

## Solder Preforms for PCB Assembly

*ALPHA Exactalloy® Tape and Reel Preforms*



macdermidalpha.com  
July, 2021

# INCREASE SOLDER VOLUME

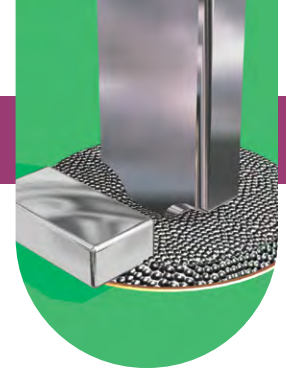
With electrical components sizes becoming ever smaller, printing sufficient amounts of solder paste onto miniaturized, overpopulated PCBs has become increasingly challenging.

**ALPHA Exactalloy Tape and Reel Preforms** are specifically designed to overcome these solder volume deficiencies, enhancing the solder joint strength and reliability and providing 100% hole fill.

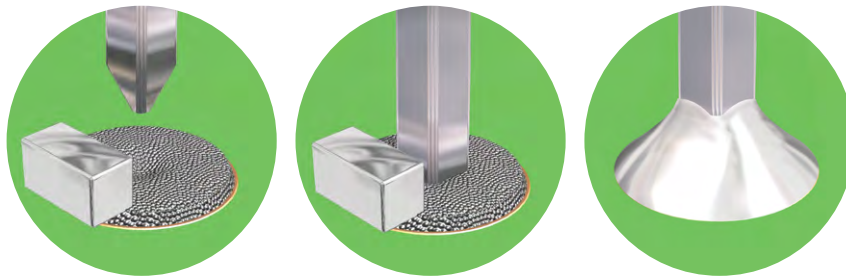
ALPHA Exactalloy Preforms in tape and reel packaging provide an easy to implement method for increasing the solder volume of SMT and through-hole components assembled using surface mount technology.

Specifically targeted for use with solder paste in SMT assembly applications, small solder rectangles are inserted into solder paste to precisely increase solder volume, the solder paste acting as both an adhesive and flux vehicle. The solder rectangles are 100% alloy, and due to the minimal amount of solder paste required to provide adequate wetting, near zero flux residue is realized.

The entire family of solder rectangles in tape and reel packaging are placed with standard pick and place equipment, utilizing industry standard chip capacitor size preforms for ease of use.

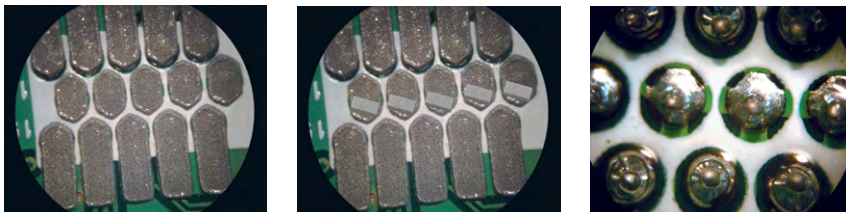


## Supplemented with ALPHA Exactalloy Preforms



A preform added to solder paste yields 100% hole fill plus fillet.

## Restricted Printing Area



Solder paste as printed

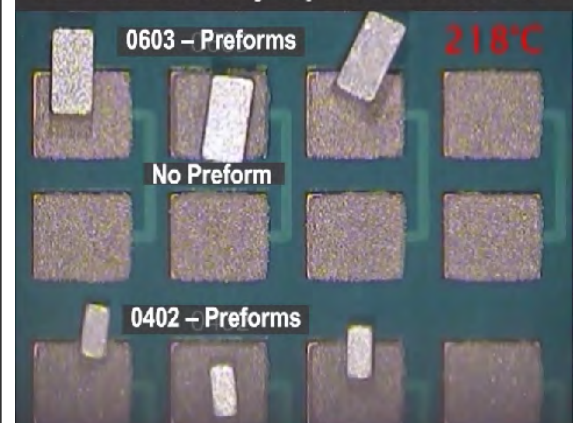
Preforms placed in paste

Solder paste and preforms reflowed



Add a preform to an SMT component lead to increase joint strength.

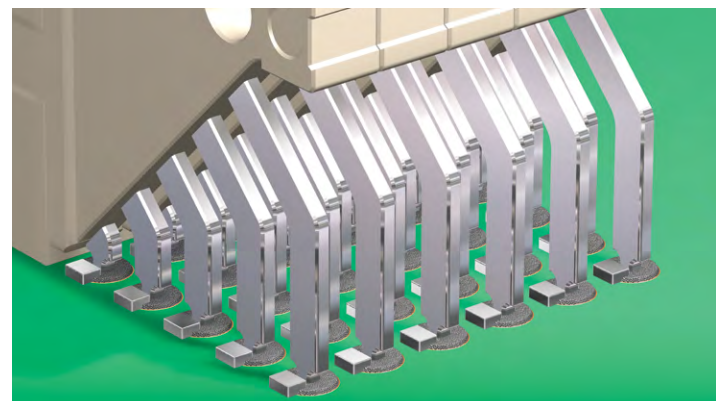
## ALPHA Exactalloy Tape & Reel Preforms



Click on image to view reflow video.



ALPHA Exactalloy Tape and Reel Preforms enable the use of standard pick and place equipment.



Preforms provide additional solder for tight pitch components and thick PCBs ensuring 100% hole fill and fillet formation.



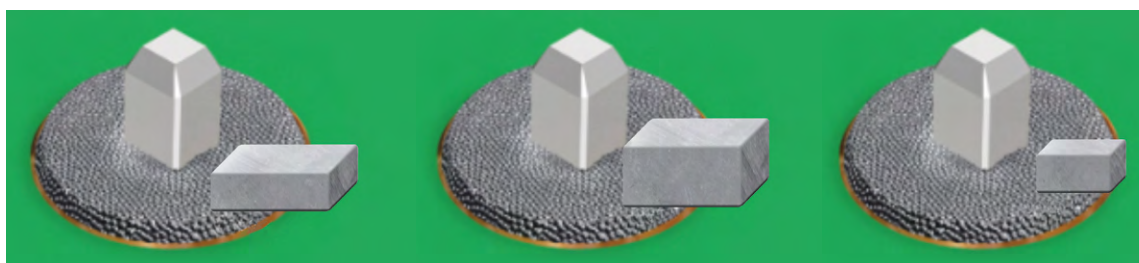
# INCREASE SOLDER VOLUME

## Alpha Exactalloy Tape and Reel Preforms

provide customers with:

- Increased solder joint reliability
- Improved first pass yields
- 100% hole fill
- Increased solder volume without the need for PCB layout changes or use of step stencils
- A significant time-to-market advantage with the use of tape and reel packaging

ALPHA Exactalloy Preforms are available in a wide variety of solder alloys, including low temperature, RoHS compliant alloys, such as SnBiAg and the Innolot alloy for extra joint strength.

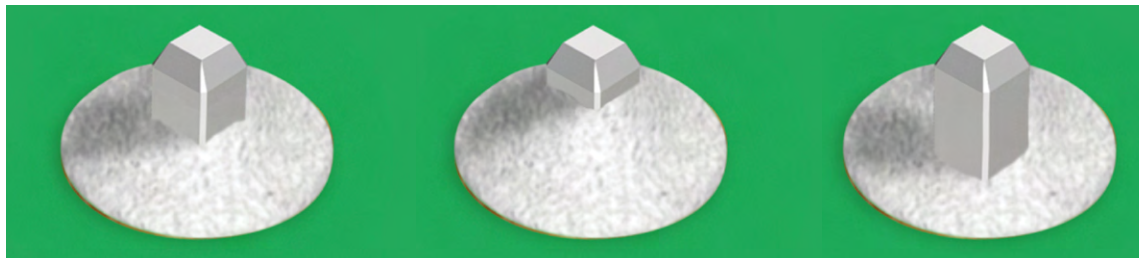


0603H

0603

0402

Different chip cap. size solder preforms applied before reflow



Desired result after reflow, the 0603 chip cap. size creating the largest fillet

Size		Dimensions			Volume	Dimensions			Volume	Pb-Free	Sn-Pb	Low Temp Pb-free
		a	b	c		a	b	c				
inch	mm	mm			mm <sup>3</sup>	mil			mm <sup>2</sup>			
0201H	0503H	0.51	0.25	0.10	0.013	20	10	4	800	✓	*	*
0201	0503	0.47	0.28	0.28	0.037	19	11	11	2,249	✓	✓	✓
0202	0505	0.51	0.51	0.25	0.065	20	20	10	3,968	✓	✓	✓
030155	06035	0.60	0.35	0.35	0.074	24	14	14	4,485	✓	✓	✓
0402H	1006H	1.00	0.60	0.25	0.150	39	24	10	9,154	✓	✓	✓
0402	1005	1.00	0.50	0.50	0.250	39	20	20	15,256	✓	✓	✓
0402B	10055	1.00	0.55	0.55	0.303	39	22	22	18,460	✓	*	*
0603H	1608H	1.60	0.80	0.50	0.640	63	31	20	39,055	✓	✓	✓
0603	1608	1.60	0.80	0.80	1.024	63	31	31	62,488	✓	✓	✓
0805H	2013H	2.01	1.30	0.40	1.045	79	51	16	63,782	✓	✓	✓
0805	2013	2.01	1.30	0.76	1.986	79	51	30	121,186	✓	✓	✓
0805S	2013S	2.01	1.30	1.30	3.397	79	51	51	207,292	✓	✓	*
1406	3515	3.56	1.52	0.77	4.167	140	60	30	254,263	✓	✓	*

\*Production will depend on market demand. Please check with your local sales representative for availability.

# ALPHA Solder Preforms for PCB Assembly



ALPHA Exactalloy solder preforms are available in a wide range of leaded and lead-free alloys to meet the most challenging assembly requirements.

Leaded Exactalloy	Melting Temp Range		Remarks
Alloy Name	°C	°F	
Sn62 Pb36 Ag2	179	354	Silver containing eutectic alloy
Sn63 Pb37	183	361	Most popular leaded eutectic alloy
Sn60 Pb40	183-188	361-370	Off-eutectic, silver free alloy
In50 Pb50	184-209	363-408	High ductility alloy
Low Temp Leaded Exactalloy	Melting Temp Range		Remarks
Alloy Name	°C	°F	
Sn16 Pb32 Bi52	95-96	203-205	Ultra low temperature, cadmium free
Sn25 Pb25 Bi50	95-115	203-239	Low temperature, cadmium free
High Temp Leaded Exactalloy	Melting Temp Range		Remarks
Alloy Name	°C	°F	
Sn10 Pb88 Ag2	268-290	514-554	Most popular high leaded, high temperature alloys
Sn5 Pb92.5 Ag2.5	280	536	
Sn2 Pb95.5 Ag2.5	299-304	570-579	
In5 Pb92.5 Ag2.5	300	572	
Sn5 Pb95	310-314	590-597	

RoHS Compliant Exactalloy	Melting Temp Range		Remarks
Alloy Name	°C	°F	
SAC305*	217-221	422-430	Most popular RoHS compliant alloy
SACX	217-228	422-442	Low silver (Ag0.3) SAC alloy
Sn96.5 Ag3.5	221	430	Eutectic, copper free
SN96 Ag4	221-238	430-460	Off-eutectic, copper free
Sn99 Sb1	235	455	Eutectic, Sb containing alloy
Sn95 Sb5	232-240	450-464	Off-eutectic, Sb containing alloy
Low Temp RoHS Compliant Exactalloy	Melting Temp Range		Remarks
Alloy Name	°C	°F	
Sn42 Bi58	138	280	Eutectic, RoHS compliant alloy
Sn42 Bi57.6 Ag0.4	138-139	280-282	Silver added for ductility
Sn60 Bi39.6 Ag0.4	138-170	280-338	Off-eutectic, low temperature RoHS alloy
Sn52 In48	118-131	244-268	Ultra low temperature, off eutectic alloy
Sn48 In52	118	244	Ultra low temperature, eutectic alloy
High Reliability RoHS Compliant Exactalloy	Melting Temp Range		Remarks
Alloy Name	°C	°F	
Innotot	206-218	403-424	High reliability alloy

\* Various other SAC alloy variants can be made available, including SAC105, SAC387 and SAC405

\*\*Above listed alloys are the most commonly used types in our industries. Please consult us about the availability of other alloys.

For available preform shapes, alloys, sizes and flux options, please refer to the corresponding Technical Bulletin or contact your local Kester Distributor.

## Sustainability

All ALPHA Exactalloy Solder Preforms are produced in an ISO 14001 & 45001 qualified production environment. This certification ensures strict adherence to environmental management systems with a strong focus on health and safety. All metal waste resulting from our manufacturing processes is recycled.

ALPHA Exactalloy Solder Preforms are manufactured in TS16949 certified production sites.

During assembly processes, solder preforms support the use of alternative soldering methods like induction, laser or light beam soldering, using short bursts of energy rather than prolonged energy consumption associated with traditional soldering methods. ALPHA Exactalloy Solder Preforms are available in a range of low temperature, RoHS compliant alloys, enabling the most energy efficient soldering solutions.



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Alpha and Kester are product brands of MacDermid Alpha Electronics Solutions.

**For more information, contact us at  
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