Foil High Temperature Strain Gage

Product application

High temperature strain gage is mainly used for aviation, aerospace, atomic energy, engine, energy power generation, iron and steel smelting, chemical and other areas of stress and strain testing, health monitoring, strength measurement, etc. It has a very good adaptive capability in high temperature (including transient temperature) stress measurement. It is a good weapon to ensure the safety of components, study of the failure mode. It's also a reliable sensitive component to obtain high temperature stress and strain measurement data. Using foil manufacturing process, it has good flexibility, can meet various requirements of customers.

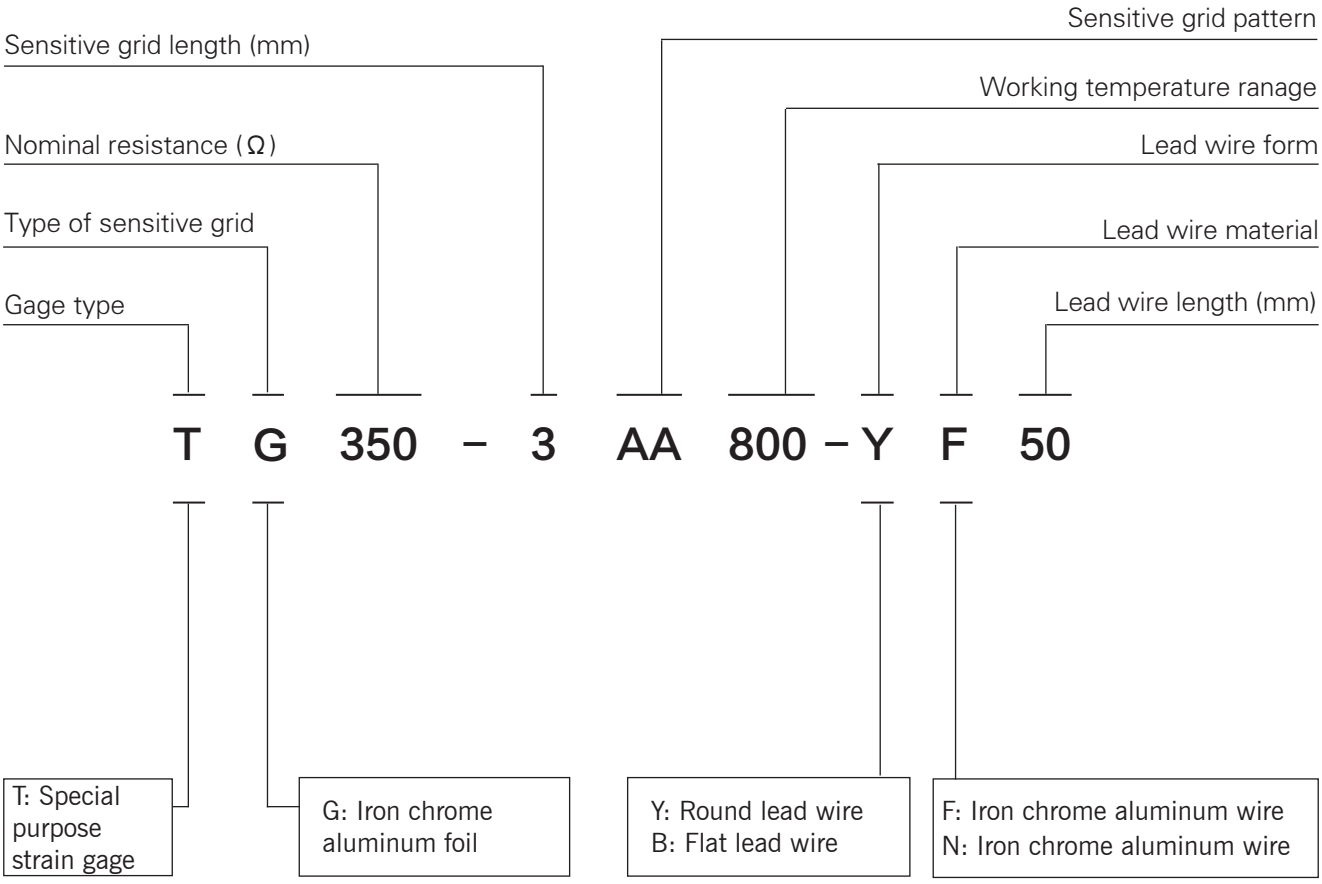
Product Introduction

TG series high-temperature strain gage is the iron-chromium alloy foil, through chemical etching to form a sensitive grid, can be used for high temperature structure and strain test within 800 ℃ . Using our company produced special high-temperature ceramic glue or flame spray to install.

TG series strain gage is not able to achieve temperature self-compensation function. During the test process, need to install a strain gage on nearby arm, with the same temperature degree on measuring arm, to improve test accuracy.

TG series strain gage provide a moving high temperature carrier, to fix the sensitive grid during strain gage's installation.

Naming system for foil high temperature strain gage



Foil High Temperature Strain Gage

Product manual

1. Product resistance

TG series strain gage with 50mm length, diameter 0.1mm iron chrome aluminum round lead wire, each wire resistance is 10 ohms. Measured resistance is 350 ± 0.3% ohms in the length 25 ± 1mm of two wires. Special lead wire length need to be customized.

2. Product structure

Can be designed in the form of uniaxial or biaxial sensitive grid structure. Special size and shape need to be customized.

3. Product material

Strain gage high temperature carrier is 0.8mm thickness of glass fiber reinforced teflon material. The surface coated with silicone rubber, temperature up to 250 ℃ , guarantee period is 10 months.

4. Lead wire

TG series strain gage normal lead wire is 0.1mm iron chrome aluminum round wire. In addition, can also provide different specifications of pure nickel wire diameter, nickel-chromium belt and nickel-chromium round wire, jacket ceramic tube or high temperature fiber insulation tube.

5. Product protection

Ceramic glue moisture, dark preservation, storage period is 1 year.

Gage bonding method

1. Polish and clean

Using 220 mesh alumina blasting, sandblasting pressure is about 4kg / cm (0.4MPa), increase the surface roughness and remove the specimen surface oxide. If without sandblasting condition, you can use 80 mesh sandpaper cross grinding treatment. And with acetone or methyl ethyl ketone cleaning the area for gage bonding, clear specimen surface sand or oil.

2. Paste tape

With a thickness of 0.08mm polyimide tape in the sand or polished place cross-paste the coating area, the tape edge inside of the sandblasting or polish edge area.

3. Base glue

Using glass rods or sticks stir the ceramic glue, so that the sediment dispersed evenly, the glue drops in the gage

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bonding area. With a scraper coated a thin ceramic glue on the sample surface. Glue area is 2 to 3 times larger than the gage bonding area, natural drying 45 minutes, then put into the oven. With the temperature 2℃ /per minute, from room temperature raised to 75 ° C, keep 45 minutes (or using an infrared lamp at 80 ° C heating 30 minutes), then the temperature raised to 100 ℃ for 30 minutes, raised to 230 ℃ for 30 minutes, raised to 350 ℃ for 30 minutes, down to room temperature to prepare gage bonding.

4. Gage bonding

According to above method, in the cured pre-coating surface, coating a thin layer ceramic glue with knife. Peel off the Teflon tape fixed strain gauge from the glass carefully. Hold the strain gauge lead wire with the other hand, prevent bending, put the strain gauge gently on the position. Then use tweezers or toothpick to adjust the strain gauge position, fix the strain gauge with Teflon tape, then use the Teflon tape to fix lead wire. Coating ceramic glue on the strain gage grid which is out of Teflon tape frame. At the same time, coating ceramic glue on the strain gauge pad and lead wire connection position. The area width is the same as Teflon frame brushing ceramic glue width, length is about 6 to 8 mm. After gage bonding, dry for 45 minutes in room temperature. Then put into the oven, heat temperature to 75 ℃ for 45 minutes, heat to 100 ℃ for 30 minutes, heat to 165 ℃ for 30 minutes, down to room temperature and take out.

5. Remove the glass fiber fixed frame

With a tweezers gently remove the Teflon tape, pay attention that remove the tape can not be too large or too fast, to avoid gage grid to be damaged. Then, put into oven heat to 100℃ for 30 minutes, heat to 230℃ for 30 minutes, and heat to 350℃ for 2 hours, down to room temperature and take out.

6. Coating cover

Coating ceramic glue on sensitive grid exposed part with a soft brush or toothpick, the other parts are not need to be coated. To ensure the entire strain gauge forms a uniform thickness cover.

7. Final curing

At room temperature, naturally dry for 45 minutes. Then put into the oven heat to 75 ℃ for 45 minutes, heat to 100 ℃ for 30 minutes,

Heat to 230 ℃ for 30 minutes, heat to 350 ℃ for 30 minutes, down to room temperature, then curing process is complete.

8. Lead wire soldering

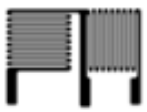
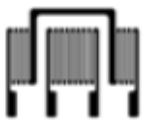
Lead wire adopts resistance melting soldering method, soldering the gage wire and measured wire together directly. Our company can purcahse the wire soldering equipment for the customers or the customers can purchase by themselves.

9. Others

Specific ceramic adhesive gage bonding curing method refers to our company "inorganic ceramic adhesive installation of high temperature strain gauges bonding method."

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Foil High Temperature Strain Gage Series

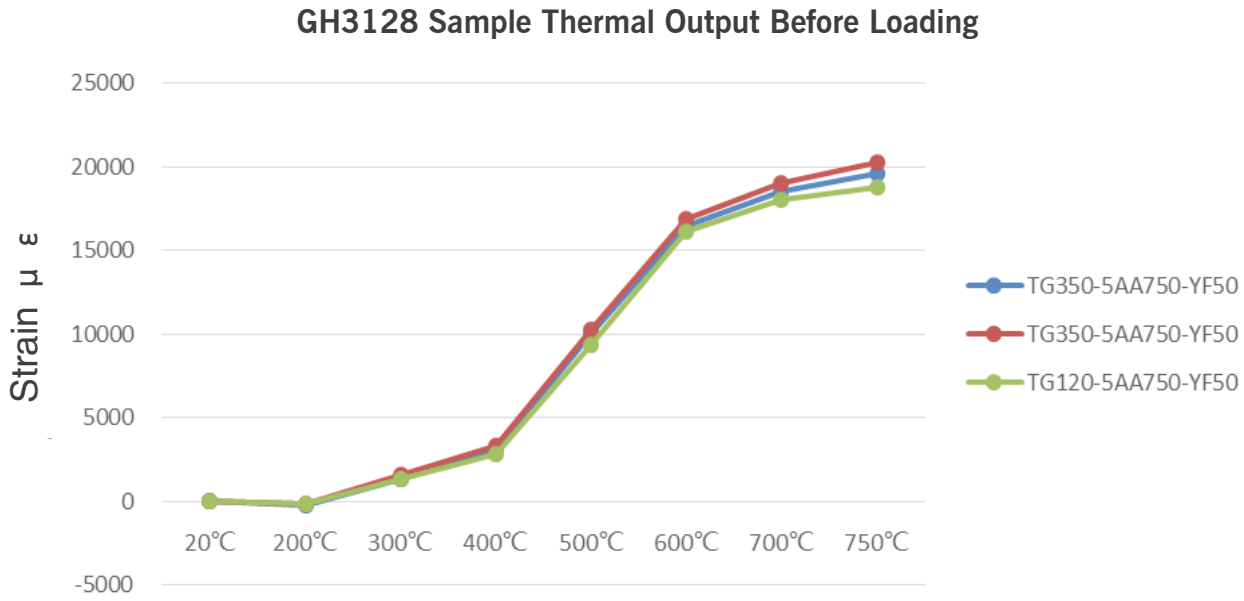
Structure type	Product Model	Resistance deviation	Size			
			Sensitive grid length (mm)	Sensitive grid width (mm)	Total length (mm)	Total width (mm)
	TG350-5AA800-YF50	350± 0.3%	5.0	3.66	7.6	3.66
	TG350-3AA800-YF50	350± 0.3%	3.0	5.11	5.6	5.11
	TG120-5AA800-YF50	120± 0.3%	5.0	2.47	7.6	2.47
	TG120-3AA800-YF50	120± 0.3%	3.0	2.0	5.6	2.0
	TG350-3BB800-YF50	350± 0.3%	3.0	7.72	5.79	7.72
	TG350-3HA800-YF50	350± 0.3%	3.0	5.53	8.16	5.53
	TG350-3FB800-YF50	350± 0.3%	3.0	8.0	6.72	8.0
Note: According to customer requirements, special structure and size high temperature strain gauges can be customized.						

Precautions

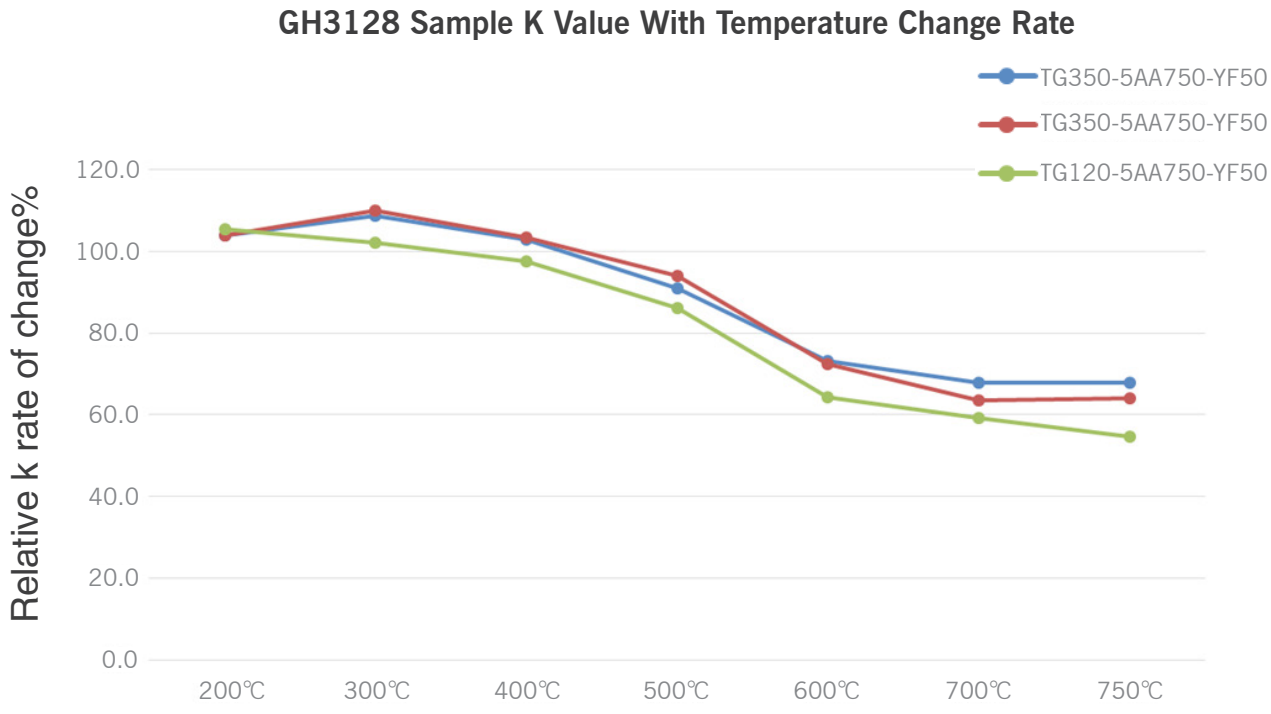
1. Ceramic glue is inorganic material including lead, please avoid direct contact the glue when coating. If inadvertently contact, should promptly rinse with water, and wash with soap water. After opening the bottle, should cover bottle cap timely and put into the drying cabinet moisture storage.
2. To avoid crack, please do not coat the adhesive too thick.
3. When stripping Teflon fixed frame, use the cotton swab dipped in absolute ethanol along the Teflon frame layer wetting, lift slowly to prevent the release power is too large, if too fast it will pull out the sensitive grid.
4. When using cotton cleaning sensitive grid surface, the scrubbing direction shall along with the sensitive grid length direction, meanwhile to avoid cotton fiber hair stick on the sensitive grid.

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Typical Thermal Output Curve



Sensitivity Coefficient With Temperature Curve



Description: The heat output test is only calibrated for the strain gage, without temperature compensation. The sample material is GH3128 high temperatue alloy.