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Adhesive Technical Support Europe

Comparison of Araldite[®] 2031
(Araldite[®] AV 4076-1 BK / Hardener HV 5309-1 BK)

&

Araldite[®] 2031-1
(Araldite[®] AV 4076-1 BK / Hardener HV 5310 Black)

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® 2031-1, which is equivalent in performance to the Araldite® 2031.

The following side by side report was issued to compare directly performances of the standard Araldite® 2031 with the new system Araldite® 2031-1. Processing parameters like density, mix ratio in volume are the same with exception of a slightly different mix ratio in weight and a slightly slower strength build up at low temperature.

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 conditions : 16h/40°C

Functional properties

	Hardener HV 5309-1 BK (Araldite® 2031)	Hardener HV 5310 BK (Araldite® 2031-1)
Aspect	Smooth black paste	Smooth black paste
Viscosity	Thixotropic	Thixotropic
Mix Ratio	100:117 (weight) 100:100 (volume)	100:120 (weight) 100:100 (volume)

Reactivity

	Araldite® 2031	Araldite® 2031-1
Pot life (100 g)	60 – 70 min.	60 – 70 min.

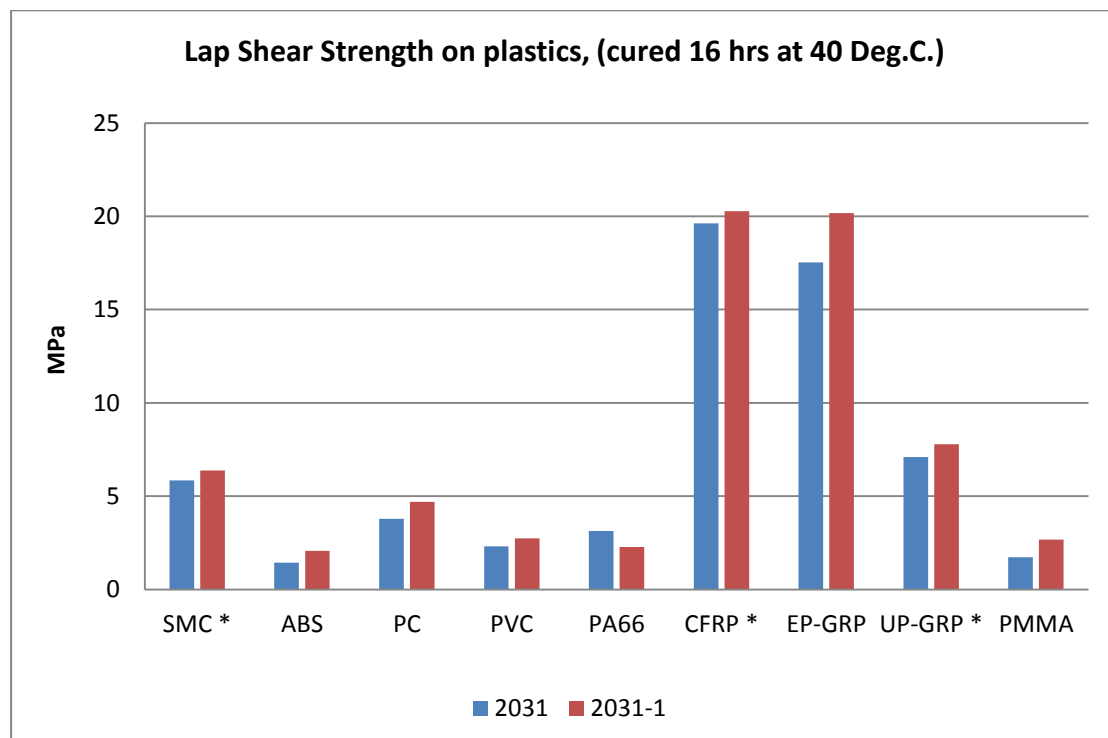
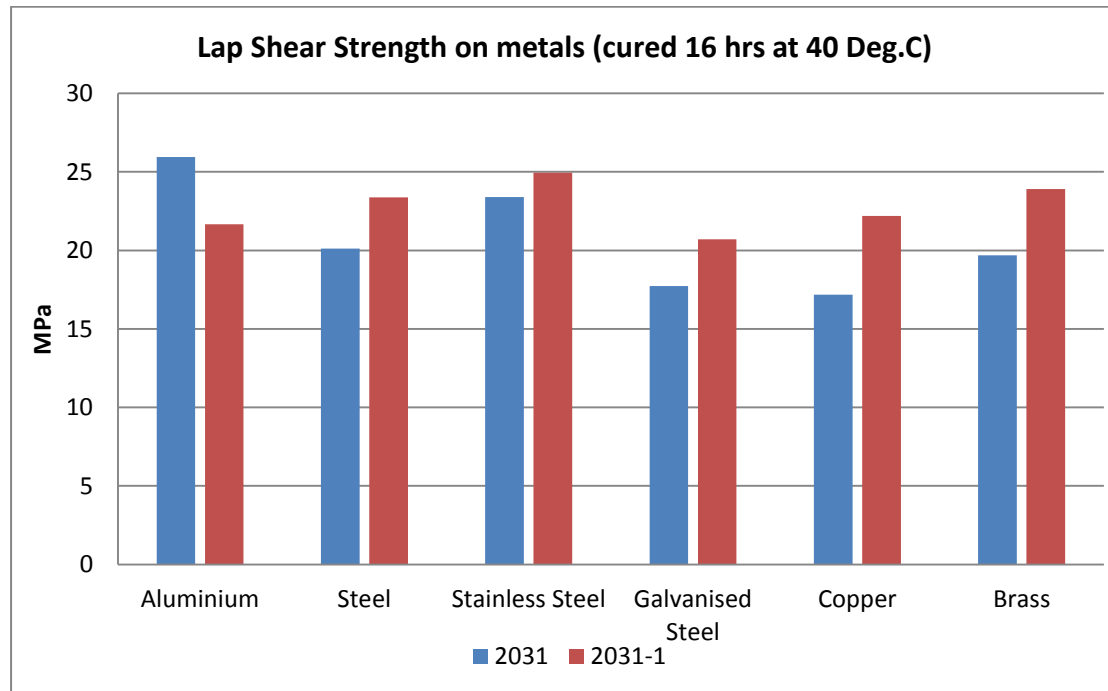
Time to reach a specific lap shear strength on sandblasted aluminium at different temperatures.

Time to reach Lap Shear Strength	Araldite® 2031	Araldite® 2031-1
1 MPa @ 15°C	8 hours	7 hours
10 MPa @ 15°C	22 hours	32 hours
1 MPa @ 23°C	4 hours	3 hours
10 MPa @ 23°C	12 hours	15 hours
1 MPa @ 40°C	70 min.	90 mins
10 MPa @ 40°C	3 hours	3 hours

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

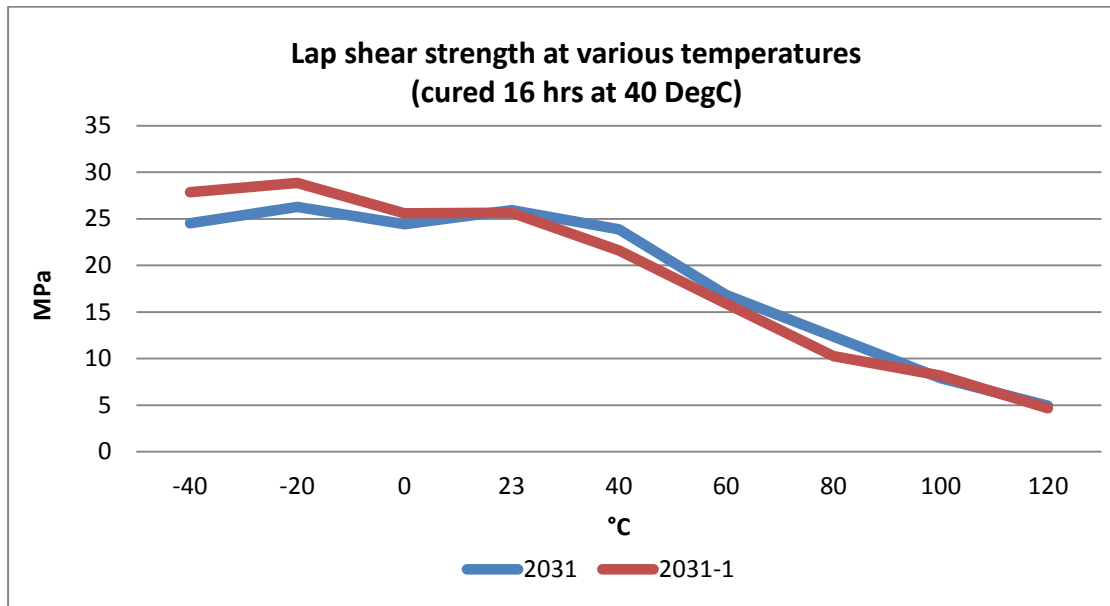
Metal substrates : sandblasted & degreased with acetone

Plastic substrates : abraded & degreased with isopropanol



* SMC / UP-GRP / CFRP: Substrate's failures

Lap Shear Strength vs temperature (ISO 4587)



Tensile properties (ISO 527)

Cure 16 hours at 40°C

	Tensile modulus (GPa)	Tensile strength (MPa)	Elongation at break (%)
Araldite® 2031	1	25	6
Araldite® 2031-1	1	23	12

Flexural properties (ISO 527)

Cure 16 hours at 40°C

	Flexural modulus (GPa)	Flexural strength (MPa)	Elongation at break (%)
Araldite® 2031	1.2	37	10
Araldite® 2031-1	1.2	37	11

Glass transition temperature (DMA) (ISO 6721)

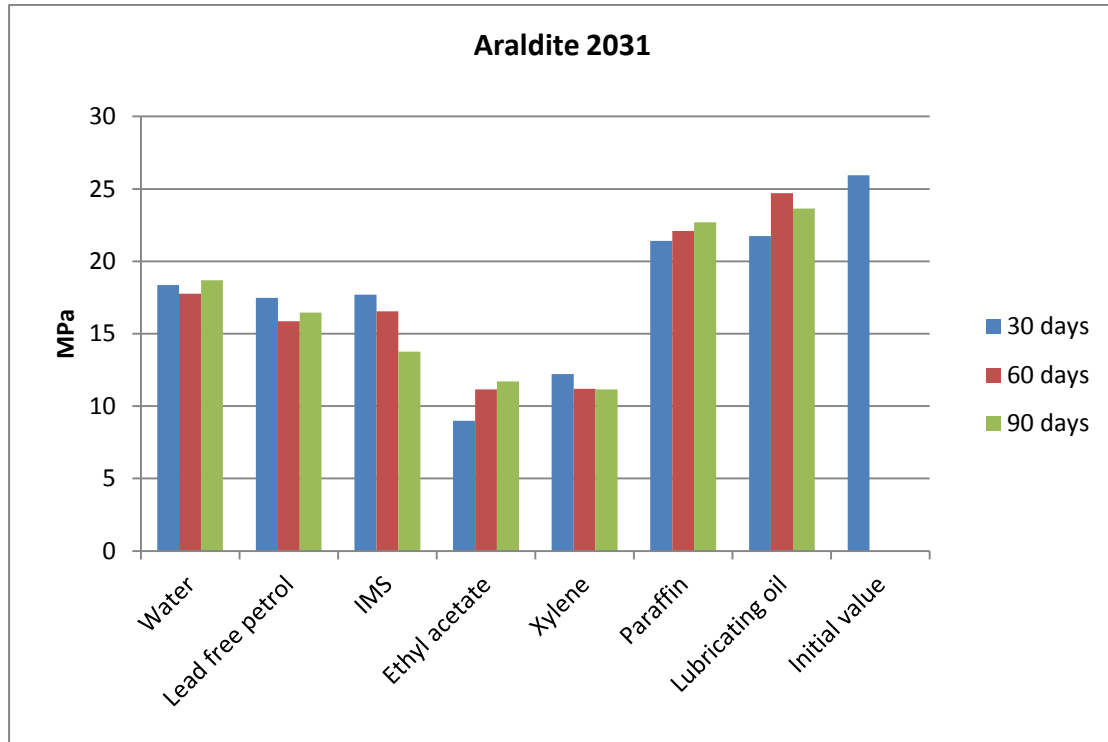
Cure 16 hours at 40°C

	Glass transition temperature by DMA (peak tan delta) (°C)
Araldite® 2031	82
Araldite® 2031-1	75

Chemical resistance : ageing tests
Immersion in different media at 23°C

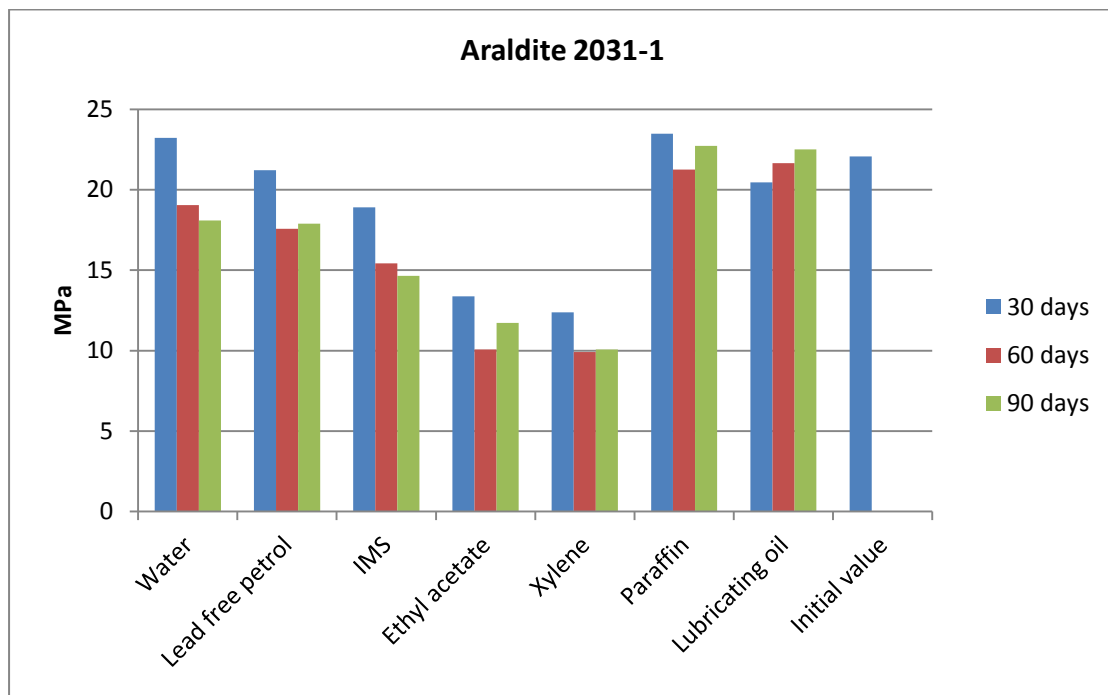
Araldite® 2031

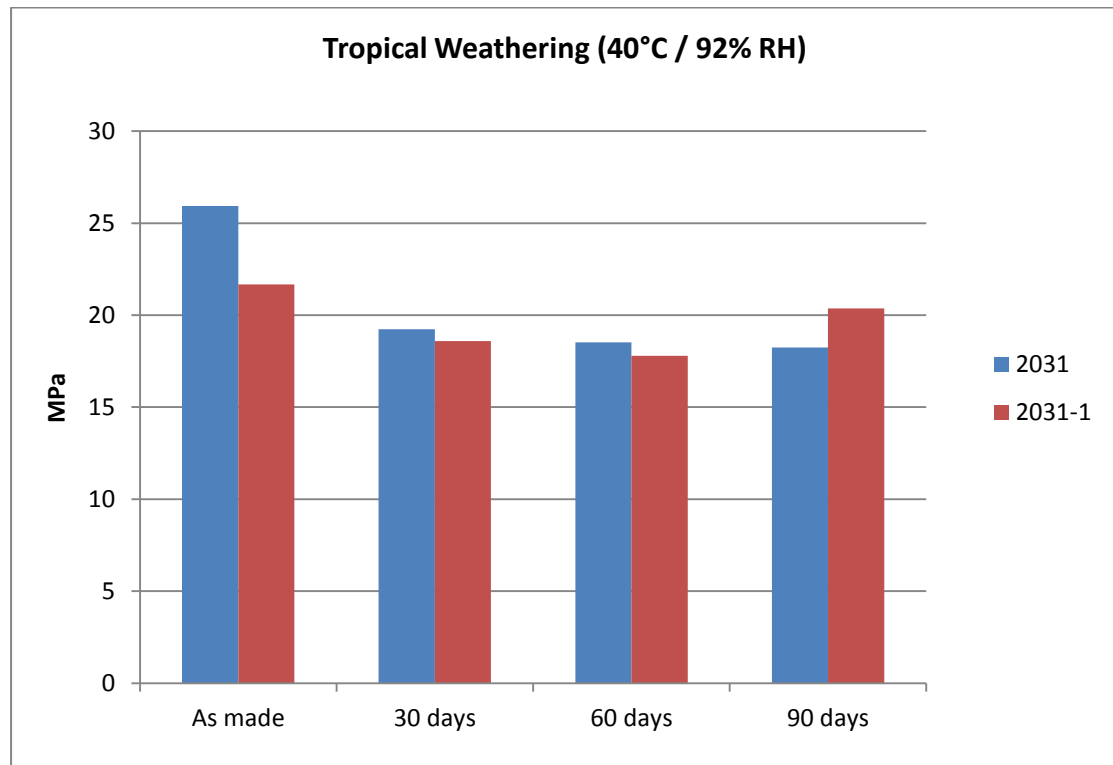
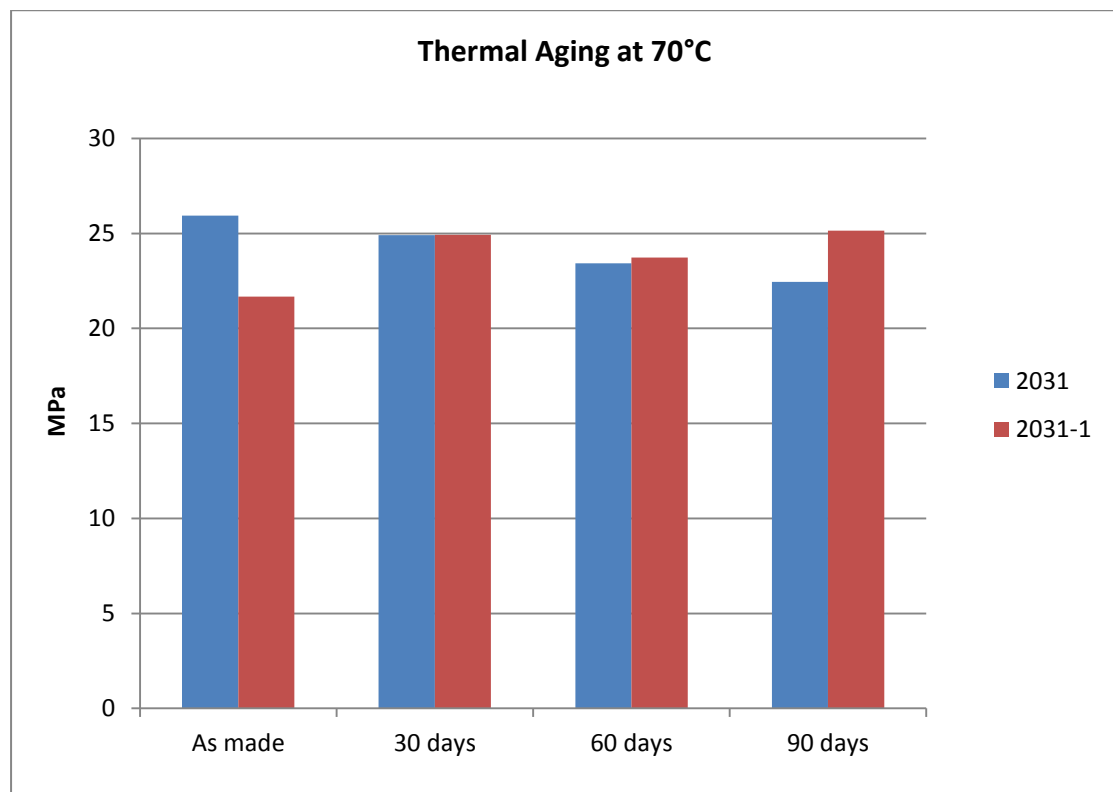
Cure 16 hours at 40°C



Araldite® 2031-1

Cure 16 hours at 40°C

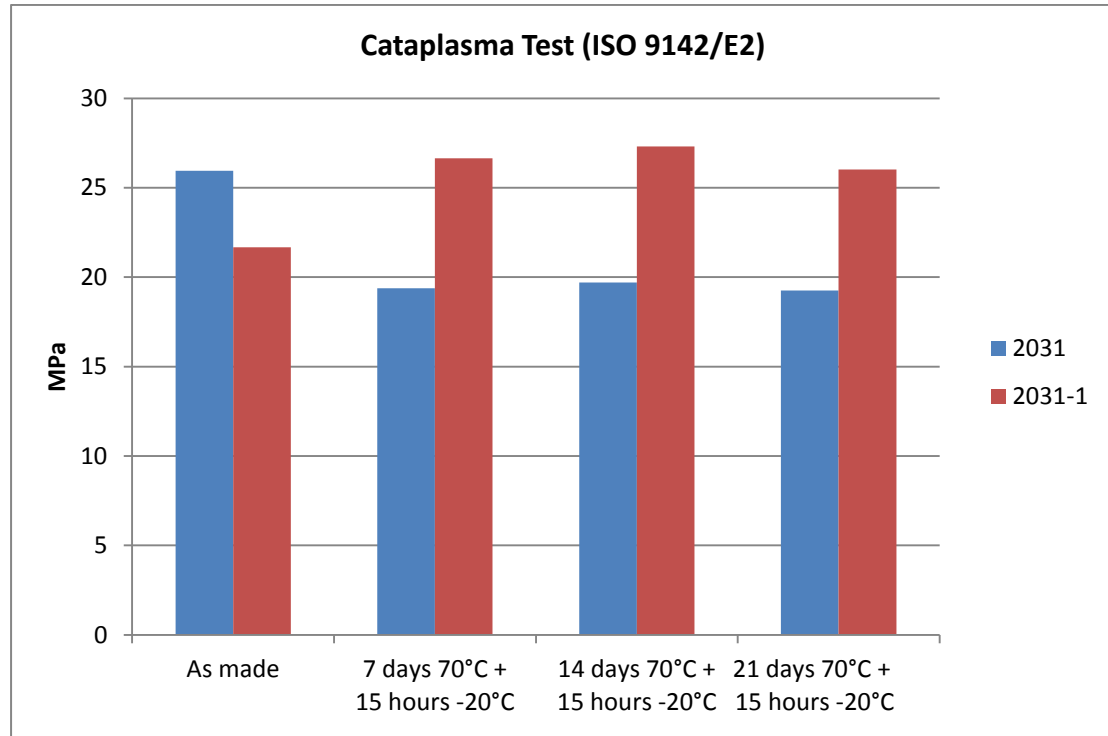


Climatic testing : tropical weathering (40°C/92% humidity)**Thermal resistance : heat ageing at 70°C**

Moisture resistance - Cataplasma test

Cure 7 days at RT

Aging according to cataplasma ISO 9142/E2 (7 days, 14 days and 21 days at 70°C in moisture + 15 hours at -20°C)



CONCLUSION & RECOMMENDATIONS

We can conclude that Araldite® 2031-1 is directly equivalent to Araldite® 2031, 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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