

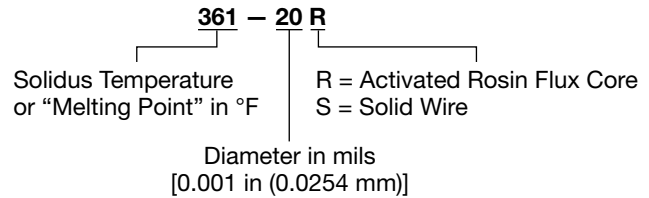
## Solders, Fluxes, Kits, and Soldering Units

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 SELECTION CHART                                        |                                                                                                                                                                                                                                        |               |                                     |                        |                    |                            |                         |
|---------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-------------------------------------|------------------------|--------------------|----------------------------|-------------------------|
| Solder Type<br>(See Note 1)                                   | Packaging                                                                                                                                                                                                                              |               | Solidus/<br>Liquidus<br>Temperature | Wetting<br>and<br>Flow | Mech.<br>Strength  | Electrical<br>Conductivity | Corrosion<br>Resistance |
|                                                               | Order No.                                                                                                                                                                                                                              | Unit Size     |                                     |                        |                    |                            |                         |
| 361A-20R<br>63%Tin<br>36.65% Lead<br>0.35% Antimony           | 361A-20R-25                                                                                                                                                                                                                            | 25 ft (7.6 m) | 361°/361°F<br>[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<br>63%Tin<br>37% Lead                                 | 361-40R-15                                                                                                                                                                                                                             | 15 ft (4.6 m) | 361°/361°F<br>[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<br>96.3% Tin<br>3.7% Silver                           | 430-20S-25                                                                                                                                                                                                                             | 25 ft (7.6 m) | 430°/430°F<br>[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<br>95% Tin<br>5% Antimony                             | 450-20R-25                                                                                                                                                                                                                             | 25 ft (7.6 m) | 450°/460°F<br>[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<br>95% Tin<br>5% Antimony                             | 450-20S-25                                                                                                                                                                                                                             | 25 ft (7.6 m) | 450°/460°F<br>[232°/238°C]          | Excellent              | Very Good,<br>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<br>93.5% Lead<br>5% Tin<br>1.5% Silver                | 570-28R-20                                                                                                                                                                                                                             | 20 ft (6.1 m) | 565°/574°F<br>[296°/301°C]          | Very Good              | Very Good,<br>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<br>40% Silver<br>28% Zinc<br>30% Copper<br>2% Nickel | 1240-FPA                                                                                                                                                                                                                               | 1 oz (28 g)   | 1220°/1435°F<br>(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) |                                                                                                                                                                       |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>FAR-2 M-Flux AR Kit</b>               | Two 1-oz (30-ml) brush-cap bottles M-Flux AR<br>Two 1-oz (30-ml) brush-cap bottles <i>M-LINE</i> Rosin Solvent                                                        |
| <b>RSK-1 M-LINE Rosin Solvent Kit</b>    | Twelve 1-oz (30-ml) brush-cap bottles                                                                                                                                 |
| <b>RSK-2 M-LINE Rosin Solvent Bulk</b>   | 1-qt (960-ml) bottles                                                                                                                                                 |
| <b>RSK-4 M-LINE Rosin Solvent Kit</b>    | Four 1-oz (30-ml) brush-cap bottles                                                                                                                                   |
| <b>FSS-1 M-Flux SS Kit</b>               | One 1-oz (30-ml) applicator cap bottle M-Flux SS<br>One 1-oz (30-ml) brush-cap bottle M-Prep Conditioner A<br>One 1-oz (30-ml) brush-cap bottle M-Prep Neutralizer 5A |

**Note 1:** All products shown are RoHS compliant.

| MARK V SOLDERING STATION |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                          | <p>A time-proven precision soldering instrument for miniature and/or delicate soldering applications. Full 25-watt rating in 17 selector positions to handle all <i>M-LINE</i> 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.</p> <p><b>M5S-1</b>    <b>Mark V Soldering Station,</b><br/>Complete with M5S-4 Tip</p> <p><b>M5S-2</b>    <b>Mark V Control Unit only</b></p> <p><b>M5S-3</b>    <b>Mark V Soldering Pencil only (includes one tip)</b></p> <p><b>M5S-4</b>    <b>Mark V Soldering Tip only</b></p> |

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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