14.11.2016
Revision: First issue

HUNTSMAN

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Comparison of Araldite® 2013 (Araldite® AV 144-2 / Hardener HV 997)

& Araldite® 2013-1 (Araldite® AV 144-2 / Hardener HV 997-1)

NEW PRODUCT DEVELOPMENT REPORT

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INTRODUCTION

In order to provide more user friendly and sustainable products to our customers, we have developed a new system called Araldite® 2013-1, which is equivalent in performance to the Araldite® 2013.
The following side by side report was issued to compare directly performances of the standard Araldite® 2013 with the new system Araldite® 2013-1. Processing parameters like density, mix ratios in weight & volume are the same with exception of slightly reduced reactivity.

RESULTS & DISCUSSION

Unless otherwise stated, the figures given below were all determined by testing standard specimens made by lap-jointing 114 x 25 x 1.6 mm strips of aluminium alloy. The joint area was 12.5 x 25 mm in each case. Cure condition: 16h/40°C.

Functional properties

	Araldite® 2013	Araldite® 2013-1
Aspect	Grey paste	Grey paste
Viscosity	Thixotropic paste	Thixotropic paste
Mix Ratio	100:60 weight 100:100 volume	100:60 weight 100:100 volume

Reactivity

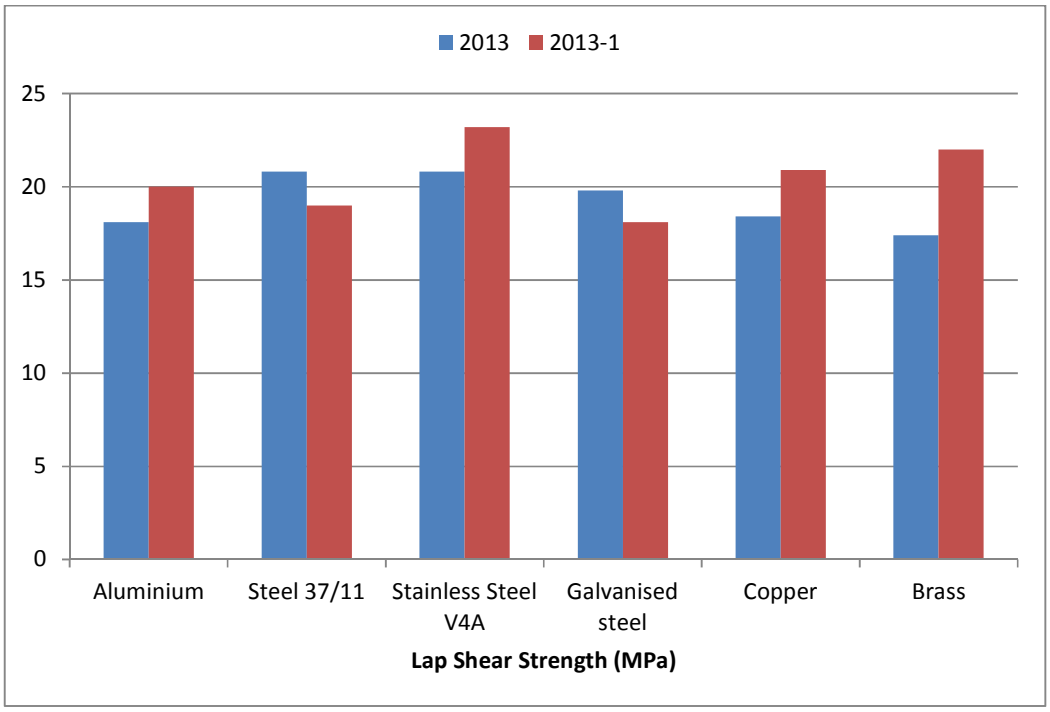
	Araldite® 2013	Araldite® 2013-1
Gel time	70 - 80 mins	80 – 90 mins

Time to reach a specific lap shear strength on sandblasted alumimium at different temperatures.

Time to reach	Araldite® 2013	Araldite® 2013-1
1 MPa @ 15°C	9h	11h
10 MPa @ 15°C	14h	16h
1 MPa @ 23°C	4h	< 5h
10 MPa @ 23°C	8h	8h30
1 MPa @ 40°C	70 min.	80 min.
10 MPa @ 40°C	130 min.	150 min.

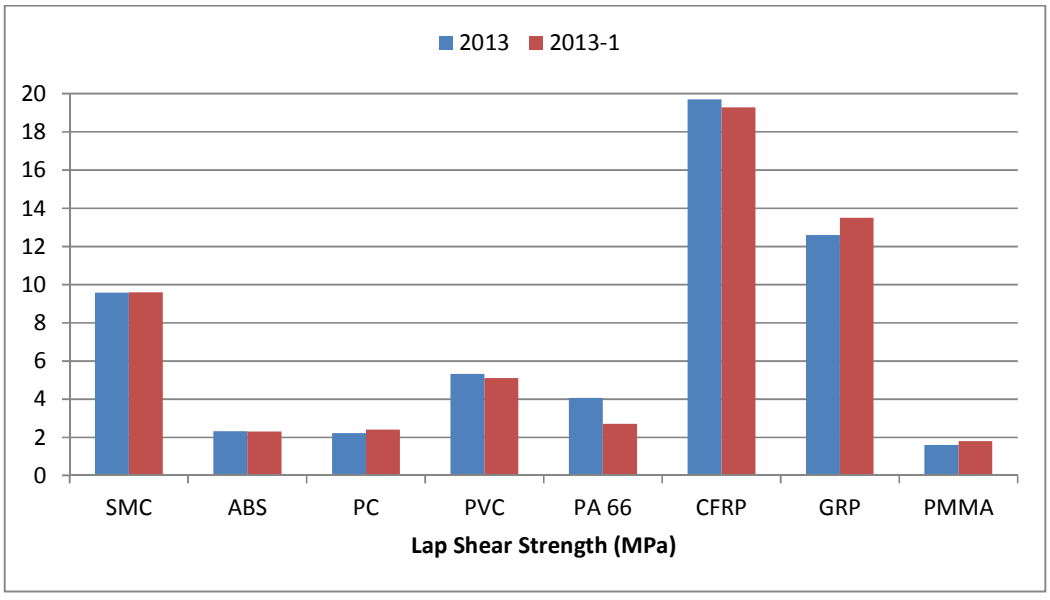
Lap Shear Strength (LSS) on metals (ISO 4587)

Pretreatment: sandblasted & degreased with acetone



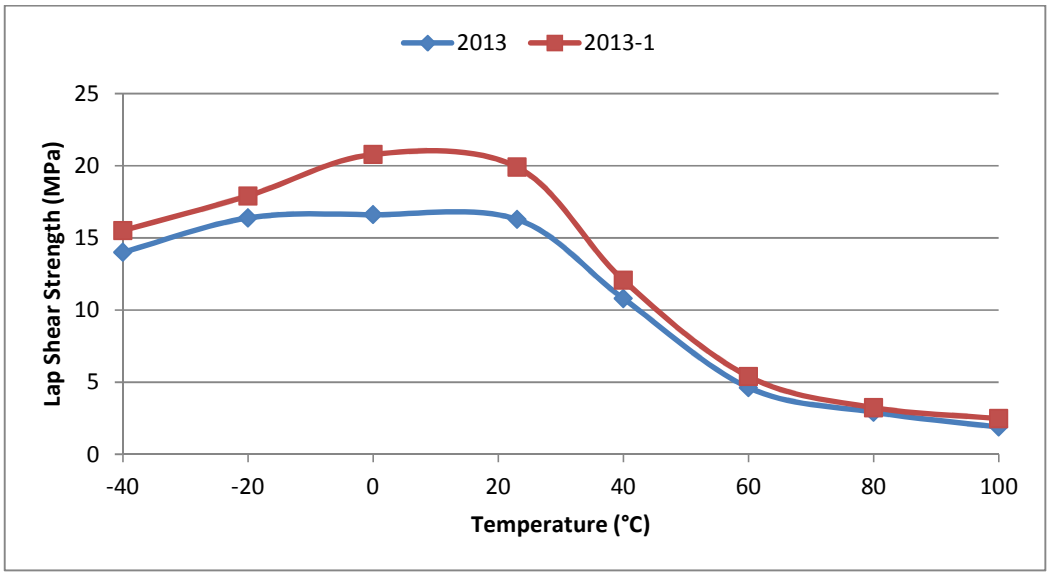
Lap Shear Strength (LSS) on plastics (ISO 4587)

Pretreatment: abraded & degreased with isopropanol

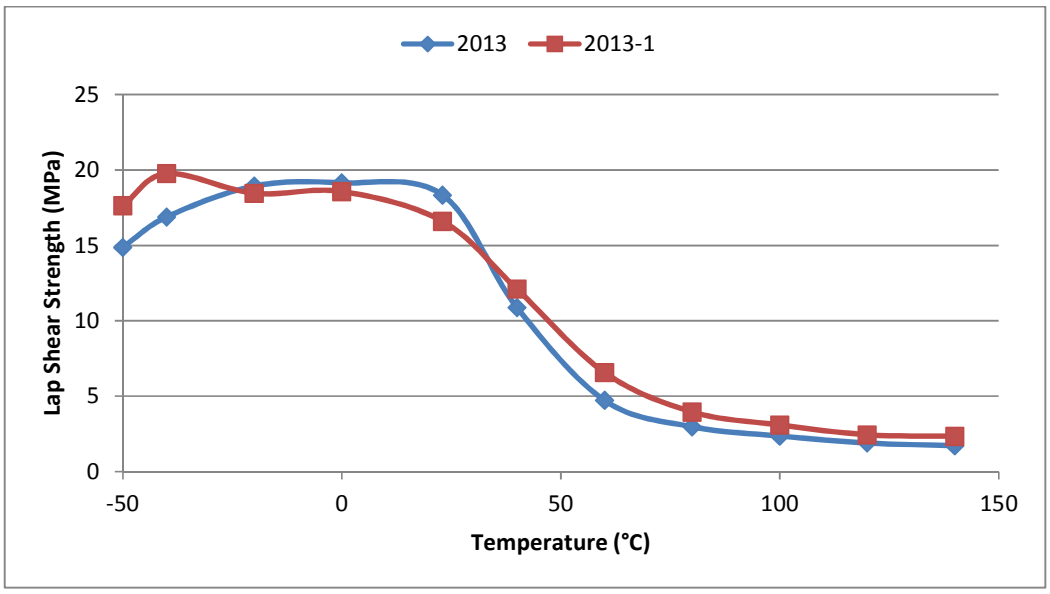


Lap Shear Strength vs temperature (ISO 4587)

Cure 7 days at RT



Cure 16 hours at 40°C



Tensile properties (ISO 527)

Cure 16 hours at 40°C

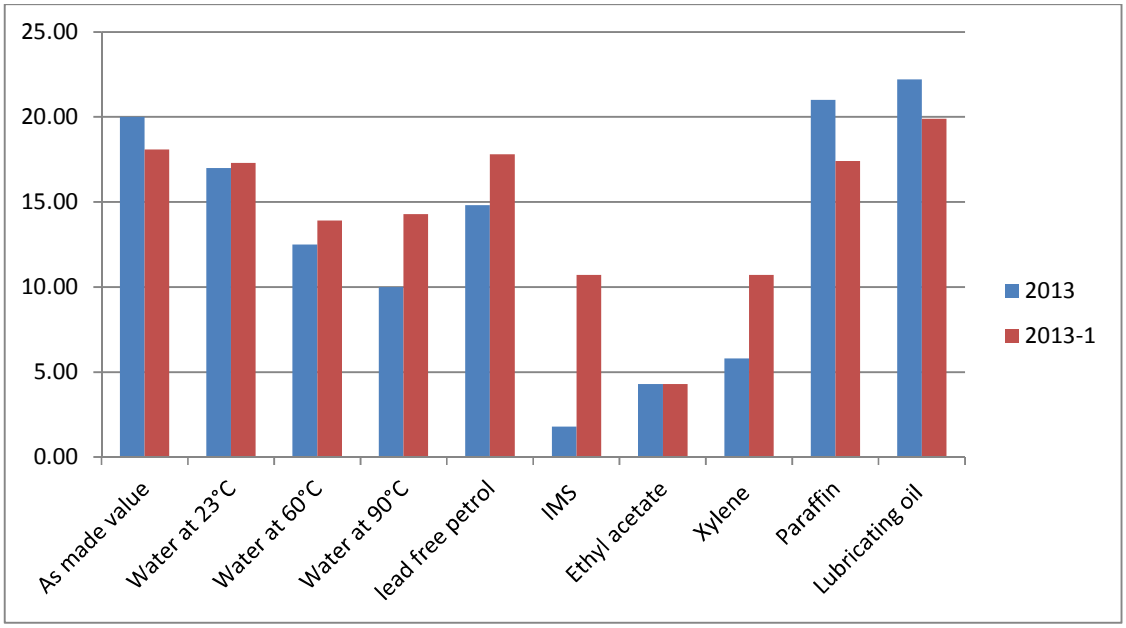
	Tensile modulus	Tensile strength	Elongation at break
Araldite® 2013	1130 MPa	24 MPa	< 5%
Araldite® 2013-1	1370 MPa	22 MPa	< 5%

Tg measurement

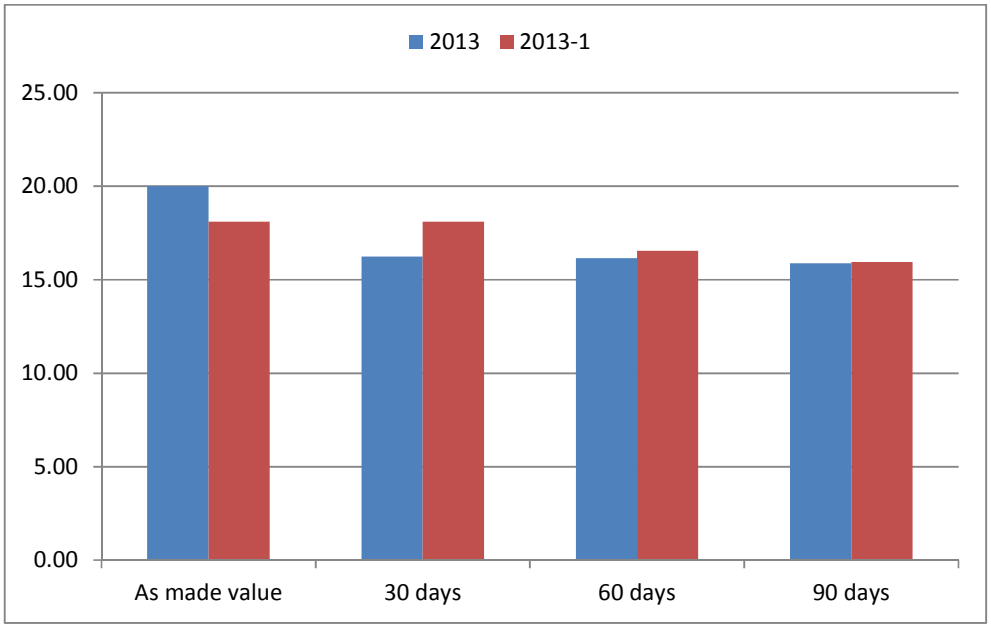
DMA – cure 16 hours at 40°C

	Araldite® 2013	Araldite® 2013-1
DSC (midpoint)	60°C	63°C

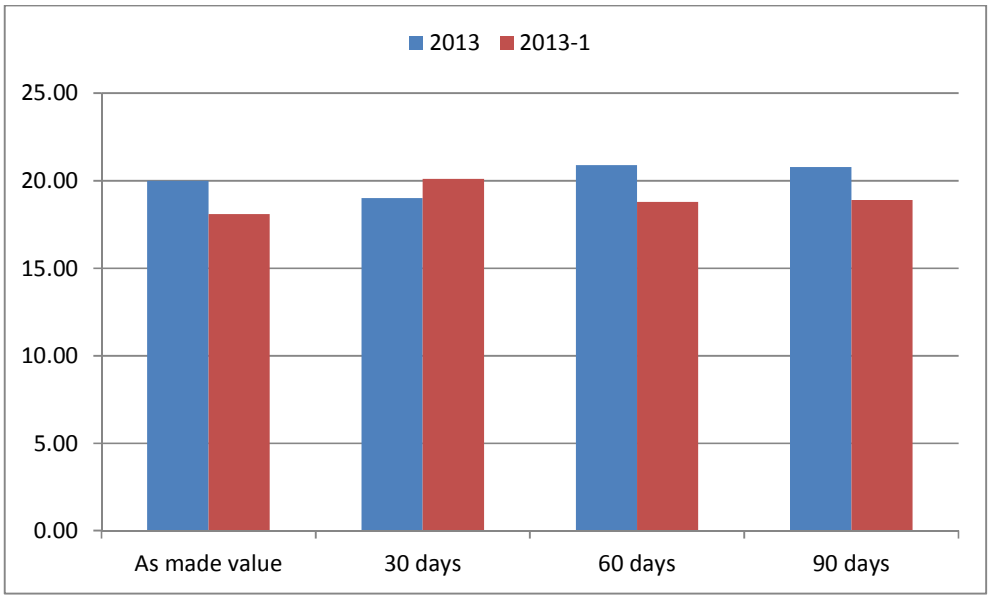
Chemical resistance: ageing tests - immersion in different media



Climatic testing : tropical weathering (40℃/ 92% humidity)



Thermal resistance : heat ageing at 70℃



CONCLUSION & RECOMMENDATIONS

We can conclude that Araldite® 2013-1 is directly equivalent to Araldite® 2013, in terms of performance and mechanical properties. However we recommend to our customers to check that the product is suitable for their specific application.

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