HARIMA
CHEMICALS GROUP

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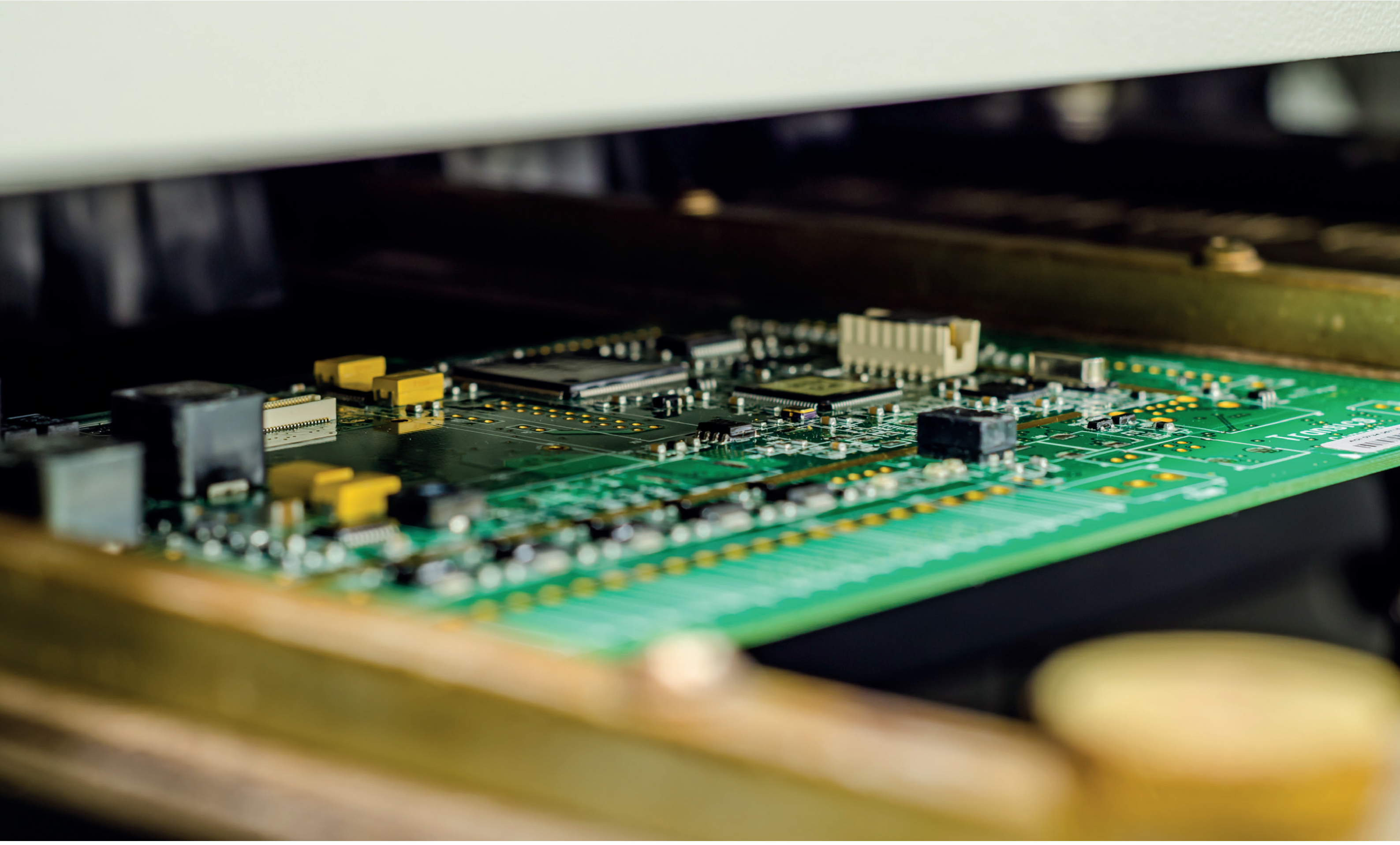
MULTICORE

A **HARIMA** BRAND



ELECTRONICS SOLDERING SOLUTIONS

PRODUCT PORTFOLIO

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MESSAGE FROM THE PRESIDENT OF HARIMA

A Symphony of Future Prosperity Played by Humans and Nature: That is our Wish at Harima Chemicals

Since 1947, Harima Chemicals Group has transformed the natural potential of pine trees into high-value products that enrich both industry and everyday life. Built on decades of expertise and continuous research and development, our innovations have established us as a world-renowned leader in pine-based chemicals.

We will continue expanding our business globally, at home and abroad, guided by the belief that the Earth is one shared field. As an environmentally responsible company, we are committed to advancing solutions that support society while respecting the planet. The establishment of the Shorai Foundation reflects our dedication to promoting the progress of science and technology.

At the heart of our work is a simple philosophy: live better through what nature provides. By harmonizing natural resources with innovation, we strive to enrich lives and contribute to a more sustainable and prosperous society.

With this vision, we will deepen collaboration across our group companies, maximize synergy, and further strengthen our position as a global leader in pine chemicals.

Yoshihiro Hasegawa, President

OUR VALUES

- We provide high quality product and service support to our customers at all times.
- We are committed to exceeding requirements to achieve this goal, and to comply with applicable laws.
- We provide the necessary information for our employees, and training and opportunities to implement and improve our core values.
- We are commited to minimising the impact of our activities and products on the environment in order to support the sustainability of our business.
- Continuous improvement of the quality and environmental management system, safety standards, environmental performance, and prevention of environmental pollution is a responsibility of every employee.

ISO 14001 2015 CERTIFIED

ISO 9001 2015 CERTIFIED

IATF 16949 2016 CERTIFIED

HARIMA CHEMICALS GROUP, INC.

Harima Chemicals Group. Inc. were founded in 1947, manufacturing pine chemicals extracted from pine rosin. The business has expanded over the decades with Harima now supplying rosin derivatives, speciality chemicals for printing inks, paper, solder, and other electronics materials. With a product development centre in Japan, and a dedicated MULTiCORE development centre in the United Kingdom, and manufacturing plants globally Harima is ideally situated to provide global support for all electronics manufacturers.

1947	Harima Chemicals Industries, Inc. formed
1952	Production of tall oil rosin starts
1985	Commenced manufacturing electronics materials
2002	Electronics production started in Japan
2003	Established Harimatec facilities in China, United States, and Malaysia
2007	Established plant in Czech Republic
2022	Procured former Multicore Solders business from Henkel AG&Co. KGaA

MULTICORE SOLDERS

1939	Newly formed Multicore Solders supplies world's first multi-cored solder wire
1951	New 5-core wire patented for rosin cored solder wire
1951	New ARAX cored wire launched for stainless steel
1974	Aluminium solder wire, ALUSOL, patented
1975	Oxide free solder paste introduced
1989	Acquired German solder manufacturer Stannol GmbH
2000	Multicore Solders Ltd sold to Henkel AG&Co. KGaA
2005	Patented high reliability alloy 90iSC (from Brite program) introduced in solder paste
2016	Launched the first temperature stable solder paste
2022	Acquired by Harima Chemicals Group, Inc

SUSTAINABILITY AND HALOGEN-FREE

Sustainability is central to HARIMA Corporation's philosophy and is fully embraced in the HARIMA MULTiCORE portfolio. Harima aim to reduce the environmental footprint of our products, providing our customers with improved sustainability in their processes and subsequently adding value to their products. With products surpassing international requirements such as REACH (halogen-free), RoHS (restriction of hazardous substances) and EICC (conflict free metals sourcing) HARIMA can provide peace of mind.

HARIMA MULTiCORE is committed to formulating next-generation solder pastes with zero deliberately added halogens and our company sets the benchmark for environmental responsibility.

HALOGEN-FREE and HALIDE-FREE comparison

The movement to halogen-free solder materials has been driven both by environmental regulations and the focus of major companies in line with their corporate responsibility to create more sustainable products. With concerns about product reliability due to halogen containing flux residues, electronics manufacturers are promoting eco-friendly solutions by shifting to halogen-free soldering.

HALOGEN-FREE		
Drivers for	REACH Non-Governmental Organisations (NGO's)	
Definition	No intentional addition of halogens to flux Complies with international standards (see below)	
Test Procedures	O_2 bomb test on flux Ion Chromatography (IC) on flux	
International Standards	JPCA-ES-01-1999	Bromine < 900ppm Chlorine < 900ppm
	IEC 61249-2-21	Bromine 900ppm max Chlorine 900ppm max Total halogens 1500ppm max
	IPC-4101B	Bromine 900ppm max Chlorine 900ppm max Total halogens 1500ppm max

HALIDE-FREE		
High reliability interconnects with international standards		
No flux corrosivity of dendritic growth detection Specific requirements to give ROL0 classification		
Well established quantitative halide test performed		
IPC-J-STD-004B IPC-TM-650	Copper mirror	No breakthrough
	Silver chromate	No discolouration
	Fluoride spot test	No colour change
	Halide by titration	<0.005%
	Flux corrosion	No pitting No colour change
	Surface Insulation Resistance (SIR)	No discolouration No dendrites SIR > 10^8Ω

HARIMA MULTiCORE SOLDER PORTFOLIO

With solder solutions that span diverse applications within numerous market sectors, HARIMA MULTiCORE is the solder technology market leader. A history of innovative formulations and market firsts – from high-reliability alloys to temperature-stable solder pastes – HARIMA continue to deliver the performance that electronics specialists require for today's demanding assemblies.

Materials development ingenuity is at the core of every MULTiCORE solder material – and has been for decades. Our multi-award-winning solder portfolio has earned the praise of industry experts and the trust of our customers. With a broad selection of solder pastes, cored solder wires, liquid fluxes and solder alloys, HARIMA MULTiCORE offers a total solution for current and future solder materials requirements.

SOLDERING SOLUTIONS for the electronics market

MARKET	PASTES	FLUXES	WIRES
Aerospace & Defence	LF 318 MP 218 GC 18	6381/35 MF 390 HR	C400 309
Automotive	HF 212 LF 318 GC 18	MF 390 HR X33S-07i	C400 309
Consumer Appliances	HF 212 LF 318 GC 10	MF 390 HR MF 300 X33-12i X33S-07i MF 210	309 C502 C511
Consumer Electronics	GC 10 GC 50 HF 212 GC 18	MF 390 HR MFR 301	309 C502 C511
Energy and Solar	GC 10 GC 18 GC 50 GC 3W HF 2W	X33-08i X33-12i X33S-07i MF 210	C400 309
Industrial Electronics	GC 10 GC 18 LF 318 HF 212	MFR 301 X33-12i X33S-07i MF 210	C400 309 C511
Lighting	GC 18 LF 318	X33S-07i	309 C511 ALU
Medical	HF 2W GC 3W GC 50	HYDX 20	HYDX ARAX
Telecom	HF 212 LF 318 GC 10 GC 18 GC 50	MF 390 HR X33S-07i	C400 C511

HIGH RELIABILITY ALLOY
90iSC

HARIMA MULTiCORE's 90iSC alloy was developed in 2005 in collaboration with the automotive industry specifically for applications and markets where extreme temperature resistance and reliability are non-negotiable and lead-free compliance is required.

When traditional SAC alloys can't deliver safety-critical performance, HARIMA MULTiCORE's 90iSC is the answer.

Tough, durable, adaptable and high-temperature capable, 90iSC is the lead-free benchmark for high reliability applications. The alloy's ability to provide high creep and strain resistance within operating temperatures up to 150°C and when subjected to vibration, drop and thermal shock is unmatched.

This, in combination with its solderability when integrated with the appropriate flux system, makes 90iSC a leading global, high reliability, lead-free, RoHS-compliant solder alloy.

The 90iSC alloy is compatible with several flux systems, including halogen-free, thus ensuring adaptability for customized manufacturing requirements.

MARKET REQUIREMENTS

PERFORMANCE REQUIREMENT	CONSUMER	INDUSTRIAL	AUTOMOTIVE
Operating temperature range	0 to +40°C	-10 to +70°C	-40 to +155°C
Life cycle	1 - 3 years	5 - 10 years	Up to 15 years
Humidity	30 - 50%	30 - 70%	0 - 100%
Tolerated field failures	<10%	<1%	0%
Material life cycle	None	Up to 5 years	Up to 30 years

OUTSTANDING CREEP RESISTANCE AND REFLOW

HARIMA MULTiCORE's 90iSC lead free solder alloy surpasses the creep properties of SAC and tin-lead solder alloys at all measured strain rates and temperatures. The creep resistance of 90iSC at 150°C is equal to or better than that of Sn63Pb37 at 80°C, increasing the number of thermal cycles to failure as predicted by the Coffin-Manson equation. What's more, the creep resistance of 90iSC alloy is balanced with reflow capabilities at temperatures at or below that of conventional SAC alloys.

ALLOY CREEP RESISTANCE

STRAIN RATE (s^{-1})	STRESS (Pa)		
	Sn63Pb37 @ 80°C	SAC @ 120°C	90iSC @ 150°C
0.0001	17.1	14.0	20.9
0.001	26.1	22.5	28.9
0.01	35.6	29.3	42.1
0.1	45.1	37.4	54.9

90iSC - A SOLUTION TO SOLDER JOINT FAILURE IN HARSH ENVIRONMENTS

90iSC was developed to overcome the 4 potential failure modes observed in soldered joints when exposed to harsh environments as highlighted in the below table.

STRESS FACTOR	FAILURE MECHANISM	90iSC SOLUTION [1] [2]
THERMAL AGEING	Thermal ageing causes growth of the intermetallic compound (IMC) and weakens the solder joint. Crack propagation in the bulk of the solder joint is a stress relief mechanism.	90iSC is formulated with alloy dopants that prevent IMC growth during reflow and thermal ageing.
THERMAL SHOCK	Thermal shock testing is a more extreme version of thermal cycling, where the stress results in crack propagation in the bulk of the solder joint and occurs earlier than thermal cycling.	The number of cycles to failure for 90iSC is 50% greater than that of SnPb and SAC alloys, regardless of the change in powered cycling temperatures.
VIBRATION	20% of airborne failures are attributed to vibrational stress[3] which is exhibited as crack propagation along the IMC and in the bulk. SAC alloys have been shown to fail more frequently than Sn63Pb37 alloy as a result of vibration.	Vibration resistance of 90iSC is comparable to Sn63Pb37 alloy and significantly better to both SAC and SnCu alloys. At 85°C and an acceleration of 3G, 90iSC survives greater than 10 times more cycles to failure.
DROP	Drop test resistance is an essential attribute of holistic reliability performance and should not be compromised. Drop failure mechanism is crack propagation along or within the IMC.	90iSC has reduced ductility when compared to standard SAC alloys, however it still compares favourably in drop tests performed on OSP Cu and AuNi surface finishes to SAC305 with the same failure mode.

[1] Ratchev, R. (2008). Presentation at LIVE Project Seminar "Material Verhalten von Loten in Mikrobereichen," Berlin.
[2] Barry, N. (2008). Lead-free Solders for High-Reliability Applications: High-cycle Fatigue Studies. University of Birmingham.
[3] Steinberg, D.S. & Associates. Designing Electronics for High Vibration and Shock.

TEMPERATURE STABLE SOLDER PASTES

HARIMA MULTiCORE introduced the GC range of innovative temperature stable solder pastes for reduced costs, fast start up and unequalled performance. The stable flux chemistry delivers unprecedented performance and is the basis of all GC materials, including the award-winning GC 10, low-voiding GC 18, the unsurpassed jettable GC 50 and water-washable GC 3W.

NO REFRIGERATION REQUIRED.

Delivering cost savings and value at every stage of use, with no refrigeration required, transportation, on-site storage and paste management are simplified. Exceptional paste stability translates to 20 percent less material waste, outstanding printing performance, a wide reflow process window and excellent solderability in air. With the ability to qualify a single material for multiple applications and low defects per million for higher yields, GC materials are destroying previous perceptions of solder paste capability.

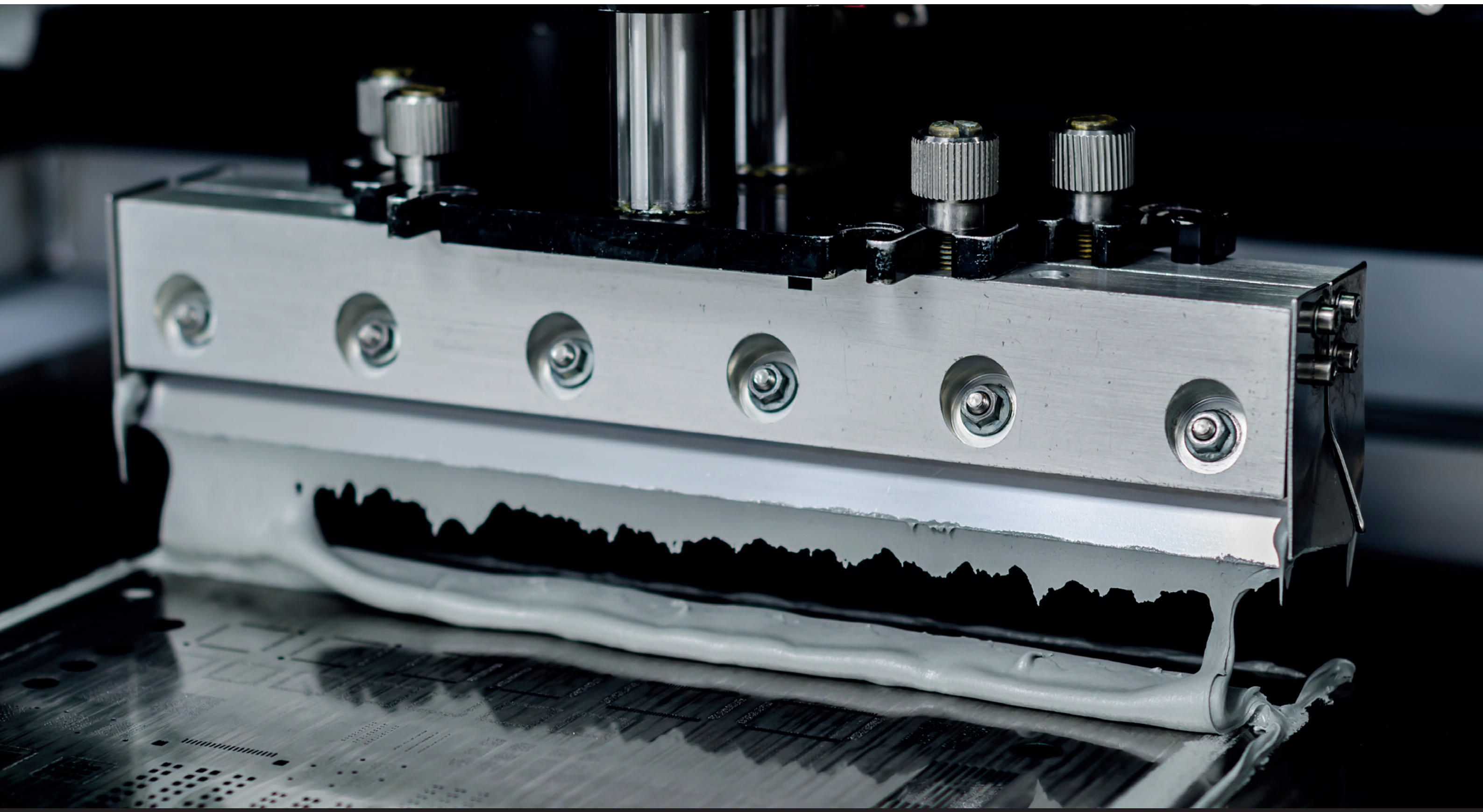
SOLDER PASTES

HARIMA MULTiCORE's commitment to best-in-class solder performance, printability, reflow and reliability is unyielding. This, in combination with our focus on enabling a sustainable future, has led to some of the industry's most advanced formulations.

HARIMA MULTiCORE's halogen-free solder paste materials have set the bar higher for environmental compliance. With zero deliberately added halogens and integrating the purest raw materials available, we can assure our customers that HARIMA MULTiCORE's halogen-free formulations are, indeed, halogen-free.

TEMPERATURE STABLE		HALOGEN FREE		HALIDE FREE		HALIDE
Pb-free No-clean	Pb-free Water wash	Pb-free No-clean	SnPb Water wash	Pb-free No-clean	SnPb No-clean	SnPb No-clean
GC 10	GC 3W	HF 212†	HF 2W	CR 32	CR 32	RP 15
GC 18		HF 18†		LF 318†	MP 218	
GC 50						

Available in 90iSC†



TEMPERATURE STABLE, HALOGEN-FREE SOLDER PASTES

PRODUCT	DESCRIPTION	ALLOY	PARTICLE SIZE DISTRIBUTION	IPC-J-STD-004B CLASSIFICATION	SHELF LIFE
Pb-free, No-clean					
GC 10	RoHS-compliant solder paste with excellent resistance in high humidity. Industry leader in paste-transfer efficiency. Improved stability at different storage and operating temperatures, with extended stencil life up to 72 hours and extended abandon time up to 24 hours. Suitable for high-density, small to large boards.	SAC305	Type 3, 4, 5	ROL0	12 months up to 26.5°C
GC 18	RoHS-compliant solder paste specially formulated to provide low voiding when soldering bottom terminated components. Improved stability at different storage and operating temperatures, with extended stencil life up to 72 hours and extended abandon time up to 24 hours. Suitable for high-density, small to large boards.	SAC305	Type 3, 4	ROL0	12 months up to 26.5°C
GC 50	RoHS-compliant solder paste designed to provide enhanced stability when used in jet printing and other dispensing applications. Industry leader in paste- transfer efficiency. Improved stability at different storage and operating temperatures. Suitable for high-density, small to large boards. Eliminates the need for step-stencils or preforms.	SAC305	Type 4, 5	ROL0	12 months up to 26.5°C
Pb-free, Water wash					
GC 3W	RoHS-compliant solder paste with excellent resistance in high humidity. Improved stability at different storage and operating temperatures, with extended stencil life over 24 hours. Suitable for high-density, small to large boards. Residues can be removed with aqueous cleaner followed by deionized water for 5 minutes at 45°C to 60°C.	SAC305	Type 3, 4	ORM0	6 months up to 26.5°C

HALOGEN-FREE SOLDER PASTES

PRODUCT	DESCRIPTION	ALLOY	PARTICLE SIZE DISTRIBUTION	IPC-J-STD-004B CLASSIFICATION	SHELF LIFE
Pb-free, No-clean					
HF 212	High tack, low voiding, RoHS-compliant solder paste with excellent fine pitch coalescence and extended stencil life and abandon time. Designed for medium to large boards and compatible with many Pb-free alloys, including high reliability 90iSC.	90iSC SAC305 SAC387 SAC0307	Type 3, 4, 5	ROL0	6 months at 0-10°C
HF 18	RoHS-compliant high reliability solder paste specially formulated to provide low voiding when soldering bottom terminated components. Improved stability at different storage and operating temperatures, with extended stencil life up to 72 hours and extended abandon time up to 24 hours. Suitable for high-density, small to large boards.	90iSC	Type 4	ROL0	6 months at 0-10°C
SnPb, Water wash					
HF 2W	Low voiding, REACH-compliant solder paste with excellent resistance to solder balling, humidity and slump. Residues can be removed with aqueous cleaner followed by deionized water in 5 to 15 minutes at 40°C to 60°C.	63S4 Sn63	Type 3, ACP, 4	ORM0	6 months at 0-10°C

HALIDE-FREE SOLDER PASTES

PRODUCT	DESCRIPTION	ALLOY	PARTICLE SIZE DISTRIBUTION	IPC-J-STD-004B CLASSIFICATION	SHELF LIFE
Pb-free, No-clean					
CR 32	A modest residue level solder paste with robust flux for printing and reflow. Its non-corrosive residues eliminate the need for cleaning. Excellent resistance to solder balling and suitable for fine pitch, stencil printing applications.	95A	AAS	ROL0	6 months at 0-10°C
LF 318	RoHS-compliant solder paste with pin-testable flux exhibits excellent humidity resistance and ability to resist component movement during high-speed placement.	90iSC SAC305 SAC387	Type 3, 4	ROL0	6 months at 0-10°C
SnPb, No-clean					
CR 32	Solder paste with robust flux for printing and reflow. Its noncorrosive residues eliminate the need for cleaning. Excellent resistance to solder balling and suitable for fine pitch, stencil printing applications.	63S4 Sn62 Sn63	Type 3, ACP	ROL0	6 months at 0-10°C
MP 218	High activity, soft, colourless residue solder paste with pin-testable flux that displays resistance to high temperature and humidity environments. Suitable for a large range of assembly processes, including enclosed head printing, large and high-density boards.	63S4 Sn62 Sn63	Type 3, ACP, Type 4	ROL0	6 months at 0-10°C

HALIDE-CONTAINING SOLDER PASTES

PRODUCT	DESCRIPTION	ALLOY	PARTICLE SIZE DISTRIBUTION	IPC-J-STD-004B CLASSIFICATION	SHELF LIFE
SnPb, No-clean					
RP 15	Solder paste formulated for dispensing or printing and reflow in air, where process yield is critical. Excellent open time and good soldering activity, especially on OSP Cu. Suitable for many board sizes.	63S4 Sn62	Type 3, ACP	ROL1	6 months at 0-10°C

SOLDER POWDER PARTICLE SIZE DISTRIBUTION

J-STD-005 DESCRIPTION	HARIMA CODE	PARTICLE SIZE DISTRIBUTION (µm)
Type 2	BAS	53-75
-	AAS	38-53
Type 3	AGS/T3	25-45
-	ACP	15-45
Type 4	DAP/T4	20-38
Type 5	T5	10-25
Type 6	T6	5-15

FLUX IDENTIFICATION, COMPOSITION AND ACTIVITY LEVELS (J-STD-004B)

Flux composition	Flux activity	% Halide (w/w)	Flux type	Flux designator
Rosin (RO)	Low	<0.05	L0	ROL0
		<0.5	L1	ROL1
	Moderate	<0.05	M0	ROM0
		0.5-2.0	M1	ROM1
	High	<0.05	H0	ROH0
		>2.0	H1	ROH1
Resin (RE)	Low	<0.05	L0	REL0
		<0.5	L1	REL1
	Moderate	<0.05	M0	REM0
		0.5-2.0	M1	REM1
	High	<0.05	H0	REH0
		>2.0	H1	REH1

Flux composition	Flux activity	% Halide (w/w)	Flux type	Flux designator
Organic (OR)	Low	<0.05	L0	ORL0
		<0.5	L1	ORL1
	Moderate	<0.05	M0	ORM0
		0.5-2.0	M1	ORM1
	High	<0.05	H0	ORH0
		>2.0	H1	ORH1
Inorganic (IN)	Low	<0.05	L0	INL0
		<0.5	L1	INL1
	Moderate	<0.05	M0	INM0
		0.5-2.0	M1	INM1
	High	<0.05	H0	INH0
		>2.0	H1	INH1

SOLDER WIRES

The HARIMA MULTiCORE portfolio of flux cored solder wires gives the user assurance of continuous flux availability through the use of Multicore's unique award winning core construction which ensures consistent distribution of the flux throughout the reel of solder wire.

As a trusted brand in electronics for over 80 years, Multicore flux cored solder wire delivers ease of use and outstanding performance for today's electronics industry; be it for rework, robot soldering or simple hand soldering applications.

The fluxes within the wires have been formulated for use in a range of different alloys and in wide reaching applications, with standard rosin based fluxes for electronics applications through to specialist fluxes such as ARAX and ALU for more difficult substrates such as stainless steel and aluminium alloys.

Supporting both the traditional tin-lead manufacturers and modern lead-free process our fast wetting materials deliver consistent, reliable solder joint integrity providing outstanding long term performance.

NO CLEAN		WATER WASH	
Halogen free	Halide	Electronic	Industrial
X39	C502	HYDX	ARAX
C400†	C511		ALU
	309		

Available in 90iSC†

SOLDER WIRE

PRODUCT	DESCRIPTION	FLUX CONTENT (%)	HALIDE CONTENT (%)	ALLOY		IPC-J-STD-004B CLASSIFICATION
				SnPb	Pb Free	
Halogen-free, no-clean						
C400	Low colour clear residue wire, complementary to halogen free solder applications. Available in the high reliability 90iSC solder alloy for automotive and aerospace applications. Ideal for rework applications.	2.2-3.0	0	Sn60 Sn62 Sn63	90iSC 99C SAC305 SAC387	ROL0
Halide containing, no-clean						
C502	Moderate activity rosin flux for electronics applications where difficult to solder finishes are involved. Clear, amber residues can be left on the assembly after soldering.	2.0-3.0	0.2	Sn60 Sn62 Sn63	99C SAC305 SAC387	ROM1
C511	High activity rosin flux for electronics applications where difficult to solder finishes are involved. Clear, amber residues can be left on the assembly after soldering.	2.0-3.0	1.1	Sn60	99C SAC305 SAC387	ROM1
309	High activity rosin flux for electronics applications where difficult to solder finishes are involved. Preferred option for robotic soldering.	3.0	0.95	Sn60 Sn62 Sn63	99C SAC305 SAC387	ROM1
Halide containing, water wash						
HYDX	High activity with excellent wetting performance on difficult to solder surface, including brass, copper, nickel and mild steel. The material is designed for use on electronic assemblies in a water-wash process.	2.0	3.0	Sn60	SAC305 SAC387	ORM1
ARAX	High activity water washable solder wire designed specifically for soldering stainless steel and similar difficult to solder metals. An industrial grade material not recommended for electronic applications.	2.0-2.7	11.5	Sn63	96S 97Cu	INH1
ALU	High activity water washable solder wire designed specifically for soldering aluminium and similar difficult to solder metals. An industrial grade material not recommended for electronic applications.	2.0-2.7	-	45D 31D 4D	97Cu	ORH1

CORE CONSTRUCTION/FLUX CONTENT

NUMBER OF CORES	FLUX CONTENT (% BY WEIGHT)
1	1.0 - 3.0
2	1.0 - 1.2
3	1.5 - 2.5
4	2.0 - 2.7
5	1.7 - 3.0

SOLDER ALLOYS

HARIMA MULTiCORE offers a range of solder alloys suitable for use in electronics applications. From traditional tin-lead to lead-free and high reliability lead-free, our alloy portfolio delivers solutions for many applications within the board assembly process.

SOLDER ALLOYS SPECIFICATIONS

MULTiCORE NAME	ALLOY COMPOSITION	J-STD-006C	ISO 9453 (Alloy No.)	JIS-Z-3282 (Alloy Code)	MELTING POINT (°C)
2.5S	Pb92.5Sn5Ag2.5	Sn5Pb92.5Ag2.5	-	-	287-296
HMP	Pb93.5Sn5Ag1.5	Sn5Pb93.5Ag1.5	Pb93Sn5Ag2 (191)	-	296-301
Sn60, 60EN	Sn60Pb40	Sn60Pb40	Sn60Pb40E (104)	Sn60Pb40E (H60E)	183-191
Sn63, 63EN	Sn63Pb37	Sn63Pb37	Sn63Pb37E (102)	Sn63Pb37E (H63E)	183
63S4	Sn62.8Pb36.8Ag0.4	-	-	-	179-183
Sn62	Sn62Pb36Ag2	Sn62Pb36Ag2	Sn62Pb36Ag2 (171)	Sn62Pb36Ag2 (H62Ag2A)	179
99C	Sn99.3Cu0.7	Sn99.3Cu0.7	Sn99.3Cu0.7 (401)	Sn99.3Cu0.7 (C7)	227
96S	Sn96Ag4	Sn96.5Ag3.5	Sn96.5Ag3.5 (703)	Sn96.5Ag3.5 (A35)	221
SAC0307	Sn99Cu0.7Ag0.3	-	Sn99Cu0.7Ag0.3 (501)	-	217-228
SAC387, 96SC	Sn95.5Ag3.8Cu0.7	Sn95.5Ag3.8Cu0.7	Sn95.5Ag3.8Cu0.7 (713)	Sn95.5Ag3.8Cu0.7 (A38C7)	217
SAC305, 97SC	Sn96.5Ag3Cu0.5	Sn96.5Ag3Cu0.5	Sn96.5Ag3Cu0.5 (711)	Sn96.5Ag3Cu0.5 (A30C5)	217-220
90iSC	Sn90.85Ag3.8Cu0.7 Bi3Sb1.5Ni0.15	-	-	-	205-218
92A	Sn91.5Sb8.5	-	-	-	241-247
95A	Sn95Sb5	Sn95Sb5	Sn95Sb5 (201)	Sn95Sb5 (S50)	235-240
Bi58	Sn42Bi58	Sn42Bi58	Bi58Sn42 (301)	Bi58Sn42 (B580)	138

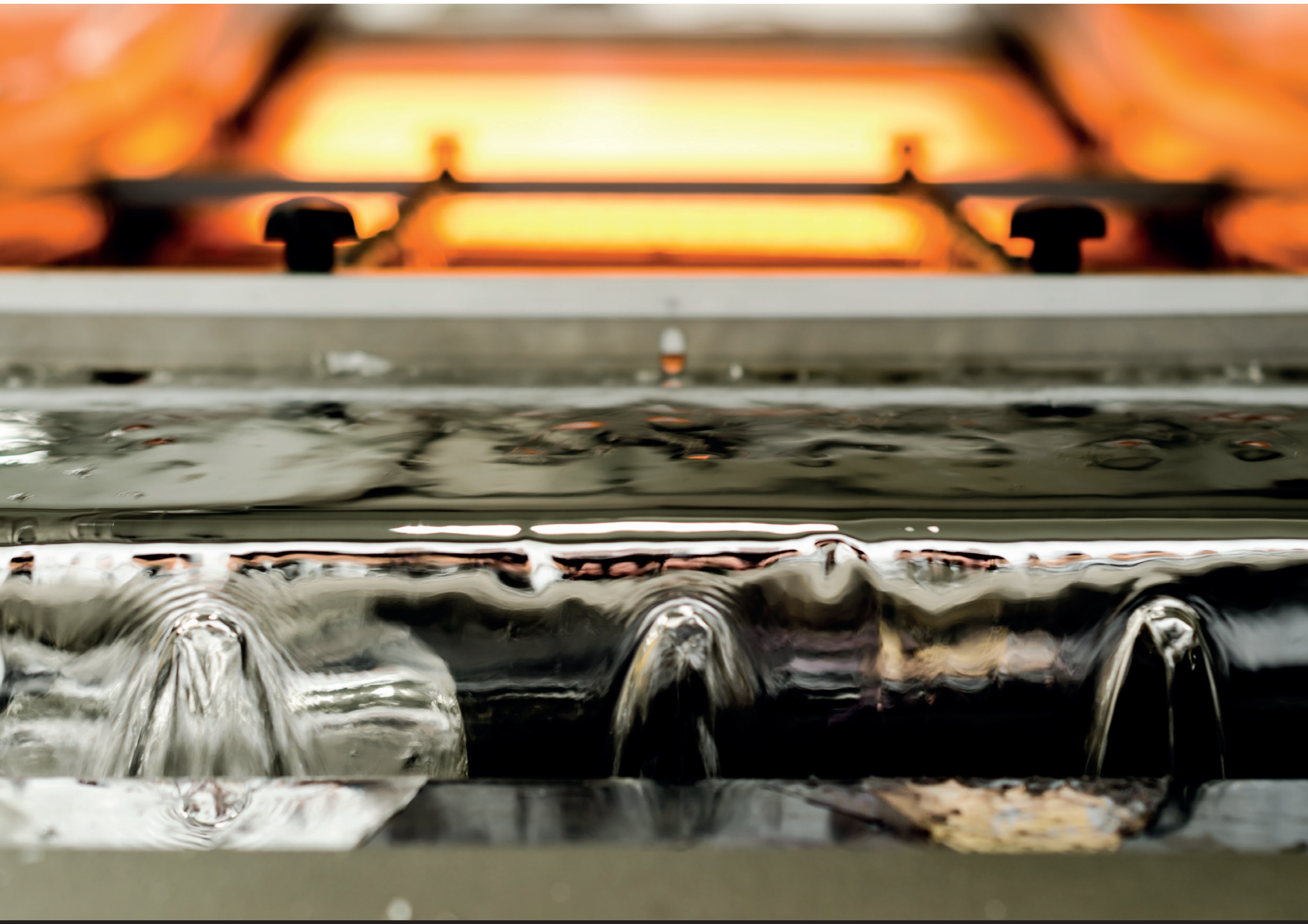
SOLDER ALLOY AVAILABLE FORMS

MULTiCORE NAME	ALLOY	RoHS COMPLIANT	PASTE	WIRE
2.5S	Pb92.5Sn5Ag2.5	NO	YES	NO
HMP	Pb93.5Sn5Ag1.5	NO	YES	YES
Sn60, 60EN	Sn60Pb40	NO	NO	YES
Sn63, 63EN	Sn63Pb37	NO	YES	YES
63S4	Sn62.8Pb36.8Ag0.4	NO	YES	NO
Sn62	Sn62Pb36Ag2	NO	YES	YES
99C	Sn99.3Cu0.7	YES	YES	YES
97Cu	Sn97Cu3	YES	NO	YES
96S	Sn96Ag4	YES	YES	YES
SAC0307	Sn99Cu0.7Ag0.3	YES	YES	NO
SAC387, 96SC	Sn95.5Ag3.8Cu0.7	YES	YES	YES
SAC305, 97SC	Sn96.5Ag3Cu0.5	YES	YES	YES
90iSC	Sn90.85Ag3.8Cu0.7 Bi3Sb1.5Ni0.15	YES	YES	YES
92A	Sn92Sb8	YES	YES	NO
95A	Sn95Sb5	YES	YES	YES
Bi58	Sn42Bi58	YES	YES	NO

Other alloys available on request.

LIQUID FLUXES

HARIMA MULTiCORE has developed a variety of liquid flux formulations to facilitate Pb-free and SnPb wave soldering processes, rework operations and selective soldering. No-clean, low-residue, VOC-free, halide-free and halogen-free flux formulas provide manufacturers with several options for specific manufacturing requirements, delivering high-performance, defect-free soldering and excellent throughput. HARIMA MULTiCORE's liquid flux technologies are environmentally responsible and align with sustainable manufacturing approaches.



ROSIN FREE NO-CLEAN		LOW SOLIDS ROSIN			WATER WASH
Halogen free	Halide free	Halogen free	Halide free	Halide	Halide
X33S-07i	X33-12i	MF 390 HR	MFR 301	R41-01i	HYDX-20
MF 300	X33-08i				
	MF 210				

LIQUID FLUXES

PRODUCT	DESCRIPTION	SOLID CONTENT (% by weight)	ACID VALUE (mgKOH/g)	APPLICATION METHOD	IPC-J-STD-004B CLASSIFICATION
Halogen-free, VOC-free, no-clean					
MF 300	General purpose resin-free, water-based flux with a special formulation designed to minimise solder balling. Compatible with both lead free and Sn/Pb wave soldering applications.	4.6	37.0	Spray/foam	ORM0
Halogen-free, no-clean					
X33S-07i	Designed for exceptional topside penetration of plated-through holes and for oxidised substrates. Suitable for solar, telecoms and general electronic soldering processes using either lead-free or Sn/Pb alloys.	2.9	19.0	Spray	ORL0
MF 390 HR	Liquid flux designed for exceptional through-hole fill and recommended for automotive electronics and general electronic applications. Ideal for selective soldering applications and with both lead-free and Sn/Pb alloys.	6.0	22.5	Spray/foam	ROL0
Halide-free, no-clean					
X33-08i	Resin-free flux designed to solder onto surfaces known to have poor solderability. Recommended for solar, consumer electronics and general soldering applications where high throughput is required. Compatible with both lead free and Sn/Pb wave soldering applications.	1.6	17.5	Spray/foam	ORL0
X33-12i	Resin-free flux designed to solder onto surfaces known to have poor solderability. Recommended for consumer electronics and general soldering applications where high throughput is required. Compatible with both lead free and Sn/Pb wave soldering applications.	2.9	22.5	Spray/foam	ORM0
MF 210	Resin-free flux recommended for solar cell tabbing, consumer electronics and general soldering applications where high throughput is required. Compatible with both lead free and Sn/Pb wave soldering applications.	2.9	22.5	Spray/foam	ORM0
MFR 301	Higher solids flux for better wetting on poor solderability surfaces and to minimise bridging on complex geometries. Compatible with both lead free and Sn/Pb wave soldering applications.	6.0	40.0	Spray/foam	ROM0
Halide containing, water wash					
HYDX-20	Water-soluble formulation for use on electronic assemblies. Residues are designed to be cleaned with water. HYDX-20 will solder brass, copper, nickel and mild steel efficiently. Compatible with both lead free and Sn/Pb wave soldering applications.	20.0	24.0	Spray/foam	ORH1

SOLDER ACCESSORIES

To support the core solder products from solder paste, liquid flux and cored solder wire ranges HARIMA MULTiCORE have a number of accessories allowing the customer to receive full support in their soldering process. Whether if be to mask areas to allow components to be added in a later process, to removing and reworking a solder joint or to remove flux residues from stencils or circuit boards HARIMA MULTiCORE can provide for your needs.

REWORK FLUX GELS, PENS, AND DESOLDERING WICKS

REWORK FLUX GELS		FLUX PENS		DESOLDERING WICKS
Halogen-free No-clean	Halide-free No-clean	No-clean	Cleaners	Halogen-free
450-01 RWF	LF 318 RWF	X33S-07i	MCF 800*	NC-AA
HF 108 RWF	TFN 700B	MF 300		NC-AB
HF 212 RWF		MFR 301		NC-OO
				NC-BB

*See Cleaners section

REWORK FLUX GELS

PRODUCT	DESCRIPTION	SOLID CONTENT (%)	ACID VALUE (mgKOH/g)	VISCOSITY (kcP)	IPC-J-STD-004B CLASSIFICATION
Halogen free, no-clean					
450-01 RWF	Tacky flux designed for use in a wide range of electronic rework applications. Low colour residue.	43	70	550	ROL0
HF 108 RWF	Low colour residue rework gel, designed for use in traditional rework applications. Can be applied by dipping, printing or dispensing.	66	130	220	ROL0
HF 212 RWF	Non-Newtonian fluid, ideal for use in soldering of large ground plane devices where low void formation is required. Suitable for reflow in both standard and vacuum oven systems, along with traditional rework.	77	125	58	ROL0
Halide free, no-clean					
LF 318 RWF	Low colour residue rework gel for traditional rework applications, even on more difficult to solder substrates.	55	107	545	ROL0
TFN 700B	Newtonian flux system designed for POP applications. Ideally suited to dip-transfer process with good performance on copper and AuNi. Blue colour for image recognition in AOI systems.	80	108	47	ROL0

REWORK PENS

PRODUCT	DESCRIPTION	SOLID CONTENT (%)	ACID VALUE (mgKOH/g)	IPC-J-STD-004B CLASSIFICATION
Halogen free, no-clean				
X33S-07i	Designed for use on oxidised substrates. Ultra-low residue suitable for electronic rework processes using either lead-free or tin/lead alloys.	2.9	19	ORL0
MF 300	General purpose resin-free, water-based flux. Compatible with both lead free and Sn/Pb applications.	4.6	37	ORM0
Halide free, no-clean				
MFR 301	Higher solids flux for better wetting on poor solderability surfaces. Compatible with both lead free and Sn/Pb applications. Light rosin residue.	6.0	40	ROM0

DESOLDERING WICKS

PRODUCT	BRAID WIDTH (mm)	DESCRIPTION
NC-OO	0.89 +/- 10%	No-clean desoldering wick is designed for static-free desoldering applications and repair of printed circuit boards without the need for the subsequent removal of flux residues. Desoldering wick is a copper braid impregnated with a specially formulated halogen free no-clean flux designed to provide improved wicking whilst maintaining flexibility and reliability on storage.
NC-AA	1.42 +/-10%	
NC-AB	1.88 +/- 10%	
NC-BB	2.59 +/- 10%	

CLEANERS AND TEMPORARY SOLDER MASK

SOLVENT CLEANERS	TIP TINNER CLEANER	TEMPORARY SOLDER MASK
MCF 800	TTC-LF	MSC 1000S
MSC 01		

SOLVENT CLEANERS

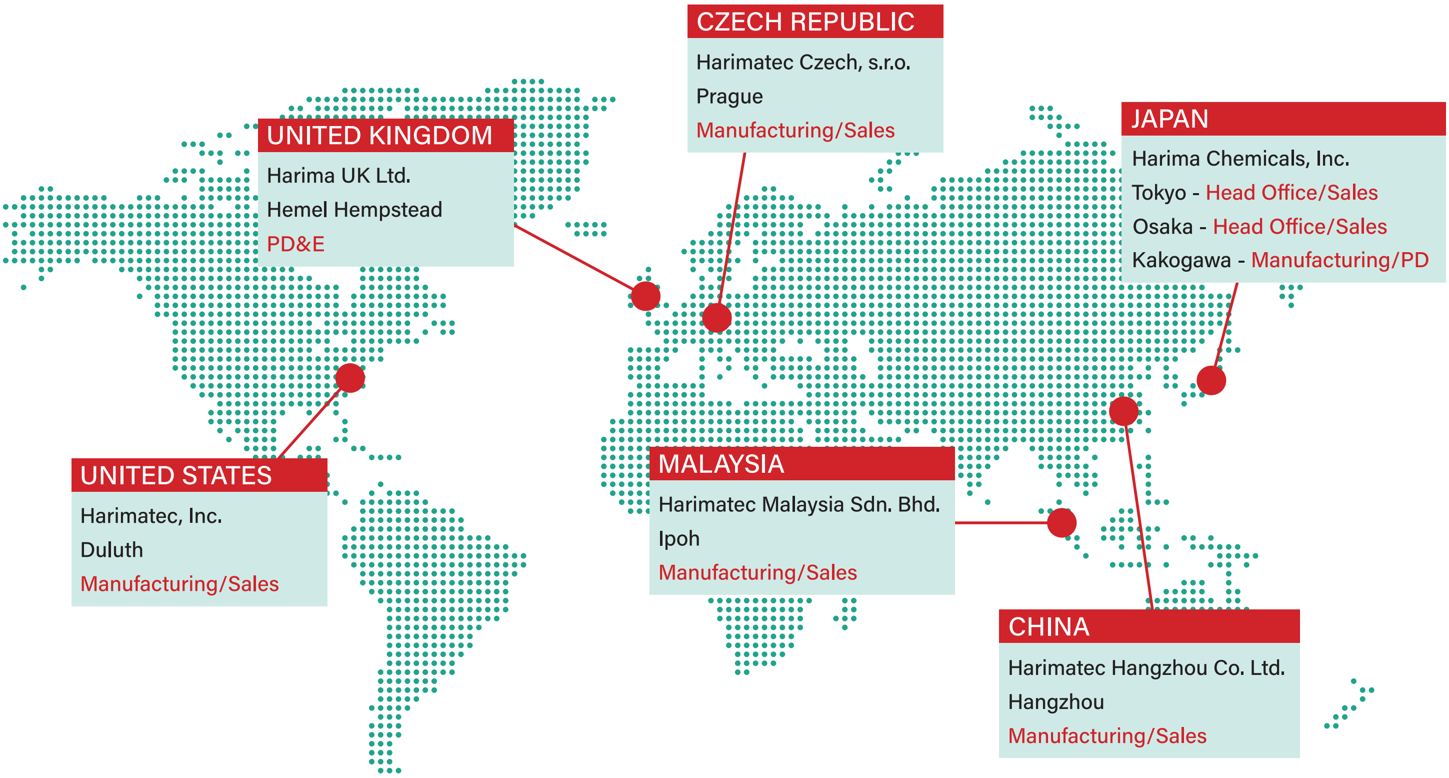
PRODUCT	DESCRIPTION	FLASH POINT (°C)	BOILING POINT (°C)	APPLICATION
MCF 800	Designed for the effective removal of all types of soldering process residues from circuit boards, stencil, fixtures and equipment. High flash point allows use in heated cleaning systems. Can be used as straight solvent or with water rinsing.	105	225	Batch cleaning of post-soldering residues. Also available for rework cleaning in a pen applicator.
MSC 01	Designed for both manual and automatic cleaning of stencils. Ideal also as a manual rework cleaner. Highly effective cleaner which dries rapidly.	40	130-133	Stencil and rework cleaner.

TIP TINNER CLEANER

PRODUCT	DESCRIPTION
TTC-LF	Compacted disc of electronics grade lead free solder powder and flux designed for the efficient cleaning and re-tinning of all oxidised soldering iron tips that normal tinning methods struggle to resurrect. Can be used with lead-based solders.

TEMPORARY SOLDER MASK

PRODUCT	DESCRIPTION
MSC 1000S	Peelable temporary solder mask designed to prevent solder being applied in areas where not required in a wave soldering process. Can be applied by brush, stencil or dispensed. Mask should be peeled from the substrate after soldering.



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