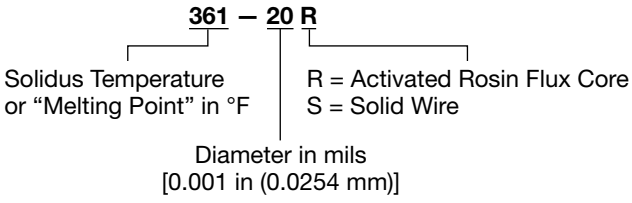
Solders, Fluxes, Kits, and Soldering Units

The quality of the solder joints is a critical element in the performance of any strain gage installation. Because of special requirements associated with strain gage circuitry, many commercial solders and fluxes are not satisfactory for this purpose. Micro-Measurements stocks and distributes a selection of solders and fluxes that have been carefully tested and qualified for use with strain gages.

SOLDERS

Strain gage solders are listed at right, along with their compositions, principal properties, and recommended applications. For ordering purposes, the solders are specified according to the coding system shown at right. All solders are supplied on spools, except for the 1240-FPA paste, which is supplied in a jar.



SOLDER SELECTION CHART

Solder Type (See Note 1)	Packaging		Solidus/ Liquidus Temperature	Wetting and Flow	Mech. Strength	Electrical Conductivity	Corrosion Resistance
	Order No.	Unit Size					
361A-20R 63%Tin 36.65% Lead 0.35% Antimony	361A-20R-25	25 ft (7.6 m)	361°/361°F [183°/183°C]	Excellent	Very Good	High	Good
	361A-20R	1 lb (450 g)					
	Best all-around solder for general use. Also capable of use at cryogenic temperature.						
361-40R 63%Tin 37% Lead	361-40R-15	15 ft (4.6 m)	361°/361°F [183°/183°C]	Excellent	Very Good	High	Good
	361-40R	1 lb (450 g)					
	General use with heavy leadwires. Not recommended for use at cryogenic temperatures.						
430-20S 96.3% Tin 3.7% Silver	430-20S-25	25 ft (7.6 m)	430°/430°F [221°/221°C]	Excellent	Very Good	Best	Excellent
	430-20S	1 lb (450 g)					
	Recommended for use where high electrical conductivity is required. Good mechanical fatigue properties. Do not use at cryogenic temperatures.						
450-20R 95% Tin 5% Antimony	450-20R-25	25 ft (7.6 m)	450°/460°F [232°/238°C]	Excellent	Very Good	High	Good
	450-20R	1 lb (450 g)					
	Higher temperature solder with very good handling properties. Can be used with M-Flux AR or M-Flux SS. Presence of antimony prevents "tin disease"; can be used in cryogenic environments, although quite brittle at low temperatures.						
450-20S 95% Tin 5% Antimony	450-20S-25	25 ft (7.6 m)	450°/460°F [232°/238°C]	Excellent	Very Good, Hard	High	Good
	450-20S	1 lb (450 g)					
	Higher temperature solder with very good handling properties. Can be used with M-Flux AR or M-Flux SS. Presence of antimony prevents "tin disease"; can be used in cryogenic environments, although quite brittle at low temperatures.						
570-28R 93.5% Lead 5% Tin 1.5% Silver	570-28R-20	20 ft (6.1 m)	565°/574°F [296°/301°C]	Very Good	Very Good, Hard	Fair	Fair
	570-28R	1 lb (450 g)					
	High-lead content. For high-temperature connections and long-term use at cryogenic temperature.						
1240-FPA 40% Silver 28% Zinc 30% Copper 2% Nickel	1240-FPA	1 oz (28 g)	1220°/1435°F (660°/780°C)	Excellent	Excellent	High	Good
	For very-high-temperature solder joints, generally with WK-Series strain gages. The WRS-1 Resistance Soldering Unit is an ideal tool for use with this solder. Has a shelf life of 9 months.						

Note 1: Products shown in bold are RoHS compliant.

Solders, Fluxes, Kits, and Soldering Units

FLUXES

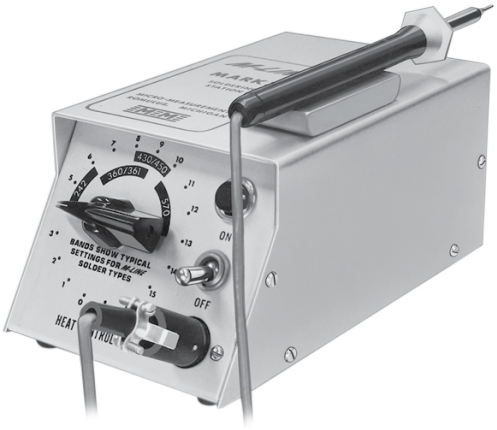
With solid wire solders, it is necessary to use separate, externally applied fluxes. Even with rosin-core solders, flux may be helpful when soldering fine jumper wires to gage tabs or printed-circuit terminals, because not enough flux is released from the cored solder. It may also be necessary to supplement the cored flux in high-temperature solders such as Type 570.

Two fluxing compounds are available for strain gage soldering applications. M-Flux AR is an active but noncorrosive rosin flux that is effective on constantan, copper, and nickel. M-Flux SS is a very active acid flux that is used primarily with solid-wire solders applied to isoelastic and K-alloy gages, and to stainless steel. The two fluxes should never be mixed. Whether the rosin or acid flux is used, it must be completely removed immediately after soldering to prevent degradation of protective coatings and corrosion of the metals, and to eliminate conductive flux residues. Rosin residues are best removed with *M-LINE* Rosin Solvent. Removal of M-Flux SS requires two steps: liberal applications of M-Prep Conditioner A, which must be blotted dry; and then M-Prep Neutralizer 5A, also to be blotted dry.

FLUX AND ROSIN SOLVENT KITS (See Note 1)	
FAR-2 M-Flux AR Kit	Two 1-oz (30-ml) brush-cap bottles M-Flux AR Two 1-oz (30-ml) brush-cap bottles *M-LINE* Rosin Solvent
RSK-1 *M-LINE* Rosin Solvent Kit	Twelve 1-oz (30-ml) brush-cap bottles
RSK-2 *M-LINE* Rosin Solvent Bulk	1-qt (960-ml) bottles
RSK-4 *M-LINE* Rosin Solvent Kit	Four 1-oz (30-ml) brush-cap bottles
FSS-1 M-Flux SS Kit	One 1-oz (30-ml) applicator cap bottle M-Flux SS One 1-oz (30-ml) brush-cap bottle M-Prep Conditioner A One 1-oz (30-ml) brush-cap bottle M-Prep Neutralizer 5A

Note 1: All products shown are RoHS compliant.

MARK V SOLDERING STATION



A time-proven precision soldering instrument for miniature and/or delicate soldering applications. Full 25-watt rating in 17 selector positions to handle all *M-LINE* solder alloys except 1240-FPA. Magnetic solder pencil holder and flexible, burn-resistant cord. Lightweight soldering pencil [1.1oz (31g)]. Specify 115 or 220 Vac, 50 or 60 Hz operation.

M5S-1 **Mark V Soldering Station**, Complete with M5S-4 Tip

M5S-2 **Mark V Control Unit only**

M5S-3 **Mark V Soldering Pencil only (includes one tip)**

M5S-4 **Mark V Soldering Tip only**

Solders, Fluxes, Kits, and Soldering Units

RESISTANCE SOLDERING UNIT

Used in combination with 1240-FPA silver-solder paste, this unit makes an excellent lead attachment system for strain gage operation above +500°F (+260°C). The variable power control allows adjustment from zero to 100 watts and zero to 3 Vac. The power control is fused, and a pilot light is incorporated. The foot switch and tweezer soldering handpiece give excellent operator control over each solder joint. Includes power unit and foot switch, both with three-wire NEMA plugs, tweezer soldering handpiece, and replacement electrodes.

WRS-1 **Resistance Soldering Unit,** 110 Vac

WRS-2 **Resistance Soldering Unit,** 220 Vac

WRS-A **Replacement Electrodes**, package of 6

REFERENCES

Application Note TT-606, “Soldering Techniques for Lead Attachment to Strain Gages with Solder Dots.”
Application Note TT-602, “Silver Soldering Technique for Attachment of Leads to Strain Gages.”
Application Note TT-609, “Strain Gage Soldering Techniques.”

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