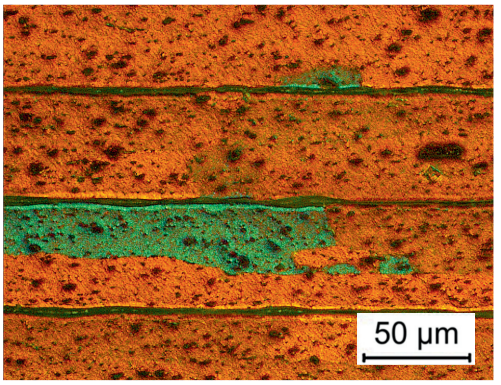
SSR high-strength clad fin material

Sapa Heat Transfer

Next generation high-strength, clad fin materials with excellent sag resistance

This alloy is suited for controlled atmosphere brazing

This new clad fin product has been designed to enhance stability during brazing, allowing a wider process window. The technology provides for lower recrystallisation temperatures, still resulting in coarse grains, very high-strength and excellent sagging resistance. In addition, the thermomechanical processing of this new fin material provides not only for the above mentioned benefits, but also for product manufacturing performance improvements such as fin forming. The unique Sapa process route for SSR allows for improvements in product manufacturing performance, particularly in fin forming. With the Sapa next-generation SSR fin, a more reliable material for your current and next generation heat exchanger applications is introduced.



Large post braze grains.

Chemical composition

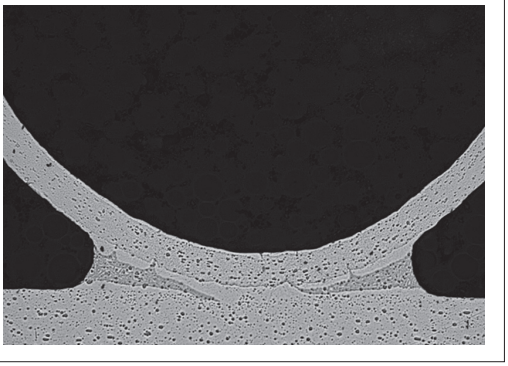
Weight %	Si	Fe	Cu	Mn	Mg	Zn	Zr
SSR 0 % Zn	0.40–0.70	<0.4	<0.04	1.4–1.8	<0.05	<0.10	0.05–0.20
SSR 0.7 % Zn	0.40–0.70	<0.4	<0.04	1.4–1.8	<0.05	0.5-0.9	0.05–0.20
SSR 1.5 % Zn	0.40–0.70	<0.4	<0.04	1.4–1.8	<0.05	1.3–1.7	0.05–0.20
SSR 2.5 % Zn	0.40–0.70	<0.4	<0.04	1.4–1.8	<0.05	2.3–2.7	0.05–0.20
AA3003	<0.6	<0.7	0.05-0.2	1.0–1.5	<0.05	<0.10	–

Melting range*	Solidus [°C]	Liquidus [°C]
SSR 1.5 % Zn	645	655
FA6815	635	655
AA3003	640	655

*as found from plate material.

Brazing

This product is designed to recrystalise at a lower temperature to a coarser grain size during the braze cycle. The coarser grain size significantly improves the sagging behavior, and it also contributes to decreasing the amount of cladding that penetrates the core of the fin. As a result, the SSR fin maintains its shape through out the braze process, with very nice fillets formed. For an illustrative comparison of sagging, watch the sagging movie at www.sapaheattransfer.com



Formed fin brazed on a MPE tube.

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Mechanical properties

Delivery condition temper and properties

	Temper	$R_{p0.2}$ [MPa]	R_m [MPa]	A_{50mm} [%]
SSR 1.5 % Zn	SSR	>140	160–200	>3
FA6815	H14SR	>160	180–220	>0.5
AA3003	H14	>125	145–185	>1

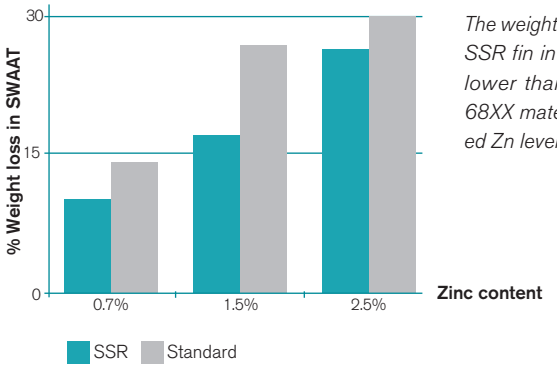
Typical properties after brazing

	$R_{p0.2}$ [MPa]	R_m [MPa]	Sag [mm]*	Conductivity** [W/mK]
SSR	65	155	10	160
FA6815	50	130	15	160
AA3003	40	110	25	145

*Measured on 70 µm material, 35 mm beam. **Calculated from electric resistivity data measured at room temperature.

Corrosion resistance

In a heat exchanger, the tube is protected from corrosion by designing the system using a fin with a corrosion potential lower than that of the tube. If the difference in corrosion potential is too large, there is a risk for a too high corrosion rate of the fin. The new SSR fin has an improved self corrosion rate as compared to a standard fin alloy, at all tested Zn levels.



The weight loss for the new SSR fin in SWAAT test is lower than the standard 68XX materials at all tested Zn levels of the fin.

Corrosion potential after brazing

	AA3003	FA6815	SSR 0 % Zn	SSR 0.7 % Zn	SSR 1.5 % Zn	SSR 2.5 % Zn
Zn (weight %)	0	1.5	0	0.7	1.5	2.5
Corrosion potential (mV vs SCE)	-720	-800	-730	-750	-800	-850

SHT process capabilities

Width	10–1400 mm	Coil size, OD	up to 1800 mm
Thickness	0.050–3.18 mm	Inner diameter, ID	254, 305, 406, 508 mm
Clad thickness	3–15 %	Coil weight	up to 7500 kg

Exceptions to the above standard capabilities could be made available upon request.

For more information, please call: +46 122 83003 (Europe)
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www.sapaheattransfer.com