

TML – Tokyo Measuring Instruments Laboratory Ltd

GLUES

TML offer various adhesives, all tested for mounting of strain gauges. For each strain gauge type, applicable adhesives are listed.

Type	Component	Operating temperature (°C)	Applicable specimen	Remarks
P-2*	Polyester	-30 ~ +180	Metal	Two-component (mixing ratio 1~3%), Room-temperature-curing, For general purpose
RP-2*	Polyester	-30 ~ +180	Concrete, Mortar	Two-component (mixing ratio 2~4%), Room-temperature-curing
NP-50B*	Polyester	-30 ~ +300	Metal, Composite	Two-component (mixing ratio 2~3%), Room-temperature-curing, For high temperature
PS*	Polyester	-30 ~ +100	Concrete, Mortar, Wood	Two-component (mixing ratio 2~4%), Room-temperature-curing
CN	Cyanoacrylate	-196 ~ +120	Metal, Plastics, Composite	Fast-curing, Single component, For general purpose
CN-E	Cyanoacrylate	-30 ~ +120	Porous material, Concrete, Mortar, Wood	Fast-curing, Single component, More viscous than CN
CN-Y	Cyanoacrylate	-30 ~ +80	Metal, Plastics, Composite	Fast-curing, Single component, For post-yield strain gauge (large strain)
CN-R	Cyanoacrylate	-30 ~ +120	Metal, Plastics, Composite	Fast-curing, Single component, Extremely quick curing exclusively for winter
C-1*	Phenol	-269 ~ +200	Metal	Single component, Heat-curing, For long-term measurement and transducers
EA-2A*	Epoxy	-269 ~ +50	Metal, Concrete, Composite	Two-component (mixing ratio 2:1), Room-temperature-curing, For cryogenic use
EB-2*	Epoxy	-60 ~ +200	Metal, Composite	Two-component (mixing ratio 10:3), Room-temperature-curing, For long-term measurement
A-2*	Epoxy	-30 ~ +100	Installation of Bolt strain gauge	Two-component (mixing ratio 10:1), Heat-curing

***Dangerous Goods in Excepted Quantities.** This implies that the goods cannot be shipped together with other items. Must be shipped separately and as dangerous goods. The price for sending to Europe is high. Alternatives available in Europe might be found, but they are not tested by TML.

Primary Installations - Bonding Strain Gauges

When bonding the strain gauges, the most suitable adhesive should be selected for each application. A typical installation procedure is described below using the fast-curing adhesive CN.

1. Preparation

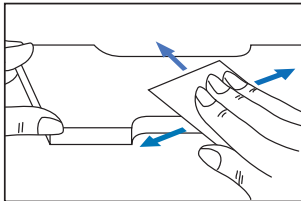
The following items are required for bonding and leadwire connection: Strain gauges, bonding adhesive, connecting terminals, test specimen, solvent, cleaning tissue for industrial use, soldering iron, solder, abrasive paper (120 - 320 grit), marking pencil, scale, tweezers, extension leadwire, polyethylene sheet, nippers.

2. Positioning

Roughly determine a location on the test specimen where the strain gauge is to be bonded.

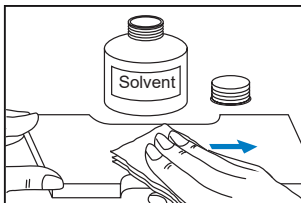
3. Surface preparation

Before bonding, remove all grease, rust, paint, etc., from the bonding area to provide a shiny metallic surface. Use abrasive paper to abrade an area somewhat larger than the bonding area uniformly and finely with abrasive paper. Finish the surface with #120 to 180 abrasive paper for steel, or #240 to 320 for aluminium.



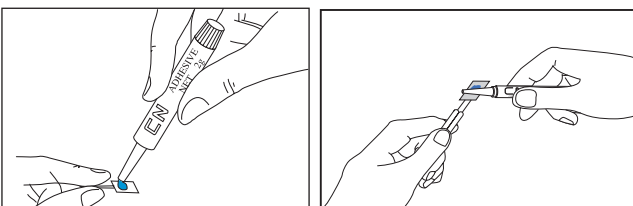
4. Fine cleaning

Clean the abraded surface with industrial tissue or cloth soaked in a small quantity of chemical solvent such as acetone. Continue cleaning until a new tissue or cloth comes away completely free of contamination. Following the surface preparation, be sure to attach the gauge before the surface becomes covered with an oxidizing membrane or becomes newly contaminated.



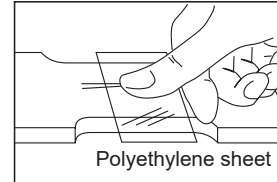
5. Applying bonding adhesive

Drop a proper amount of adhesive onto the back of the gauge base. Usually one drop of adhesive will suffice, but you may increase the number of drops according to the size of the gauge. Use the adhesive nozzle to spread the adhesive over the back surface thinly and uniformly.



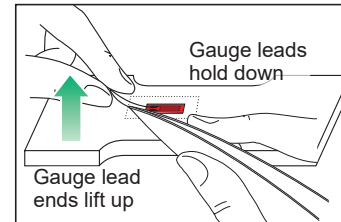
6. Curing and pressing

Place the gauge on the position, place a polyethylene sheet onto it and press down on the gauge constantly using your thumb or a gauge clamp. This should be done quickly as the curing process is completed very fast. The curing time varies depending on the gauge, test specimen, temperature, humidity and pressing force. The curing time under normal conditions is 20-60 seconds.



7. Raising gauge leads

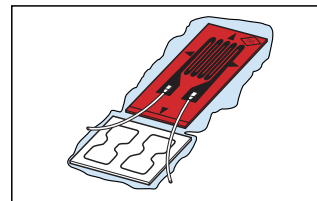
After the adhesive beneath the polyethylene sheet has been perfectly cured, raise the gauge leads. Raise the leads up to a bit inside the gauge base while pressing down the foot of the leads by tweezers not to damage the leads.



8. Bonding connecting terminals

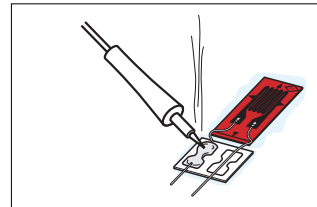
Bond the terminal close to the gauge base.

Foil type connecting terminals



9. Soldering the gauge leads

Place the gauge leads on the gauge terminal with a little slack and apply solder so that the metal foil of terminal is covered with the solder. An excess gauge leads should be twisted off by tweezers.



10. Soldering leadwires

It is recommended to plate the exposed core wires of the extension leadwires with solder preliminarily.

Solder the end of leadwire to the terminals. Take care not to excessively heat the terminal to peel off the metal foil.

