3 Selecting adhesive and bonding tools

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To obtain good measurement results, the strain gage must be bonded completely to the measuring object. Thus, it is important to select a suitable adhesive for the materials of the measuring object and gage base and for measuring conditions.

Applicable Gages	Model	Features	Curing Requirements 100kPa = Approx. 1kgf/cm²	Operating Temperature Range (°C)	Ingredient	Content (g)
KFG KFGT KFR KFW KFWS KFRP KFRS KFP KFML KSP KSN (excl. E5) KSPH KSPL KFL KFN KFS KFF KCH KV KTB	CC-33A	High-speed cold setting, enabling measurement 1 hour after bonding with finger pressure. Suitable for strain measurement of metal, plastics and composite materials under normal room temperature.	Apply finger pressure (100 to 300kPa) for 15 to 60 seconds. Then, leave the gage as it is for 1 hour or more at normal temperatures. The finger pressure application time depends on temperature and humidity conditions. Lower the temperature and humidity, the longer the finger pressure application time required.	–196 to 120	Cyano-acrylate, 1 liquid	2g x1 or 2g x5
KFG KFGT KFR KC KFRP KFP	CC-35	High-speed cold setting. Suitable for porous materials such as lumber, concrete and composite materials.	Apply finger pressure (100 to 300kPa) for 30 to 60 seconds. Then, leave the gage as it is for 1 hour or more at normal temperatures. The finger pressure application time depends on temperature and humidity conditions. Lower the temperature, the longer the finger pressure application time required.	–30 to 120	Cyano-acrylate, 1 liquid	2g x1 or 2g x5
KLM KFEL	CC-36	For high-elongation strain gages. Instantaneous bonding at room temperature and less aging change.		–10 to 80	Cyano-acrylate, 1 liquid	2g x1 or 2g x5
KFG KC KSP KSN (excl. E5) KSPH KSPL	PC-12	Cold setting. Suitable for strain measurement at middle to high temperatures. Product under export regulations	Apply pressure (30 to 50kPa) for 2 hours at normal temperatures.	–196 to 250	Polyester, 2 liquids	30 or 100
KFG KFGT KFR KFRP KFP KFH KFF KTB	EP-34B	Cold or hot setting. Suitable for strain measurement at middle to high temperatures and for bonding gages to transducers used at room temperaure.	Apply pressure (30 to 50kPa) for 24 hours at 25°C or for 2 hours at 80°C. Pressing is possible with tape.	–55 to 200	Epoxy, 2 liquids	30 (main agent 5.6g x4 & curing agent 2.1g x4)
KFG KFR KFH KFL KFN KFS	PC-6	Hot setting. Suitable for strain measurement at middle to high temperatures and for bonding gages to transducers.	Apply pressure (150 to 300kPa) for 1 hour at 80°C, for 2 hours at 130°C and for 2 hours at 150°C.	–269 to 250	Phenol, 1 liquid	100
KFG (C20) KFW KFWS KFF	EP-18	Cold or hot setting. Low viscosity makes it suitable for bonding bolt tightening force gages.	Apply pressure (50 to 100kPa) for 24 hours at normal temperatures or for 2 hours at 80°C.	–50 to 100	Epoxy, 2 liquids	30
KSN-2-E5	EP-17	Hot setting. Dedicated to KSN-2-E5. (Less cure shrinkage strain)	With the gage put on the adhesive, heat it for 2 hours at 130°C and for additional 2 hours at 150°C.	–50 to 170	Epoxy, 1 liquid & 1 powder	30
KFG KFR	PC-28	Hot setting. Suitable for aluminum alloy and for bonding gages to transducers.	Apply pressure (150 to 300kPa) for 1 hour at 100°C and for 2 hours at 160°C.	–20 to 80	Phenol, 1 liquid	60 (30g x2)
KFU KFH	PI-32	Hot setting. Suitable for strain measurement at high temperatures. Product under export regulations	Apply pressure (200 to 500kPa) for 1 hour at 100°C and for 2 hours at 200°C. Then, with the pressure removed, heat it for 2 hours at operating temperatures. Or apply pressure (200 to 500kPa) for 1 hour at 100°C and for 5 hours at 160°C and with the pressure removed, heat it for 2 hours at operating temperatures.	–269 to 350	Polyimide, 1 liquid	20
KFL	UC-26	Cold setting. Dedicated to KFL gages. (Mainly for concrete and lumber)	Apply pressure (30 to 50kPa) for 24 hours at normal temperatures.	–196 to 50	Poly-urethane, 2 liquids	40
KFML KLM	EC-30	Cold setting. Mainly for ultrahigh-elongation gages.	Apply pressure (30 to 50kPa) for 24 hours at normal temperatures.	0 to 60	Epoxy, 2 liquids	30
	S-7	Cure accelerator for CC-33A (shortens the curing time in cold environments)				30mL
	S-9	Surface treatment agent for instantaneous adhesives (improves adhesion to polyethylene, etc. Product under export regulations				100mL

Product under export regulations

on strategic commodities as provided for in the Foreign Exchange Law and the Foreign Trade Control Law. The necessary legal procedures should therefore be taken, including acquisition of an export license from the Government of Japan, if they are to be taken abroad.

Note: The stated operating temperature ranges are of adhesives. Practical ranges depend on combination with strain gages. When using, read the attached Instruction Manual carefully.

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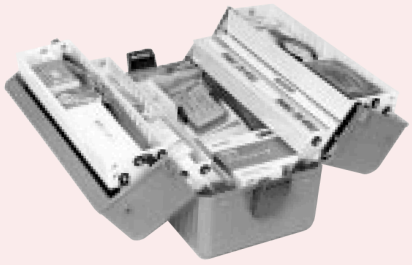
Gage Bonding Tool Kit

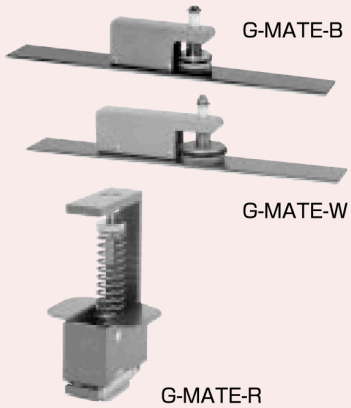


● GTK-77 Tool Kit

This kit includes all tools, gage terminals, solder and other expendables required for gage bonding work.

Contents
Tool box, screwdriver set, tweezers, nippers, radio pliers, tape measure (2m), stainless steel scale, protractor, sandpaper (#100), sandpaper (#320), soldering iron tip cleaner, knife, cutter, scriber, soldering iron (40W), compasses, roller, picker, marking pencil, mending tape, pencils (4H, 6H), scissors, cotton swabs, clean paper, high-temperature solder, flux for high-temperature solder, heat-resistant glass tube, gage terminals (T-P1, T-P4, T-P5, T-P6, T-P7, T-P8, T-P9,T-P10, T-F2, T-F3, T-F7, T-F8, T-F10, T-F13, T-F17, T-H11, T-R9), hair dryer (400W), AC plug, insulation vinyl tape, table tap (2.5m), soldering iron (ANTEX), silicon rubber (2m), fluoroplastic sheet (0.1mm)

Gage Pressers



● Gage Pressers G-MATE

The G-MATE can apply pressure to a bonded strain gage continuously until the adhesive is cured. It consists of a frame equipped with a strong ferrite magnet to firmly fix the object under testing and a presser disk equipped with silicon sponge rubber and coil spring to apply constant pressure to the strain gage.

Name	Model	Application
Gage Mate	G-MATE-B	For normal temp. (up to approx. 80°C)
High-temperature Gage Mate	G-MATE-H	For high temp. (up to approx. 180°C)
Waterproof Gage Mate	G-MATE-W	For KFW and KFWS
Reinforcing Steel Bar Gage Mate	G-MATE-R	For reinforcing steel bar

Sales unit: 6 pieces per pack

● Gage Picker G-PICKER

Utilizing the adhesion of cellophane tape, the G-PICKER enables the user to freely pick up the strain gage by lightly applying the tip of the G-PICKER to the gage terminal, etc. Thus, it improves the efficiency of gage bonding work.

Compact Spot Welder

● GW-3C Compact Spot Welder

Developed to mount encapsuled strain gages such as the KHCX, KHCS and KHCD and to fix high-temperature leadwires and thermocouples, the GW-3C is an easy-to-use welder providing an increased welding capability and allowing continuously variable settings of welding energy. (Patent pending)

Specifications
Welding Energy: LOW: 0 to 25Ws, continuously variable HIGH: 0 to 50Ws, continuously variable **Welding Speed:** 1Ws: 150 times/min., 5Ws: 120 times/min., 10Ws: 80 times/min., 20Ws: 60 times/min., 50Ws: 30 times/min. **Power Requirements:** 90 to 110 VAC, 50/60Hz: 500VA max. **Dimensions and Mass:** 183(W) x 153(H) x 313(D) mm (excluding protrusions), approx. 8.2kg (mainframe) **Accessories:** Square welding head, grounding clip (with 0.3m long cable), 2 electrodes (GW-02), metal file, fuse (5A), hexagonal wrench, instruction manual **Option:** Aluminum trunk (GW-01)

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