Solder plus Support

Teknis France

www.teknisfrance.com

M8

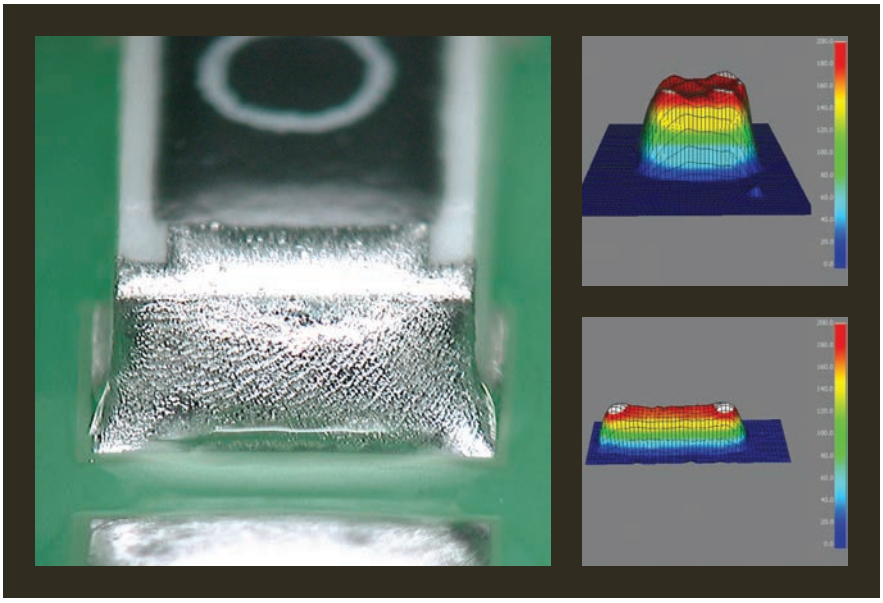
SOLDER PASTE

M8 SOLDER PASTE AT A GLANCE

- Halogen-free
- Low voiding on BGA and BTC components
- REACH and RoHS compliant
- For use with demanding, high density electronic assemblies
- High SIR/Electrically safe residue
- Formulated for use with T4 and finer powders
- Mitigates head-in-pillow

AIM, a leading global manufacturer of solder assembly materials for the electronics industry, introduces M8 Solder Paste, a high reliability no clean paste for use with SAC305 and Sn/Pb alloys.

M8 NO CLEAN SOLDER PASTE is designed for the most demanding high density electronic assemblies. An evolution of the highly successful NC258 platform, M8 brings no clean solder paste to the next level. Developed in combination with T4 and finer mesh lead-free alloy powders, M8 provides stable transfer efficiencies required for today's challenging applications. A novel activator system provides powerful, durable wetting action accommodating a wide range of profiling processes and techniques. M8 eliminates HiP defects on BGA and reduced voiding on QFN/BTC components while producing bright shiny solder joints. M8 leaves minimal, high purity residue, engineered to be safely left in place. Developed with the input of coating and cleaning industry partners, residues can be directly coated or easily removed.



EUROPE +48 42-663-60-04

M8

NEW

SOLDER PASTE

Solder plus Support

16 Questions for M8 !

Printing

- **Are you placing QFN, umBGA or 0201 components?** M8 will improve yields with high volume consistent transfer efficiencies.
- **Do you want longer open times and reduced paste consumption?** M8 will reduce use by remaining viable longer than any other paste.
- **Do you use type 4 paste?** M8 was developed with T4 and tested with T4 and finer powder.
- **Is T4 more expensive? Long lead time? Minimum orders? In stock?** M8 is standard in T4 - reducing lead time, inventory requirements, and enjoys 'preferred pricing' status.
- **Are you using the MPM Enclosed Flow?** M8 is approved for use by MPM.

Reflow

- **Would you like to reduce voiding on BTC and BGA?** M8 reduces voiding < 10% on BTC and < 5% on BGA.
- **Are you using OSP or ImSn surface finishes on your PCB?** M8 improves wetting on all surface finishes and platings.
- **Is HiP on umBGA devices a concern?** M8 transfer efficiency and wetting action reduces/eliminates HiP defects.
- **Do you need more flexibility with profiling?** M8 has a wide process window and it improves results even as a 'drop in'.
- **Are you placing 0201 devices and smaller?** M8 both prints UFP devices with marginal aspect rations and eliminates 'graping' common to UFP paste deposits.

No Clean Residue

- **Is no clean residue appearance a concern?** M8 residue is crystal clear with minimal spread.
- **Do you have high reliability requirements? (i.e. Class III)** M8 Passes both J-STD-004A and -004B and has exceptionally high SIR values. M8 is compatible with all other recommended AIM no clean products.
- **Is ICT adversely affected by no clean flux residue?** M8 residue is formulated for pin-test compatibility.
- **Do you apply conformal coating?** M8 is tested and deemed compatible with many commonly applied coatings.
- **Is your oven exhaust a maintenance issue?** Thermogravimetric Analysis (TGA) of M8 shows less volatiles are released during reflow reducing exhaust build-up and oven maintenance.
- **Are you cleaning no clean?** M8 has been tested and approved by leading cleaning chemistry manufacturers.

Link for all **SOLDER PASTE SAMPLE REQUESTS**

PasteSample.AIMsolder.com

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- For use with demanding, high density electronic assemblies
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M8 Solder Paste at a Glance

M8 Solder Paste, a high reliability no clean paste for use with SAC305 and Sn/Pb alloys, designed for the most demanding high density electronic assemblies. An evolution of the highly successful NC258 platform, M8 brings no clean solder paste to the next level. Developed in combination with T4 and finer mesh lead-free alloy powders, M8 provides stable transfer efficiencies required for today's challenging applications. A novel activator system provides powerful, durable wetting action accommodating a wide range of profiling processes and techniques. M8 eliminates HiP defects on BGA and reduced voiding on QFN/BTC components while producing bright shiny solder joints. M8 leaves minimal, high purity residue, engineered to be safely left in place. Developed with the input of coating and cleaning industry partners, residues can be directly coated or easily removed.

Solder plus Support

M8 NO CLEAN SOLDER PASTE

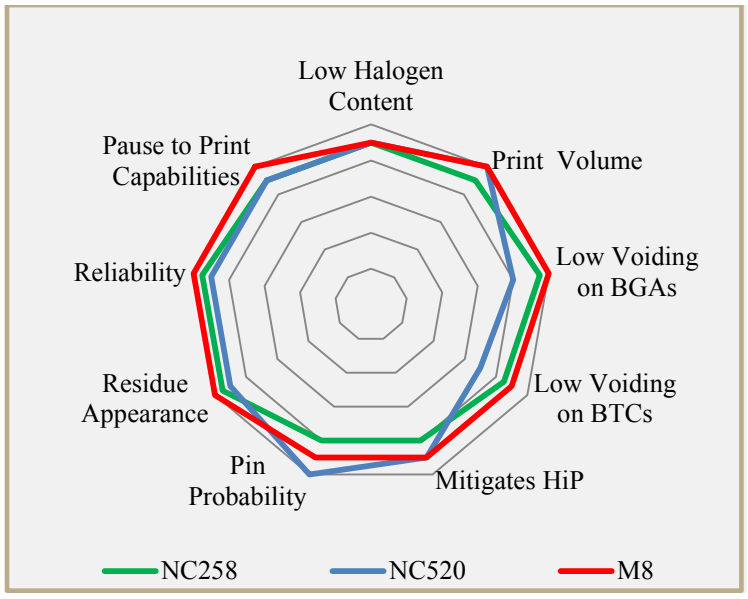
FEATURES

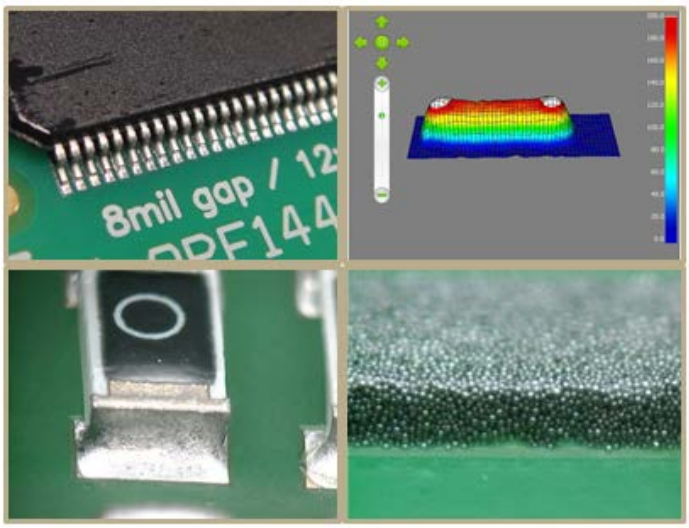
- Low Voiding: <5% on BGA and <10% on BTC Components
- Excellent Print Transfer Efficiencies on 0201 Components
- Eliminates HiP Defects
- REACH and RoHS* Compliant
- Formulated for use with T4 and Finer Powders
- Powerful Wetting on Lead-Free Surface Finishes
- Approved for use with MPM Enclosed Flow

DESCRIPTION

An evolution of the highly successful NC258 platform, M8 brings no clean solder paste performance to the next level. Developed in combination with T4 and finer mesh lead-free alloy powders, M8 provides stable transfer efficiencies required for today's UFP and umBGA devices, reducing DPMO on the most challenging applications. A novel activator system provides powerful, durable wetting action accommodating a wide range of profiling processes and techniques. M8 activators will reduce wetting related defects such as HiP (head-in-pillow) and provide smooth shiny joints. M8 has reduced BGA and BTC voiding to as low as <5% on BGA and <10% on BTC ground pads.

CHARACTERISTICS





HANDLING & STORAGE

Parameter	Time	Temperature
Sealed Shelf Life	6 months	0°C-10°C (32°F-50°F)
Open Shelf Life	1 week	22°C (72°F)

Do not add used paste to unused paste. Store used paste separately; keep unused paste tightly sealed with internal plug or end cap in place. See AIM's paste handling guidelines for further information.

CLEANING

Pre-Reflow: AIM DJAW-10 effectively removes M8 solder paste from stencils while in process. DJAW-10 can be hand applied or used in under stencil wipe equipment. DJAW-10 will not dry M8 and will enhance transfer properties. Do not over-apply DJAW-10. Do not apply DJAW-10 to stencil topside. Isopropanol (IPA) is not recommended in process, but may be used as a final stencil rinse.

Post-Reflow Flux Residue: M8 residues can remain on the assembly after reflow and do not require cleaning. Where cleaning is mandated, AIM has worked closely with industry partners to ensure that M8 residues can be effectively removed with common defluxing agents. Contact AIM for cleaning compatibility information.

*Lead-free alloys

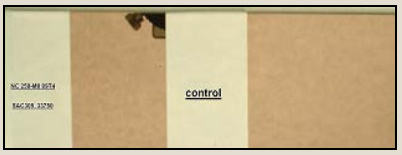
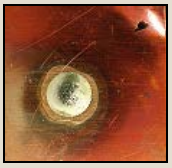
REFLOW PROFILE

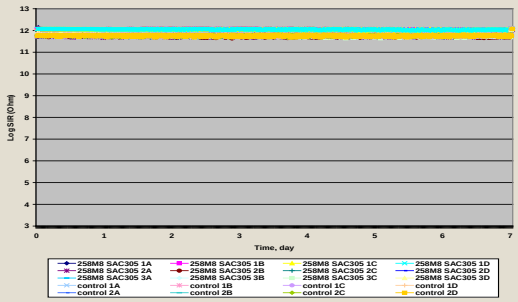
Detailed profile information may be found at http://www.aimsolder.com/reflow-profile-supplements. Contact AIM for additional information.

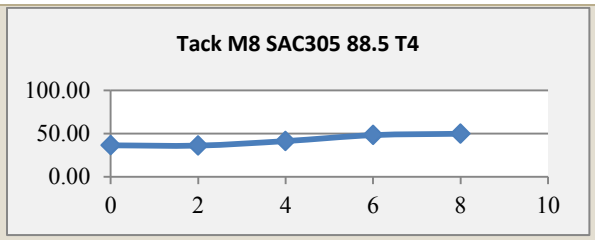
PRINTING

Recommended Initial Printer Settings - Dependent on PCB and Pad Design	
Parameter	Recommended Initial Settings
Squeegee Pressure	0.4 - 0.7kg/25mm
Squeegee Speed	13 – 152 mm/second
Snap-off Distance	On Contact 0.00 mm
PCB Separation Distance	0.75 - 2.0 mm
PCB Separation Speed	3 - 20 mm/second

TEST DATA SUMMARY

Name	Test Method	Results	
IPC Flux Classification	J-STD-004	ROL0	
IPC Flux Classification	J-STD-004B 3.3.1	ROL1	
Name	**Test Method**	**Typical Results**	**Image**
Copper Mirror	J-STD-004B 3.4.1.1 IPC-TM-650 2.3.32	LOW	
Corrosion	J-STD-004B 3.4.1.2 IPC-TM-650 2.6.15	PASS	 BEFORE  AFTER
Quantitative Halides	J-STD-004B 3.4.1.3 IPC-TM-650 2.3.28.1	Br: 0.24% Cl: 0.0% Typical	
Qualitative Halides, Silver Chromate	J-STD-004B 3.5.1.1 IPC-TM-650 2.3.33	PASS	

Qualitative Halides, Fluoride Spot	J-STD-004B 3.5.1.2 IPC-TM-650 2.3.35.1	No fluoride	
Name	**Test Method**	**Typical Results**	**Image**
Surface Insulation Resistance	J-STD-004B 3.4.1.4 IPC-TM-650 2.6.3.7	All measurements on test patterns exceed 100 MΩ	
Oxygen Bomb Halogen Testing	EN14582:2007 SW 9056 SW 5050	Br <50.1 mg/Kg Cl <125 mg/Kg	
Electrochemical Migration	J-STD-004B 3.4.1.5 IPC-TM-650 2.6.14.1	PASS	
Flux Solids, Nonvolatile Determination	J-STD-004B 3.4.2.1 IPC-TM-650 2.3.34	94.77% Typical	
Acid Value Determination	J-STD-004B 3.4.2.2 IPC-TM-650 2.3.13	135.95 mgKOH/g flux Typical	
Flux Specific Gravity Determination	J-STD-004B 3.4.2.3 ASTM D-1298	4.07 Typical	
Viscosity	J-STD-004B 3.4.2.4 IPC-TM-650 2.4.34	600 Kcp Typical	
Visual	J-STD-004B 3.4.2.5	PASS	
Slump	J-STD-005A 3.6 IPC-TM-650 2.4.35	PASS	
Solder Ball	J-STD-005A 3.7 IPC-TM-650 2.4.43	PASS	 15 min  4 hrs

Tack	J-STD-005A 3.8 IPC-TM-650 2.4.44	36.1 gf Time 0 Typical	

REFLOW PROFILE SUPPLEMENT

Solder plus Support

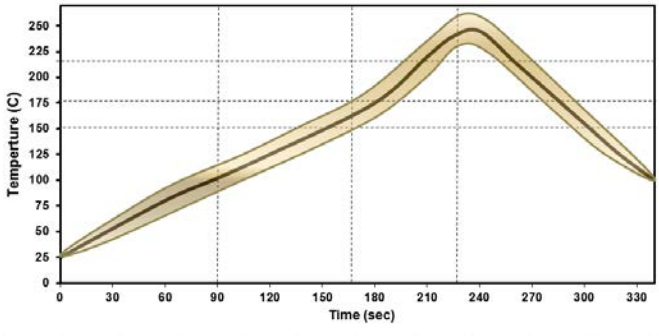
LEAD-FREE ALLOYS

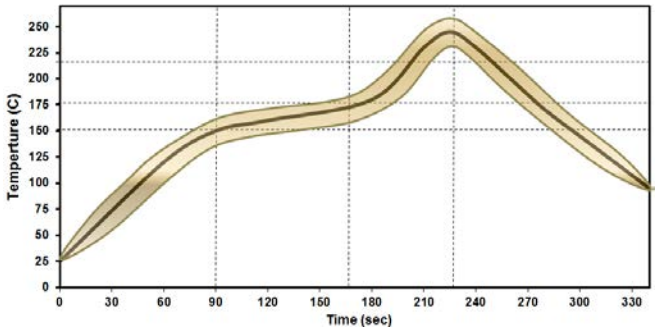
REFLOW PROFILE GUIDELINES

The information provided is a guideline only. Your profile will depend upon many factors including paste chemistry, customer requirements, component limitations, oven characteristics, board layout, etc. Ultimately, quality requirements should drive the process, not adherence to these guidelines.

Ideally, profile measurements are to be collected on a populated assembly with the reflow profile recorded for each assembly being processed. It is common for the same profile settings to be used for multiple assemblies. Reflow profile data should be collected, analyzed and recorded for each assembly part number at the beginning of individual production runs. Profile modifications are more precise when oven zone settings are adjusted rather than belt speed /profile length.

There are two basic profile types: Ramp-Soak-Spike (RSS) and Ramp-To-Spike (RTS). RTS profiles are suitable for use in most applications for enhanced solder performance. RSS profiles are appropriate when the assembly has a large thermal mass or large ΔT.





Typical **RTS** Profile
Profile Length: 3.5/4.5 minutes
Ramp Rate: 1.5-3°C/sec. to 240°C ± 15°C
Time above Liquidus: 45 seconds ± 15 seconds
Peak Temperature: 240-245°C
Cool Down Rate: 4°C per second MAX

Typical **RSS** Profile
Profile Length: 3.5/4.5 minutes
Preheat: 2-3°C/sec. for 60-90 seconds
Soak: 150-170°C for 45-75 seconds
Time above Liquidus: 45 seconds ± 15 seconds
Peak Temperature: 240-245°C
Cool Down Rate: 4°C per second MAX

Contact AIM Technical Staff for Profiling Assistance and Process Support

PROFILE TROUBLESHOOTING

Void Reduction

Solder paste is approximately 50% flux by volume and not all of this flux can be evacuated from the solder joint during reflow. Profiling techniques can be used to reduce void formation with modest improvements. Other process variables may have more significant impact.

Typical Void Reduction Profile
Profile Length: 4/4.5 minutes
Ramp: 2-3°C/sec for 60 seconds
Standard Soak: 150-170°C for 90-120 seconds
1. High Soak: 190-200°C for 60-120 seconds
2. Low Soak: 120-140°C for 60-120 seconds
Spike to Peak: 1.5-2°C per second to 240°C
Time above Liquidus: 45 sec ±15
Peak: 240-245°C
Cool Down Rate: 4°C per second MAX

BGA Head-in-Pillow (HiP) Reduction

This profile will help reduce the effects of warpage of plastic BGA packages that leads to HiP defects and may require peak temperature in penultimate heating zone.

Typical HiP Reduction Profile
Profile Length: 4/4.5 minutes
Ramp: 2-3°C/sec for 60 seconds
Soak: 150-170°C for 90-120 seconds
Spike to Peak: 1-1.5°C per second to 240-245°C
Peak: 240-245°C
HiP Cool-Down Soak: 240-220°C for 15-25 seconds
Time above Liquidus: ≥60 seconds
Cool Down Rate: 4°C per second MAX

Wetting Improvement

Wetting issues, whether component or substrate can be improved through profiling. If the wetting issue is global, it can often be improved with proper profiling technique. If the wetting issue is component specific, it is likely a plating issue with the component/substrate. Profiling can be manipulated to improve wetting, but may affect other devices on the assembly. A general approach is to shorten the profile to as little as three (3) minutes and to increase the peak temperature by 10-15°C.

Contact AIM Technical Staff for Profiling Assistance and Process Support

TROUBLESHOOTING

	Possible Cause											
Issue	**Preheat Rate Is Too High**	**Preheat Rate Is Too Low**	**Soak Zone Too Long or Too High**	**Soak Zone Too Short or Too Cool**	**Excessive Time Above Liquidus (TAL)**	**Insufficient Time Above Liquidus (TAL)**	**Peak Temp Too High**	**Peak Temp Too Low**	**Cooling Rate Too Fast**	**Cooling Rate Too Slow**	**Profile Too Long**	**Profile Too Short**
Dark residue	✓						✓					
Brittle solder joints						✓		✓			✓	✓
Frosty solder joint										✓		
Component deformation/ damage							✓					
Crazing of residue									✓			
De-wetting	✓		✓		✓		✓					
Joints/visible solder spheres						✓					✓	✓
Grainy solder joints	✓		✓		✓		✓	✓		✓	✓	✓
Excess residue						✓		✓				✓
Flux/solder paste spatter	✓											
Malleable/ weak solder joint					✓					✓		
Poor or non-wetting						✓		✓			✓	✓
Popcorning/ component damage	✓											
Solder balls/solder beads		✓										
Thermal shock/ component damage									✓			
Tombstoning			✓	✓					✓			
Voiding						✓		✓				

This defect information is specific to potential causes that are reflow profile related. Soldering defects can be caused by a myriad of other process/material variables. Please consult AIM Technical Support for targeted process and profiling assistance.

TIN/LEAD ALLOYS

REFLOW PROFILE GUIDELINES

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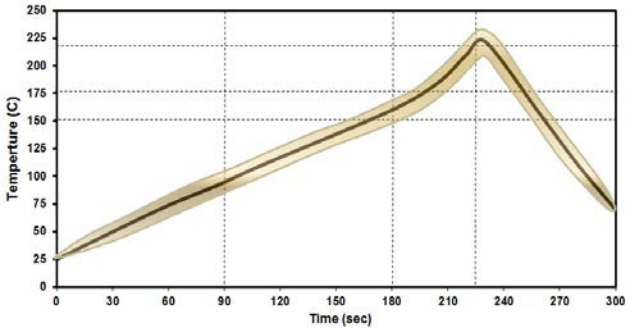
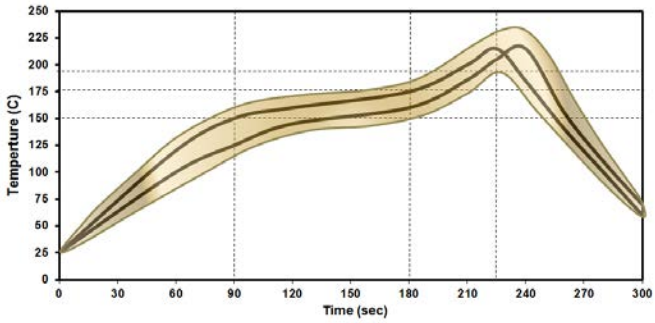


Typical **RTS** Profile
Profile Length: 3-3.5/4.5 minutes from
50°C to peak 215°C +\~ 10°C
Ramp Rate: 0.7-1.8°C per second
Time Above Liquidus: 45 seconds ± 15 seconds
Cool Down Rate: within 4°C per second



Typical **RSS** Profile
Profile Length: 3-3.5/4.5 minutes
Preheat: 2-3°C per second for 60 seconds
Soak: 150-170°C for 60 seconds
Spike to Peak: 1.5-2°C per second
Peak: 215°C +\~ 10°C
Time Above Liquidus: 45 seconds ± 15 seconds
Cool Down Rate: within 4°C per second

Wetting Improvement

Wetting issues, whether component (lead-free) or substrate related can be improved through profiling. If the wetting issue is global, it can often be improved with proper profiling technique. If the wetting issue is component specific, it is likely a plating issue with the component/substrate. Profiling can be manipulated to improve wetting, but may affect other devices on the assembly. A general approach is to shorten the profile to as little as three (3) minutes and to increase the peak temperature by 10-15°C.

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Dark residue	✓						✓					
Brittle solder joints						✓		✓			✓	✓
Frosty solder joint										✓		
Component deformation/ damage							✓					
Crazing of residue									✓			
De-wetting	✓		✓		✓		✓					
Joints/visible solder spheres						✓					✓	✓
Grainy solder joints	✓		✓		✓		✓	✓		✓	✓	✓
Excess residue						✓		✓				✓
Flux/solder paste spatter	✓											
Malleable/ weak solder joint					✓					✓		
Poor or non-wetting						✓		✓			✓	✓
Popcorning/ component damage	✓											
Solder balls/solder beads		✓										
Thermal shock/ component damage									✓			
Tombstoning			✓	✓					✓			
Voiding						✓		✓				

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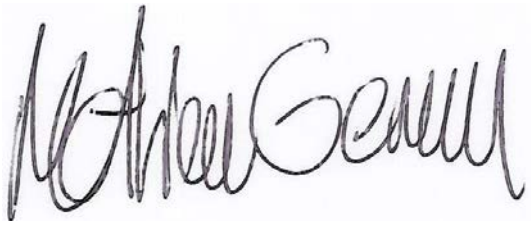
November 20th, 2014

CERTIFICATE OF RoHS 2 COMPLIANCE

We certify that the **SAC305 M8 solder paste** does not contain lead (Pb), mercury (Hg), cadmium (Cd), hexavalent chromium (CrVI), polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE)[(1)] as stated in the 2011/65/EU directive (RoHS 2).

Therefore, the **SAC305 M8 solder paste** is compliant with directive 2011/65/EU.

[(1)] This product does NOT contain any DecaBDE.



Mathieu Germain
Environmental Director

AIM
9100 Henri-Bourassa E.
Montreal (Quebec)
Canada
H1E 2S4

SAFETY DATA SHEET

SAC305 M8

SECTION 1: Identification of the substance/mixture and of the company/ undertaking

1.1 Product identifier

Product name : SAC305 M8

Product type : Solder paste.

1.2 Relevant identified uses of the substance or mixture and uses advised against

Not applicable.

1.3 Details of the supplier of the safety data sheet

AIM
9100 Henri Bourassa East
Montreal, QC
H1E 2S4
(514) 494-2000

e-mail address of person responsible for this SDS : Safetydata@aimsolder.com

1.4 Emergency telephone number

National advisory body/Poison Center

Telephone number : INFOTRAC 24h
International: (352) 323-3500
North America: (800) 535-5053

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition : Mixture

Classification according to Directive 1999/45/EC [DPD]

The product is classified as dangerous according to Directive 1999/45/EC and its amendments.

Classification : Xi; R36/38
R43
N; R50

Human health hazards : Irritating to eyes and skin. May cause sensitization by skin contact.

Environmental hazards : Very toxic to aquatic organisms.

See Section 16 for the full text of the R phrases or H statements declared above.

See Section 11 for more detailed information on health effects and symptoms.

2.2 Label elements

Hazard symbol or symbols :

Indication of danger : Irritant, Dangerous for the environment

Risk phrases : R36/38- Irritating to eyes and skin.
R43- May cause sensitization by skin contact.
R50- Very toxic to aquatic organisms.

SECTION 2: Hazards identification

Safety phrases : S2- Keep out of the reach of children.
S24- Avoid contact with skin.
S29- Do not empty into drains.
S37- Wear suitable gloves.
S46- If swallowed, seek medical advice immediately and show this container or label.
S61- Avoid release to the environment. Refer to special instructions/safety data sheet.

Hazardous ingredients : tin
silver
Rosin, hydrogenated
maleic acid

Supplemental label elements : Not applicable.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles : Not applicable.

Special packaging requirements

Containers to be fitted with child-resistant fastenings : Not applicable.

Tactile warning of danger : Not applicable.

2.3 Other hazards

Other hazards which do not result in classification : None known.

SECTION 3: Composition/information on ingredients

3.2 Mixtures : Mixture

Product/ingredient name	Identifiers	%	Classification 67/548/EEC	Classification Regulation (EC) No. 1272/2008 [CLP]	Type
tin	EC: 231-141-8 CAS: 7440-31-5	>=75 - <90	Xi; R36/38 R43	Not classified.	[1]
silver	EC: 231-131-3 CAS: 7440-22-4	>=1 - <5	Xi; R36/38 R43	Aquatic Acute 1, H400 Aquatic Chronic 1, H410	[1] [2]
Rosin, hydrogenated	EC: 266-041-3 CAS: 65997-06-0	>=1 - <5	Xi; R36/38 R43	Not classified.	[1]
tributylamine	EC: 203-058-7 CAS: 102-82-9	>=0.1 - <1	T; R25	Acute Tox. 3, H301 Aquatic Chronic 2, H411	[1]
maleic acid	EC: 203-742-5 CAS: 110-16-7 Index: 607-095-00-3	>=0.1 - <1	Xn; R22 Xi; R36/37/38 R43	Acute Tox. 4, H302 Skin Irrit. 2, H315 Eye Irrit. 2, H319 Skin Sens. 1, H317 STOT SE 3, H335 (Respiratory tract irritation) Aquatic Chronic 2, H411	[1]
copper	EC: 231-159-6	<25	N; R50	Aquatic Acute 1, H400	[1]

SECTION 3: Composition/information on ingredients

	CAS: 7440-50-8		**See Section 16 for the full text of the R-phrases declared above.**	Aquatic Chronic 1, H410 **See Section 16 for the full text of the H statements declared above.**	

There are no additional ingredients present which, within the current knowledge of the supplier, are classified and contribute to the classification of the substance and hence require reporting in this section.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment, are PBTs, vPvBs or Substances of equivalent concern, or have been assigned a workplace exposure limit and hence require reporting in this section.

Type

[1] Substance classified with a health or environmental hazard
[2] Substance with a workplace exposure limit
[3] Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII
[4] Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII
[5] Substance of equivalent concern

Occupational exposure limits, if available, are listed in Section 8.

SECTION 4: First aid measures

4.1 Description of first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

4.2 Most important symptoms and effects, both acute and delayed

Potential acute health effects

Eye contact : Irritating to eyes.

Inhalation : No known significant effects or critical hazards.

Skin contact : Irritating to skin. May cause sensitization by skin contact.

Ingestion : Irritating to mouth, throat and stomach.

SECTION 4: First aid measures

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
irritation
watering
redness

Inhalation : No specific data.

Skin contact : Adverse symptoms may include the following:
irritation
redness

Ingestion : No specific data.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture : No specific fire or explosion hazard.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
metal oxide/oxides

5.3 Advice for firefighters

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. This material is very toxic to aquatic organisms. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also Section 8 for additional information on hygiene measures.

SECTION 6: Accidental release measures

6.2 Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.

6.3 Methods and materials for containment and cleaning up

Small spill : Move containers from spill area. Avoid dust generation. Using a vacuum with HEPA filter will reduce dust dispersal. Place spilled material in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor.

Large spill : Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Dispose of via a licensed waste disposal contractor.

6.4 Reference to other sections : See Section 1 for emergency contact information.
See Section 8 for information on appropriate personal protective equipment.
See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

7.1 Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not ingest. Avoid release to the environment. Refer to special instructions/safety data sheet. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

7.2 Conditions for safe storage, including any incompatibilities

Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Seveso II Directive - Reporting thresholds (in tonnes)

Danger criteria

Category	Notification and MAPP threshold	Safety report threshold
E1: Hazardous to the aquatic environment - Acute 1 or Chronic 1	100	200
C9i: Very toxic for the environment	100	200

7.3 Specific end use(s)

Recommendations : Not available.

Industrial sector specific solutions : Not available.

SECTION 8: Exposure controls/personal protection

The information in this section contains generic advice and guidance. Information is provided based on typical anticipated uses of the product. Additional measures might be required for bulk handling or other uses that could significantly increase worker or exposure or environmental releases.

8.1 Control parameters

Occupational exposure limits

Product/ingredient name	Exposure limit values
silver	**EU OEL (Europe, 12/2009). Notes: list of indicative occupational exposure limit values** TWA: 0.1 mg/m³ 8 hours.

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

DNELs/DMELs

No DNELs/DMELs available.

PNECs

No PNECs available.

8.2 Exposure controls

Appropriate engineering controls : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

SECTION 8: Exposure controls/personal protection

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

Physical state : Solid.

Color : Not available.

Odor : Not available.

Odor threshold : Not available.

pH : Not available.

Melting point/freezing point : Not available.

Initial boiling point and boiling range : Not available.

Flash point : Not available.

Evaporation rate : Not available.

Flammability (solid, gas) : Not available.

Upper/lower flammability or explosive limits : Not available.

Vapor pressure : Not available.

Vapor density : Not available.

Relative density : Not available.

Solubility(ies) : Not available.

Partition coefficient: n-octanol/water : Not available.

Auto-ignition temperature : Not available.

Decomposition temperature : Not available.

Viscosity : Not available.

Explosive properties : Non-explosive in the presence of the following materials or conditions: open flames, sparks and static discharge, heat and shocks and mechanical impacts.

Oxidizing properties : Not available.

9.2 Other information

No additional information.

SECTION 10: Stability and reactivity

10.1 Reactivity : No specific test data related to reactivity available for this product or its ingredients.

10.2 Chemical stability : The product is stable.

10.3 Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

SECTION 10: Stability and reactivity

10.4 Conditions to avoid : No specific data.

10.5 Incompatible materials : No specific data.

10.6 Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Rosin, hydrogenated	LD50 Oral	Guinea pig	5000 mg/kg	-
	LD50 Oral	Rat	8400 mg/kg	-
tributylamine	LD50 Oral	Rat	114 mg/kg	-

Conclusion/Summary : Not available.

Acute toxicity estimates

Route	ATE value
Oral	1750 mg/kg

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
maleic acid	Eyes - Severe irritant	Rabbit	-	2 minutes 1 Percent	-

Conclusion/Summary : Not available.

Sensitization

Conclusion/Summary : Not available.

Mutagenicity

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye contact : Irritating to eyes.

Inhalation : No known significant effects or critical hazards.

Skin contact : Irritating to skin. May cause sensitization by skin contact.

Ingestion : Irritating to mouth, throat and stomach.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following:
irritation
watering
redness

SECTION 11: Toxicological information

Inhalation : No specific data.

Skin contact : Adverse symptoms may include the following:
irritation
redness

Ingestion : No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Not available.

Conclusion/Summary : Not available.

General : Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Other information : Not available.

SECTION 12: Ecological information

12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
silver	Acute EC50 1.4 µg/l Marine water	Algae - Chroomonas sp.	4 days
	Acute EC50 0.24 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 11 µg/l Fresh water	Crustaceans - Ceriodaphnia reticulata	48 hours
	Acute LC50 2.13 µg/l Fresh water	Fish - Pimephales promelas	96 hours
	Chronic NOEC 5 mg/l Marine water	Algae - Glenodinium halli	72 hours
tributylamine	Acute EC50 8 mg/l Fresh water	Daphnia - Daphnia magna	48 hours
maleic acid	Acute EC50 316200 µg/l Fresh water	Daphnia - Daphnia magna - Larvae	48 hours
	Acute LC50 5000 µg/l Fresh water	Fish - Pimephales promelas	96 hours
copper	Acute EC50 1100 µg/l Fresh water	Aquatic plants - Lemna minor	4 days
	Acute EC50 2.1 µg/l Fresh water	Daphnia - Daphnia longispina - Juvenile (Fledgling, Hatchling, Weanling)	48 hours
	Acute IC50 13 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata - Exponential growth phase	72 hours
	Acute IC50 5.4 mg/l Marine water	Aquatic plants - Plantae - Exponential growth phase	72 hours
	Acute LC50 0.072 µg/l Marine water	Crustaceans - Amphipoda - Adult	48 hours
	Acute LC50 7.56 µg/l Marine water	Fish - Periophthalmus waltoni - Adult	96 hours

SECTION 12: Ecological information

	Chronic NOEC 2.5 µg/l Marine water	Algae - Nitzschia closterium - Exponential growth phase	72 hours
	Chronic NOEC 7 mg/l Fresh water	Aquatic plants - Ceratophyllum demersum	3 days
	Chronic NOEC 0.02 mg/l Fresh water	Crustaceans - Cambarus bartonii - Mature	21 days
	Chronic NOEC 2 µg/l Fresh water	Daphnia - Daphnia magna	21 days
	Chronic NOEC 0.8 µg/l Fresh water	Fish - Oreochromis niloticus - Juvenile (Fledgling, Hatchling, Weanling)	6 weeks

Conclusion/Summary : Not available.

12.2 Persistence and degradability

Conclusion/Summary : Not available.

12.3 Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
silver	-	70	low
Rosin, hydrogenated	3.42	-	high
tributylamine	3.338	25.12	low
maleic acid	-1.3	-	low

12.4 Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Mobility : Not available.

12.5 Results of PBT and vPvB assessment

PBT : Not applicable.

vPvB : Not applicable.

12.6 Other adverse effects : No known significant effects or critical hazards.

SECTION 13: Disposal considerations

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

13.1 Waste treatment methods

Product

Methods of disposal : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction.

Hazardous waste : The classification of the product may meet the criteria for a hazardous waste.

Packaging

Methods of disposal : The generation of waste should be avoided or minimized wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

SECTION 13: Disposal considerations

Special precautions : This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

SECTION 14: Transport information

	ADR/RID	ADN	IMDG	IATA
14.1 UN number	Not regulated.	Not regulated.	Not regulated.	Not regulated.
14.2 UN proper shipping name	-	-	-	-
14.3 Transport hazard class(es)	-	-	-	-
14.4 Packing group	-	-	-	-
14.5 Environmental hazards	No.	No.	No.	No.
Additional information	-	-	-	-

14.6 Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code : Not available.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

EU Regulation (EC) No. 1907/2006 (REACH)

Annex XIV - List of substances subject to authorization

Annex XIV

None of the components are listed.

Substances of very high concern

None of the components are listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles : Not applicable.

Other EU regulations

Europe inventory : Not determined.

Integrated pollution prevention and control list (IPPC) - Air : Listed

SECTION 15: Regulatory information

Integrated pollution prevention and control list (IPPC) - Water : Listed

Seveso II Directive

This product is controlled under the Seveso II Directive.

Danger criteria

Category
E1: Hazardous to the aquatic environment - Acute 1 or Chronic 1 C9i: Very toxic for the environment

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol (Annexes A, B, C, E)

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Inform Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

International lists

National inventory

Australia : Not determined.
Canada : Not determined.
China : Not determined.
Japan : Not determined.
Malaysia : Not determined.
New Zealand : Not determined.
Philippines : Not determined.
Republic of Korea : Not determined.
Taiwan : Not determined.
United States : Not determined.

15.2 Chemical Safety Assessment : This product contains substances for which Chemical Safety Assessments are still required.

SECTION 16: Other information

Indicates information that has changed from previously issued version.

Abbreviations and acronyms : ATE = Acute Toxicity Estimate
CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
DMEL = Derived Minimal Effect Level
DNEL = Derived No Effect Level
EUH statement = CLP-specific Hazard statement
PBT = Persistent, Bioaccumulative and Toxic
PNEC = Predicted No Effect Concentration
RRN = REACH Registration Number
vPvB = Very Persistent and Very Bioaccumulative

Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

SECTION 16: Other information

Acute Tox. 4, H302
Skin Sens. 1, H317
Aquatic Acute 1, H400
Aquatic Chronic 1, H410

Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Classification	Justification
Acute Tox. 4, H302	Calculation method
Skin Sens. 1, H317	Calculation method
Aquatic Acute 1, H400	Calculation method
Aquatic Chronic 1, H410	Calculation method

Full text of abbreviated H statements :

H301	Toxic if swallowed.
H302	Harmful if swallowed.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H335 (Respiratory tract irritation)	May cause respiratory irritation. (Respiratory tract irritation)
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
H411	Toxic to aquatic life with long lasting effects.

Full text of classifications [CLP/GHS] :

Acute Tox. 3, H301	ACUTE TOXICITY (oral) - Category 3
Acute Tox. 4, H302	ACUTE TOXICITY (oral) - Category 4
Aquatic Acute 1, H400	AQUATIC HAZARD (ACUTE) - Category 1
Aquatic Chronic 1, H410	AQUATIC HAZARD (LONG-TERM) - Category 1
Aquatic Chronic 2, H411	AQUATIC HAZARD (LONG-TERM) - Category 2
Eye Irrit. 2, H319	SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2
Skin Irrit. 2, H315	SKIN CORROSION/IRRITATION - Category 2
Skin Sens. 1, H317	SKIN SENSITIZATION - Category 1
STOT SE 3, H335 (Respiratory tract irritation)	SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3

Full text of abbreviated R phrases : R25- Toxic if swallowed.
R22- Harmful if swallowed.
R36/38- Irritating to eyes and skin.
R36/37/38- Irritating to eyes, respiratory system and skin.
R43- May cause sensitization by skin contact.
R50- Very toxic to aquatic organisms.

Full text of classifications [DSD/DPD] : T - Toxic
Xn - Harmful
Xi - Irritant
N - Dangerous for the environment

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Version : 1.01

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

January 5th, 2015

REACH Product Information (REACH-161) / Non-presence of SVHC

To Whom It May Concern,

The intent of this document is to clarify how products (including packaging materials) manufactured by AIM are affected by the REACH 'Candidate List'. As supplied, there are no substances to be released from the following product as defined by article 7(1)[1] under normal or reasonably foreseeable conditions of use:

- **SAC305 M8 solder paste**

AIM confirms that, to our current knowledge, the product aforementioned (including packaging materials) manufactured by AIM do not contain any of the 161 substances listed on the Candidate list[2] of Substances of Very High Concern (SVHC), published on the ECHA website on December 17th 2014, in an individual concentration of ≥0.1% by weight.

We are committed to comply in every aspect to the requirements of REACH and relevant amendments. At present, we do not expect any anticipated SVHC to be in our products that would require reporting to the supply chain.

We anticipate this statement satisfies your concerns regarding our products and the requirements of your company, if not, please contact us and we will do our best to provide additional information.

Mathieu Germain
Environmental Director

[1] EC 1907/2006
[2] http://echa.europa.eu/chem_data/authorisation_process/candidate_list_table_en.asp