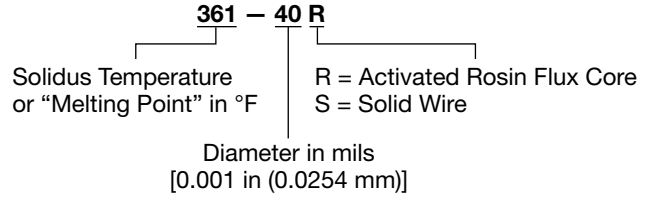


Solders, Fluxes, Kits, and Soldering Unit

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.

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.



SOLDERS

Strain gage solders are listed at right, along with their compositions, principal properties, and recommended

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. Three-year shelf life.							
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. Three-year shelf life.							
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. Shelf life is indefinite.							
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. Three-year shelf life.							
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. Shelf life is indefinite.							
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. Three-year shelf life.							
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 Unit

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-2 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)	
M-Flux FAR-2 Kit	Two 1-oz (30-ml) brush-cap bottles M-Flux AR-2 Two 1-oz (30-ml) brush-cap bottles <i>M-LINE</i> Rosin Solvent
M-Flux AR-2 Bulk	Twelve 1-oz (30-ml) brush-cap bottles M-Flux AR-2
RSK-1 <i>M-LINE</i> Rosin Solvent Kit	Twelve 1-oz (30-ml) brush-cap bottles
RSK-2 <i>M-LINE</i> Rosin Solvent Bulk	1-qt (960-ml) bottles
RSK-4 <i>M-LINE</i> 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.

SOLDERING UNIT

RESISTANCE SOLDERING UNIT	
	<p>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.</p> <p>WRS-1 Resistance Soldering Unit, 110 Vac WRS-2 Resistance Soldering Unit, 220 Vac (not CE rated) WRS-A Replacement Electrodes, package of 6</p>

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."



Disclaimer

ALL PRODUCTS, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE.

Vishay Precision Group, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "VPG"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

The product specifications do not expand or otherwise modify VPG's terms and conditions of purchase, including but not limited to, the warranty expressed therein.

VPG makes no warranty, representation or guarantee other than as set forth in the terms and conditions of purchase. **To the maximum extent permitted by applicable law, VPG disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.**

Information provided in datasheets and/or specifications may vary from actual results in different applications and performance may vary over time. Statements regarding the suitability of products for certain types of applications are based on VPG's knowledge of typical requirements that are often placed on VPG products. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. You should ensure you have the current version of the relevant information by contacting VPG prior to performing installation or use of the product, such as on our website at vpgsensors.com.

No license, express, implied, or otherwise, to any intellectual property rights is granted by this document, or by any conduct of VPG.

The products shown herein are not designed for use in life-saving or life-sustaining applications unless otherwise expressly indicated. Customers using or selling VPG products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify VPG for any damages arising or resulting from such use or sale. Please contact authorized VPG personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.

Copyright Vishay Precision Group, Inc., 2014. All rights reserved.