

HUNTSMAN

Enriching lives through innovation

Technical Support Department
Adhesives Europe

Side-by-side report
Araldite[®] 2021-1
Araldite[®] F 361-1 / Hardener F 361-1

PREPARED BY

Laurent CHOUVET
HUNTSMAN ADVANCED MATERIALS
Klybeckstrasse 200
K 401. 5
4057 BASEL
Switzerland

Email: laurent_chouvet@huntsman.com

In order to always provide the best products to our customers and to ensure the sustainability of our structural adhesive range, we have developed the system Araldite® 2021-1 (in bulk Araldite® F 361-1 / Hardener F 361-1), which replaces Araldite® 2021. This new product enables:

- a new production process with **secured sources of raw materials**;
- the consolidation of our Methyl Methacrylate (MMA) adhesives production to a **dedicated plant in EU**;
- a simplification of our internal Supply-Chain **ensuring reliable deliveries** to our customers.

PRODUCT HIGHLIGHTS

Technical features

Feature	Benefit for the customer
Good Lap Shear Strength on a variety of substrates	Multipurpose, versatile/universal use
Toughness & Resilience	Resistant to vibrations & dynamic loading, impact resistance, assembly of dissimilar substrates
Short open time	Fast handling, rapid curing, increased productivity. Suitable for high volume runs
Non sagging & gap filling	Easy processing, vertical application possible
Temperature resistance up to 100°C	Continuous operating temperature of end-part from very low temperatures to 100°C
Tolerant to non ideal surface preparation	Easy processing, increased productivity

Packaging

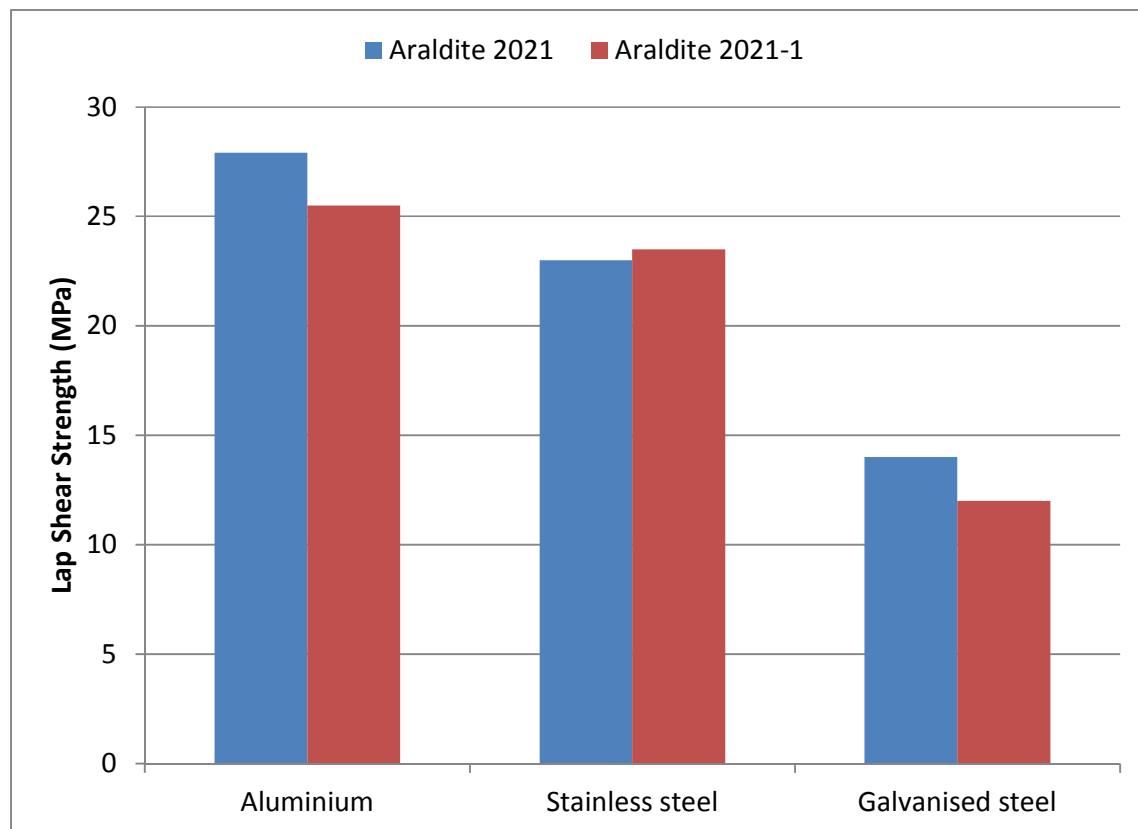
New cartridge type with special outlets avoiding cross contamination between resin and activator. This cartridge design prevents the cartridge to be blocked by cured adhesive residues after the first use.



TECHNICAL ASSESSMENT

Unless otherwise stated, the figures given below were all determined by testing standard specimens made by lap-jointing 114 x 25 x 1.5 mm strips of aluminium alloy. The joint area was 12.5 x 25 mm in each case. Cure condition was 16 hours at 40°C.

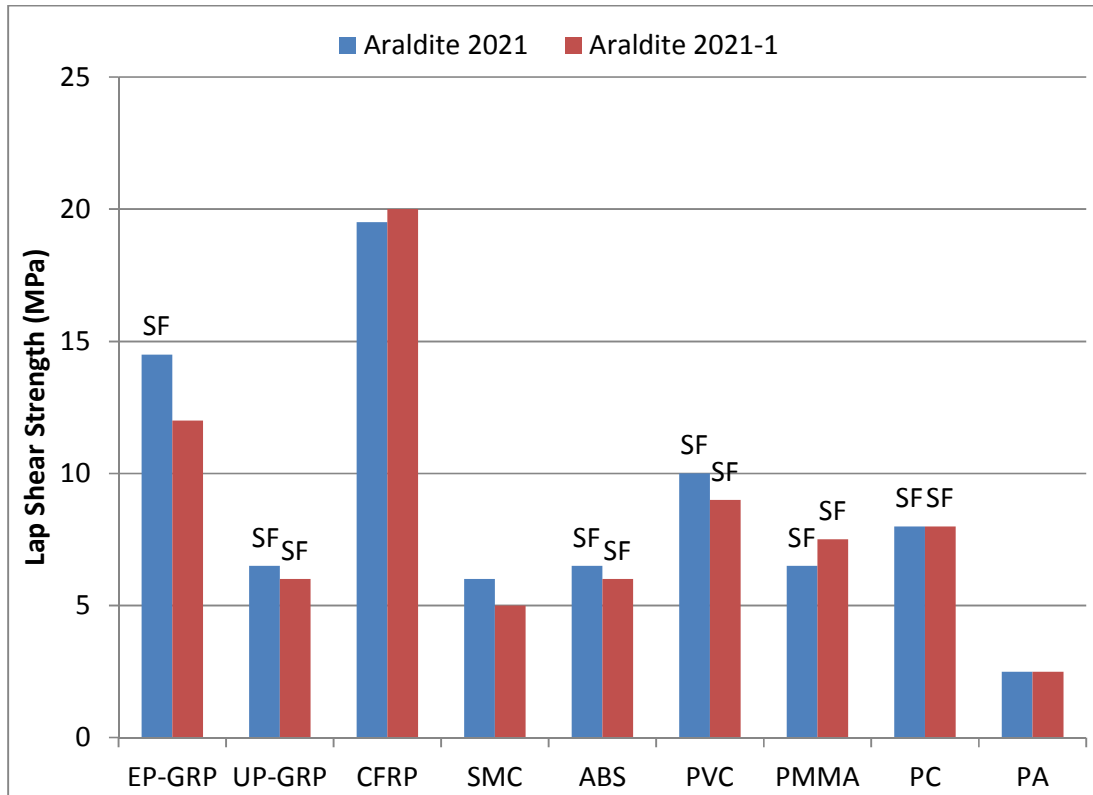
Lap Shear Strength at 23°C on different metal substrates (ISO 4587)



Substrates: sandblasted & degreased with acetone

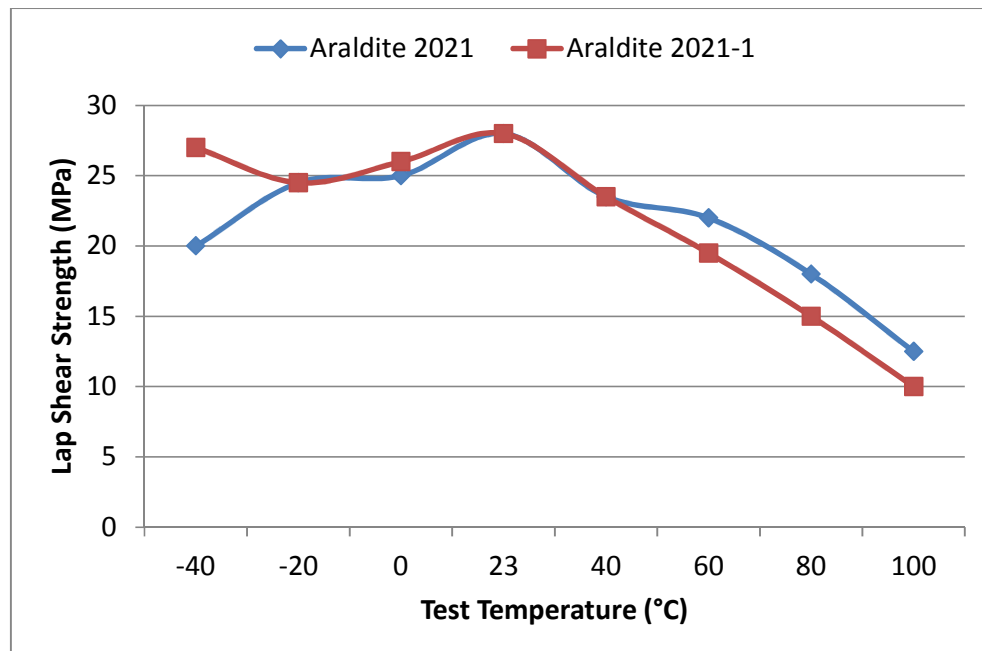
Note: Araldite® 2021-1 is not recommended to bond copper, brass and other copper alloys. Araldite® 2047-1 or Araldite® 2022-1 may be used for these substrates.

Lap Shear Strength at 23°C on plastic substrates (ISO 4587)



*Plastic substrates: abraded & degreased with isopropanol
SF: Substrate's failure*

Lap Shear Strength vs Temperature (ISO 4587)



Tensile properties (ISO 527)

	Tensile modulus	Tensile Strength	Elongation at break
Araldite® 2021	1800 MPa	36 MPa	3.4%
Araldite® 2021-1	1800 MPa	42 MPa	>5%

Chemical resistance – Lap Shear Strength on aluminium after immersion

	Araldite® 2021	Araldite® 2021-1
30 days in water at 60°C	> 15 MPa	> 15 MPa
30 days in water at 90°C		
30 days in lead free petrol at 23°C		
30 days in IMS* at 23°C		
30 days in Xylene at 23°C		
30 days in Acetic Acid at 23°C		

IMS*: Industrial Methylated Spirit.

Thermal aging :

Lap Shear Strength on aluminium after 30days heat aging at 70°C or 100 cycles - 30°C to 70°C.

	Araldite® 2021	Araldite® 2021-1
30 days at 70 °C	> 25 MPa	> 25 MPa
100 cycles (-30 °C / 70 °C)		

Reactivity: time to reach Lap Shear Strength of 1 & 10 MPa

	Araldite® 2021	Araldite® 2021-1
Time to reach 1 MPa at 23 °C	9 minutes	9 minutes
Time to reach 10 MPa at 23 °C	15 minutes	13 minutes

PACKAGING / REFERENCES**ADHESIVE**

	Reference	Content / Box
Araldite® 2021-1 50mL Cartridge	2670808	ARALDITE 2021-1 GB 6X6X50ML BL1
Araldite® 2021-1 380mL Cartridge	2675008	ARALDITE 2021-1 GB 6X380ML BL1
Araldite® F 361-1 Resin / Pail	3936308	ARALDITE F 361-1 GB 18KG Q4E
Hardener F 361-1 Hardener / Pail	3934708	HARDENER F 361-1 GB 18KG Q4E

DISPENSERS

	Reference	Designation
Manual gun for 50mL cart.	3933508	ARALDITE 2000 GUN 1:1 MMA 1 PAC 0 8 dispensers per pack
Additional Mixers for 50ML Cartridge	3959608	ARALDITE MIXER 1:1 MMA 50ML 50 PAC 00 50 mixers per pack
Manual gun for 380mL cart.	153267400	ARALDITE 2000 MAN GUN 400ML 1PCK 00
Pneumatic gun for 380mL cart.	153268500	ARALDITE 2000 AIR GUN 400ML 1PCK 00
Additional Mixers for 380 ML cartridge	3959708	ARALDITE MIXER 1:1 MMA 380ML 12 PAC 00 12 mixers per pack

CONCLUSION & RECOMMENDATIONS

Araldite® 2021-1 is directly equivalent to Araldite® 2021, in terms of performance and mechanical properties. However we recommend to our customers to check that the product is suitable for their specific application.



Huntsman Advanced Materials (Switzerland) GmbH

Klybeckstrasse 200
CH - 4057 Basel
Switzerland

Tel: +41 (0)61 299 11 11
Fax: +41 (0)61 299 11 12

www.aralditeadhesives.com

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