Complete Solder Solutions

™

EFD®
A NORDSON COMPANY

Our Vision

EFD Solder Paste Group is the service leader in the solder dispensing market, delivering integrated process solutions through best-in-class performance in delivery, localized application support and innovative products meeting customer needs.

- Expedient product delivery
- Local application support worldwide
- Consistent, global standards
- Flexible, specialized formulations

EFD Guarantee

EFD guarantees exceptional product quality and no-compromise service. We guarantee:

- EFD solder paste will not separate in package
- Lot-to-lot consistency
- 6-month shelf life from date of shipment
- Orders ship within 3 days
- Immediate, professional support
- Compliance with IPC-J Standards

SolderPlus®, PrintPlus® and FluxPlus™

PrintPlus® Print Paste

PrintPlus® Print Paste

- Meets rigorous demands of today's surface mount technology (SMT) process
- Exceptional lot-to-lot consistency
- Specialized Formulations

SolderPlus® Solder Paste

- Highest quality standards in the industry
- Formulated for consistent top-to-bottom dispensing
- Reliable process control to increase throughput and first-pass yield
- Less than 0.2mm microdot capability
- Easy to automate
- Custom packaging available
- Specialized formulations

FluxPlus™ Paste Flux

FluxPlus™ Paste Flux

- Specialized flux formulations designed for your process
- Paste flux stays where you put it for precise reflow
- Easy rework
- Micro-BGA printing formulations
- Increased control, less mess

Building technical partnerships with our customers

- Personal account representative assigned to your company
- In-house application development designing the total soldering process to fit your needs
- Talk to us directly via phone, fax, e-mail or Web; we are always there to support your needs

Formulations

Find the right solder paste in 3 easy steps.

Step 1 Choose Alloy

Alloy Selection Containing Lead	Solidus (°C)	Liquidus (°C)	Tensile Strength (psi) / (MPa)	Powder Mesh Size
Sn43 Pb43 Bi14	144	163	6120 / 42.2	II, III
Sn62 Pb36 Ag2	179	189	6700 / 46.2	II, III, IV, V, VI
Sn63 Pb37	–E–	183	6700 / 46.2	II, III, IV, V, VI
Sn60 Pb40	183	191	6200 / 42.7	II, III, IV, V, VI
Sn10 Pb88 Ag2	268	290	4900 / 33.8	II, III, IV, ,V, VI
Sn5 Pb92.5 Ag2.5	287	296	4210 / 29.0	II, III, IV, V
Sn10 Pb90	275	302	4600 / 31.7	II, III, IV, V, VI
Sn5 Pb95	308	312	4190 / 28.9	II, III, IV, V

–E– : Eutectic MP: Melting Point

Lead-Free Alloy Selection	Solidus (°C)	Liquidus (°C)	Tensile Strength (psi) / (MPa)	Powder Mesh Size
Sn42 Bi58	–E–	138	8000 / 55.2	II, III
Sn96.5 Ag3.0 Cu0.5	217	219	7340 NA 50.6	II, III, IV, V, VI
Sn96.3 Ag3.7	–E–	221	8900 / 61.4	II, III, IV, V, VI
Sn100	MP	232	1800 / 12.4	II, III, IV, V
Sn95 Sb5	232	240	5900 / 40.7	II, III, IV, V
Sn95 Ag5	221	245	10100 / 69.6	II, III, IV, V, VI
Sn89 Sb10.5 Cu0.5	242	262	12000 / 82.7	II, III, IV, V

–E– : Eutectic MP: Melting Point

Step 2 Choose Alloy Powder Size

Powder Type	Dispense Tip Size	Size (micron)	Mesh Count	Dispense Dot Dia. Aperture (mm/in)	Gullwing Lead Pitch (mm/in)	Square/Circle Aperture (mm/in)
II	≥21 ga.	75-45µ	-200+325	0.80/0.030	0.65/0.025	0.65/0.025
III	≥23 ga.	45-25µ	-325+500	0.50/0.020	0.50/0.020	0.50/0.020
IV	≥25 ga.	38-25µ	-400+500	0.30/0.012	0.30/0.012	0.30/0.012
V	≥27 ga.	25-20µ	-500+635	0.25/0.010	0.20/0.008	0.15/0.006
VI	≥32 ga.	15-5µ	NA	0.10/0.004	0.10/0.004	0.05/0.002

Color	Gauge	Inner Dia. inch	Inner Dia. mm	Outer Dia. inch	Outer Dia. mm
Olive	**14**	.060	1.54	.072	1.83
Amber	**15**	.053	1.36	.065	1.65
Grey	**16**	.047	1.19	n/a	n/a
Green	**18**	.033	0.84	.050	1.27
Pink	**20**	.024	0.61	.036	0.91
Purple	**21**	.020	0.51	.032	0.82
Blue	**22**	.016	0.41	.028	0.72
Orange	**23**	.013	0.33	.025	0.65
Red	**25**	.010	0.25	.020	0.52
Clear	**27**	.008	0.20	.016	0.42
Lavender	**30**	.006	0.15	.012	0.31
Yellow	**32**	.004	0.10	.009	0.24

Note: OD dimensions: stainless tips only

* When choosing a tip, EFD recommends a tip size where the deposit diameter is 1 1/2 times the tip ID or larger.

Step 3 Choose Flux Features

Printing	NC	RMA	RA	WS
General Purpose	✓	✓	✓	✓
24-hour	✓	✓	–	✓
Clear Residue	✓	–	–	–
Enhanced Wetting	✓	✓	–	✓
Fine Pitch	✓	✓	✓	✓
Reduced Slump	✓	✓	–	✓
Restricted Residue	✓	–	–	–
Lead-Free Shiny Fillet	✓	–	–	–
Halide-free	–	–	–	✓
Difficult to Solder Surfaces	–	✓	✓	–
Extended Reflow Cycle Times (>6 minutes)	✓	✓	–	✓

Dispensing	NC	RMA	RA	WS
General Purpose	✓	✓	✓	✓
Clear Residue	✓	–	–	–
Enhanced Wetting	✓	✓	✓	✓
Fine Pitch	✓	✓	✓	✓
Low Residue	✓	–	–	–
Reduced Slump	✓	✓	–	✓
Restricted Residue	✓	–	–	–
Lead-Free Shiny Fillet	✓	–	–	–
Halide-free	–	–	–	✓
Difficult to Solder Surfaces	✓	–	✓	✓
Extended Reflow Cycle Times (>6 minutes)	✓	✓	–	✓
Gap Filling and/or Vertical Surfaces	✓	✓	–	–
Rapid Reflow Cycle Time (< 5 seconds)	–	✓	–	–
UV Traceable	–	✓	–	–
Pin Transfer or Dipping (low viscosity)	✓	–	–	–

Flux Choices

No Clean (NC) Consists of rosin, solvent, and a small amount of activator. NC flux has low activity and is suited to easily solderable surfaces. NC residue is clear, hard, non-corrosive, non-conductive, and designed to be left on your assembly. Residue may be removed with an appropriate solvent.

Rosin Mildly Activated (RMA) Consists of rosin, solvent, and a small amount of activator. Most RMA flux is fairly low in activity and best suited to easily solderable surfaces. RMA flux residue is clear, soft, non-corrosive, and non-conductive. Cleaning is optional. Residue may be removed with an appropriate solvent.

Rosin Activated (RA) Consists of rosin, solvent, and aggressive activators. RA flux has higher activity than RMA for moderately oxidized surfaces. RA flux residue is corrosive and should be removed as soon as possible after reflow to prevent damage to your assembly. Maximum safe time before cleaning is product dependent. Residue may be removed with an appropriate solvent.

Water Soluble (WS) Consists of organic acids, thixotrope, and solvent. WS flux comes in a wide range of activity levels for soldering to even the most difficult surfaces. WS flux residue is corrosive and should be removed as soon as possible after reflow to avoid damage to your assembly. Maximum safe time before cleaning is product dependent. Residue may be removed with 60°C (140°F) water and 40 psi pressure.

Solder Families

Dispensing and Printing

General Purpose – **Dispensing** and **Printing**
Suitable for the majority of applications not requiring additional flux features to make a quality solder joint. Available in NC, RA, RMA, and WS.

Clear Residue – **Dispensing** and **Printing**
An enhanced No-Clean flux formulation remaining on the surface area after solder paste has been reflowed, leaving minimal visible flux.

Enhanced Wetting – **Dispensing** and **Printing**
Improved alloy spread on wettable surfaces.

Fine Pitch – **Dispensing** and **Printing**
The centerline spacing of the pads on a surface mount board or the leads 20 mils (0.5 mm) or less on a component.

Reduced Slump – **Dispensing** and **Printing**
The reduction of spreading out of solder paste after deposition, resulting in loss of definition.

Restricted Residue – **Dispensing** and **Printing**
The part of flux that remains after solder paste has been reflowed remains on or very close to the fillet.

Lead-Free Shiny Fillet – **Dispensing** and **Printing**
The lead-free solder joint is shiny with similar appearance to Sn/Pb.

Halide-free – **Dispensing** and **Printing**
Materials that may be found in some flux activators. Halides include: Chloride, Bromide, Fluoride, and Iodide.

Difficult to Solder Surfaces – **Dispensing** and **Printing**
Degradation of a metal surface caused by an attack by oxygen. The result is a more difficult to wet surface.

Extended Reflow Cycle Time – **Dispensing** and **Printing**
(>6 minutes)
A term used to describe the heating and melting of pre-alloyed solder is extended beyond normal times where the assembly has a high thermal mass.

Low Residue – **Dispensing**
The part of flux that remains after solder paste has been reflowed is reduced in volume.

Gap Filling and/or Vertical Surfaces – **Dispensing**
Paste resists flow prior to reflow resulting in the ability to fill gaps or be applied to vertical surfaces.

Rapid Reflow Cycle Time (<5 seconds) – **Dispensing**
A term used to describe the heating and melting of pre-alloyed solder. Typical reflow processes includes laser, solder iron, hot bar, or induction.

UV Traceable – **Dispensing**
A fluorescent dye is added to aid in the inspection of the solder deposit using UV lighting.

Pin Transfer or Dipping (low viscosity) – **Dispensing**
An application technique where the soldering is applied by dipping into the solder or transferring with a pin.

24-hour – **Printing**
The working life of printing paste

Solderability

Alloy and flux selection guide

	RMA	RA	WS	No-Clean	High Activity WS
Aluminum	✖	✖	✖	✖	✖
Beryllium Copper	✔	✔	✔	✔	✖
Brass	☎	✔	☎	☎	✔
Bronze	☎	✔	☎	☎	✔
Cadmium	✔	✔	✔	▲	✖
Chromium			Non-solderable		
Copper	✔	✔	✔	✔	✖
Galvanized Steel	✖	▲	▲	✖	✔
Gold	✔	✔	✔	✔	✖
Kovar	▲	✔	✔	▲	✖
Magnesium			Non-solderable		
Mild Steel	✖	▲	✖	✖	✔
Monel	✖	▲	▲	✖	✔
Nichrome	✖	✖	✖	✖	✔
Nickel	✔	✔	✔	▲	✖
Nickel Iron / Alloy42	▲	✔	▲	▲	✔
Nickel silver	✔	✔	✔	▲	✖
Palladium	✔	✔	✔	✔	✖
Platinum	✔	✔	✔	✔	✖
Silver	✔	✔	✔	✔	✖
Solder Plated	✔	✔	✔	✔	✖
Stainless Steel	✖	✖	✖	✖	☎
Tin	✔	✔	✔	✔	✖
Titanium			Non-solderable		
Zinc	✖	▲	▲	✖	✔

Key: ✔ wets readily ▲ wets clean surfaces ✖ not recommended ☎ alloy specific

For assistance; call technical support at 800-338-4353.

Complete Soldering Solutions

Solder Paste   Dispensing Equipment   Reflow Equipment

ProcessMate™ 3000 Linear Axis Workstation

Solder Paste Dispensing Equipment

- World-class innovator of precision fluid dispensing equipment
- High quality, low maintenance dispensing systems for reliable results
- Many configurations and systems to suit your application needs

  - Hand Dispensers
  - Air Dispensers
  - Auger Valves
  - Benchtop Robots
  - Dispensing Accessories
  - Solder Workstations

Ultra® 2400 Air Dispensing

Ultra® TT Dispensing Solder Paste With Auger Valve

ProcessMate™ 6500 Temperature Control Unit

Solder Paste Reflow Equipment

- Compact, easy to use hot air reflow system
- Easy to integrate with EFD equipment
- Safe heating methods for temperature-sensitive parts
  - Hot Air Reflow Systems
  - Laser Reflow Systems (with lasers provided by Leister Technologies)

ProcessMate™ 6100 Hot Air Reflow System

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