

## Solder Pastes

### SC3400

#### Solvent Clean

#### Description:

The SC3400 series pastes are formulated for infrared, vapor phase and convection reflow on SMOBC or tin-lead plated printed circuit boards, or cermet thick film on ceramic. Variation in pad and component solderability is tolerated without a negative effect on yields.

The SC3400 series subdivides into two unique product lines. the "HT" series is designed for fine pitch applications followed by traditional halocarbon-alcohol solvent cleaning. the "HTP" series residue can be removed by aqueous cleaners using a saponifer OR by solvent cleaning.

#### ● Key Benefits:

- Designed for fine pitch applications with 0.010" pads
- Reproducible printing without wiping the stencil
- Tack time of 24 hours to accommodate multi-stage placement
- Infrared (lamp or panel) convection and vapor phase reflow compatible
- Compatible with long IR profiles
- Very low odor, 2% solvent
- Contains no harmful solvents

#### ● Solder Paste Selection Table

Product Series:	SC3400HT	SC3410HT	SC3400HTP	SC3410	SC3400	SC3400S
Application:	Screen or Stencil	Stencil	Screen or Stencil	Stencil	Screen	Syringe
Solderability of Component s/ Boards	Good	Good	Fair	Fair-Good	Fair-Good	Good
Reflow Method:	IR (lamp or panel), convection or VPR; no drying required			Bath or in-line vapor phase, all IR & convection, low peak temperature profiles		Any
Mesh size:	-325	-200 +325	-325	-200 +325	-325	-325
% Metal:	90	90	90	90	90	90
Viscosity (Kcps)*	800-1000	800-1000	800-1000	500-700	550-750	400-600
L**	600-750	600-750	600-750	400-600	450-650	-
H**	-	-	-	600-800	650-850	-
Flux:	RMA (high)	RMA (high)	RMA (high)	RMA (high)	RMA (high)	RMA (Moderate)

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Alloy (mp)	Series/Product Number					
62/36/2 (179)	SC3400HT	SC3410HT	SC3400HTP	SC3410	SC3400	SC3400S
63/37 (183)	SC3401HT	SC3411HT	SC3401HTP	SC3411	SC3401	SC3401S
60/40 (183-190)	SC3413HT	SC3423HT	SC3413HTP	SC3423	SC3413	SC3413S
96.5/3.5 (221)	SC3408HT	SC3418HT	SC3408HTP	SC3418	SC3408	SC3408S
95/5 (220-240)	SC3403HT	SC3412HT	SC3403HTP	SC3412	SC3403	SC3403S
10/90 (268-300)	SC3405HT	SC3415HT	SC3405HTP	SC3415	SC3405	SC3405S
10/88/2 (268-300)	SC3407HT	SC3417HT	SC3407HTP	SC3417	SC3407	SC3407S
58Bi/42Sn (138)	-	SC3402HT	-SC3422	-	-	-
80Au/20Sn (280)				SC3404		

#### ● Special Paste Formulations:

##### Opens and Tombstoning

CL30-5460 RMA, Sn63 paste is based on a Texas Instruments' idea of combining metal powders to achieve a slower melting solder, thus avoiding opens and tombstoning. This paste must be stencil printed due to the -100 mesh powder used, and the minimum pitch which can be printed is 0.050". Request a separate Engineering Data Sheet for additional information.

##### Bismuth/Tin Eutectic paste for Low Temp. Soldering

SC3402HT is a 58 bismuth/42 tin paste which melts at 138°C. Applications include soldering components on flexible circuits and step soldering. It prints 0.010" pads and remains tacky for at least eight hours. It can be reflowed using infrared, vapor phase, or belt reflow equipment.

##### Aqueous Cleaning Pastes

The SC3400HTP series pastes contain an RMA activity level flux which can be removed rapidly with standard aqueous cleaners using a detergent, saponifier, or surfactant to aid removal. Combined with their ability to print 0.020" pitch pads, they are a unique technological advance. These pastes contain -325 mesh powder, with 90% metal content and a viscosity of 800-1000 Kcps.

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- **Recommended Processing Guidelines:**

- Stir paste 3-5 minutes prior to using to homogenize.
- Print through a stencil or 80 mesh screen. Use 0.025" - 0.040" snap-off and 15-30 psi squeegee pressure. (For screens or stencils . 12" x 12" increase snap-off as needed to obtain good print definition.) If the printer does not have a snap-off gauge, metal shims, a substrate, or a board can be used to adjust the snap-off. Trial prints can be made on newspaper. A typical print thickness is 0.008", or 200µm.
- To syringe paste, remove the Luer-lock cap and attach needle. Adjust the amount and duration of applied pressure to achieve the desired dot volume.

- **REPLACE JAR LID AND CLOSE TIGHTLY AFTER USE:**

- Wet paste can be cleaned from screens and printers with isopropanol or halogenated hydrocarbon solvents.
- Drying is **NOT** typically needed with HT and HTP Series pastes prior to reflow. An infrared preheat of three minutes at 100-120°C can be beneficial to even heating of the board before vapor phase reflow, however, IR and convection profiles have a build-in preheat stage; no further pre-heat is needed.

- The HT and HTP Series pastes will remain tacky for at least 24 hours to allow for device insertion. The exact tack time depends on the air flow, temperature, and relative humidity. It is advisable to store the circuits in tightly closed areas if they will be stored for more than 24 hours prior to reflow. This is especially important if the relative humidity exceeds 65% to avoid solder balling and dewetting.
- Reflow pastes at 25-50°C higher than the melting range of the alloy. Be sure to use a correct paste-reflow combination. For optimum results, the reflow temperature should be maintained for a minimum period of time, and heating should be uniform across the substrate and components. check the profile often to ensure minimal deviation.

- **Cleaning**

Flux residues are easily removed using standard cleaning systems and solvents.

For optimum results:

- 1) Use a combined halogenated hydrocarbon-alcohol solvent.
- 2) Clean circuits immediately after reflow, while still warm
- 2) High pressure spray and/or ultrasound can improve cleaning under large, tightly spaced, or low clearance components

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#### ● SAFETY INFORMATION:

Store all solder pastes in tightly closed containers. Do not smoke or eat in the area where these products are being used. Avoid contact with eyes, skin, and clothing. Use with adequate ventilation, especially in the reflow area. Ten air changes per hour, the standard for a workplace using chemicals, is recommended.

Wash thoroughly after handling. MSDS are provided with the first paste order or sample.

#### ● General Information

##### Coverage

45 in<sup>2</sup>/oz at 0.010";  
11 cm<sup>2</sup>/g at 250 microns

##### Thinner:

RV-517  
Thinning is not usually required.

##### Warranty:

Material guaranteed to meet specifications for 6 months from date of shipment.

##### Storage:

Store in a dry location at 10°C-30°C.  
DO NOT REFRIGERATE.  
Allow paste to come to room temperature prior to opening.  
Spatulate well before using.  
Store syringes vertically, tip down.

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- **Quality Control**

All raw materials, as well as finished solder pastes undergo stringent and documented quality control procedures to ensure reproducibility. The standard tests each must pass to be accepted are shown below. A QC data sheet is available for each lot of solder paste manufactured.

- **Raw Material QC**

Test	Test Method	(Procedure Number)	Acceptance Criteria
Particle Size and Distribution	SEM	(TP 43)	>90% spherical particles; min. number satellites and <0.020" diameter particles (-325)
Powder Purity	ICP	(TP 2-8)	Must exceed QQ-S-571E
Water Content	Carl Fisher	(TP 2-9)	>1%

- **Solder Paste QC**

Test	Test Method	(Procedure Number)	Acceptance Criteria
Viscosity	Brookfield RVT, TF spindle, 5 rpm, 25°C	(TP 2-2)	± approx. 15% of nominal value
Percent Metal	Reflow 10g; wt. fillet/wt. paste	(TP 38)	± 1% of nominal value
Solder Balls	Reflow on blank substrate; determine wt. solder balls	(TP 46)	<0.5 - 1% by wt.
Wetting	oxidized Cu (SC3400)	(TP 50)	95%
Slump	Print pads; let sit 24 hrs; determine spread	(TP 41)	Within spec for series

All SC3400 Series materials described in this Datasheet are available off the shelf as standard products. However, many other solder paste compositions are also available to meet special application requirements. To learn more please contact your Heraeus technical service representative or the factory direct. **Technical articles which discuss solder paste use, selection and quality control procedures, in addition to other articles on various aspects of SMT are also available upon request.** As a pioneer manufacturer of solder pastes for SMT, our staff is knowledgeable and responsive to your questions concerning use of these materials. Contact us to discuss your application requirements in detail.

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