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kester®

RECOMMENDED

ELECTRONIC ASSEMBLY MATERIALS

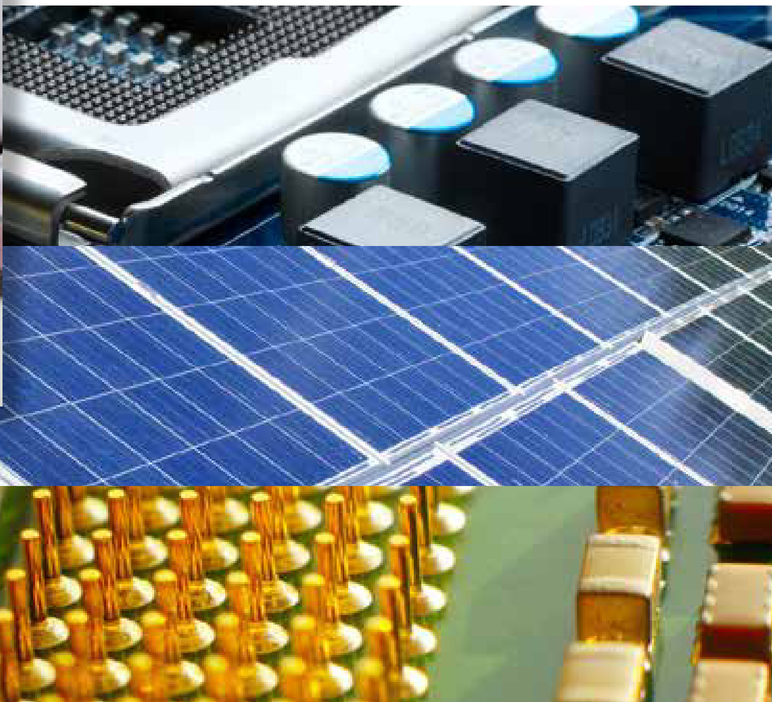
MATERIALS AND PEOPLE THAT DRIVE INNOVATION

Kester, an Illinois Tool Works Company (ITW), is a leading global supplier of assembly materials to the electronic assembly, component and microelectronic marketplaces. Our products include an array of basic and high-tech attachment materials including traditional soldering chemicals, paste, wire and bar products. We serve a worldwide customer base with facilities in North America, Europe and Asia. ITW has become one of the world's leading diversified manufacturers of specialized industrial equipment, consumables and related service businesses. ITW businesses serve local customers and markets around the globe, with a significant presence in developed as well as emerging markets. The company has operations in 57 countries that employ more than 50,000 women and men who adhere to the highest ethical standards.

Kester products are solution-driven, reliable and backed by unparalleled customer service. We believe that long-term relationships drive innovation and that people are at the center of everything we do.

Kester offers the following solutions:

- Solder Paste
- Liquid Solder Flux
- Solder Wire
- Tacky Solder Flux (TSF)
- Preforms
- SE-CURE™ Advanced Materials for Semiconductor Packaging
- Bar Solder
- A full spectrum of global customer technical support



KESTER'S PRODUCTS OFFER HIGH-RELIABILITY

Soldering made easy with high-reliability products for demanding applications.

Recently, manufacturers in the Electronic Assembly industry have expressed concern over no-clean flux residue and its influence on reliability. This concern has been heightened by miniaturization simultaneous with high-density board design trends.

To ensure high reliability, Kester has followed specific experimental procedures based on simple chemical fundamentals. These protocols discriminate two primary chemical mechanisms causing reliability failures: corrosion and electrochemical migration. Including industry standards and customer-specific testing, Kester is proud to present our series of chemically reliable products.

NP505-HR Solder Paste
A zero-halogen, lead-free, no-clean solder paste formula developed specifically for high-reliability applications. Recently passed the Bono Corrosion Test with a corrosion factor (Fc) value of 1.1%.

275 Flux-Cored Wire
A no-clean flux for cored solder wire developed to provide superior wetting performance for hand soldering in the electronics industry. The use of 275 No-Clean Flux results in an extremely clear post-soldering residue without cleaning. The unique chemistry in 275 was also designed to reduce spattering common to most core fluxes. 275 can be used for both lead-free and leaded soldering and is classified as ROL0 per J-STD-004.

SELECT-10™ Selective Soldering Flux
A zero-halogen, no-clean selective soldering flux designed to withstand long dwell times and high preheat temperatures. Also available as a flux-pen.

NF372-TB Soldering Flux
A zero-halogen, no-clean, low solids liquid flux designed to withstand long dwell times and high preheat temperatures needed in thick board assemblies. Recently passed the Bono Corrosion Test with a corrosion factor (Fc) value of 0.5%. Also available as a flux-pen.

RF550
A high-reliability, zero-halogen, no-clean rework flux designed for electronic component rework and repair applications.

NEW PRODUCTS

NP560 IS A NO-CLEAN, LOW VOIDING SOLDER PASTE CAPABLE OF <5% UNDER DIFFERENT SIZES OF QFNS FEATURING:

- Classified as ROL0 per J-STD-004B
- Environmentally friendly – Halogen-Free and Lead-Free (RoHS Compliant)
- Excellent activity and printability
- Very low graping
- Reflowable in air and nitrogen conditions
- Wide reflow profile window with good solderability on various PCB surface finish

WP616 IS A ZERO-HALOGEN, LEAD-FREE, WATER-SOLUBLE SOLDER PASTE FORMULA FOR BOTH NITROGEN AND AIR REFLOW APPLICATIONS FEATURING:

- Superior reflow characteristics
- Classified as ORM0 per J-STD-004B
- Excellent activity and printability
- Zero-Halogen (none intentionally added)
- Wide reflow profile window with good solderability
- Reflowable in air and nitrogen conditions
- Cleaning can be accomplished with heated de-ionized water

NP505-LT IS A NO-CLEAN, LOW TEMPERATURE SOLDER PASTE WITH A REFLOW PEAK TEMPERATURE OF 160-185° C FEATURING:

- Classified as ROL0 per IPC J-STD-004B
- Environmentally friendly – Zero-Halogen (none intentionally added) and Lead-Free (RoHS Compliant)
- Reduced reflow temperatures improving efficiency in energy and cost
- Wide reflow profile window with good solderability on various PCB surface finish
- Excellent activity and printability
- Extremely stable paste properties
- Colorless residues for easy post-reflow inspection
- Reduction in board-to-package warpage
- Consistent printing performance to 0.55 AR

SOLDER PASTE

Kester offers a complete line of solder paste to fit the needs of the electronic assembly market. The preferred products below cover the complete range of application types including no-clean, water-soluble, halogen-free and lead-free.

Please visit **www.kester.com** or call customer service for the latest offerings.

Formula	Description	Type	Alloy/Mesh	Class	Packaging
NP505-LT	The Paste Designed for Low Temperature Applications	NC	Sn42Bi57Ag01, Type 4	ROL0	500g JAR 600g CRT
NP560	The Ultra-Low Voiding Paste under QFNs	NC	SAC305, Type 4	ROL0	500g JAR 600g CRT 100g SYR
NP545	The Backward Compatible Paste with a 12-Month Room Temperature Shelf Life for High Mix, Low Volume Manufacturing	NC	SAC305, Type 3 & 4; Sn63Pb37, Type 4	ROL0	500g JAR 600g CRT 750g DEK
NP505-HR	The Preferred Lead-Free, No-Clean Paste that Passes Harsh Modified SIR Testing for Medical, Automotive and Other Harsh Applications	NC	SAC305, Type 3, 4 & 5	ROL0	500g JAR 600g CRT
NXG1	The Lead-Free, No-Clean Paste that Works as Well as SnPb Alloys	NC	SAC305, Type 3	ROL1	500g JAR 600g CRT
EP256HA	The No-Clean Leaded Paste with Ultimate Activity for Difficult Soldering Applications	NC	Sn63Pb37, Type 3	ROL0	500g JAR 600g CRT
R276	The Dispensable Paste for Every Application, Formulated in Both Leaded and Lead-Free Alloys	NC	Sn63Pb37 & SAC305, Type 3	ROL0	35g SYR 100g SYR
RF550	The High-Reliability, Zero-Halogen, No-Clean Rework Flux	NC		ROL0	30g SYR
WP616	The Zero-Halogen Chemistry for Water-Soluble Applications	WS	SAC305, Type 4 & 5	ORM0	500g JAR 600g CRT
HM531	The Water-Soluble, Leaded Paste that Prints Everything	WS	Sn63Pb37, Type 3	ORM0	500g JAR 600g CRT
R500	The Dispensable Water-Soluble Solder Paste for Leaded Alloys	WS	Sn63Pb37 Type 3	ORM0	35g SYR

PREFERRED PRODUCTS

SELECT-10™ Selective Soldering Flux

THE LIQUID FLUX DESIGNED SPECIFICALLY FOR THE NEEDS OF THE SELECTIVE SOLDERING PROCESS

SELECT-10™ IS A ZERO-HALOGEN, NO-CLEAN LIQUID FLUX DESIGNED TO WITHSTAND LONG DWELL TIMES AND HIGH PREHEAT TEMPERATURES FEATURING:

- Zero-Halogen Chemistry (none intentionally added)
- Sustained Activity – flux is able to withstand long dwell times and high preheat temperatures to improve hole-fill and wetting on thick or challenging boards
- Reliability Assurance – unheated flux will pass SIR testing therefore ensuring reliability in final assemblies
- Controlled flux application, flux does not spread beyond the spray pattern
- Ability to provide desired hole-fill with preheat temperatures over 135°C
- Clear and Minimal Residue – clear residue that is non-tacky for improved cosmetics and testing
- No Clogging – does not cause clogging of the fluxer head

NF372-TB Soldering Flux

THE HIGH-RELIABILITY FLUX FOR BOTH THERMALLY CHALLENGING THIN AND THICK BOARD APPLICATIONS

NF372-TB IS A ZERO-HALOGEN, LOW-SOLIDS, NO-CLEAN LIQUID FLUX FEATURING:

- Wide process preheat window of 90-140°C (194-284°F) that accommodates both thin and thick board applications
- High reliability flux that passes both IPC SIR 85/85 and SIR 40/90 and Bono Test for both leaded and lead-free alloys
- Hot bar application
- Pallet process friendly
  - Extends pallet life and does not attack pallet materials
  - The seepage of the flux between pallets and PCB is safer and does not cause reliability issues in condensing or high humidity environment

LIQUID FLUX

Lead-free wave and selective soldering systems require exposing the flux to slightly higher soldering temperatures. Lead-free alloys traditionally wet metal surfaces more slowly than tin-lead. Kester liquid fluxes for lead-free assembly have new activator packages to enable rapid wetting and hole-filling, ensuring reliable product output. The table below shows preferred Kester liquid fluxes available globally.

Please visit **www.kester.com** or call customer service for the latest offerings.

Formula	Description	Packaging		Type	Solvent	% Solids	Class
NF372-TB	The No-Clean Flux for High Temperature (90-140°C) and Thin and Thick Board Applications and Pallet Process Friendly	1 Gal 5 Gal	53 Gal 20 Liter	NC	Alcohol	3.9	ROL0
SELECT-10™	The Liquid Flux Designed Specifically for the Needs of the Selective Soldering Process with a Pre-heat Temperature over 140°C	1 Gal	5 Gal	NC	Alcohol	10	ROL0
NF1060-VF	The Zero-Halogen, VOC-Free Soldering Flux	1 Gal 53 Gal	5 Gal	NC	Alcohol	4.9	ORM0
SF800-LR	The Zero-Halogen, Low Residue and Low Solid Liquid Flux for Photovoltaic Assembly	1 Gal	20 Liter	NC	Alcohol	1.5	N/A
985M	The No-Clean General Use Wave Solder Flux	1 Gal 5 Gal	53 Gal 20 Liter	NC	Alcohol	3.6	ROL0
952-S	The Solar Applications Flux	1 Gal 5 Gal	53 Gal 20 Liter	NC	Alcohol	2.0	ORL0
959T	The Low-Solids, No-Clean Flux that Minimizes Micro-Solderballs	1 Gal 5 Gal	53 Gal 20 Liter	NC	Alcohol	2.9	ORL0
979VT	The Best Wetting Properties Available in a VOC-Free Liquid Flux	1 Gal 5 Gal	53 Gal 20 Liter	WS	Water	5.0	ORL0
2331-ZX	The Industry Proven Water-Soluble Wave Solder Flux	1 Gal 5 Gal	53 Gal 20 Liter	WS	Alcohol	33	ORH1
2235	The High Activity, Low Foaming, Water-Soluble Flux	1 Gal 5 Gal	53 Gal 20 Liter	WS	Alcohol	11	ORH1
186	The RMA Flux Designed for High Thermal Stability	1 Gal 5 Gal	53 Gal 20 Liter	RMA	Alcohol	36	ROL0
4662	The Thinner for No-Clean Alcohol-Based Fluxes	1 Gal 5 Gal	53 Gal 20 Liter	Thinner	Alcohol		

SOLDER WIRE

Kester wire products have been developed to provide superior performance for robotic soldering and hand soldering in the electronics industry. While the globally available preferred products are listed below, other combinations and core fluxes may be available.

Please visit www.kester.com for the most updated listing of all available cored wire and solid wire products.

LEAD-FREE WIRE OFFERINGS

Formula	Description	Type	Alloy	Class
268	The Zero-Halogen Cored Wire for Robotic Soldering	NC	SAC305 K100LD	ROL0
275	The Superior Wetting No-Clean Core Flux	NC	SAC305 K100LD	ROL0
245	The No-Clean Cored Flux Core Choice for Lead-Free Builds	NC	SAC305 K100LD	ROL0
331	The High Activity, Water-Soluble Core Flux for Soldering Difficult Metals	WS	SAC305 K100LD	ORH1
48	The Activated Rosin Flux Developed for Lead-Free Applications	RA	SAC305 K100LD	ROM1

LEADED WIRE OFFERINGS

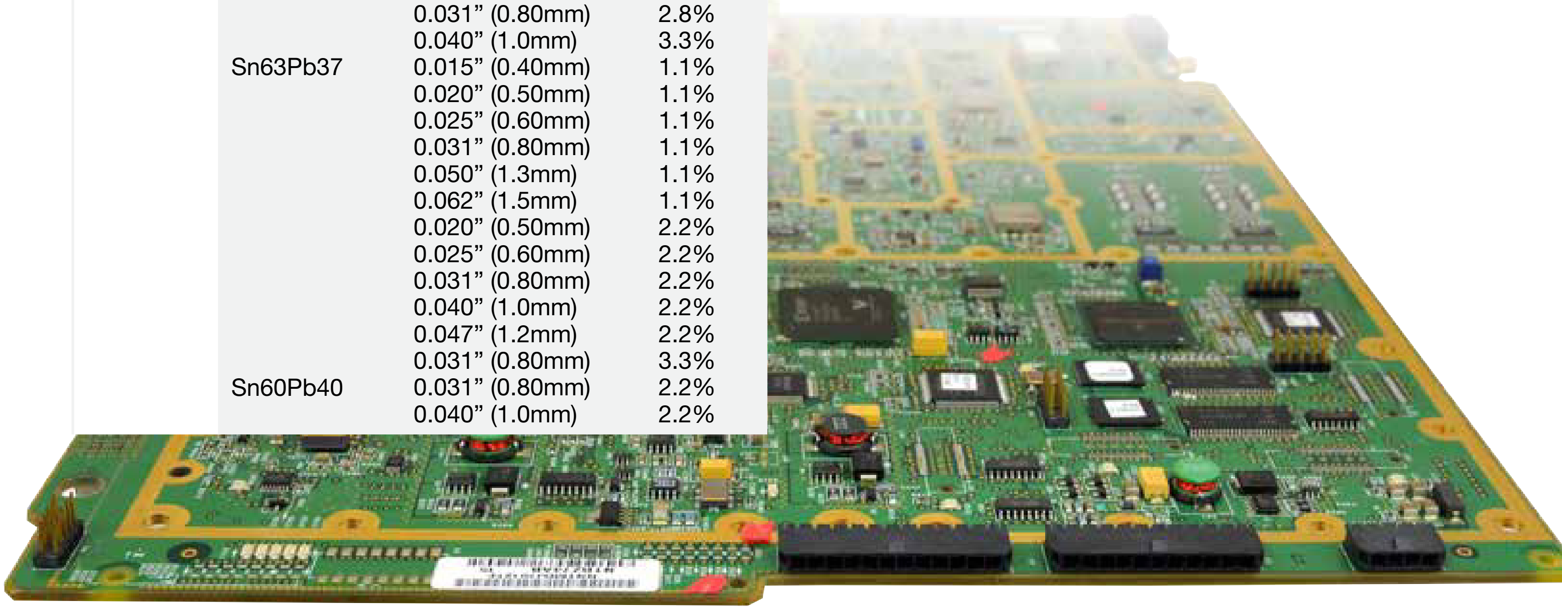
Formula	Description	Type	Alloy	Class
268	The Zero-Halogen Cored Wire for Robotic Soldering	NC	Sn63Pb37	ROL0
245	The No-Clean Flux Core Choice for Leaded Builds	NC	Sn63Pb37	ROL0
331	The High Activity, Water-Soluble Core Flux for Soldering Difficult Metals	WS	Sn63Pb37	ORH1
44	The Activated Rosin Flux Designed for Instant Wetting Action	RA	Sn63Pb37 Sn60Pb40	ROM1

PREFERRED CONFIGURATIONS

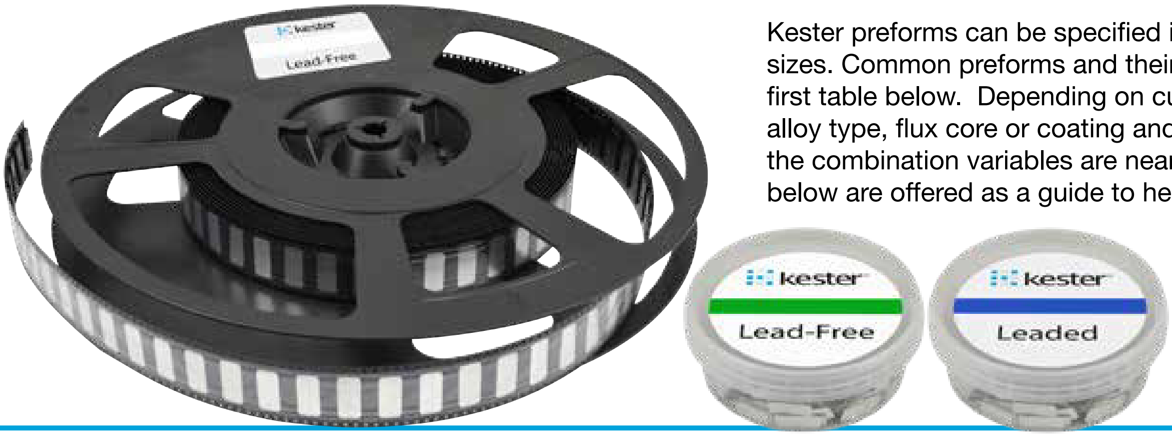
Other diameter and core size options may be available. Please visit **www.kester.com** or call customer service for the latest offerings.

Formula	Alloy	Diameter	Flux %
268	SAC305	0.010” (0.25mm)	3.3%
		0.015” (0.40mm)	3.3%
		0.020” (0.50mm)	3.3%
		0.025” (0.60mm)	3.3%
		0.031” (0.80mm	3.3%
		0.040” (1.0mm)	3.3%
	K100LD	0.015” (0.40mm)	3.3%
		0.020” (0.50mm)	3.3%
		0.025” (0.60mm)	3.3%
		0.031” (0.80mm)	3.3%
		0.040” (1.0mm)	3.3%
	Sn63Pb37	0.015” (0.40mm)	3.3%
		0.031” (0.80mm)	3.3%
275	SAC305	0.010” (0.25mm)	2.2%
		0.015” (0.4mm)	2.2%
		0.020” (0.5mm)	2.2%
		0.025” (0.6mm)	2.2%
		0.031” (0.8mm)	2.2%
		0.040” (1.0mm)	2.2%
		0.050” (1.3mm)	2.2%
		0.062” (1.6mm)	2.2%
		0.020” (0.50mm)	2.8%
		0.031” (0.8mm)	2.8%
		0.015” (0.40mm)	3.3%
		0.020” (0.50mm)	3.3%
		0.031” (0.80mm)	3.3%
		0.062” (1.5mm)	3.3%
	K100LD	0.031” (0.80mm)	3.3%
		0.047” (1.2mm)	3.3%
		0.015” (0.40mm)	3.3%
		0.031” (0.80mm)	3.3%
		0.062” (1.5mm)	3.3%
245	SAC305	0.031” (0.80mm)	1.1%
		0.015” (0.40mm)	2.2%
		0.025” (0.60mm)	2.2%
		0.062” (1.5mm)	2.2%
		0.025” (0.60mm)	2.8%
		0.031” (0.80mm)	2.8%
		0.040” (1.0mm)	3.3%
	Sn63Pb37	0.015” (0.40mm)	1.1%
		0.020” (0.50mm)	1.1%
		0.025” (0.60mm)	1.1%
		0.031” (0.80mm)	1.1%
		0.050” (1.3mm)	1.1%
		0.062” (1.5mm)	1.1%
		0.020” (0.50mm)	2.2%
		0.025” (0.60mm)	2.2%
		0.031” (0.80mm)	2.2%
		0.040” (1.0mm)	2.2%
		0.047” (1.2mm)	2.2%
		0.031” (0.80mm)	3.3%
	Sn60Pb40	0.031” (0.80mm)	2.2%
		0.040” (1.0mm)	2.2%

Formula	Alloy	Diameter	Flux %
331	SAC305	0.015” (0.40mm)	3.3%
		0.020” (0.50mm)	3.3%
		0.031” (0.80mm)	3.3%
	Sn63Pb37	0.020” (0.50mm)	3.3%
		0.031” (0.80mm)	3.3%
	Sn95Sb5	0.062” (1.5mm)	3.3%
48	SAC305	0.020” (0.50mm)	3.3%
		0.025” (0.60mm)	3.3%
		0.031” (0.80mm)	3.3%
		0.062” (1.5mm)	3.3%
	K100LD	0.031” (0.80mm)	3.3%
		0.062” (1.5mm)	3.3%
44	SAC305	0.062” (1.5mm)	2.2%
	Sn63Pb37	0.015” (0.40mm)	3.3%
		0.020” (0.50mm)	3.3%
		0.025” (0.60mm)	3.3%
		0.031” (0.80mm)	3.3%
		0.050” (1.3mm)	3.3%
		0.062” (1.5mm)	3.3%
	Sn60Pb40	0.031” (0.80mm)	2.2%
		0.025” (0.60mm)	3.3%
		0.031” (0.80mm)	3.3%
		0.040” (1.0mm)	3.3%
		0.050” (1.3mm)	3.3%
		0.062” (1.5mm)	3.3%
		0.093” (2.5mm)	3.3%
		0.125” (3.2mm)	3.3%
	Sn95Sb5	0.062” (1.5mm)	2.2%

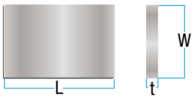
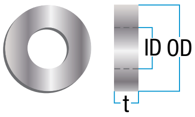
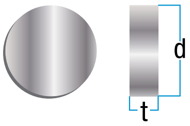
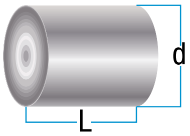


PREFORMS



Kester preforms can be specified in a variety of forms and sizes. Common preforms and their dimensions are seen in the first table below. Depending on customer specifications on alloy type, flux core or coating and packaging requirements, the combination variables are nearly endless. The charts below are offered as a guide to help customers understand the possible options and configurations. Please call Kester Sales to start your preform quote.

Solderforms

			Dimensions	Tolerance
	RIBBONS		.050" - 2.5" (1.27 - 63.5mm)	± .005" (.127mm)
		t	.005" - .060" (.127 - 1.52mm)	± .002" (.050mm)
	CUT-OFFS	W	.028" - .250" (.0011-6.3mm) > .250" (6.35mm)	± .003" (.076mm) ± .005" (.127mm)
		L	< .500" (12.7mm) > .500" (12.7mm)	± .003" (.076mm) ± .005" (.127mm)
		t	.004" - .125" (.102 - 3.1mm)	± .002" (.050mm)
	WASHERS	OD	.030" - 1.0" (.762 - 25.4mm)	± .002" (.050mm)
		ID	.015" - 0.93" (.381-23.6mm)	± .002" (.050mm)
		t	.004" - 0.95" (.102 - 24.1mm)	± .002" (.050mm)
	DISCS	d	.020" -.250" (.508 - 6.35mm)	± .002" (.0500mm)
		t	.004" - .012" (.102 - .305mm)	± .002" (.050mm)
	PELLETS	d	.010" - .585" (.254 - 14.8mm)	± .003" (.076mm)
		L	< 2" (50.8mm) 2 - 6" (50.8 - 152.4mm) 6 - 10" (152 - 2520mm)	± .003" (.076mm) ± .010" (.254mm) ± .020" (.508mm)

Alloy

Preferred Lead-Free Alloys
Sn96.5Ag3.0Cu0.5
K100LD

Preferred Leaded Alloys
Sn63Pb37
Sn60Pb40

Other alloys maybe available depending on melt point required.

Fluxing Type
% Varies by Configuration

CORED - INTERNAL	COATED - EXTERNAL
245S	285
285	290S
48SF	44
44	291S
88	435

Flux Descriptions

245S	No-Clean Flux ROL0
285	RMA Flux ROL0
290S	Low Solids Flux ROL0
48SF	RA Flux ROL1
44	RA Flux ROM1
88	RA Flux ROM1
291S	No-Clean Flux ORL0
435	High Activity WS Flux ORH1

Key

W = Width
L = Length
d = Diameter
t = Thickness
OD = Outer Diameter
ID = Inner Diameter

Packaging Types

Bulk in Jar
Stackpack
Tape & Reel
Layer Pack

TACKY SOLDER FLUX

Kester Tacky Solder Fluxes (TSFs) are the industrial standard for Flip Chip and BGA Sphere Attach. With viscosities optimized for high speed application and holding of a chip or sphere in place prior to reflow, Kester TSFs enable wide process windows for our users. Known for their active soldering, Kester TSFs ensure good electrical connections on known good die and components.

Please visit **www.kester.com** or call customer service for the latest offerings.

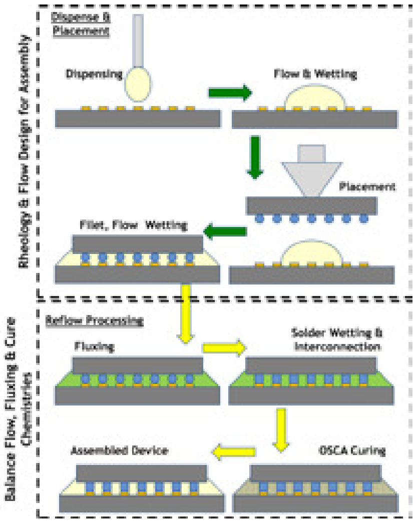
Formula	Description	Type	Class	Packaging*
TSF-8818HF	TSF-8818HF is a synthetic rosin-free, water-soluble tacky solder flux. TSF-8818HF is a zero-halogen formula that uses TSF-6852 best-in-class cleanable chemistry. TSF-8818HF works well in dipping, printing and dispensing applications.	WS	ORH1	30g SYR 150g CRT
TSF-6750	TSF-6750 is a zero-halogen, rosin-based tacky solder flux with the solderability of a fully halogenated flux. TSF-6750 works well in dipping, printing and dispense applications.	NC	ROL0	30g SYR 150g CRT
TSF-6852	TSF-6852 is a synthetic rosin-free, water-soluble tacky solder flux. TSF-6852 has easy to clean liquid residues and solders quickly, allowing for short profiles.	WS	ORH1	15g SYR 30g SYR 100g JAR 165g CRT
TSF-6522RH	TSF-6522RH is a rosin-based, no-clean tacky soldering flux formula designed to be compliant with IEC 61249-2-21 definition for halogen-free materials.	NC	ROL0	10g SYR 30g SYR 100g JAR
TSF-6522	TSF-6522 is a rosin-based tacky solder flux that provides a wide process window for printing or dipping applications.	NC	ROL0	30g SYR 100g JAR 150g CRT

*Other packaging may be available upon request.

OSCA-R™ One Step Chip Attach

Kester's new OSCA-R product line combines Flux and Underfill Technology for Flip Chip and Cu-Pillar Die Attach processes, enabling:

- Process Simplification, by eliminating a separate cleaning and underfill dispensing process steps.
- Increased Profitability, by improving throughput with this faster process.
- Cost Reduction, based material consumption and less process equipment.



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