

LOCTITE HF 212

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PRODUCT DESCRIPTION

LOCTITE HF 212 provides the following product characteristics:

| | |
|--------------------|--|
| Technology | No-clean and Halogen-free Solder Paste |
| Application | Pb-free soldering |

LOCTITE HF 212 solder paste is a halogen-free (no intended added halogen in formulation), no clean, low voiding Pb-free solder paste. LOCTITE HF 212 also shows excellent solderability when reflowed in both air and nitrogen across a wide range of challenging surface finishes including immersion Ag, OSP-Cu, ENIG and CuNiZn.

LOCTITE HF 212 is suitable for use with industry standard SAC ,high reliability SAC and low silver alloys SAC.

FEATURES AND BENEFITS

- Halogen-free flux: passes IC with pretreatment IPC-TM-650 2.3.34/EN14582
- Halogen-free flux classification: ROL0 to ANSI/J-STD-004 Rev. B
- Printing: Fine pitch capability (0.3 mm), stencil life (>8 hours), and abandon time (>4 hours)
- Printing: suitable for high-speed printing up to 150 mm/s
- Reflow: Solderable on challenging surface finishes (CuNiZn and Copper OSP)
- Colorless residues for easy post-reflow inspection

TYPICAL PROPERTIES

Solder Powder:

Careful control of the atomization process for production of solder powders for LOCTITE HF 212 solder pastes ensures that the solder powder is produced to a quality level that exceeds requirements for sphericity, size distribution, impurities and oxide levels. Minimum order requirements may apply to certain alloys and powder sizes. For availability contact your local technical service helpdesk.

All solder powders are RoHS compliant.

Particle Size Distribution (PSD) (J-STD 005A)

| Henkel Powder Description | Powder Particle Size Distribution | IPC EQUIVALENT |
|---------------------------|-----------------------------------|----------------|
| AGS | 45-20 µm | Type 3 |
| DAP | 38-20 µm | Type 4 |
| DAP+ | 38-15 µm | Type 4.5 |
| KBP | 25-15 µm | Type 5 |

Solder Alloy (J-STD 006)

| Henkel Code | Alloy | Melting Point, °C | Ag % |
|-------------|-------------------|-------------------|------|
| SAC0307 | Low Silver | 217 to 226 | 0.3 |
| 97SC | Industry Standard | 217 | 3.0 |
| 96SC | Industry Standard | 217 | 3.8 |
| 90iSC | High Reliability | 205 to 218 | 3.8 |

Based on Type 3 powder

Solder Paste Typical Properties

| | |
|---|---------|
| Metal Content, % | 88.5 |
| Brookfield Viscosity @ 25°C, mPa·s Spindle TF, speed 5 rpm after 2 minutes | 750,000 |
| Malcom Viscosity @ 25°C, Pa·s Speed 10 rpm | 175 |
| Malcom Thixotropic Index | 0.5 |
| IPC Slump , mm <i>150°C, 15 minutes</i> | |
| 0.33 x 2.03 mm pads | 0.25 |
| 0.63 x 2.03 mm pads | 0.33 |

Based on Type 4 powder

Solder Paste Typical Properties

| | |
|--|---------|
| Metal Content, % | 88.5 |
| Brookfield Viscosity @ 25 °C, mPa·s Spindle TF, speed 5 rpm after 2 minutes | 750,000 |
| Malcom Viscosity @ 25 °C, Pa·s Speed 10 rpm | 175 |
| Malcom Thixotropic Index | 0.5 |
| IPC Slump , mm <i>150°C, 15 minutes</i> | |
| 0.33 x 2.03 mm pads | 0.25 |
| 0.63 x 2.03 mm pads | 0.33 |

Based on Type 4.5 powder

Solder Paste Typical Properties

| | |
|--|---------|
| Metal Content, % | 88.5 |
| Brookfield Viscosity @ 25°C, mPa·s Spindle TF, Speed 5 rpm, after 2 minutes | 750,000 |
| Malcom Viscosity @ 25 °C, Pa·s Speed 10 rpm | 175 |
| Malcom Thixotropic Index | 0.5 |
| IPC Slump , mm <i>150°C, 15 minutes</i> | |
| 0.33 x 2.03 mm pads | 0.25 |
| 0.63 x 2.03 mm pads | 0.33 |

Based on Type 5 powder

Solder Paste Typical Properties

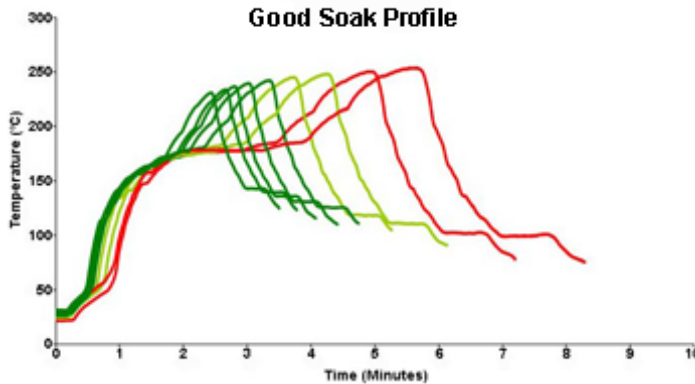
| | |
|--|---------|
| Metal Content, % | 88.5 |
| Brookfield Viscosity @ 25°C, mPa·s Spindle TF, Speed 5 rpm, after 2 minutes | 900,000 |
| Malcom Viscosity @ 25 °C, Pa·s Speed 10 rpm | 165 |
| IPC Slump , mm <i>182°C, 15 minutes</i> | |
| 0.33 x 2.0 mm pads | |
| 0.63 x 2.0 mm pads | |

DIRECTIONS FOR USE**Printing:**

1. LOCTITE HF 212 is available for stencil printing with type Type 3 and Type 4 powder.
2. Printing at speeds between 60 and 150 mm/s can be achieved by using laser cut, electropolished or electroformed stencils and metal squeegees .

Reflow:

- Any of the available methods of heating to cause reflow may be used including IR, convection, hot belt, vapor phase and laser soldering.
- Typical profiles that have shown good performance are shown below.

**Cleaning:**

1. LOCTITE HF 212 solder pastes are no-clean and are designed to be left on the PCB in many applications post-assembly since they do not pose a hazard to long-term reliability.
2. Residue removal can be achieved using conventional cleaning processes based on solvents such as MCF800 or suitable saponifying agents.
3. For stencil cleaning and cleaning board misprints, LOCTITE MSC 01 solvent cleaner is recommended.

RELIABILITY PROPERTIES**Solder Paste Medium:**

LOCTITE HF 212 medium contains a stable resin system, slow evaporating solvents and with minimal odor. The formulation has been tested to the requirements of the ANSI/J-STD-004B for a type ROL0 classification specification.

| Test | Specification | Results |
|--|--|--------------|
| Copper Plate Corrosion | ANSI/J-STD-004B | Pass |
| Copper Mirror Corrosion | ANSI/J-STD-004B | Pass |
| Chlorides & Bromides | ANSI/J-STD-004B | Pass |
| Surface Insulation Resistance (SIR) (without cleaning) | ANSI/J-STD-004B Telecordia GR-78-Core | Pass Pass |
| Flux Classification (without cleaning) | ANSI/J-STD-004B | ROL0 |
| Halogen-free | JPCA-ES-01-1999 | Pass |
| | IEC 61249-2-21 | Pass |
| | IPC-401B | Pass |

STORAGE AND SHELF LIFE**Storage:**

The material should be removed from cold storage a minimum of 8 hours before use. It is recommended to store LOCTITE HF 212 solder paste at 0 to 10°C . Do not use forced heating methods to bring solder paste up to temperature. LOCTITE HF 212 solder paste has been formulated to minimize flux separation on storage but should this occur, gentle stirring for 15 seconds will return the product to the correct rheological performance. To prevent contamination of unused product, do not return any material to its original container. For further specific shelf life information, contact your local Technical Service Center.

Shelf Life:

183 days, stored in original containers @ 0 to 10 °C.

DATA RANGES

The data contained herein may be reported as a typical value and/or a range. Values are based on actual test data and are verified on a periodic basis.

GENERAL INFORMATION

For safe handling information on this product, consult the Material Safety Data Sheet (MSDS).

Not for Product Specifications

The technical information contained herein is intended for reference only. Please contact Henkel Technologies Technical Service for assistance and recommendations on specifications for this product.

Conversions

$(^{\circ}\text{C} \times 1.8) + 32 = ^{\circ}\text{F}$
 $\text{kV/mm} \times 25.4 = \text{V/mil}$
 $\text{mm} / 25.4 = \text{inches}$
 $\mu\text{m} / 25.4 = \text{mil}$
 $\text{N} \times 0.225 = \text{lb}$
 $\text{N/mm} \times 5.71 = \text{lb/in}$
 $\text{N/mm}^2 \times 145 = \text{psi}$
 $\text{MPa} \times 145 = \text{psi}$
 $\text{N}\cdot\text{m} \times 8.851 = \text{lb}\cdot\text{in}$
 $\text{N}\cdot\text{m} \times 0.738 = \text{lb}\cdot\text{ft}$
 $\text{mPa}\cdot\text{s} = \text{cP}$

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