



Product Training Module: TG Series

Jan 2012

Introduction

- Purpose
 - This training module is used to give an introduction to t-Global Technology's TG product range
- Objectives
 - To identify the key properties of the TG product range
 - To identify the key design criteria for product selection
 - To identify common applications for the product
- Content
 - Introduction and background to the TG Series
- Learning time
 - 30 mins



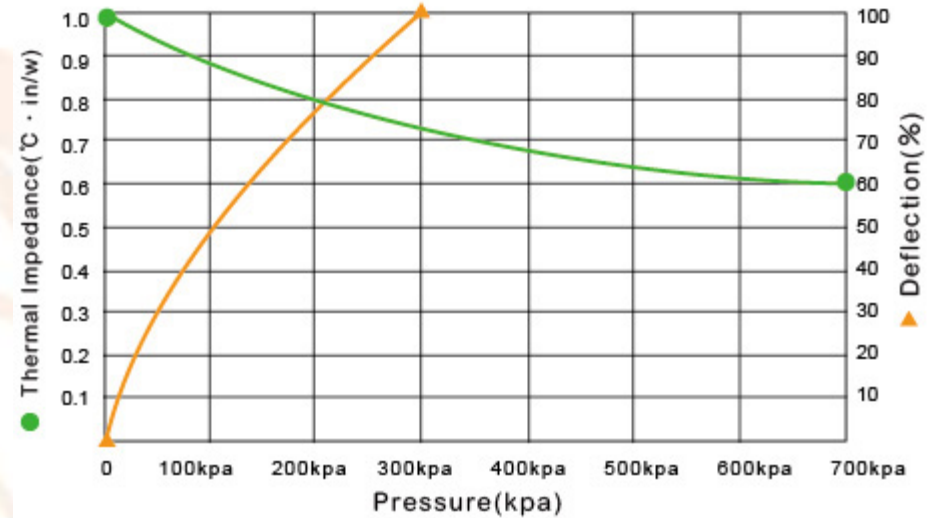
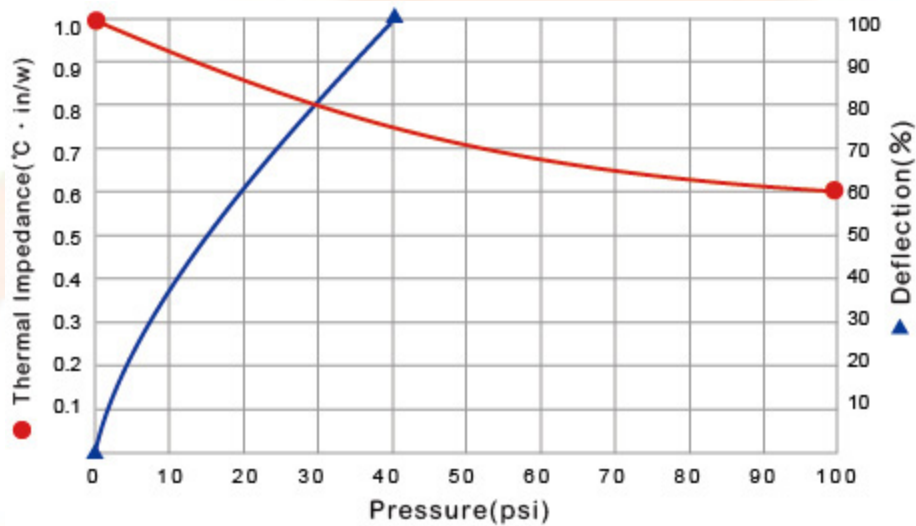
TG - Series

- The TG series is t-Global Technology's premium performing range of silicone based thermal interface products
- Each member in the family has been developed to address specific industrial needs
- All products are available as standard sheets, custom-die cuts and on rolls
- The thermal conductivity varies from 2 – 12 W/m-k

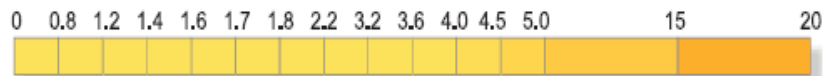
TG2030

- TG2030 is a silicone based thermal interface product with a thermal conductivity of 2 W/m.k
- It offers
 - 90% compression at low pressure
 - Low silicone outgassing
 - Low hardness
- Common applications include:
 - Consumer electronics
 - Automotive electronics
 - Telecom basestations

TG2030

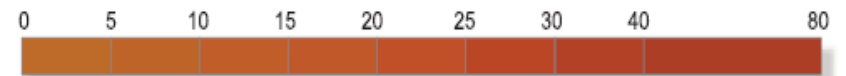


Thermal Conductivity: 2.0 W/m.k
(W / m.k - Z Axis)



Testing sample thickness : 1.0 mm

Hardeness: 30 (Shore 00)
(Shore 00)



TG2030 - Datasheet

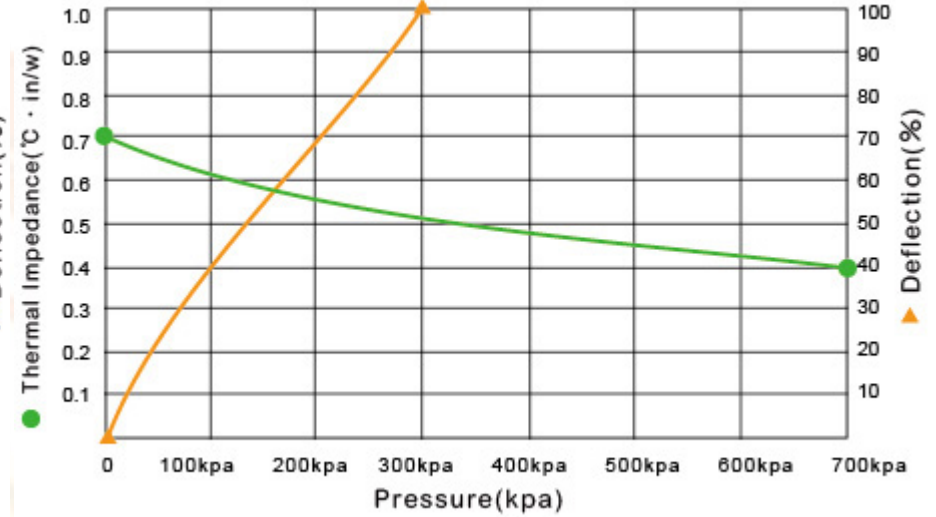
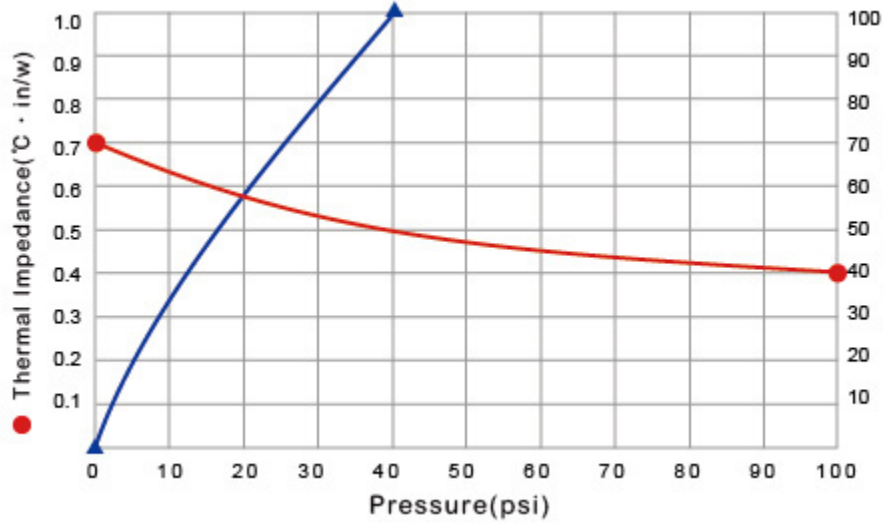
Property	TG2030	Unit	Tolerance	Test Method
Colour	White	-	-	Visual
Thickness	0.5 - 5.0	mm	-	ASTM D374
	0.0197 - 0.1969	inch	-	ASTM D374
Thermal Conductivity	2	W/m.k	-	ASTM D5470
Flame Rating	V-0	-	-	UL94
Dielectric Breakdown Voltage	16	kV/mm	-	ASTM D149
Weight Loss	<1	%	-	ASTM E595
Specific Gravity	2.4	g/cm ³	±0.2	ASTM D792
Working Temperature	-45 to 200	°C	-	-
Volume Resistance	>10 ¹²	Ohm-cm	-	ASTM D257
Elongation	300	%	±13	ASTM D412
Tensile Strength	1	Kgf/cm ²	±2	ASTM D412
Standard Shape	-	Sheet ones	-	-
Hardness	30	Shore 00	±5	ASTM D2240

• REACH Compliant • RoHS Compliant

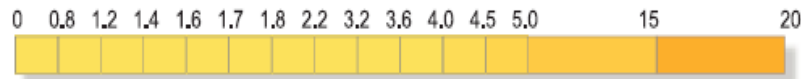
TG4040

- TG4040 is a silicone based thermal interface product with a thermal conductivity of 4 W/m.k
- It offers
 - 90% compression at low pressure
 - Low silicone outgassing
 - Low hardness
- Common applications include:
 - Consumer electronics
 - Automotive electronics
 - Power electronics

TG4040

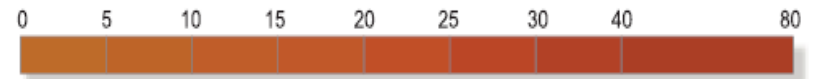


Thermal Conductivity: 4.0 W/m.k
(W / m.k - Z Axis)



Testing sample thickness : 1.0 mm

Hardness: 40 (Shore 00)
(Shore 00)



TG4040 - Datasheet

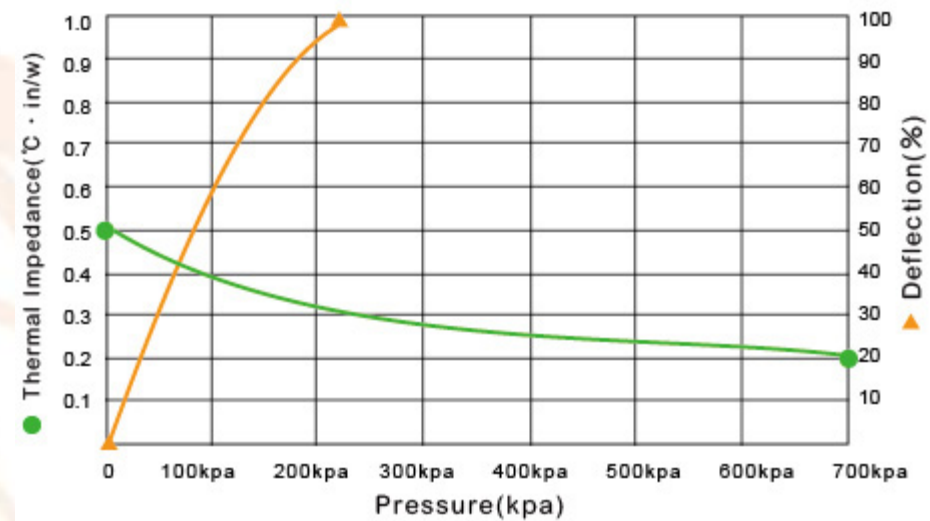
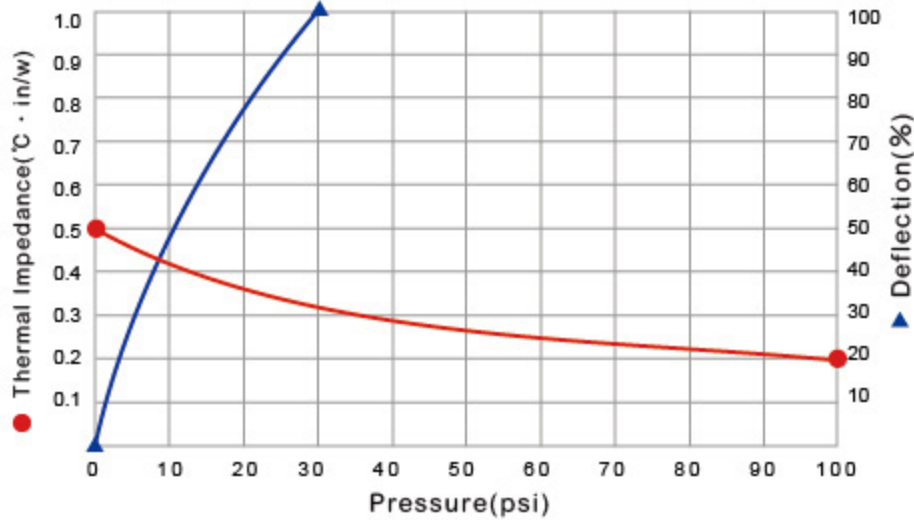
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Colour	Blue	-	-	Visual
Thickness	0.5 - 5.0	mm	-	ASTM D374
	0.0197 - 0.1969	inch	-	ASTM D374
Thermal Conductivity	4	W/m.k	-	ASTM D5470
Flame Rating	V-0	-	-	UL94
Dielectric Breakdown Voltage	15	kV/mm	-	ASTM D149
Weight Loss	<1	%	-	ASTM E595
Specific Gravity	2.8	g/cm ³	±0.2	ASTM D792
Working Temperature	-45 to 200	°C	-	-
Volume Resistance	>10 ¹²	Ohm-cm	-	ASTM D257
Elongation	100	%	±13	ASTM D412
Tensile Strength	1	Kgf/cm ²	±2	ASTM D412
Standard Shape	-	Sheet ones	-	-
Hardness	40	Shore 00	±5	ASTM D2240

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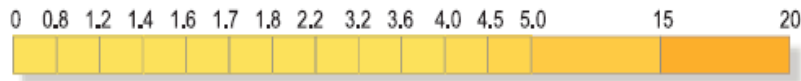
TG6050

- TG6050 is a silicone based thermal interface product with a thermal conductivity of 8 W/m.k
- It offers
 - 70% compression at low pressure
 - Low silicone outgassing
 - Low hardness
- Common applications include:
 - Consumer electronics
 - Automotive electronics
 - Power electronics

TG6050

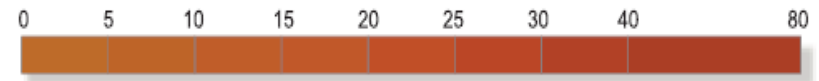


Thermal Conductivity: 6.0 W/m.k
(W / m.k - Z Axis)



Testing sample thickness : 1.0 mm

Hardness: 50 (Shore 00)
(Shore 00)



TG6050 - Datasheet

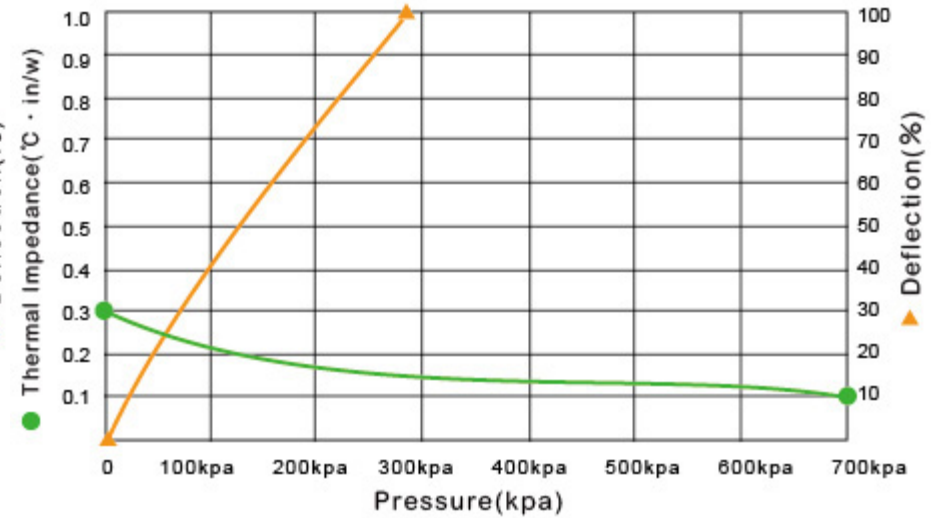
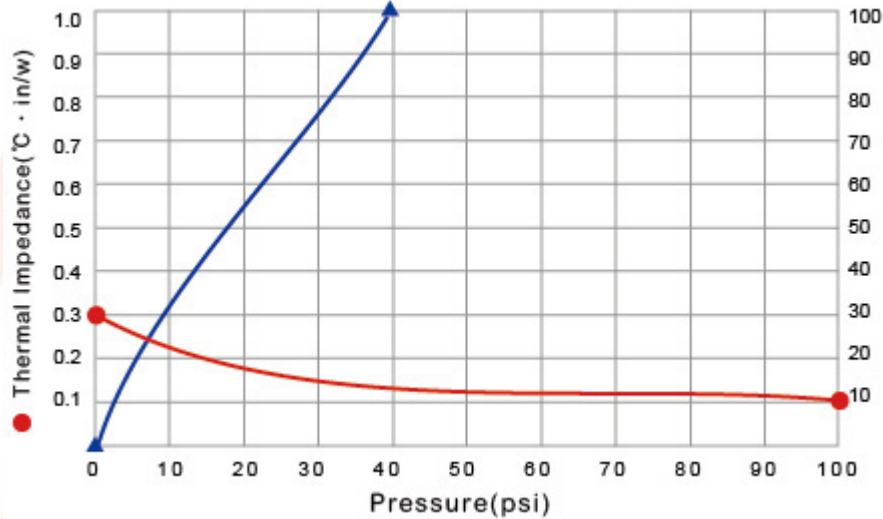
Property	TG6050	Unit	Tolerance	Test Method
Colour	Red	-	-	Visual
Thickness	0.5 - 2.0	mm	-	ASTM D374
	0.0197 - 0.0787	inch	-	ASTM D374
Thermal Conductivity	6	W/m.k	-	ASTM D5470
Flame Rating	V-0	-	-	UL94
Dielectric Breakdown Voltage	13	kV/mm	-	ASTM D149
Weight Loss	<1	%	-	ASTM E595
Specific Gravity	3.2	g/cm ³	±0.2	ASTM D792
Working Temperature	-45 to 200	°C	-	-
Volume Resistance	>10 ¹²	Ohm-cm	-	ASTM D257
Elongation	50	%	±13	ASTM D412
Tensile Strength	0.5	Kgf/cm ²	±2	ASTM D412
Standard Shape	-	Sheet ones	-	-
Hardness	50	Shore 00	±5	ASTM D2240

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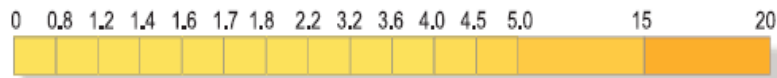
TG-X

- TG-X is a silicone based thermal interface product with a thermal conductivity of 12 W/m.k
- It offers
 - 70% compression at low pressure
 - Low silicone outgassing
 - Low hardness
- Common applications include:
 - Consumer electronics
 - Automotive electronics
 - Power electronics

TG-X



Thermal Conductivity: 1.0 W/m.k
(W / m.k - Z Axis)



Testing sample thickness : 1.0 mm

Hardness: 60 (Shore 00)
(Shore 00)



TG-X - Datasheet

Property	TG-X	Unit	Tolerance	Test Method
Colour	Grey	-	-	Visual
Thickness	0.5 - 1.0	mm	-	ASTM D374
	0.0197 - 0.0394	inch	-	ASTM D374
Thermal Conductivity	12	W/m.k	-	ASTM D5470
Flame Rating	V-0	-	-	UL94
Dielectric Breakdown Voltage	12	kV/mm	-	ASTM D149
Weight Loss	<1	%	-	ASTM E595
Specific Gravity	3.4	g/cm ³	±0.2	ASTM D792
Working Temperature	-45 to 200	°C	-	-
Volume Resistance	>10 ¹¹	Ohm-cm	-	ASTM D257
Standard Shape	-	Sheet ones	-	-
Hardness	60	Shore 00	±5	ASTM D2240

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Design Guide Lines

- For effective thermal management TG series products should be used under a compression of 20 – 45% based on the original thickness
- TG series products should only be used within the temperature range of – 40 + 200C. For applications outside of this range please contact t-global

Frequently Asked Questions

- **Can TG Series be reworked?**
 - With care the product can be removed and repositioned without an appreciable loss in thermal performance
- **What is the shelf-life of the product?**
 - Shelf-life for most gap-pads is one year. For gap-pads with an adhesive the shelf life is six months from the date of manufacture. After these dates adhesive strength and inherent tack must be re-characterised
- **Will the pads soften with temperature?**
 - Up to the maximum working temperature, as specified on the individual product datasheet, the materials will not suffer with temperature

Frequently Asked Questions

- Can the TG series be supplied in different formats?
 - The TG series can be supplied in sheet form, die-cuts, moulded parts and with adhesive applied to one or both sides
- How does TG-X respond to ageing and thermal cycling tests?
 - H48-2 does not exhibit any measurable changes in property when tested using all common industry standard environmental test regimes



Summary

- The TG Series is a silicone based gap filler range from t-Global technology
- The product family offers the design engineer a number of solutions to specific thermal problems
- Thermal conductivity for the series varies from 2 – 12 W/m.k
- Hardness for the series varies from 30 – 60 Shore OO
- The series is available as standard sheets, custom die cuts and rolls