM-210-1008	B	1.30	BCTIM-210-1075	B	4.10
BCTIM-210-1003	B	1.50	BCTIM-210-1076	B/C	5.00
BCTIM-210-1004	B	1.50	BCTIM-210-1074	B	8.00
BCTIM-210-1010	B	1.50	BCTIM-210-1077	C	1.00
BCTIM-210-1062	B	1.50	BCTIM-210-1061	D	1.40
BCTIM-210-1009	B	1.60			

Properties	BCTIM-210-1001	BCTIM-210-1002	BCTIM-210-1003	BCTIM-210-1004
Material	Silicone Gap Pad	Silicone Gap Pad	Silicone Gap Pad	Silicone Gap Pad
Structure	B	B	B	B
Thermal Conductivity (W/mK)	1	1	2	2
Hardness	80	80	80	80
Shore	Shore A	Shore A	Shore A	Shore A
Reinforcement	Fiberglass	Fiberglass	Fiberglass	Fiberglass
Tack	0	0	0	0
Volume Resistivity ( $\Omega$ cm)	$10^{13}$	$10^{13}$	$10^{13}$	$10^{13}$
Break Down Voltage (kV/mm)	10	10	10	10
Minimum Temperature ( $^{\circ}$ C)	-50	-50	-50	-50
Maximum Temperature ( $^{\circ}$ C)	200	200	200	200
Minimum Thickness (mm)	0.2	0.2	0.2	0.2
Maximum Thickness (mm)	0	0	0	0
Format Type	Roll, Sheet	Roll, Sheet	Roll, Sheet	Roll, Sheet

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**TRANSTHERM® THERMALLY CONDUCTIVE SILICONE RUBBER & SILICONE-FREE RUBBER PAD**

**MATERIALS PROPERTIES:**

Properties	BCTIM-210-1005	BCTIM-210-1006	BCTIM-210-1007	BCTIM-210-1008
Material	Silicone Gap Pad	Silicone Gap Pad	Silicone Gap Pad	Silicone Gap Pad
Structure	B	B	B	B
Thermal Conductivity (W/mK)	2	2	1	1
Hardness	80	80	80	80
Shore	Shore A	Shore A	Shore A	Shore A
Reinforcement	Fiberglass	Fiberglass	Polyimide	Polyimide
Tack	0	0	0	0
Volume Resistivity (Ω cm)	10 <sup>13</sup>	10 <sup>13</sup>	10 <sup>13</sup>	10 <sup>13</sup>
Break Down Voltage (kV/mm)	6	6	10	10
Minimum Temperature (°C)	-50	-50	-50	-50
Maximum Temperature (°C)	200	200	200	200
Minimum Thickness (mm)	0.02	0.02	0.2	0.2
Maximum Thickness (mm)	0	0	0	0
Format Type	Roll, Sheet	Roll, Sheet	Roll, Sheet	Roll, Sheet

Properties	BCTIM-210-1009	BCTIM-210-1010 <i>Known as TGP19</i>	BCTIM-210-1061 <i>Known as SFB &amp; KU-SFB30</i>	BCTIM-210-1062
Material	Silicone Gap Pad	Silicone Gap Pad	Silicone Free Gap Pad	Silicone Gap Pad
Structure	B	B	D/E	B
Thermal Conductivity (W/mK)	1.6	1.5	1.4	1.5
Hardness	8	86	70	80
Shore	Shore A	Shore A	Shore A	Shore A
Reinforcement	Fiberglass	Fiberglass	N	Fiberglass
Tack	0	0	0	0
Volume Resistivity (Ω cm)	10 <sup>13</sup>	10 <sup>13</sup>	3.0 x 10 <sup>14</sup>	10 <sup>13</sup>
Break Down Voltage (kV/mm)	6	6	7.5	10
Minimum Temperature (°C)	-60	-60	-20	-50
Maximum Temperature (°C)	180	180	100	200
Minimum Thickness (mm)	0.23	0.19	0.3	0.23
Maximum Thickness (mm)	0.23	0.19	0.5	0.23
Format Type	Roll, Sheet	Roll	Roll	Roll, Sheet

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**TRANSTHERM® THERMALLY CONDUCTIVE SILICONE RUBBER & SILICONE-FREE RUBBER PAD**

**MATERIALS PROPERTIES:**

Properties	BCTIM-210-1074 <i>Known as BDC</i>	BCTIM-210-1075 <i>Known as BGD, KU-BGD20, &amp; KU-BGD30</i>	BCTIM-210-1076 <i>Known as BGDx, KU-BGDx08, KU- BGDx20</i>
Material	Silicone Gap Pad	Silicone Gap Pad	Silicone Gap Pad
Structure	B	B/C	B/C
Thermal Conductivity (W/mK)	8	4	5
Hardness	83	88	90
Shore	Shore A	Shore A	Shore A
Reinforcement	Fiberglass	Fiberglass	Fiberglass
Tack	0	0/1	0/1
Thermal Resistance - inch <sup>2</sup> (cm <sup>2</sup> ) (°C/W)	0.08 (0.50) 0.11 (0.64)	0.19 (1.26) 0.22 (1.40)	0.13 (0.84) 0.16 (1.05)
Breakdown Voltage (V (AC))	4000 5000	3000 6500	3000 6000
Minimum Temperature (°C)	-50	-50	-50
Maximum Temperature (°C)	180	180	180
Flammability	N/A	V0	V0
Thickness (mm)	0.2 ± 0.05 0.3 ± 0.05	0.2 ± 0.05 0.3 ± 0.05	0.2 ± 0.05 0.3 ± 0.05
Format Type	Sheet: 440 x 510	Sheet	Sheet: 440 x 510

*^All values listed are for structure B, the single-sided adhesive variations typically have up to 20% lower thermal conductivity.*

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*To maintain the material integrity, recommended storage temperature is between +10°C to +40 °C with a humidity of 25% to 65%. Exposure to direct sunlight or direct pressure on packaging or parts is prohibited. Process material at +20 °C and above.*

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**TRANSTHERM® THERMALLY CONDUCTIVE SILICONE RUBBER & SILICOME-FREE RUBBER PAD**

**MATERIALS PROPERTIES:**

Properties	BCTIM-210-1078 <i>Known as T3</i>	BCTIM-210-1079 <i>Known as T400-7</i>	BCTIM-210-1080 <i>Known as TAG, KU-TAG20 &amp; KU-TAG30</i>	BCTIM-210-1081 <i>Known as TAP11 &amp; KU-TAP11</i>	BCTIM-210-1082 <i>Known as TEG, KU-TEG20 &amp; KU-TEG30</i>
Material	Silicone Gap Pad	Silicone Gap Pad	Silicone Gap Pad	Silicone Gap Pad	Silicone Gap Pad
Structure	B/C	B	B/C	A	E
Thermal Conductivity (W/mK)	2	1	2	2	6
Hardness	84	85	90	87	Aluminum
Shore	Shore A	Shore A	Shore A	Shore A	Shore A
Reinforcement	Fiberglass	Fiberglass	Fiberglass	Polyimide	Fiberglass
Tack	0	0	0/1	0	1
Thermal Resistance - inch <sup>2</sup> (cm <sup>2</sup> ) (°C/W)	0.11 (0.71)	0.45 (2.9)	0.26 (1.67) 0.37 (2.39)	0.29 (1.87)	0.38 (2.45)
Breakdown Voltage (V (AC))	Not Electrically Isolating	4000	7000 10,000	10,000	4000
Minimum Temperature (°C)	-60	-60	-40	-40	-60
Maximum Temperature (°C)	180	180	180	180	180
Flammability	N/A	V0	V0	V0	V0
Thickness (mm)	0.13 ± 0.02	0.18 ± 0.03	0.2 ± 0.05 0.3 ± 0.05	0.11 ± 0.02	0.23 ± 0.03
Format Type	Roll	Roll	Roll	Roll	Roll

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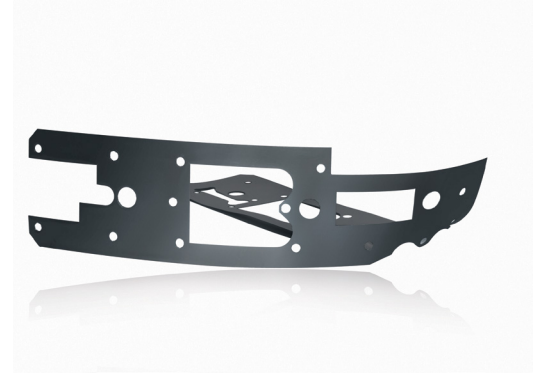
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**TRANSTHERM® THERMALLY CONDUCTIVE GRAPHITE**

Boyd's Transtherm® Thermally Conductive Graphite Pads & Films are composed of graphite, the isotope of pure carbon that arranges itself in stacked sheets. Graphite's sheet-like crystals, graphene, offers superior in-plane thermal conductivity compared to its through-plane thermal conductivity.

With low mass and high heat transfer capabilities, graphite pads & films are high performance, high heat spreading thermal interface materials available in ultra-thin and light weight configurations which makes it an ideal solution for ultra-low profile heat spreading for lightweight applications.

Thermally conductive graphite pads & films fall into three groups: Pyrolytic Graphite (PG) or Pyrolytic Graphite Sheets (PGS) and Annealed Pyrolytic Graphite (APG) also known as Thermally Annealed Pyrolytic Graphite (TPG). Both are created through Chemical Vapor Deposition (CVD) with high purity hydrocarbons. Boyd's Transtherm® Graphite Pads & Films conform with REACH and RoHS regulations.



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**STRUCTURE TYPES:**

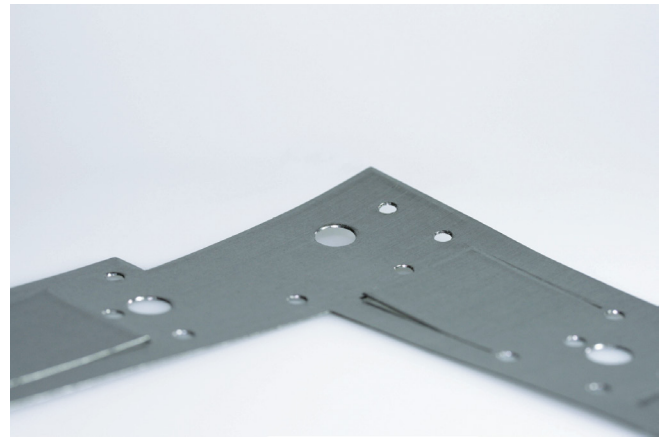
PROPERTIES	BCTIM-230-1016 <i>Known as Gra SS400</i>	BCTIM-230-1018 <i>Known as HT-1205 (0.127mm) &amp; HT-1210 (0.250mm)</i>
Material	Graphite	Graphite
Planar Conductivity (W)	400	150
Through Conductivity (mK)	3.7	10
Hardness (Shore A)	N/A	N/A
Electrical Resistivity In-plane (μΩm)	5.2	N/A
Minimum Temperature (°C)	-40	-40
Maximum Temperature (°C)	400	400
Flammability (UL 94)	V0	V0
Minimum Thickness. (mm)	0.127	0.127
Maximum Thickness (mm)	0.25	0.25

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**TRANSTHERM® THERMALLY CONDUCTITVE GRAPHITE**

**MATERIALS PROPERTIES**

Properties	BCTIM-230-1019 <i>Known as HT-2505 (0.127mm) &amp; HT-2510 (0.250mm)</i>	BCTIM-230-1020 <i>Known as KU-CBGA</i>	BCTIM-230-1021 <i>Known as KU-CBMA</i>
Material	Graphite	Graphite	Graphite
Planar Conductivity (W)	120	99	134
Through Conductivity (mK)	16	5	6
Hardness (Shore A)	85	N/A	89
Volume Resistivity (Ω cm)	80*10 <sup>6</sup> / 1550*10 <sup>6</sup>	600 / 6500	1.5*10 <sup>8</sup>
Minimum Temperature (°C)	-25	-240	-240
Maximum Temperature (°C)	125	500	400
Flammability (UL 94)	V0	N/A	N/A
Minimum Thickness. (mm)	0.127	0	0.125
Maximum Thickness (mm)	0.25	2	0.25



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*To maintain the material integrity, recommended storage temperature is between +10°C to +40 °C with a humidity of 25% to 65%. Exposure to direct sunlight or direct pressure on packaging or parts is prohibited. Process material at +20 °C and above.*

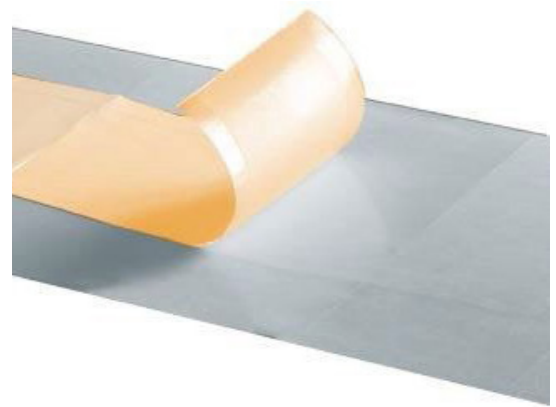
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**TRANSTHERM® THERMALLY CONDUCTIVE PHASE CHANGE MATERIAL**

Transtherm® Thermally Conductive Phase Change Materials (PCMs) are thin wax like materials designed to melt at a specific temperature. While the PCM absorbs heat, it completely wets-out across the surface achieving an extremely thin bond line. This provides excellent temperature control, close contact between surfaces, and minimal thermal resistance.

Once the phase change temperature is first exceeded, optimal thermal performance is maintained above and below the melt temperature. Phase change materials are best for thermally conductive applications that require good wet out on surfaces with little or no force. While the PCM is soft or in its liquid state, excessive pressure will squeeze out extra material from in between the surfaces.

Phase change materials are temperature sensitive where they may reach their phase change temperature during transport. We recommend keeping stock in a temperature- controlled environment during summer or in warmer climates. Boyd's Transtherm® Phase Change Materials conform with REACH and RoHS regulations.



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**STRUCTURE TYPES:**

Part Number	Structure Type	Thermal Conductivity (W/mK)
BCTIM-220-1056	A	0.1
BCTIM-220-1060	A	0.8
BCTIM-220-1048	A	1.2
BCTIM-220-1049	A	1.2
BCTIM-220-1050	A	1.2
BCTIM-220-1051	A	1.2
BCTIM-220-1070	A	1.2
BCTIM-220-1061	B	0.6
BCTIM-220-1062	B	0.6
BCTIM-220-1063	C	1.2
BCTIM-220-1064	C	1.2
BCTIM-220-1059	C	1.1

Structures	Illustration	Description
A		A Phase Change Material
B		A Phase Change Material
		Polyimide
		Adhesive
C		A Phase Change Material
		Polyimide
		A Phase Change Material
D		A Phase Change Material
		Aluminum
		Adhesive
E		A Phase Change Material
		Aluminum
		A Phase Change Material

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**TRANSTHERM® THERMALLY CONDUCTIVE PHASE CHANGE MATERIALS**

**MATERIALS PROPERTIES:**

Properties	BCTIM-220-1054 <i>Known as PC-07</i>	BCTIM-220-1055	BCTIM-220-1056 <i>Known as PC-08</i>	BCTIM-220-1059 <i>Known as ALC5 &amp; KU-ALC5</i>
Material	Phase Change Material	Phase Change Material	Phase Change Material	Phase Change Material
Structure	A	A	B	E
Thermal Conductivity (W/mK)	4	4	2	6
Reinforcement	N	N	Polyimide	Aluminum
Tack	0	0	1	0
Thermal Resistance - inch <sup>2</sup> (cm <sup>2</sup> ) (°C/W)	0.84 (5.42)	-	N/A	0.021 (0.135)
Breakdown Voltage [V(AC)]	Not Electrically Isolating	Not Electrically Isolating	5000	Not Electrically Isolating
Minimum Temperature (°C)	-40	-40	-40	-60
Maximum Temperature (°C)	125	125	150	150
Phase Change Temperature (°C)	50	45	60	60
Total Thickness (mm)	0.2 ± 0.02	0.25	0.1 ± 0.01	0.075 ± 0.015
Approx. PCM Coating Thickness	N/A	N/A	0.0	0.0
Phase Change Material	Wax	Wax	Wax	Crayotherm® Wax
Flammability	N/A	N/A	N/A	N/A

Properties	BCTIM-220-1060 <i>Known as ALF5 / ALF-H2, KUALF5 &amp; KU-ALF/H2</i>	BCTIM-220-1061 <i>Known as Series EPC, KU-EPC25, KU-EPC50</i>	BCTIM-220-1062 <i>Known as KG, KU-KG25, KUKG38 &amp; KU-KG50</i>	BCTIM-220-1063 <i>Known as PC03-AL</i>
Material	Phase Change Material	Phase Change Material	Phase Change Material	Phase Change Material
Structure	E	B/C	B	E
Thermal Conductivity (W/mK)	13.1	0.36	1.2	4.5
Reinforcement	Aluminum	Polyimide	Polyimide	Aluminum
Tack	0	0 (B) / 1 (C)	1	0
Thermal Resistance - inch <sup>2</sup> (cm <sup>2</sup> ) (°C/W)	0.009 (0.058) 0.012 (0.077)	0.125 (0.806) 0.207 (1.335)	0.26 (1.680)	0.12 (0.774)
BreakDown Voltage [V(AC)]	Not Electrically Isolating	5200 9800	5000	Not Electrically Isolating
Minimum Temperature (°C)	-60	-60	-40	-40
Maximum Temperature (°C)	150	150	150	150
Phase Change Temperature (°C)	51	60	60	60
Total Thickness (mm)	0.075 ± 0.015 0.105 ± 0.015	0.050 ± 0.01 0.075 ± 0.015	0.1 ± 0.01	0.112 - 0.022/ + 0.028
Approx. PCM Coating Thickness	0.0125 0.0275	0.0125	0.038	0.03
Phase Change Material	Crayotherm® Wax	Crayotherm® Wax	Acrylic	Acrylic
Flammability	N/A	N/A	V0	N/A

*\*All values listed are for structure B, the single-sided adhesive variations typically have up to 20% lower thermal conductivity.*

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**TRANSTHERM® THERMALLY CONDUCTIVE PHASE CHANGE MATERIALS**

**MATERIALS PROPERTIES:**

Properties	BCTIM-220-1064 <i>Known as PC03-AL-2021</i>	BCTIM-220-1065 <i>Known as PC03-MT-100</i>	BCTIM-220-1066 <i>Known as PC03-MT1-2021</i>	BCTIM-220-1072 <i>Known as PC09</i>
Material	Phase Change Material	Phase Change Material	Phase Change Material	Phase Change Material
Structure	D	C	B	C
Thermal Conductivity (W/mK)	3.9	1.6	1.2	1.6
Reinforcement	Aluminum	Polyimide	Polyimide	Polyimide
Tack	1	0	1	0
Thermal Resistance - inch <sup>2</sup> (cm <sup>2</sup> ) (°C/W)	0.049 (0.316)	0.20 (1.29)	0.26 (1.680)	N/A
BreakDown Voltage [V(AC)]	Not Electrically Isolating	5000	5000	5000
Minimum Temperature (°C)	-40	-40	-40	-40
Maximum Temperature (°C)	150	150	150	150
Phase Change Temperature (°C)	60	60	60	60
Total Thickness (mm)	0.13 ± 0.02	0.1 ± 0.01	0.1 ± 0.01	0.1 ± 0.01
Approx. PCM Coating Thickness	0.05	0.038	0.038	0.038
Phase Change Material	Acrylic	Acrylic	Acrylic	WAX
Flammability	N/A	V0	V1	N/A



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*To maintain the material integrity, recommended storage temperature is between +10°C to +40 °C with a humidity of 25% to 65%. Exposure to direct sunlight or direct pressure on packaging or parts is prohibited. Process material at +20 °C and above.*

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**TRANSTHERM® THERMALLY CONDUCTIVE ADHESIVE TAPES**

Transtherm® Thermally Conductive Adhesive Tapes combine mechanical attachment with improved thermal conductivity between joined surfaces. Utilizing these tapes reduce the thermal resistance between surfaces with a thin bond line of thermally conductive acrylic adhesive. Transtherm® Adhesive Tapes are commonly used to adhere LED light bars or semiconductor packages to heat sink surfaces.

These tapes feature pressure sensitive adhesives (PSAs), meaning they only require pressure application and do not need heat cycling for maximum bonding or material wet-out. Adhesive tapes offer easy peel and stick application, enabling the user to replace mechanical attachment hardware, such as springs and screws and improve installation time.

Because thermally conductive adhesive tapes are composed of acrylic and are silicone free, they are ideal for sensitive applications. Transtherm® Tapes are available with a reinforcement material for high mechanical stability and typically feature double-sided adhesive, making them beneficial components in an integrated, multi-functional assembly.

Boyd's Transtherm® Thermally Conductive Adhesive Tapes conform with REACH and RoHS regulations.



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**STRUCTURE TYPES:**

Structures	Illustration	Description
A		Adhesive
B		Polyimide
		Adhesive
C		Adhesive
		Polyimide
		Adhesive
D		Adhesive
		Polyester (PET)
E		Adhesive
		Fiberglass
		Adhesive

Part Number	Structure Type	Thermal Conductivity (W/mK)
BCTIM-219-1056	A	0.1
BCTIM-219-1060	A	0.8
BCTIM-219-1048	A	1.2
BCTIM-219-1049	A	1.2
BCTIM-219-1050	A	1.2
BCTIM-219-1051	A	1.2
BCTIM-219-1070	A	1.2
BCTIM-219-1061	B	0.6
BCTIM-219-1062	C	0.6
BCTIM-219-1063	C	1.2
BCTIM-219-1064	C	1.2
BCTIM-219-1059	D	1.1

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**TRANSTHERM® THERMALLY CONDUCTIVE ADHESIVE TAPES**

**MATERIALS PROPERTIES:**

Properties	BCTIM-219-1048	BCTIM-219-1049	BCTIM-219-1050	BCTIM-219-1051
Material	Acrylic Thermal Tape	Acrylic Thermal Tape	Acrylic Thermal Tape	Acrylic Thermal Tape
Thermal Conductivity (W/mK)	1.2	1.2	1.2	1.2
Reinforcement	N	N	N	N
Adhesive Strength (N/M)	500	500	500	500
Break Down Voltage (kV/mm)	16	16	16	16
Minimum Temperature (°C)	-20	-20	-20	-20
Maximum Temperature (°C)	120	120	120	120
Flammability	v0	v0	v0	v0
Thickness (mm)	0.125	0.25	0.375	0.5
Structure	A	A	A	A

Properties	BCTIM-219-1056	BCTIM-219-1059 <i>Known as SFG, KU-SFG20 &amp; KU-SFG25</i>	BCTIM-219-1060 <i>Known as T2022-100</i>	BCTIM-219-1061 <i>Known as TAP003</i>
Material	Acrylic Thermal Tape	Acrylic Thermal Tape	Acrylic Thermal Tape	Acrylic Thermal Tape
Thermal Conductivity (W/mK)	0.6	1.2	1.2	0.6
Reinforcement	N	PET	N	polyimide
Adhesive Strength (N/M)	500	610	500	620
Break Down Voltage (kV/mm)	20	34	20	79
Minimum Temperature (°C)	-40	-40	-60	-40
Maximum Temperature (°C)	150	120	150	150
Flammability	-	v0	v0	N/A
Thickness (mm)	0.05	0.25	0.1	0.075
Structure	A	D	A	B

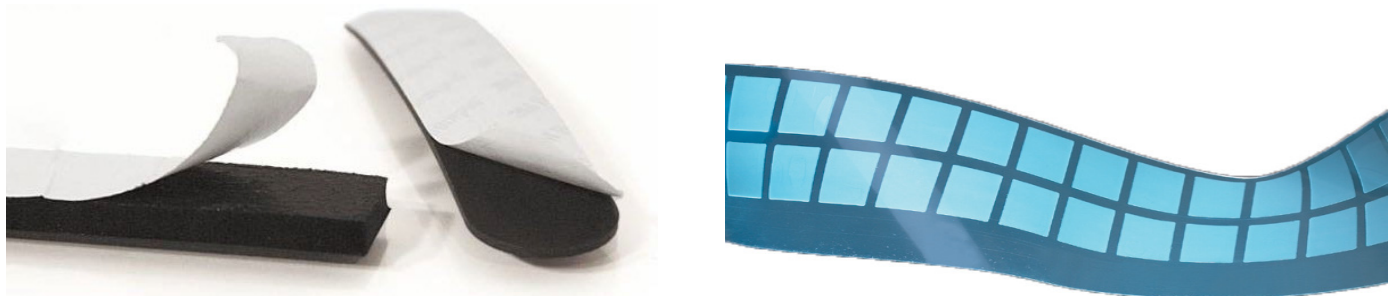
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**TRANSTHERM® THERMALLY CONDUCTIVE ADHESIVE TAPE**

**MATERIALS PROPERTIES:**

Properties	BCTIM-219-1062 <i>Known as TAP005</i>	BCTIM-219-1063 <i>Known as TAP005 S</i>	BCTIM-219-1064 <i>Known as TAP010 S</i>	BCTIM-219-1070
Material	Acrylic Thermal Tape	Acrylic Thermal Tape	Acrylic Thermal Tape	Acrylic Thermal Tape
Thermal Conductivity (W/mK)	0.6	1.2	1.2	1.2
Reinforcement	polyimide	polyimide	polyimide	polyimide
Adhesive Strength (N/M)	700	580	780	235
Break Down Voltage (kV/mm)	48	48	24	-
Minimum Temperature (°C)	-40	-40	-40	-20
Maximum Temperature (°C)	150	150	150	200
Flammability	v0	v0	v0	-
Thickness (mm)	0.125	0.125	0.25	0.15
Structure	C	C	C	A
Format type	Roll, Sheet	Roll, Sheet	Roll, Sheet	Roll, Sheet



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*To maintain the material integrity, recommended storage temperature is between +10°C to +40 °C with a humidity of 25% to 65%. Exposure to direct sunlight or direct pressure on packaging or parts is prohibited. Process material at +20 °C and above.*

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**TRANSTHERM® THERMAL EPOXY**

Boyd's Transtherm® Thermal Epoxies provide both thermal conductivity and strong adhesion and can be used where no mounting holes are available.

Thermal epoxies create a strong mechanical bond between surfaces while offering high heat transfer and high voltage isolation. These specialized epoxies are mixed with thermally conductive fillers like ceramics or metallic particles that enable heat to easily transfer through the material. Thermal epoxy can act as both a thermal interface material and a mounting method to reduce the amount of mounting hardware utilized in a product or application.

Epoxy compounds offer low shrinkage and coefficients of thermal expansion comparable to copper or aluminum. They bond easily to metals, ceramics, most plastics and a wide variety of other materials.

Boyd's Transtherm® Thermal Epoxies conform with REACH and RoHS regulations.



**ORDERING INFORMATION**

Contact your Boyd representative for more information or connect with us through our website: <https://www.boydcorp.com/contact-us.html>

**MATERIAL PROPERTIES:**

Properties	Thermal Bond	Ther-O-Bond 1500	Ther-O-Bond 1600
Material	Thermal Grease	Thermal Grease	Thermal Grease
Thermal Conductivity (W/mK)	1.34	1.26	0.85
Hardness	88.0	88.0	90.0
Shore	D	D	D
Break Down Voltage (kV/mm)	59	31	16
Compressive Strength (kpsi)	20.9	14	--
Tensile Strength (kpsi)	9.2	9	9
CTE (ppm/°C)	24	25	25
Minimum Temperature (°C)	-65	-60	-70
Maximum Temperature (°C)	155	155	115
Product Type	2-Part	2-Part	2-Part
Bonds To	Copper, Aluminium, Steel, Glass, Ceramics, Most Plastics	Metals, Ceramics, Silica, Steatite, Alumina, Sapphire, Glass, Plastics	Metals, Ceramics, Silica, Steatite, Alumina, Sapphire, Glass

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**TRANSTHERM® THERMAL GREASE**

Boyd's Transtherm® Thermal Grease, also known as thermal paste, is a spreadable compound specially designed for high thermal conductivity to reduce thermal interface resistance between surfaces. Thermal greases can be silicone based or silicone-free based compounds with thermally conductive filler particles that increase the overall conductivity of the mixture.

Thermal grease is a popular thermal interface material choice for many high performance thermal management applications. When two flat surfaces are mated together with grease, the grease spreads out and thins, decreasing the thermal resistance between surfaces. Higher forces, typically with the use of mounting hardware and spring forces, ensure the highest performance with thermal greases. When heated, grease can thin out further, which is why spring forces are typically required for most applications that will experience significant thermal cycling.

Boyd's Transtherm® Thermal Grease conforms with REACH and RoHS regulations.



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**MATERIAL PROPERTIES:**



Properties	BCTIM-240-1000	BCTIM-240-1005	BCTIM-240-1006	Thermalcote
Material	Thermal Grease	Thermal Grease	Thermal Grease	Thermal Grease
Thermal Conductivity (W/mK)	4	1	1	1
Volume Resistivity (Ω cm)	10 <sup>12</sup>	10 <sup>15</sup>	10 <sup>12</sup>	-
Break Down Voltage (kV/mm)	6	9.8	8.8	11.8
Minimum Temperature (°C)	-20	-40	-40	-40
Maximum Temperature (°C)	180	200	200	204

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