ENABLING TECHNOLOGY LEADERSHIP

ALPHA
EF-Series
Environmentally Friendly
FLUXES

ALPHA EF-3001 Flux

Greenline

Air.

Earth.

Fire.

Water.

Now you can protect the environment.

- Remove VOCs
- Transition to lead-free

And your boards can survive heat and humidity.

- Meet electrical reliability requirements
  Pass Bellcore
  Pass IPC

Product Manual

Cookson Electronics ASSEMBLY MATERIALS

ALPHA
EF-Series
Environmentally Friendly
FLUXES

EF-3001 Environmentally Friendly Flux
Information Manual

WELCOME TO THE ALPHA EF-3001 INTERACTIVE PRODUCT MANUAL.

SIMPLY CLICK ON THE NAVIGATION BUTTONS TO QUICKLY LOCATE SPECIFIC PRODUCT INFORMATION. THERE ARE LINKS TO OTHER DOCUMENTS AND TO COOKSON'S WEB SITE, WHERE YOU CAN OBTAIN ADDITIONAL INFORMATION. (TO USE THIS FEATURE YOU MUST LAUNCH YOUR INTERNET BROWSER.)

Greenline®

ALPHA EF-3001 meets the needs of consumer products and automotive companies involved in processing high volumes of boards in long production runs where high reliability is vital.

EF-3001, a water-based flux, offers excellent solderability and reliability, and provides excellent wetting/hole fill versus its leading competitor. EF-3001 cuts solderballing to very low levels versus the leading competitor. Its milky white appearance, resulting from Cookson Electronics' new proprietary chemistry technology (patent pending), provides very good joint and board cosmetics. In addition to being lead-free process capable, EF-3001 is VOC free – eliminating concerns based on VOC emissions from flux. It has less than 5% resin/rosin content, adding to board reliability in demanding applications. EF-3001 is also conformal coating compatible.

EF-3001 is Bellcore compliant, offers consistent, uniform flux application, and has superior stability, resulting in significantly longer shelf life versus the leading competitor.

ALPHA
EF-3001
Flux

ALPHA EF-Series Environmentally Friendly Fluxes

EF-3001 Performance Summary

Process Benefit	EF-3001 Attributes	Performance Capability
Electrical Reliability	**Bellcore SIR, EM**	Outstanding reliability versus leading competitor
	Bulk Insulation Resistance	Excellent for FR2 boards and unplated through-holes
Cosmetics	**Solder Joint With Sn63 and Lead-free Alloys**	Smooth shiny joints with full fusion
	Flux Residue	No change in residue appearance after exposure to 85%RH for 7 days
	Tack	Uniform, low-tack residue
In-Circuit Test Yield	**Pin Testability**	High yield – no visible residues on probe
Ease of Use	**Spray Fluxing**	Designed specifically for spray fluxing applications
	Shelf Life	Longer shelf life compared to the leading competitor
Soldering	**Bridging**	Minimal bridging
	Solderballs	Superior micro solderball performance versus leading competitor
	Hole Fill	Comparable hole fill versus leading competitor

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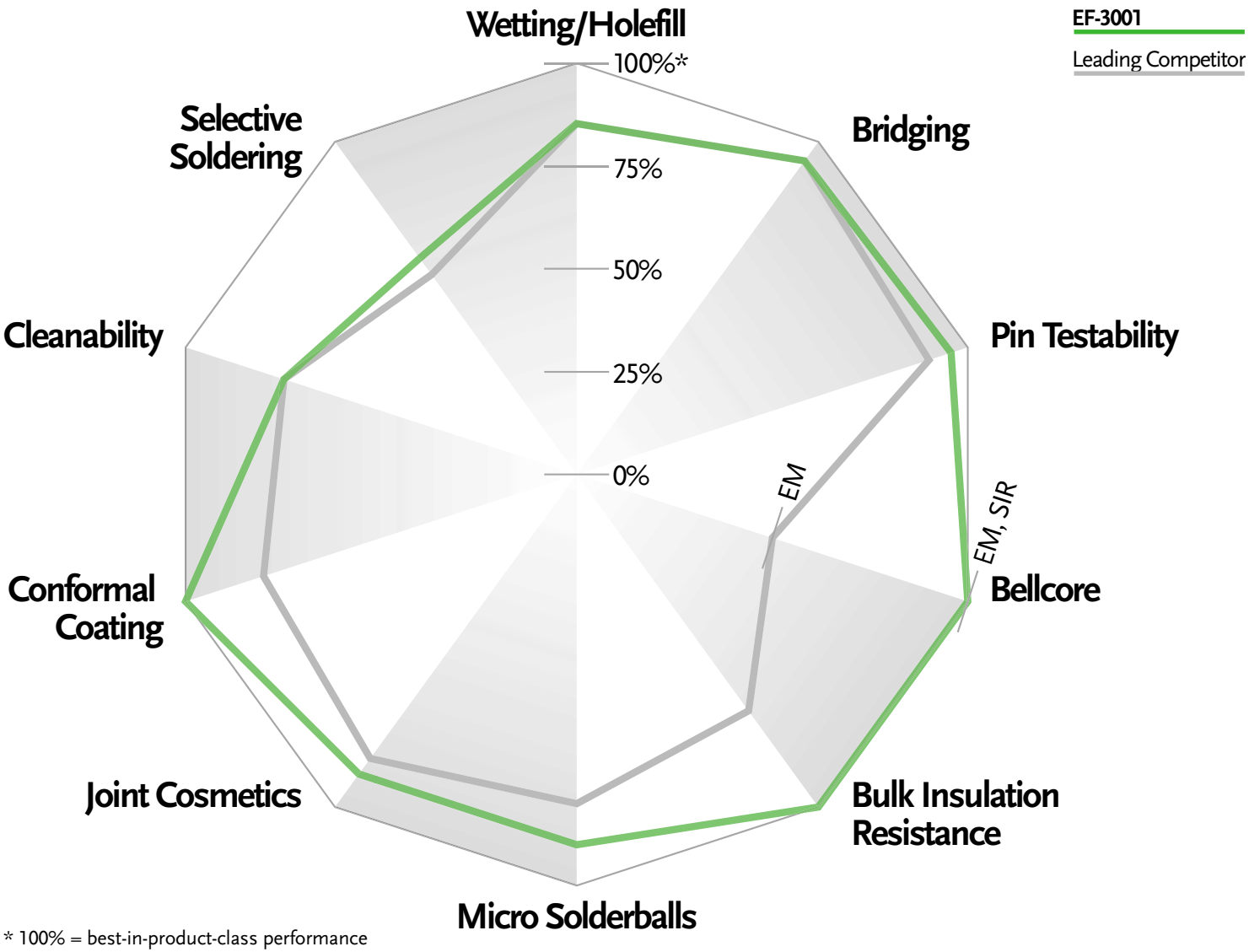
EF-3001 Key Attribute Benefits



* 100% = best-in-product-class performance

ALPHA EF-Series Environmentally Friendly Fluxes

EF-3001 Wide Process Window

EF-3001	Process Parameters	Suggested Process Settings	
		Sn/Pb Alloy System	Lead-Free Alloy System
Single Wave	Conveyor speed	0.9-1.2 m/min	0.8-1.0 m/min
	Flux loading	100-200 micrograms/cm^{2*}	120-200 micrograms/cm^{2*}
	Topside preheat	105-115°C	105-115°C
	Solder pot temperature	240-260°C	255-265°C
	Wave height	1/2 to 2/3 of board thickness	1/2 to 2/3 of board thickness
Dual Wave	Conveyor speed	0.9-1.2 m/min	0.9-1.2 m/min
	Flux loading	150-300 micrograms/cm^{2*}	150-300 micrograms/cm^{2*}
	Topside preheat	105-120°C	105-120°C
	Solder pot temperature	240-260°C	255-265°C
	Wave height	1/2 to 2/3 of board thickness	1/2 to 2/3 of board thickness

Note:
These process parameters were used in product development work and are guidelines only. They may not be optimal for your process. You will need to optimize the process parameters for your particular application.

* Flux weight after preheat.

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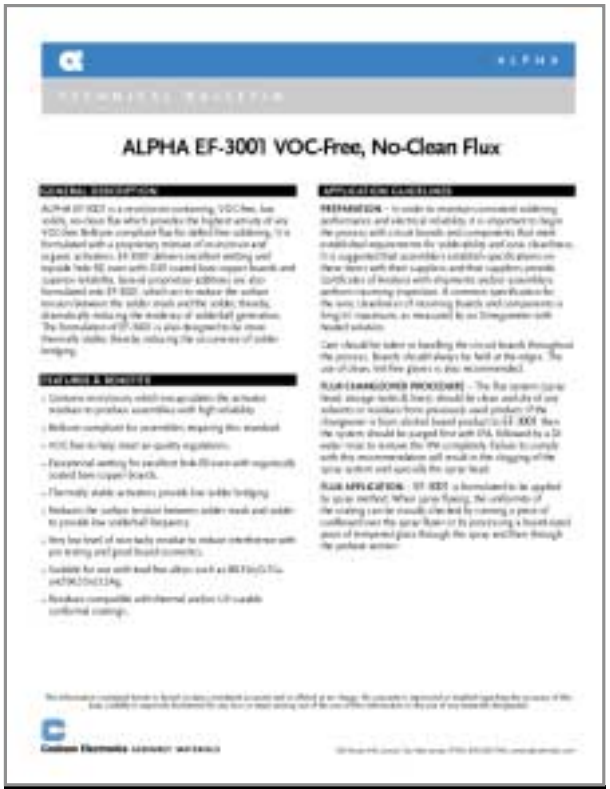
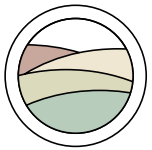

ALPHA EF-3001 VOC-Free, No-Clean Flux

To view the EF-3001 Technical Bulletin, click here

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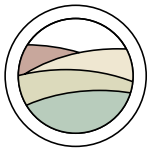
ALPHA EF-3001 FLUX

To view the EF-3001 MSDS, click here




ALPHA
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Fluxes

EF-3001 Wave Soldering Flux

Recommended Process Guidelines

Safety
EF-3001 is a non-flammable, water based flux. Please refer to the EF-3001 Material Safety Data Sheet as the primary source of health and safety information.

Storage
This product should be stored at all times above 3°C. Freezing this product will render the product unusable. Always store in original container.

Compatibility with ALPHA PASTES
EF-3001 is tested and is compatible with ALPHA no-clean solder pastes and water-soluble solder pastes after cleaning.

Cleaning
EF-3001 is a no-clean flux and the residues are designed to be left on the board. If desired, flux residues can be removed with ALPHA EC-Ultra semi-aqueous cleaner or with other commercially available solvents.

Rework
Use of the Cleanline Write Flux Applicator with NR-205 flux and Telecore Plus cored solder is recommended for hand soldering applications.

For lead-free products, the following SAC 305 wires can be used: Telecore Plus and Fluitin1532.

Shelf life
12 months from date of manufacture in factory-sealed container.

Wave soldering machines: Tested to work with infrared and convection preheat machines

EF-3001	Process Parameters	Suggested Process Settings	
		SnPb Alloy System	Lead-Free Alloy System
Single Wave	Conveyor speed	0.9-1.2 m/min	0.8-1.0 m/min
	Flux loading	100-200 micrograms/cm²*	120-200 micrograms/cm²*
	Topside preheat	105-115°C	105-115°C
	Solder pot temperature	240-260°C	255-265°C
	Wave height	1/2 to 2/3 of board thickness	1/2 to 2/3 of board thickness
Dual Wave	Conveyor speed	0.9-1.2 m/min	0.9-1.2 m/min
	Flux loading	150-300 micrograms/cm²*	150-300 micrograms/cm²*
	Topside preheat	105-120°C	105-120°C
	Solder pot temperature	240-260°C	255-265°C
	Wave height	1/2 to 2/3 of board thickness	1/2 to 2/3 of board thickness

Note: These process parameters were used in product development work and are guidelines only. They may not be optimal for your process. You will need to optimize the process parameters for your particular application.

* Flux weight after preheat.

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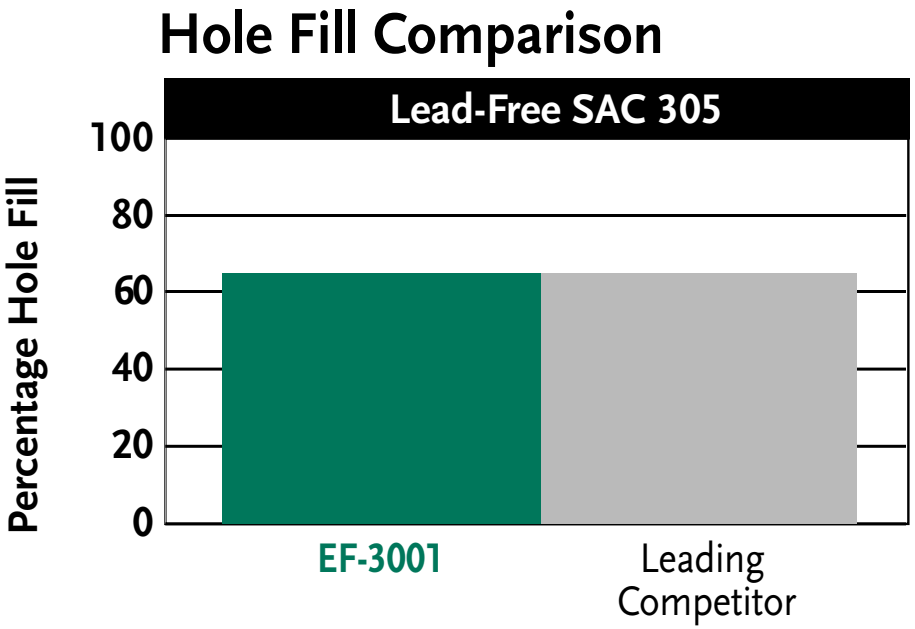
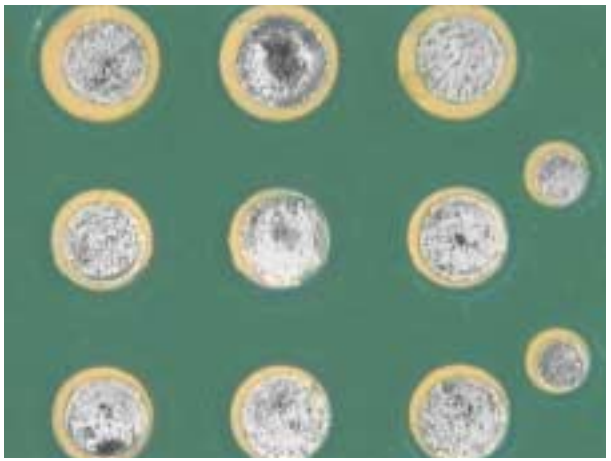
EF-3001 Flux Performance vs Competition

Hole Fill





EF-3001

EF-3001 Enhanced Performance Attributes

Comparable hole fill on Cu OSP, one prior reflow, dual wave, versus the leading competitor

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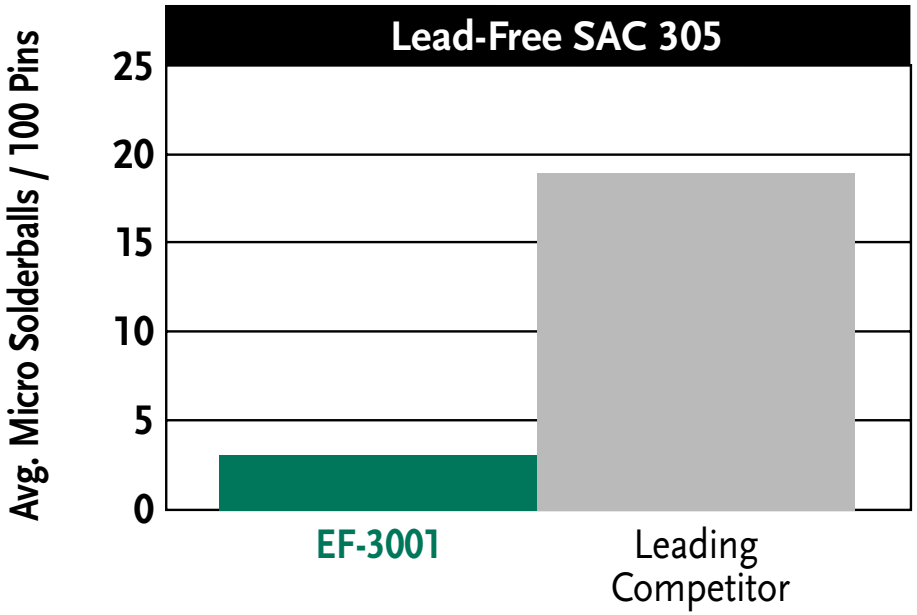
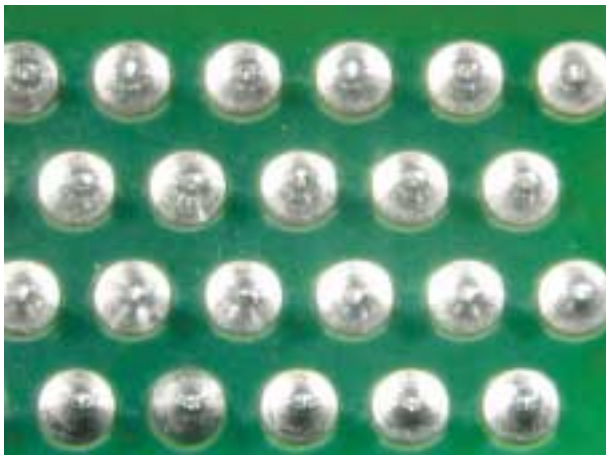
EF-3001 Flux Performance vs Competition

Reproducible Micro Solderball Results

Micro Solderballing Comparison





EF-3001

EF-3001 Enhanced Performance Attributes

Superior to leading competitor, Cu OSP, one prior reflow, dual wave.

ALPHA EF-Series Environmentally Friendly Fluxes

EF-3001 Electrical Reliability

Bellcore SIR

SIR Test Report – Bellcore
(per GR-78-CORE Issue 1, September 1997)

Test: 0241-2b
Date: 6/15/02
T/H/B: 35/85/-48

Material Tested/ Condition	SIR (1 day)	SIR (4 days)
Comb Down Geometric Mean:	7.50E+11	9.50E+11
Comb Up Geometric Mean:	7.20E+11	7.00E+11
Control Boards Geometric Mean:	9.90E+11	3.00E+11

Pass/Fail Limit: 1E+11 Ohms

EF-3001 is Bellcore Compliant per GR-78-CORE.

IPC SIR

SIR Test Report – J-STD-004
(per IPC-TM-650 Issue method 2.6.3.3)

Test: 0241-2i
Date: 9/26/02
T/H/B: 85/85/-48

Material Tested/ Condition	SIR (1 day)	SIR (4 days)	SIR (7 days)
Comb Down Arithmetic Mean:	6.70E+09	1.50E+10	2.10E+10
Comb Up Arithmetic Mean:	8.70E+09	1.00E+10	1.40E+10
Control Boards Arithmetic Mean:	2.70E+10	2.00E+10	2.50E+10

Pass/Fail Limit: 1E+08 Ohms

EF-3001 meets the SIR requirement for J-STD-004. J-STD Classification: ORL 0

Electromigration

EM – Bellcore
(per GR-78-CORE Issue 1, September 1997)

Test: 0241-1e
Date: 7/22/02
T/H/B: 65/85/10V

Material Tested/ Condition	SIR (96 hr)	SIR (500 hr bias)
Geometric Mean:	6.40E+08	1.90E+11 Comb Up
	5.60E+10	2.60E+10 Comb Down
Passed electrical and visual requirements		

Pass/Fail Limit: ≥0.1 Geometric Mean SIR Initial

EF-3001 meets the GR-78-CORE and pending IPC J-STD-004 requirement for electromigration.

ALPHA EF-Series Environmentally Friendly Fluxes

EF-3001 In-Circuit Test Data

Material: EF-3001 wave flux
Alloy: 63/37 solder pot
Process conditions: Wave soldered 105°C preheat, 1.1 m/min conveyor speed, 250°C solder pot
Process Date: 6/26/2002
Pin Tip: Chisel
Pin Force (oz.) = 3.5

EF-3001				
Resistance (ohms)	Board A	Board B	Board C	Board D
< 5	1000	998	1000	999
5 - 10	0	2	0	0
10 - 20	0	0	0	0
20 - 50	0	0	0	0
50 - 100	0	0	0	0
100 - 200	0	0	0	0
200 - 500	0	0	0	0
500 - 1000	0	0	0	0
1000 - 2000	0	0	0	0
> 2000 (miss)	0	0	0	1*
Average	0.30	0.37	0.31	0.35
Standard deviation	0.11	0.25	0.12	0.11

* Probe missed pad, producing no contact. Miss not related to flux.

- Excellent pin testability
- Two misses in 4,000 attempts
- No significant residue buildup on probe

ALPHA EF-Series Environmentally Friendly Fluxes

EF-3001 Product Demonstration

Check List

The intention of this check list is to act as a guide for setting up the equipment for running EF-3001 in a typical wave soldering process.

1. **The flux system (spray head, storage tanks and lines) should be clean and dry of any solvents or residues from the previously used product. If the changeover is from an alcohol based product to EF-3001, then the system should be purged first with IPA and then with DI water to remove the IPA completely. Failure to comply with this recommendation will result in the clogging of the spray system and especially the spray head.**
2. **Check for uniform spray on the board and measure flux loading to compare with recommended levels.**
3. **Check fingers and pallets for cleanliness.**
4. **Assure that the solder wave is free from dross. Remove dross if necessary.**
5. **Fill flux tank with EF product. Fill thinner tank with de-ionized water if present. Purge fluxing system for minimum of 120 second**
6. **Assure that the solder wave is level to the board. Use ALPHA Levchek, if required.**
7. **Check the wave height to make sure it is set to 1/2 to 2/3 of the board thickness, including chip wave, if used.**
8. **Set conveyor to the recommended speed, and degree of angle.**
9. **Measure top side preheats and adjust temperature settings on the machine to achieve the recommended temperature.**

Notes:
1. Temperature tabs can be placed at multiple locations on the board (pick high density and low density areas to determine overall range of temperature).
2. Thermocouple probes or moles can be used as well (choose high density and low density board areas to determine overall range of temperature).
3. The highest and lowest measured top-side preheat temperatures should be within the recommended guidelines for EF-3001.

ALPHA EF-Series Environmentally Friendly Fluxes

EF-3001 Product Evaluation Guide

Product Focus and Key Features

I. Exhibits excellent hole fill
II. Provides for high-yield production, minimum first-pass defects
III. Exhibits excellent conformal coating compatibility
IV. Provides both single wave and dual wave capabilities
V. Tack-free residues
VI. Provides excellent cosmetics
VII. Exhibits minimum micro solderballs

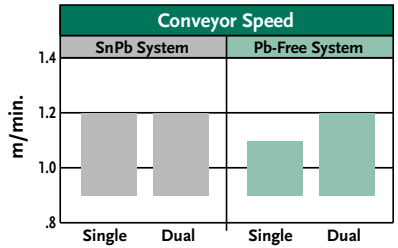
Demonstration Procedure

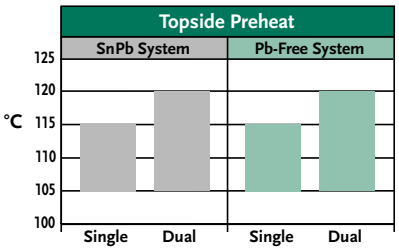
Run 5 boards with EF-3001 at suggested process parameters for either single wave or dual wave:

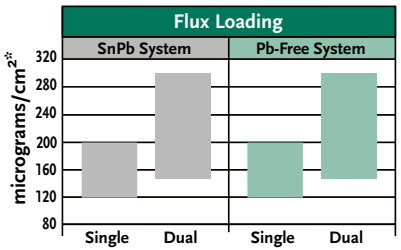
I. Evaluate hole fill and count the number of bridges and icicles
- compare to current flux

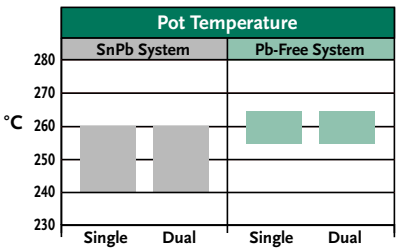
II. Evaluate residue
- on board surface
- at the edges where conveyor fingers or pallets were used
- in areas where pallets were used for selective soldering
  - compare to current flux
  - check tack

III. Evaluate conformal-coating results
- compare to current flux









* Flux weight after preheat.

ALPHA EF-Series Environmentally Friendly Fluxes

EF-3001 Flux Loading Chart

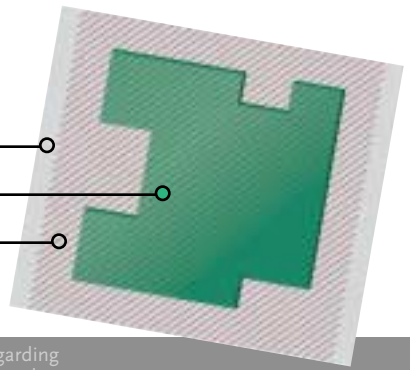
Suggested Wet Flux Weight (micrograms/cm²)

	Single Wave		Dual Wave	
Coverage Area*	Suggested Lower Limit (100 µg/cm²)	Suggested Upper Limit (200 µg/cm²)	Suggested Lower Limit (150 µg/cm²)	Suggested Upper Limit (300 µg/cm²)
cm²	grams	grams	grams	grams
100	0.192	0.385	0.288	0.577
150	0.288	0.577	0.433	0.865
200	0.385	0.769	0.577	1.154
250	0.481	0.962	0.721	1.442
300	0.577	1.154	0.865	1.731
350	0.673	1.346	1.010	2.019
400	0.769	1.538	1.154	2.308
450	0.865	1.731	1.298	2.596
500	0.962	1.923	1.442	2.885
550	1.058	2.115	1.587	3.173
600	1.154	2.308	1.731	3.462
650	1.250	2.500	1.875	3.750
700	1.346	2.692	2.019	4.038
750	1.442	2.885	2.163	4.327
800	1.538	3.077	2.308	4.615
850	1.635	3.269	2.452	4.904
900	1.731	3.462	2.596	5.192
950	1.827	3.654	2.740	5.481
1000	1.923	3.846	2.885	5.769
1050	2.019	4.038	3.029	6.058
1100	2.115	4.231	3.173	6.346
1150	2.212	4.423	3.317	6.635
1200	2.308	4.615	3.462	6.923
1250	2.404	4.808	3.606	7.212
1300	2.500	5.000	3.750	7.500
1350	2.596	5.192	3.894	7.788
1400	2.692	5.385	4.038	8.077

	Single Wave		Dual Wave	
Coverage Area*	Suggested Lower Limit (100 µg/cm²)	Suggested Upper Limit (200 µg/cm²)	Suggested Lower Limit (150 µg/cm²)	Suggested Upper Limit (300 µg/cm²)
cm²	grams	grams	grams	grams
1450	2.788	5.577	4.183	8.365
1500	2.885	5.769	4.327	8.654
1550	2.981	5.962	4.471	8.942
1600	3.077	6.154	4.615	9.231
1650	3.173	6.346	4.760	9.519
1700	3.269	6.538	4.904	9.808
1750	3.365	6.731	5.048	10.096
1800	3.462	6.923	5.192	10.385
1850	3.558	7.115	5.337	10.673
1900	3.654	7.308	5.481	10.962
1950	3.750	7.500	5.625	11.250
2000	3.846	7.692	5.769	11.538
2050	3.942	7.885	5.913	11.827
2100	4.038	8.077	6.058	12.115
2150	4.135	8.269	6.202	12.404
2200	4.231	8.462	6.346	12.692

* Surface area of board and any pallet used that has flux applied to it.

Note: If the process uses multiple boards with open areas on a single pallet, the open areas must be deducted from the total coverage area.



ALPHA EF-3001 VOC-Free, No-Clean Flux

GENERAL DESCRIPTION

ALPHA EF-3001 is a resin/rosin containing, VOC-free, low solids, no-clean flux which provides the highest activity of any VOC-free Bellcore compliant flux for defect-free soldering. It is formulated with a proprietary mixture of resin/rosin and organic activators. EF-3001 delivers excellent wetting and topside hole fill, even with OSP coated bare copper boards and superior reliability. Several proprietary additives are also formulated into EF-3001, which act to reduce the surface tension between the solder mask and the solder; thereby, dramatically reducing the tendency of solderball generation. The formulation of EF-3001 is also designed to be more thermally stable; thereby, reducing the occurrence of solder bridging.

FEATURES & BENEFITS

- Contains resin/rosin, which encapsulates the activator residues to produce assemblies with high reliability.
- Bellcore compliant for assemblies requiring this standard.
- VOC-free to help meet air quality regulations.
- Exceptional wetting for excellent hole-fill even with organically coated bare copper boards.
- Thermally stable activators provide low solder bridging.
- Reduces the surface tension between solder mask and solder to provide low solderball frequency.
- Very low level of non-tacky residue to reduce interference with pin testing and good board cosmetics.
- Suitable for use with lead-free alloys such as 99.3Sn/0.7Cu and 96.5Sn/3.5Ag.
- Residues compatible with thermal and/or UV curable conformal coatings.

APPLICATION GUIDELINES

PREPARATION – In order to maintain consistent soldering performance and electrical reliability, it is important to begin the process with circuit boards and components that meet established requirements for solderability and ionic cleanliness. It is suggested that assemblers establish specifications on these items with their suppliers and that suppliers provide Certificates of Analysis with shipments and/or assemblers perform incoming inspection. A common specification for the ionic cleanliness of incoming boards and components is 5mg/in^2 maximum, as measured by an Omegameter with heated solution.

Care should be taken in handling the circuit boards throughout the process. Boards should always be held at the edges. The use of clean, lint-free gloves is also recommended.

FLUX CHANGEOVER PROCEDURE – The flux system (spray head, storage tanks & lines) should be clean and dry of any solvents or residues from previously used product. If the changeover is from alcohol based product to EF-3001 then the system should be purged first with IPA, followed by a DI water rinse to remove the IPA completely. Failure to comply with this recommendation will result in the clogging of the spray system and specially the spray head.

FLUX APPLICATION – EF-3001 is formulated to be applied by spray method. When spray fluxing, the uniformity of the coating can be visually checked by running a piece of cardboard over the spray fluxer or by processing a board-sized piece of tempered glass through the spray and then through the preheat section

ALPHA EF-3001 VOC-Free, No-Clean Flux

GENERAL GUIDELINES FOR MACHINE SETTINGS	
OPERATING PARAMETER	**TYPICAL LEVEL**
Amount of Flux Applied	Spray: <1200 µg/in² of solids
Top-Side Preheat Temperature	210 - 235°F (99-113°C)
Bottom-side Preheat Temperature	0 to +40°F (0 to +22°C) vs. Top-Side
Recommended Preheat Profile	Straight ramp to desired top-side temperature
Maximum Ramp Rate of Topside Temperature (to avoid component damage)	2°C/second (3.5°F/second) maximum
Conveyor Angle	5-8° (6° most common)
Conveyor Speed	3.5-6.5 feet/minute (1.0-1.8 meters/minute)
Contact Time in the Solder (includes Chip Wave and Primary Wave)	1.5-4.0 seconds (2-3 seconds most common)
Solder Pot Temperature: Sn63/Pb37 Alloy Lead-Free Alloys (99.3Sn/0.7Cu, 96.5/3.5Ag, 95.5Sn/4.0Ag/0.5Cu)	 465-500°F (240-260°C) 490-510°F (255-265°C)

These are general guidelines which have proven to yield excellent results; however, depending upon your equipment, components, and circuit boards, your optimal settings may be different. In order to optimize your process, it is recommended to perform a design experiment, optimizing the most important variables (amount of flux applied, conveyor speed, topside preheat temperature, solder pot temperature and board orientation).

FLUX SOLIDS CONTROL – If rotary drum spray fluxing, the flux solids will need to be controlled via thinner addition, in this case DI water, to replace evaporative losses of the flux solvent. As with any flux with less than 5% solids content, specific gravity is not an effective measurement for assessing and controlling the solids content. The acid number should be controlled to between 16.8 and 18.8. ALPHA's Flux Solids Control Kit #3, a digital titrator, is suggested. Request ALPHA's Technical Bulletin SM-458 for details on the kit and titration procedure. When operating a rotary drum fluxer continuously, the acid number should be checked every eight hours. Over time, debris and contaminants will accumulate in recirculating type flux applicators. For consistent soldering performance, dispose of spent flux every 40 hours of operation. After emptying the flux, the reservoir should be thoroughly cleaned with DI water.

RESIDUE REMOVAL – EF-3001 is a no-clean flux and the residues are designed to be left on the board. If desired, flux residues can be removed with Axarel 46, Bioact EC-7R, Bioact EC-15 cleaners.

TOUCH-UP/REWORK - Use of the Cleanline Write Flux Applicator with NR-205 flux and Telecore Plus cored solder is recommended for hand soldering applications.

HEALTH & SAFETY

Please refer to the Material Safety Data Sheet as the primary source of health and safety information. Inhalation of the volitalized flux activator fumes which are generated at soldering temperatures may cause headaches, dizziness and nausea.

Suitable fume extraction equipment should be used to remove the flux from the work area. An exhaust at the exit end of the wave solder machine may also be needed to completely capture the fumes. Observe precautions during handling and use. Suitable protective clothing should be worn to prevent the material from coming in contact with skin and eyes.

Cookson Electronics ASSEMBLY MATERIALS

ALPHA EF-3001 VOC-Free, No-Clean Flux

TECHNICAL SPECIFICATIONS

PARAMETERS	TYPICAL VALUES	PARAMETERS/TEST METHOD	TYPICAL VALUES
Appearance	Milky-white Liquid	pH, typical	2.55
Solids Content, wt/wt	4.2%	Recommended Thinner	DI Water
Specific Gravity @ 25°C (77°C)	1.010 ± 0.003	Shelf Life	12 months
Acid Number (mg KOH/g)	17.8 ± 1.0	VOC Content %	0.6
Flash Point (T.C.C.)	NONE	IPC J-STD-004 Designation	ORL0

CORROSION AND ELECTRICAL TESTING

CORROSION TESTING

TEST	REQUIREMENTS FOR ORL0	RESULTS
Silver Chromate Paper[1] IPC-TM 650 Test Method 2.3.33	No detection of halide	Pass
Copper Mirror Tests[1] (Modified IPC/Bellcore Method)	No complete removal of copper	Pass
Copper Corrosion Test IPC-TM 650 Test Method 2.6.15	No evidence of corrosion	Pass

J-STD-004 SURFACE INSULATION RESISTANCE

TEST	CONDITION	REQUIREMENTS[2]	RESULTS[2]
"Comb-Down" Uncleaned	85°C/85% RH, 7 days	1.0×10^{8} minimum	2.1×10^{10}
"Comb-Up" Uncleaned	85°C/85% RH, 7 days	1.0×10^{8} minimum	1.4×10^{10}
Control Boards	85°C/85% RH, 7 days	2.0×10^{8} minimum	2.5×10^{10}

IPC Test Condition (per J-STD-004): -50V, measurement @ 100V/IPC B-24 board (0.4mm lines, 0.5mm spacing).

BELLCORE SURFACE INSULATION RESISTANCE

TEST	CONDITION	REQUIREMENTS[2]	RESULTS[2]
"Comb-Down" Un-cleaned	35°C/85% RH, 5 days	1.0×10^{11} minimum	9.5×10^{11}
"Comb-Up" Uncleaned	35°C/85% RH, 5 days	1.0×10^{11} minimum	7.0×10^{11}
Control Boards	35°C/85% RH, 5 days	2.0×10^{11} minimum	3.0×10^{11}

Bellcore Test Condition (per GR 78-CORE, Issue 1): 48 Volts, measurement @ 100V/25 mil lines/50 mil spacing.

BELLCORE ELECTROMIGRATION

TEST CONDITION	SIR (INITIAL)[2]	SIR (FINAL)[2]	REQUIREMENT	RESULT	VISUAL RESULT
"Comb-Down" Uncleaned	1.2×10^{11}	1.4×10^{11}	SIR (Initial)/SIR (Final) <10	Pass	Pass
"Comb-Up" Uncleaned	3.2×10^{10}	1.1×10^{11}	SIR (Initial)/SIR (Final) <10	Pass	Pass

Bellcore Test Condition (per GR 78-CORE, Issue 1): 65°C/85% RH/500 Hours/10V, measurement @ 100V/IPC B-25B Pattern (12.5 mil lines, 12.5 mil spacing).

1 Copper Mirror and Silver Chromate Paper tests were performed using flux sample prepared by reconstituting with appropriate solvent after evaporation of its water vehicle at 100°C for one hour.

2 All values shown are in ohms.

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MSDS ID: CRL008

ALPHA EF-3001 FLUX

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: EF3001 FLUX

MANUFACTURER'S NAME: ALPHA METALS, INC
ADDRESS: 600 ROUTE 440
JERSEY CITY, NJ 07304
TRANSPORT EMERGENCY #: CHEMTREC: 1-800-424-9300

BUSINESS PHONE: 1-201-434-6778

2. INGREDIENT AND EXPOSURE LIMIT INFORMATION

CHEMICAL NAME	CAS #	% W/W	OSHA PEL - TWA
MODIFIED ROSIN	Proprietarty	2 - 5	**
DICARBOXYLIC ACID	68937-72-4	1 - 2	

** Sensitizer

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: MODERATE EYE IRRITANT.
HARMFUL BY INHALATION.
MODERATE GASTROINTESTINAL TRACT IRRITANT.
MODERATE RESPIRATORY TRACT IRRITANT.
CAUSES SKIN IRRITATION

HMIS RATING SYSTEM:
Health: 2 ; Flammability: 0 ; Reactivity: 0 ; Protection: B

NFPA RATING SYSTEM:
Health: 2 ; Flammability: 0 ; Reactivity: 0

ROUTES OF ENTRY: INHALATION; INGESTION; SKIN CONTACT; EYE CONTACT
MEDICAL CONDITIONS AGGRAVATED: NO MEDICAL CONDITIONS AFFECTED BY EXPOSURE.

IMMEDIATE (ACUTE) SYMPTOMS OVER-EXPOSURE BY ROUTE OF EXPOSURE:
INHALATION: CAN CAUSE MODERATE RESPIRATORY IRRITATION, DIZZINESS, WEAKNESS, FATIGUE, NAUSEA AND HEADACHE. MAY CAUSE AN ALLERGIC REACTION. MAY CAUSE RESPIRATORY TRACT SENSITIZATION, CHARACTERIZED BY ASTHMA-LIKE SYMPTOMS. MAY CAUSE RESPIRATORY TRACT SENSITIZATION, CHARACTERIZED BY ASTHMA-LIKE SYMPTOMS SUCH AS TIGHTNESS IN THE CHEST, DIFFICULTY BREATHING, AND WHEEZING MAY RESULT FROM PROLONGED OR REPEATED INHALATION OF DUST/PROCESSING FUMES OF THIS PRODUCT.
EYES: CAN CAUSE MODERATE IRRITATION, TEARING AND REDDENING, BUT NOT LIKELY TO PERMANENTLY INJURE EYE TISSUE.
SKIN CONTACT: CAN CAUSE MODERATE SKIN IRRITATION, DEFATTING, AND

MATERIAL SAFETY DATA SHEET

3. HAZARDS IDENTIFICATION (Cont.)

DERMATITIS. NOT LIKELY TO CAUSE PERMANENT DAMAGE. MAY CAUSE SKIN SENSITIZATION, AN ALLERGIC REACTION, WHICH BECOMES EVIDENT ON RE EXPOSURE TO THIS MATERIAL.

SKIN ABSORPTION: NO ABSORPTION HAZARD IN NORMAL INDUSTRIAL USE.

INGESTION: IRRITATING TO MOUTH, THROAT, AND STOMACH. CAN CAUSE ABDOMINAL DISCOMFORT, NAUSEA, VOMITING AND DIARRHEA.

LONG TERM (CHRONIC) HEALTH EFFECTS:

CARCINOGENICITY: NONE OF THE SUBSTANCES HAVE BEEN SHOWN TO CAUSE CANCER IN LONG TERM ANIMAL STUDIES. NOT A CARCINOGEN ACCORDING TO NTP, IARC, OR OSHA.

REPRODUCTION: NO DATA AVAILABLE TO INDICATE PRODUCT OR ANY COMPONENTS PRESENT AT GREATER THAN 0.1% MAY CAUSE BIRTH DEFECTS.

MUTACENICITY: NO DATA AVAILABLE TO INDICATE PRODUCT OR ANY COMPONENTS PRESENT AT GREATER THAN 0.1% IS MUTAGENIC OR GENOTOXIC.

4. FIRST AID MEASURES

SKIN EXPOSURE: WASH WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING AND LAUNDER. GET MEDICAL ATTENTION IF IRRITATION DEVELOPS OR PERSISTS.

EYE EXPOSURE: FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 20 MINUTES RETRACTING EYELIDS OFTEN. TILT THE HEAD TO PREVENT CHEMICAL FROM TRANSFERRING TO THE UNCONTAMINATED EYE. GET IMMEDIATE MEDICAL ATTENTION.

INHALATION: REMOVE TO FRESH AIR. IF BREATHING IS DIFFICULT, HAVE A TRAINED INDIVIDUAL ADMINISTER OXYGEN. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION AND HAVE A TRAINED INDIVIDUAL ADMINISTER OXYGEN. GET MEDICAL ATTENTION IMMEDIATELY.

INGESTION: SEEK MEDICAL ATTENTION IMMEDIATELY.

NOTES TO DOCTOR: NO ADDITIONAL FIRST AID INFORMATION AVAILABLE

5. FIRE FIGHTING MEASURES

FLAMMABILITY SUMMARY:

FLASH POINT: N/A

AUTOIGNITION TEMPERATURE: N/E

EXPLOSIVE LIMITS % IN AIR: N/E

HAZARDOUS COMBUSTION PRODUCTS: CARBON MONOXIDE, CARBON DIOXIDE

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6. ACCIDENTAL RELEASE MEASURES

PRECAUTIONS AND EQUIPMENT: EXPOSURE TO THE SPILLED MATERIAL MAY BE IRRITATING OR HARMFUL. FOLLOW PERSONAL PROTECTIVE EQUIPMENT RECOMMENDATIONS FOUND IN SECTION VIII OF THIS MSDS.

METHODS FOR CLEAN-UP: WEAR COMPLETE AND PROPER PERSONAL PROTECTIVE EQUIPMENT FOLLOWING THE RECOMMENDATION OF SECTION VIII GATHER AND STORE IN A SEALED CONTAINER PENDING A WASTE DISPOSAL EVALUATION. DO NOT USE BROOM OR AIR CLEANING ETC.

7. HANDLING AND STORAGE

HANDLING MEASURES: HARMFUL OR IRRITATING MATERIAL. AVOID CONTACTING AND AVOID BREATHING THE MATERIAL. USE ONLY IN A WELL VENTILATED AREA.
AS WITH ALL CHEMICALS, GOOD INDUSTRIAL HYGIENE PRACTICES SHOULD BE FOLLOWED WHEN HANDLING THIS MATERIAL. AVOID CONTACT WITH MATERIAL, AVOID BREATHING DUSTS OR FUMES, USE ONLY IN A WELL VENTILATED AREA. WASH THOROUGHLY AFTER HANDLING; DO NOT GET IN EYES, ON SKIN AND CLOTHING; REMOVE CONTAMINATED CLOTHING AND WASH BEPORE REUSE

STORAGE MEASURES: STORE IN A COOL DRY PLACE. ISOLATE FROM INCOMPATIBLE MATERIALS.
STORE IN A COOL DRY PLACE; KEEP CONTAINER CLOSED WHEN NOT IN USE

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

ENGINEERING MEASURES: USE LOCAL EXHAUST VENTILATION OR OTHER ENGINEERING CONTROLS TO MINIMIZE EXPOSURES AND MAINTAIN OPERATOR COMFORT.
ENGINEERING CONTROLS MUST BE DESIGNED TO MEET THE OSHA CHEMICAL SPECIFIC STANDARD IN 29 CFR 1910. USE PROCESS ENCLOSURES, LOCAL EXHAUST VENTILATION, OR OTHER ENGINEERING CONTROLS TO CONTROL AIRBORNE LEVELS BELOW RECOMMENDED EXPOSURE LIMITS

RESPIRATORY PROTECTION: RESPIRATORY PROTECTION MAY BE REQUIRED TO AVOID OVEREXPOSURE WHEN HANDLING THIS PRODUCT. GENERAL OR LOCAL EXHAUST VENTILATION IS THE PREFERRED MEANS OF PROTECTION. USE A RESPIRATOR IF GENERAL ROOM VENTILATION IS NOT AVAILABLE OR SUFFICIENT TO ELIMINATE SYMPTOMS.
FOLLOW A RESPIRATORY PROTECTION PROGRAM THAT MEETS 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS WHENEVER

MATERIAL SAFETY DATA SHEET

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION (Cont.)

	WORK PLACE CONDITIONS WARRANT THE USE OF A RESPIRATOR. WEAR A NIOSH APPROVED RESPIRATOR IF ANY EXPOSURE IS POSSIBLE.
EYE PROTECTION:	WEAR CHEMICALLY RESISTANT SAFETY GLASSES WITH SIDE SHIELDS WHEN HANDLING THIS PRODUCT. DO NOT WEAR CONTACT LENSES. WEAR GOGGLES AND A FACE SHIELD
SKIN PROTECTION:	WEAR PROTECTIVE GLOVES. INSPECT GLOVES FOR CHEMICAL BREAK-THROUGH AND REPLACE AT REGULAR INTERVALS. CLEAN PROTECTIVE EQUIPMENT REGULARLY. WASH HANDS AND OTHER EXPOSED AREAS WITH MILD SOAP AND WATER BEFORE EATING, DRINKING, AND WHEN LEAVING WORK WHERE CONTACT IS LIKELY, WEAR CHEMICAL RESISTANT GLOVES, A CHEMICAL SUIT, RUBBER BOOTS, AND CHEMICAL SAFETY GOGGLES PLUS A FACE SHIELD

CONTROL PARAMETERS:	----------ACGIH EXPOSURE LIMITS----------		
CHEMICAL NAME	TLV-TWA	STEL	CEILING
MODIFIED ROSIN	sensitizer; reduce exposure to as low as possible		

9. PHYSICAL AND CHEMICAL PROPERTIES

COLOR:	MILKY
ODOR:	NONE
SPECIFIC GRAVITY	1.01
SOLUBILITY IN WATER:	NOT DETERMINED

10. STABILITY AND REACTIVITY

INCOMPATIBLE MATERIALS: STRONG OXIDIZING AGENTS

11. TOXICOLOGICAL INFORMATION

COMPONENT TOXICOLOGY DATA (NIOSH)

CHEMICAL NAME	LD50/LC50

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12. ECOLOGICAL INFORMATION

OVERVIEW: SLIGHT ECOLOGICAL HAZARD. IN HIGH CONCENTRATIONS, THIS PRODUCT MAY BE DANGEROUS TO PLANTS AND/OR WILDLIFE.

13. DISPOSAL CONSIDERATIONS

WASTE DESCRIPTION: SPENT OR DISCARDED MATERIAL MAY BE A HAZARDOUS WASTE.
DISPOSAL METHODS: DISPOSE OF IN ACCORDANCE WITH FEDERAL, STATE, LOCAL, OR PROVINCIAL LAWS AND REGULATIONS.

14. TRANSPORT INFORMATION

15. REGULATORY INFORMATION

TSCA STATUS: ALL COMPONENTS OF THIS PRODUCT ARE LISTED ON THE TSCA INVENTORY OF EXISTING CHEMICAL SUBSTANCES.

16. OTHER INFORMATION

The information contained herein is based on data considered accurate. However, no warranty is expressed of implied regarding the accuracy of these data or the results to be obtained from the use thereof. Additionally, Alpha Metals, Inc. assumes no responsibility for injury to the vendee or third persons proximately caused by the material even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in his use of the material.

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