



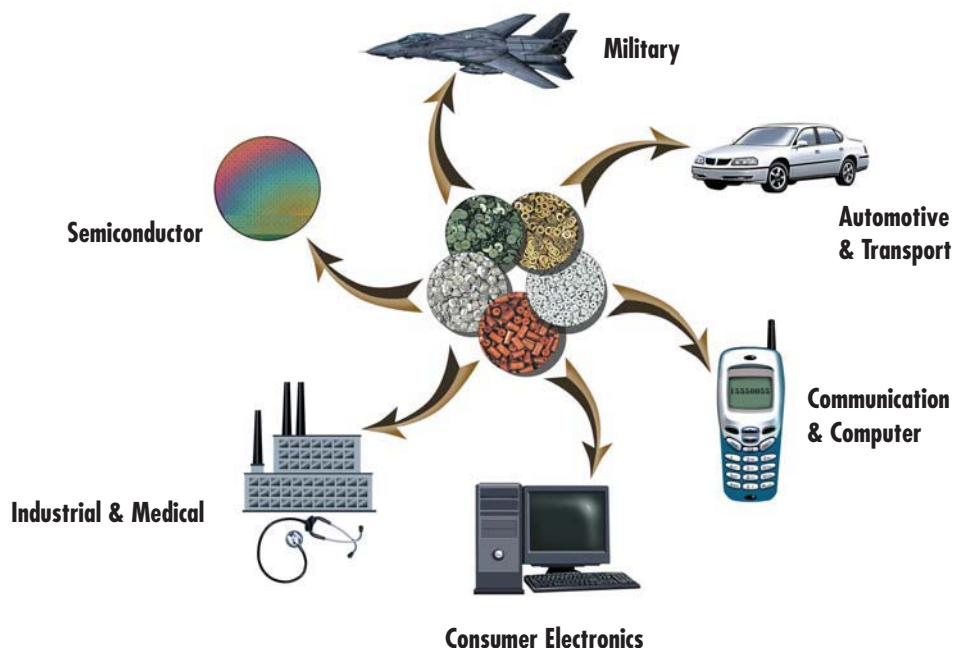
Solderforms®



Connecting Innovation™

Kester Solderforms® are helping customers in a wide array of applications with unique soldering solutions. Our award-winning flux systems combined with the consistent solder volume afforded by Solderforms® produces improved results in your most challenging applications. Regardless of your location or requirements, let Kester tailor a preform solution that's right for your application.

Preform Markets

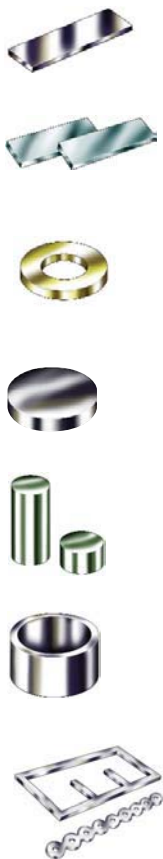


Recommended Kester Preform Fluxes

Description	Internal Flux	External Flux	Description
Rosin Fully Activated	48SF	48SF	Instant wetting action to most metal surfaces with non-corrosive/non-conductive amber residues. Classified as ROM1 flux.
Rosin Mildly Activated	286SF	286SF	Excellent wettability on Tin, HASL, and OSP surfaces. Pale yellow residue. Classified as ROL1 flux.
Water-Soluble	OR-420	435	Water washable, heat stable, low odor, and excellent wetting to most metals including brass and nickel alloys. Classified as ORH1 flux.
No-Clean	246SF	291S	Latest, highly activated no-clean flux system with extremely wide processing window. Clear residue. Classified as ROLO/ORLO flux.

For information on these or other Kester products visit
www.kester.com

Alloy	Melting Range		Specific Gravity
Tin - Lead	°F	°C	g/cm3
Sn63Pb37	361	183	8.45
Sn62Pb36Ag2	354 - 372	179 - 189	8.42
Sn60Pb40	361 - 374	183 - 190	8.51
Sn50Pb50	361 - 420	183 - 214	8.88
Sn10Pb90	514 - 576	268 - 302	10.77
Sn05Pb92.5Ag2.5	536	280	11.02
Sn10Pb88Ag02	514 - 570	268 - 299	10.75
Sn43Pb43Bi14	291 - 325	144 - 263	8.99
Lead - Free			
Sn48In52	244	118	7.30
SAF-A-LLOY (Sn97Ag0.2Sb0.8Cu2)	426 - 454	219 - 235	7.34
Sn95Ag05	430 - 473	221 - 245	7.40
Sn96Ag04	430 - 444	221 - 229	7.38
Sn96.5Ag3.5	430	221	7.36
Sn95.5Ag3.9Cu0.6	423 - 424	217 - 218	7.37
Sn96.5Ag3.0Cu0.5	423 - 424	217 - 218	7.37
Sn95Sb5	450 - 464	232 - 240	7.25



Solderform®		Minimum (in./mm)	Maximum (in./mm)
Ribbons	Width	0.015 ± 0.005 / 0.38 ± 0.13	3.50 ± 0.030 / 89 ± 0.76
	Thickness	0.002 ± 0.001 / 0.05 ± 0.03	0.125 ± 0.005 / 3.18 ± 0.13
Cut-Offs	Width	0.015 ± 0.005 / 0.38 ± 0.13	3.50 ± 0.030 / 89 ± 0.76
	Length	0.030 ± 0.010 / 0.762 ± 0.25	20.0 ± 0.050 / 500 ± 1.27
	Thickness	0.002 ± 0.001 / 0.05 ± 0.03	0.125 ± 0.005 / 3.18 ± 0.13
Washers	Outside Diameter	0.035 ± 0.002 / 0.889 ± 0.05	3.00 ± 0.005 / 76.2 ± 0.13
	Inside Diameter	0.015 ± 0.002 / 0.38 ± 0.05	2.30 ± 0.005 / 58.42 ± 0.13
	Thickness	0.002 ± 0.001 / 0.05 ± 0.03	0.125 ± 0.010 / 3.18 ± 0.25
Discs	Outside Diameter	0.016 ± 0.002 / 0.41 ± 0.05	3.00 ± 0.005 / 76.2 ± 0.13
	Thickness	0.002 ± 0.001 / 0.05 ± 0.03	0.125 ± 0.010 / 3.18 ± 0.25
Pellets	Diameter	0.010 ± 0.001 / 0.254 ± 0.03	0.585 ± 0.005 / 14.9 ± 0.13
	Length	0.020 ± 0.005 / 0.50 ± 0.13	6.00 ± 0.030 / 152.4 ± 0.76
Sleeves	Outside Diameter	0.070 ± 0.002 / 1.78 ± 0.05	0.560 ± 0.005 / 14.22 ± 0.13
	Inside Diameter	0.060 ± 0.002 / 1.52 ± 0.05	0.550 ± 0.005 / 14.0 ± 0.13
	Height	0.075 ± 0.010 / 1.90 ± 0.25	0.200 ± 0.010 / 5.0 ± 0.25
	Wall	0.010 ± 0.001 / 0.254 ± 0.03	-----
Stampings	Description	Stampings use special dies that are customer specific and require a customer's engineering drawing and specification.	

Kester Solderforms®

Kester Solderforms® are extruded, stamped, compacted or formed pieces of pure soft solder alloys manufactured with strict known tolerances to customer specifications. Kester can create a wide variety of preform shapes such as washers, discs, pellets, collars, ribbon forms, rings, and wireforms.

Solderforms® are available in solid or fluxed varieties. Depending on your application, the perform flux may be included internally or externally. Kester has No-Clean, Water-Soluble, RMA and RA flux chemistries suited for all types of soldering applications. These performs can be color-coded to aid in part identification and can be packed on tape and reel equipment or waffle packs for high volume applications. Try Kester Solderforms® today to reduce your rework and realize improved first-pass yields.



Volume Calculations for Solid Solderforms®

Solder volume for through-hole pin:

1. Determine solder volume needed.

$$V_1 = \frac{\pi D_1^2 h_1}{4} - \frac{\pi D_2^2 h_1}{4}$$

$L \times W \times h_1$ can be substituted for $\frac{\pi D_2^2 h_1}{4}$ if pins are rectangular or square.

V_1 = Solder volume

D_1 = Diameter of through-hole

D_2 = Diameter of pin or component lead

h_1 = board thickness + desired fillet height (~0.006)

t_1 = preform thickness

2. Choose preform dimensions.

ID: 2-3 mils larger than the maximum tolerance of pin or component lead. If using an external flux add 2 mils to the ID.

OD: 0-5 mils larger than through-hole pad.

$$t_1 = \left(\frac{V_1}{\frac{\pi OD^2}{4} - \frac{\pi ID^2}{4}} \right)$$

Similar calculations can be used for collars, rings, and sleeves.

Solder volume for cavity fill:

1. Determine solder volume needed.

$$V_2 = \frac{\pi D_3^2 h_2}{4}$$

V_2 = Solder Volume

D_3 = Diameter of cavity

h_2 = board thickness + desired fillet height (~0.006)

t_2 = preform thickness

2. Choose Preform dimensions.

OD: 5 mils less than minimum tolerance of cavity diameter. If using an external flux reduce OD by 3 mils.

$$t_2 = \frac{4V_2}{\pi OD^2}$$

Similar calculations can be used for pellets.



Preforms are available in tape and reel for automatic placement.

Worldwide Facilities

Kester, established in 1899, joined Northrop Grumman's Component Technologies Sector in 2001. As a leading worldwide manufacturer, supplier, and marketer of soldering materials, Kester maintains 9 modern and efficient manufacturing facilities. Kester is headquartered in Des Plaines, Illinois, United States, with additional manufacturing locations in Canada, Germany, Brazil, Singapore, Taiwan, Malaysia, Philippines, and Japan.

Kester products and services are used by a wide range of industries such as telecommunications, computer, automotive, military, components manufacturing, and consumer electronics. Throughout the world, Kester

products are known for their high quality and advanced technology. Kester's multiple plants assure quick delivery and protection against regional shipping delays and natural disasters. In addition, Kester has an extensive distributor network which permits easy access to sources of supply for Kester's fine products.



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