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# Adhesive Technical Support Europe

## Comparison of Araldite<sup>®</sup> 2014-1 (Araldite<sup>®</sup> AW 139-1 / Hardener HW 5323) & Araldite<sup>®</sup> 2014-2 (Araldite<sup>®</sup> AW 139-1 / Hardener HW 5323-1)

## 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<sup>®</sup> 2014-2, which is equivalent in performance to the Araldite<sup>®</sup> 2014-1.

The following side by side report was issued to compare directly performances of the standard Araldite<sup>®</sup> 2014-1 with the new system Araldite<sup>®</sup> 2014-2. 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  $114 \times 25 \times 1.6$  mm strips of aluminium alloy. The joint area was  $12.5 \times 25$  mm in each case. Cure condition was 16h at  $40 \,^{\circ}$ C.

#### **Functional properties**

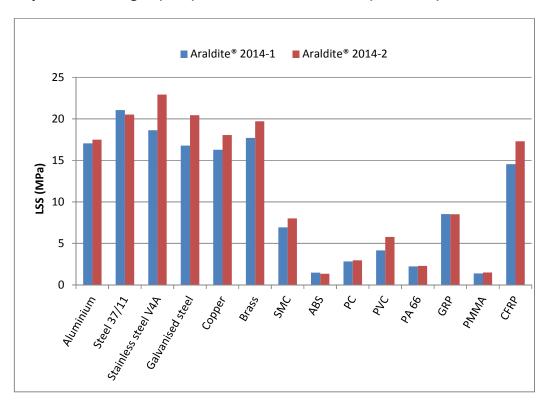
	Araldite <sup>®</sup> 2014-1	Araldite <sup>®</sup> 2014-2
Aspect	Grey paste	Grey paste
Viscosity	Thixotropic	Thixotropic
Mix Ratio	100:50 weight 100:50 volume	100:50 weight 100:50 volume

#### Reactivity

	Araldite <sup>®</sup> 2014-1	Araldite <sup>®</sup> 2014-2
Pot life	75 min.	110 min.

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

Time to reach Lap Shear Strength	Araldite <sup>®</sup> 2014-1	Araldite <sup>®</sup> 2014-2
1 MPa @ 15℃	8 hours	10 hours
10 MPa @ 15℃	14 hours	15 hours
1 MPa @ 23℃	4 hours	5 hours
10 MPa @ 23℃	7 hours	8 hours
1 MPa @ 40℃	70 min.	90 min.
10 MPa @ 40℃	100 min.	120 min.

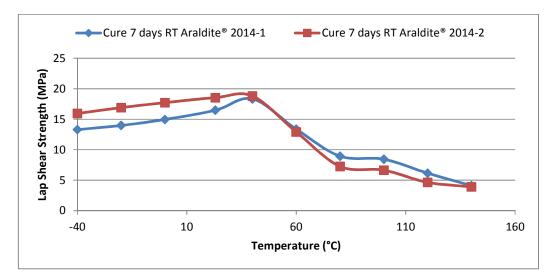


Lap Shear Strength (LSS) on different substrates (ISO 4587) at RT

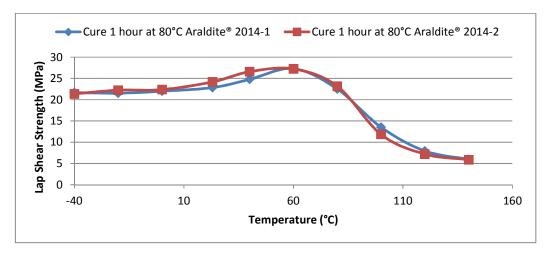
Metal substrates : sandblasted & degreased with acetone Plastic substrates : abraded & degreased with isopropanol

#### Lap Shear Strength vs temperature (ISO 4587)

Cure 7 days at RT



#### Cure 1 hour at 80°C



### Tg measurement (24h at RT + 1h at 80°C curing)

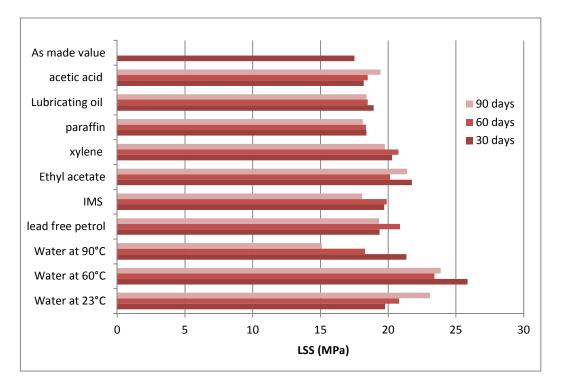
	Araldite <sup>®</sup> 2014-1	Araldite <sup>®</sup> 2014-2
DSC (midpoint)	86 <i>°</i> C	86 °C

### Chemical resistance : ageing tests - immersion in different media

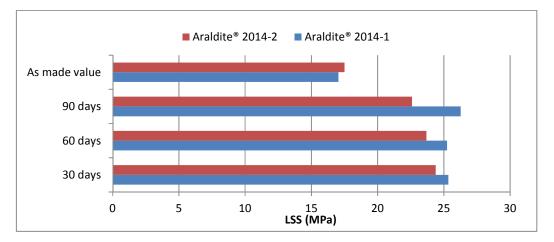
#### As made value acetic acid Lubricating oil 90 days paraffin 60 days 30 days xylene Ethyl acetate IMS lead free petrol Water at 90°C Water at 60°C Water at 23°C 0 5 10 20 25 30 15 LSS (MPa)

## Araldite<sup>®</sup> 2014-1

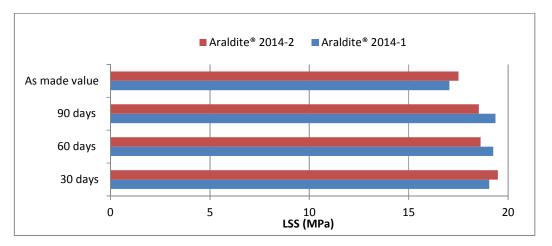
Araldite<sup>®</sup> 2014-2







### Thermal resistance : heat ageing at 70 ℃



## Tensile properties (ISO 527)

	Tensile modulus (MPa)	Tensile strength (MPa)	Elongation at break (%)
Araldite <sup>®</sup> 2014-1	3500	28	0.8
Araldite <sup>®</sup> 2014-2	3100	30	1

### Flexural properties (ISO 178)

	Flexural modulus (MPa)	Flexural strength (MPa)
Araldite <sup>®</sup> 2014-1	3800	57
Araldite <sup>®</sup> 2014-2	3500	59

#### **CONCLUSION & RECOMMENDATIONS**

We can conclude that Araldite<sup>®</sup> 2014-2 is directly equivalent to Araldite<sup>®</sup> 2014-1, 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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