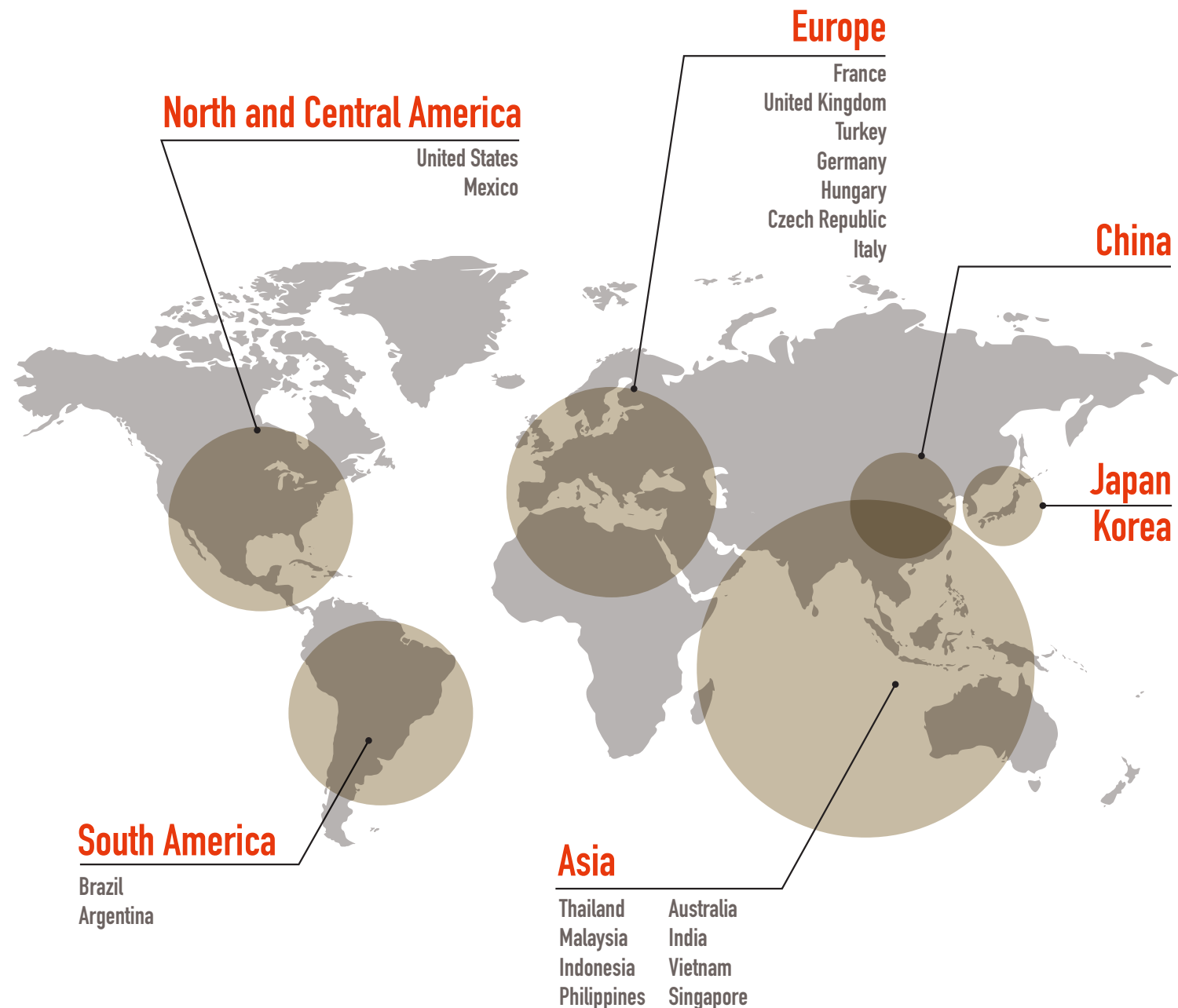


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ADHESIVES & SEALANTS
SELECTION GUIDE



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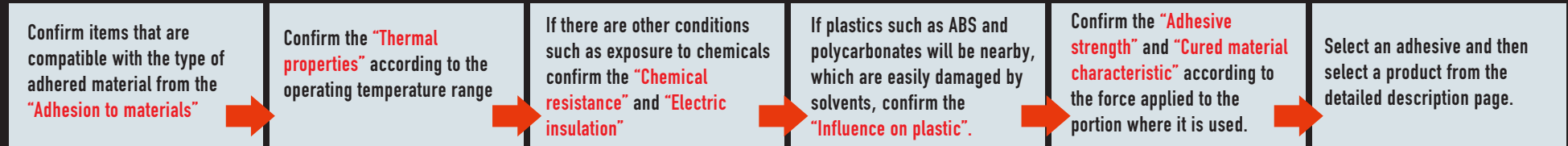
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ADHESIVES SELECTOR GUIDE

ADHESIVE SELECTION FLOW CHART



ADHESIVE PROPERTY COMPARISON TABLE

Adhesive Lineup	Main applications	Curing method	Curability	Thermal properties	Adhesion to materials			Durability		Chemical resistance					Electric Insulation	Influence on plastic ^{*3}	Adhesive strength		Cured Material Characteristic	Representative Grade
					Metal(s)	Plastic ^{*1}	Rubber ^{*2}	Continuous Heat resistance	Moisture resistance	Water	Acid	Inorganic bases	Oil	Solvent			Tensile shear bond strength	Peel strength		
Silicone-based	Bonding for electric and electronic parts, insulation, sealing, general bonding for dampproof coating, etc.	Moisture-curing * Condensation reaction by moisture in the air	Skin formation time: 5 to 10 minutes Curing speed: Approx. 3mm/day	Rubber elasticity is maintained over a wide temperature range Can be used from approximately -60°C to 250°C (heat-resistant type up to 300°C)	◎	◎	△	180°C	◎	◎	△	△	○	×	◎	None	○	○	Rubber-like Maximum elongation of about 500%	1200 Series
Anaerobic	Bonding of general screws, interlocking adhesion with sealed metal parts, surface adhesion, and bonding of motor magnets	Anaerobic curing * Radical polymerization reaction by cutting oxygen and providing metal contact * Adhesives also curable under UV light are available	Set time: From approximately a few seconds to 5 min Practical strength: 30 to 60 min Final strength: 12 to 24 hours	Can be used from approximately -40°C to 150°C (heat-resistant type upto 200°C)	◎	×	×	150°C	◎	◎	◎	◎	◎	○	◎	Yes	○	△	Hard and solid with excellent chemical resistance	1300 Series
Rubber-based	General bonding for a wide range of substrates such as rubber, leather, and metal	Solvent vaporization * Volatilization and drying of contained solvent	Surface drying: 5 - 10 min Set time: Clamping after surface drying, and bonding after that allows for immediate fixing, & practical strength is from 10 to 24 hrs. or longer	Strength maintained from approximately -40°C to 80°C	◎	△	◎	80°C	○	○	○	○	△	×	○	Yes	○	◎	Rubber-like	1500 Series
Elastomeric adhesive	Bonding to various materials such as metals, plastics, rubber, wood, and inorganic materials	Moisture-curing * Condensation reaction by moisture in the air	Skin formation time: 5 to 10 min. Practical strength: 24 hours Final strength: 3 to 5 days	Rubber elasticity is maintained over a wide temperature range Can be used from approximately -50°C to 150°C	◎	◎	◎	120°C	○	○	◎	◎	×	×	○	Partially affecting	○	◎	Rubber-like Maximum elongation of about 400%	1530 Series
Water-based adhesive	General bonding of urethane foam, polystyrene foam, wood, paper, leather, etc., and metals, plastics, rubber, etc.	Solvent vaporization * Volatilization and drying of contained solvent	Practical strength: 1 to 2 hours* Final strength: 1 to 2 days* Open time (Drying time before bonding): 20 min	Can be used from approximately -30°C to 60°C * Strength is maintained up to about 80°C	◎	◎	◎	100°C	△	△	△	△	×	×	○	None	○	◎	Elastic film with tackiness	1541C
Tacky Adhesive	Adhesive for screen printing to plastic nameplates, labels, stickers, etc.	Solvent vaporization * Volatilization and drying of contained moisture or contained solvent	50°C to 60°C ×15 to 20 min	Heat resistance strength maintained from approximately 60°C to 80°C	◎	◎	◎	80°C-100°C	△	△	△	△	×	×	○	None	○	◎	Highly sticky paste	1549
Heat-bonding sheet adhesive	Laminated-type sheet for heat-activated thermal bonding for aluminum nameplates, labels, etc.	Thermofusion, resolidification* Melt by heat, pressed onto a surface, then cooled to solidify	Laminate on nameplate and then perform thermal pressure bonding at 100°C or higher for no more than 10 seconds	Can be used from approximately -40°C to 100°C	○	×	×	60°C-80°C	○	○	○	○	△	×	○	None	○	○	Sheet-like dry film (with core)	1600 Series
Instant Adhesive	Bonding to various materials such as metals, plastics, rubber, and wood	Anionic polymerization by moisture * Curing in several seconds by moisture of the adhered material surface	Set time: From approximately a few seconds to a few minutes Practical strength: 30 min to 2 hours Final strength: 12 to 24 hours	Can be used from approximately -40°C to 100°C (heat-resistant type can be used at approximately 120°C)	◎	◎	◎	100°C-120°C	△	△	○	○	◎	◎	◎	Partially affecting	◎	○	Hard and Solid * Various grades are available including high heat resistance, high moisture resistance, & high peelability * Primers for adhesion-difficult materials available	1700 Series 7700 Series
Epoxy resin-based	Bonding, sealing, casting, impregnation, and coating for various usages including for electric and electronic parts and for construction materials	Addition polymerization * Room-temperature curing by mixing the main agent and curing agent, or thermal curing of single-component	Various types including 2-component type with room-temperature curing in 24 hrs, & single-component type with heat-curing in a few min. to a few hrs.	Can be used from approximately -60°C to 150°C (heat-resistant type can be used at approximately 200°C)	◎	○	○	120°C-150°C	◎	◎	◎	◎	◎	◎	◎	None	◎	△	Hard and Solid, tough	2000 Series 2100 Series 2200 Series
UV-curable resin-based	Bonding, sealing, casting, and coating for various usages including for electric & electronic parts and for general parts	Radical polymerization/ cationic polymerization * Curing in several secs. by UV light * Many types with additional curing property such as anaerobic, humidity, heating, and primer are available	Curing in a few seconds to under a minute by UV light irradiation from UV light irradiation equipment	Can be used from approximately -40°C to 120°C (heat-resistant type can be used at approximately 150°C)	◎	◎	○	120°C	○	◎	◎	◎	◎	◎	◎	Partially affecting	◎	○	Various, from hard and solid to soft and flexible * Acrylic resin-based, acryl rubber-based, epoxy-based, and silicone-based types are available	3000 Series 3100 Series
Ceramic-based	Filling solidification for ceramics, glass, & metal requiring high heat resistance, filling adhesion for sensors & elements, & coatings	Condensation reaction, reaction with binder	Heat-curing at 150°C, leave at room temperature +100°C×30 min	Heat resistance of 1300°C or higher	○	×	×	1400°C	○	◎	◎	◎	◎	◎	◎	None	○	×	Solid and ceramic-like	3732
SGA (two-component acrylic resin-based structural adhesive)	Adhesion of structures for various materials such as metal, plastic, rubber, wood, and inorganic materials	Honeymoon type (contact) curing * Radical polymerization by contact between Agent A and Agent B	Set time: 4 to 7 min Practical strength: 15 to 30 min Final strength: 12 hours	Can be used from approximately -40°C to 130°C	◎	◎	◎	80°C-100°C	◎	◎	◎	◎	◎	◎	◎	Partially affecting	◎	◎	Tough	3921, 3926

* 1) There are materials that are difficult to bond such as polyethylene, polypropylene, silicone resin, and fluoropolymers.
* 2) There are materials that are difficult to bond such as silicone rubber, fluororubber and urethane rubber
* 3) ABS, polycarbonate, polysulfone, polystyrene, and other materials that are easily damaged by solvents may dissolve or crack on the surface.



SEALANT SELECTOR GUIDE

SEALANT SELECTION FLOW CHART

Confirm that it matches the "Main usage" according to the parts used and the inner fluid that will be sealed.

Confirm the adequacy with the inner fluid that will be sealed according to the "Main usage", "Chemical resistance" and "Heat resistance".

Confirm the "Clearance applicability" according to the clearance at the usage location.

If sealability is required immediately after assembly to the used portion, confirm the "Initial pressure resistance".

If it is necessary to remove the portion where it is used regularly, confirm the "Removability".

Select a sealant and then select a product from the detailed description pages of the corresponding representative grade.

SEALANT PROPERTY COMPARISON TABLE

Sealant type	Sealing function	Sealant lineup	Curing method	Cured material characteristic	Main usages	Chemical Resistance				Heat Resistance	Clearance Applicability	Adhesion	Displacement Conformability	Pressure Resistance		Removability	Representative Grade	
						Oil	Water	Acid	Inorganic Bases					Initial	After Curing			
Reaction type	The sealing function works by forming an elastic adhesion layer on the joint surface due to condensation or polymerization reaction. Excellent sealability is achieved even on joint surfaces with large clearances.	Silicone-based	Moisture-curing * Condensation reaction by moisture in the air	Rubber-like	Vehicle oil pan and gear case FIGP ¹ Sealing of general use machines and general pipes *Special grade for sealing water supply pipes available	○	○	△	△	◎	◎	○	◎	○	◎	△ to ○	1200 Series	
		Modified Silicone-based	Moisture-curing * Condensation reaction by moisture in the air	Rubber-like	Agricultural machine oil pan and gear case FIGP ¹ Sealing of general use machines and general pipes	○	△	△	△	△	◎	○	◎	○	◎	△ to ○	1206 Series	
		Moisture-curing acrylate-based	Moisture-curing * Condensation reaction by moisture in the air	Rubber-like	Vehicle oil pan FIGP* ¹ Sealing of general use machines	○	○	○	○	○	◎	○	◎	○	◎	△ to ○	1158	
		Anaerobic curing acrylate-based	Anaerobic curing * Radical polymerization reaction by oxygen isolation & metal contacts	Rubber-like	Vehicle gear case FIGP ¹ Sealing of plugs and general pipes	○	○	○	○	○	○	○	○	○	◎	△	1133J	
		Curing under UV light acryl rubber-based	Curing under UV light * Radical polymerization reaction by UV light irradiation	Rubber-like	Vehicle electrical component CIPG* ²	○	○	○	○	○	○	○	○	△	○	○	○	3081J
		Two-component fluororubber-based	Two-component mixture * Condensation reaction by mixing Agents A and B	Rubber-like	Transportation equipment fuel system, seal plants, sealing of pipes	◎	◎	◎	◎	◎	◎	◎	○	◎	○	◎	△ to ○	1119
		Heat-curing olefin-based	Heat-curing * Polymerization reaction by heating	Rubber-like	FIGP and CIPG for fuel cell batteries* ¹⁺² Gas seal, methanol seal	○	○	○	○	○	○	△	○	○	-	○	○	1152C, 1153C
		Moisture-curing olefin-based	Moisture-curing * Condensation reaction by moisture in the air	Putty (mastic type)	Sealing of city gas and LPG piping	○	○	○	○	○	◎	△	◎	△	○	○	○	4333B
Non-reactive type	Solventless (non-drying) type	Sealability works by adhesion to the joint surface and by its fluid resistance. It is easy to remove because it does not cure.	Solventless, synthetic resin-based	Non-drying * Initial status is maintained	Putty	Sealing of general use machines and general pipes Supplementary sealing used with solid packing Sealing of city gas and LPG piping	○	○	○	○	△	△	-	△	○	○	◎	4320B
	Solvent type	Sealability works by forming an elastic adhesion layer on the joint elastic adhesion layer on the joint solvent (including water). Curing shrinkage is large due to vaporization of the contained solvent.	Organic solvent, synthetic resin-based	Solvent vaporization * Volatilization and drying of contained solvent	Solid to Rubber-like	Sealing of general use machines and general pipes *Special grade for sealing water supply pipes available	○	○	○	○	○	△	○	○	△	○	△ to ○	1102, 1103B
			Organic solvent, synthetic rubber-based	Solvent vaporization * Volatilization and drying of contained solvent	Rubber-like	Sealing for vehicles, general use machines and general pipes Sealing of city gas and LPG piping	○	○	○	○	○	△	○	○	△	○	△ to ○	1184 Series
	Aqueous type	Sealability works by adhesion to the joint surface due to the repulsive force that occurs from the fastening contact pressure.	Acrylic emulsion-based (water-based)	Vaporization * Volatilization and drying of contained moisture.	Rubber-like	Sealing for vehicles and general use machines Supplementary sealing used with solid packing	○	○	○	○	○	△	○	○	△	○	△ to ○	1141 Series
	Solid packing		Fiber impregnated with synthetic resin	-	Sheet-like (solid)	Sealing for vehicles and general use machines	○	○	○	○	○	△	-	△	○	○	○	Solid Sheet Packing Series
			Unbaked fluororesin	-	Tape-like (solid)	Sealing of general pipe screws	◎	◎	◎	◎	◎	△	-	△	○	○	◎	ThreeBond Tape

*1 FIGP: Formed In Place Gasket Liquid gasket that is applied on one surface and forms a seal by reactive curing after joining the other surface.

*2 CIPG: Cured In Place Gasket Liquid gasket that is applied on one surface as a bead and forms a seal by curing before joining the other surface (sealing by surface pressure of the joint surface).

PROPERTY COMPARISON TABLE ACCORDING TO SEALANT APPLICATION

◎ Highly suitable ○ Suitable △ Not very suitable × Unsuitable

Applications	Sealant lineup	Curing method	Cured material characteristic	Chemical Resistance				Heat Resistance	Clearance Applicability	Adhesion	Displacement Conformability	Pressure Resistance		Removability	Representative Grade
				Oil	Water	Acid	Inorganic Bases					Initial	After Curing		
Vehicle, agricultural machine, construction machine, general use machine, and other FIGP*	Silicone-based	Moisture-curing * Condensation reaction by moisture in the air	Rubber-like	○	○	△	△	◎	◎	○	◎	○	◎	△ to ○	1200 Series
	Modified Silicone-based	Moisture-curing * Condensation reaction by moisture in the air	Rubber-like	○	△	△	△	△	◎	○	◎	○	◎	△ to ○	1206 Series
	Moisture-curing acrylate-based	Moisture-curing * Condensation reaction by moisture in the air	Rubber-like	○	○	○	○	○	◎	○	◎	○	◎	△ to ○	1158
	Anaerobic curing acrylate-based	Anaerobic curing * Radical polymerization reaction by oxygen isolation & metal contacts	Rubber-like	○	○	○	○	○	○	○	○	○	◎	△	1133J
	Heat-curing olefin-based	Heat-curing * Polymerization reaction by heating	Rubber-like	○	○	○	○	○	○	○	△	○	-	○	○
General-purpose sealing for vehicles, agricultural machines, construction machines and general use machines, etc.	Silicone-based	Moisture-curing * Condensation reaction by moisture in the air	Rubber-like	○	○	△	△	◎	◎	○	◎	○	◎	△ to ○	1211, 1212, 1215
	Solventless synthetic resin-based	Non-Drying * Initial status is maintained	Putty	○	○	○	○	△	△	-	△	○	○	◎	1101, 1121
	Organic solvent, synthetic resin-based	Solvent vaporization * Volatilization & drying of contained solvent	Solid to Rubber-like	○	○	○	○	○	△	○	○	△	○	△ to ○	1102, 1103B
	Organic solvent, synthetic rubber-based	Solvent vaporization * Volatilization & drying of contained solvent	Rubber-like	○	○	○	○	○	△	○	○	△	○	△ to ○	1184 Series
	Acrylic emulsion-based (water-based)	Vaporization * Volatilization & drying of contained moisture	Rubber-like	○	○	○	○	○	△	○	○	△	○	△ to ○	1141 Series
Fiber impregnated with synthetic resin		Sheet-like (solid)	○	○	○	○	○	△	-	△	○	○	○	Solid Sheet Packing Series	
High-temperature sealing of mufflers for vehicles, agricultural machines, construction machines and general use machines, etc.	Organic solvent, synthetic resin-based	Solvent vaporization * Volatilization & drying of contained solvent	Solid to Putty	○	○	○	○	◎	△	○	○	△	○	△ to ○	1107D, 1109J
Highly chemical-resistant sealant for vehicles, agricultural machines, construction machines and general use machine plants, etc.	Two-component fluororubber-based	Two-component mixture * Condensation reaction by mixing Agents A and B	Rubber-like	◎	◎	◎	◎	◎	◎	○	◎	○	◎	△ to ○	1119
Sealing of general pipes	Silicone-based	Moisture-curing * Condensation reaction by moisture in the air	Rubber-like	○	○	△	△	◎	◎	○	◎	○	◎	△ to ○	1211, 1212, 1215
	Organic solvent, synthetic resin-based	Solvent vaporization * Volatilization & drying of contained solvent	Dry adhesion	○	○	○	○	○	△	○	△	△	○	△ to ○	4002
	Organic solvent, synthetic rubber-based	Solvent vaporization * Volatilization & drying of contained solvent	Rubber-like	○	○	○	○	○	△	○	○	△	○	△ to ○	1184 Series
	Anaerobic curing acrylate-based	Anaerobic curing * Radical polymerization reaction by oxygen isolation & metal contacts	Solid	○	○	○	○	○	○	○	○	○	◎	△	1100 Series
	Unbaked fluororesin		Tape-like (solid)	◎	◎	◎	◎	◎	△	-	△	○	○	◎	ThreeBond tape
Sealing of city gas and LPG piping	Moisture-curing olefin-based	Moisture-curing * Condensation reaction by moisture in the air	Putty (mastic type)	○	○	○	○	○	◎	△	◎	△	○	○	4333B
	Silicone-based	Moisture-curing * Condensation reaction by moisture in the air	Rubber-like	○	○	△	△	◎	◎	○	◎	○	◎	△ to ○	4332C
	Solventless, synthetic resin-based	Non-drying * Initial status is maintained	Putty	○	○	○	○	△	△	-	△	○	○	◎	4320B
	Organic solvent, synthetic rubber-based	Solvent vaporization * Volatilization & drying of contained solvent	Rubber-like	○	○	○	○	○	△	○	○	△	○	△ to ○	4004D, 4314D
Sealing of hot water supplies	Organic solvent, synthetic resin-based	Solvent vaporization * Volatilization & drying of contained solvent	Dry adhesion	○	○	○	○	○	△	○	△	△	○	△ to ○	4221, 4221B
	Silicone-based	Moisture-curing * Condensation reaction by moisture in the air	Rubber-like	○	○	△	△	◎	◎	○	◎	○	◎	△ to ○	4230