

# Halogen-free Rosin Core Solder (SR-38RMA)

Of all solders, halogen-free solder is the most considerate to people and the environment. Materials containing halogen are added to solder fluxes to increase workability but have recently gained attention because they release dioxins when burned. With this new lineup, Almit has introduced halogen-free products that manage to maintain the same workability of halogen based solder, while helping the environment.

## Halogen-free Specification

| Element       | General Required Specifications |                            |
|---------------|---------------------------------|----------------------------|
| Chlorine (Cl) | 900ppm or below                 | Total of 1500ppm or below. |
| Bromine (Br)  | 900ppm or below                 |                            |
| Fluorine (F)  | Unintended                      |                            |
| Iodine (I)    | Unintended                      |                            |

## SR-38RMA

Although these product fall under the halogen-free specification, their wettability is greater than or equivalent to competitor's halogen based RMA level products. Not only are these products RMA compliant and usable in a wide range of applications, but they can easy drop-in replacement for general halogen based products.

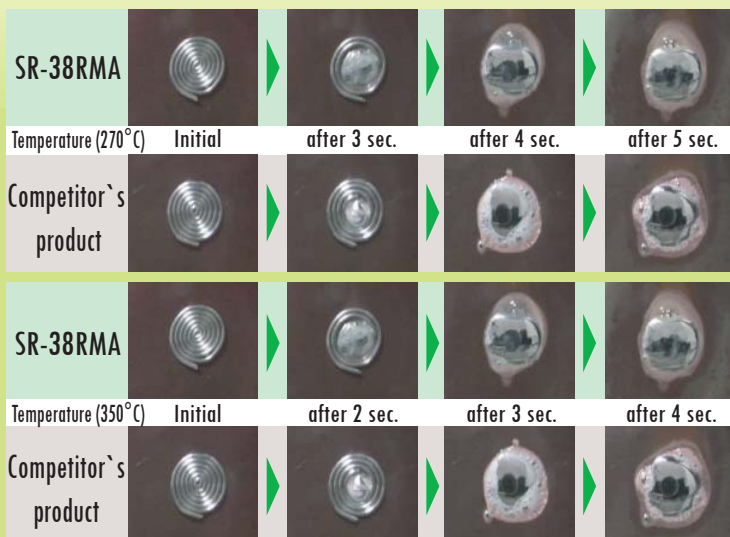
| Product Name      | SR-38RMA LFM-48        |      | Competitor's product                 |
|-------------------|------------------------|------|--------------------------------------|
| Flux Name         | SR-38RMA               |      | —                                    |
| Flux Grade        | RMA                    |      | RMA                                  |
| Alloy Name        | LFM-48                 |      | —                                    |
| Alloy Composition | Sn-3,0Ag-0,5Cu         |      | Sn-3,0Ag-0,5Cu                       |
| Meniscograph      | 270°C                  | 0,90 | 0,90                                 |
|                   | 320°C                  | 0,57 | 0,60                                 |
|                   | 370°C                  | 0,48 | 0,46                                 |
| Chlorine (Cl)     | N.D.*                  |      | N.D.*                                |
| Bromine (Br)      | N.D.*                  |      | 900ppm or above                      |
| Features          | Halogen-free RMA based |      | Halogen type RMA equivalent products |

\*N.D. = detection limit (50ppm) or lower



## Initial Wettability and Spread Comparison

Evaluation Method: Test solder is melted on an oxidized copper board. The time of the onset of wetness and time needed for wetness (wetness time) are compared using a sequence of photographs.



### Initial Wetness (270°C)

|                   | SR-38RMA        | Competitor      |
|-------------------|-----------------|-----------------|
| Onset of wetness  | after 2,07 sec. | after 2,77 sec. |
| Period of wetness | 2,03 sec.       | 2,33 sec.       |

### Spread (270°C)

|                       | SR-38RMA | Competitor |
|-----------------------|----------|------------|
| Oxidized copper board | 82,9%    | 80,7%      |
| Nickel board          | 72,3%    | 69,5%      |

### Initial Wetness (350°C)

|                   | SR-38RMA        | Competitor      |
|-------------------|-----------------|-----------------|
| Onset of wetness  | after 1,36 sec. | after 1,60 sec. |
| Period of wetness | 0,80 sec.       | 0,83 sec.       |

### Spread (350°C)

|                       | SR-38RMA | Competitor |
|-----------------------|----------|------------|
| Oxidized copper board | 84,6%    | 84,1%      |
| Nickel board          | 77,1%    | 73,1%      |

## Line-up of Rosin-Core Solder

SR-38RMA LFM-48 3,5% 0,50

Flux Name + Alloy Name + Flux Content + Wire Diameter

## Product Specifications

| Flux Name | Alloy composition       | Melting Temperature | Flux Content     | Wire Diameter (mm)             | Alloy Features             |
|-----------|-------------------------|---------------------|------------------|--------------------------------|----------------------------|
| SR-38RMA  | LFM-48 (Sn-3,0Ag-0,5Cu) | 217-220°C           | 2.5%, 3.5%, 4.5% | 0.3, 0.38, 0.5, 0.65, 0.8, 1.0 | JEITA alloy                |
|           | LFM-22 (Sn-0,7Cu)       | 227°C               | 3.5%             | 0.5, 0.65, 0.8, 1.0            | Sn-Cu eutectic             |
|           | LFM-41 (Sn-0,3Ag-2,0Cu) | 217-270°C           | 3.5%             | 0.5, 0.65, 0.8, 1.0            | Anti-copper-leaching alloy |

\* LFM-48 has been sublicensed for JP Pat.No. 3027441 and US Pat.No.5527628