

AEROPASTE® 1003

AeroPaste® 1003 is a two-part, room temperature curing, toughened epoxy paste adhesive designed for out-of-autoclave structural and semi-structural bonding and assembly or repair applications.

AeroPaste® 1003 provides high strength, high toughness and excellent hot/wet properties with flexible curing schedules and ease of use.

Features and Benefits

- Good combination of high shear and peel strengths
- Service temperature up to 150°C (300°F) dry
- Good handling strength after 24 hours at 21°C (70°F)
- Good hot/wet resistance
- 2:1 mix ratio for ease of processing
- Long open time: approx 3hrs at 21°C (70°F)
- Optimised slump resistance for complex bonding configurations
- Autoclave, press and jig compatible with broad processing window

PHYSICAL PROPERTIES

Property		Method	Units	Result
Colour	Part A Part B Mixed / cured			Off-white/cream Dark green Turquoise/teal
Mix ratio		By weight By volume	parts parts	100:50 2:1
Viscosity at 25°C (77°F)	Part A Part B Mixed	(1) Materials shear thin and are thixotropic	Pas	300-3000 200-4000 100-3500
Density at 21°C (70°F)	Part A Part B Cured		g/cm ³ (lb/US gal)	1.15 (9.60) 1.03 (8.60) 1.20 (10.18)
DMA E' onset Tg	Dry (2) Dry (3) Wet (4)	D7028	°C (°F)	63 (145) 134 (273) 115 (240)
Vertical slump at 50°C (122°F)	Part A Part B Mixed (5)	D2202	mm (in)	1.5 (0.06) 0.0 (0.00) 0.4 (0.02)
Hardness after 24h/21°C (70°F)			Shore D	78

(1) Strain rate 0.1-8.0s⁻¹, 1Hz, pp25. Initial value depends on shear history of thixotropic paste prior to test

(2) Cured for 7 days/21°C (70°F)

(3) Cured for 7 days/21°C (70°F) + 1 hour/120°C (250°F)

(4) Cured for 7 days/21°C (70°F) + 1 hour/120°C (250°F), 7 days immersion in water at 21°C (70°F)

(5) Tested at 21°C (70°F) – material gels/vitrifies <30 minutes/50°C (122°F)



STORAGE

Shelf life will depend on storage conditions and frequency of use

Shelf life of A and B components at 21°C (70°F)	At least 6 months
Open time of mixed A/B material at 21°C (70°F) (max)	3 hours (100g) - Depends on mass, vessel shape and size

RECOMMENDED CURE CYCLE

Typical recommended cure cycle is for out of autoclave ambient conditions

Segment	Recommendation
Bonding pressure	Apply contact pressure of 70ksi (10psi) by means of a jig, fixture or press
Cure cycle	Maintain 20-25°C (68-77°F) for a minimum of 16 hours before removing from fixture.
	Maximum strength obtained after 2-7 days at 21°C (70°F)

ALTERNATE CURE CYCLES

There are many elevated temperature cure cycles possible for AeroPaste® 1003, for example:

Segment	Recommendation
Bonding pressure	Apply contact pressure of 70ksi (10psi) by means of a jig, fixture or press
Heating rate	1-2°C/min (2-5°F/min)
Post cure cycle	1-5 hours at 60°C -0/+5°C (140°F -0/+9°F)
Cool down	Maximum of 5°C/minute (9°F/minute) to 40-60°C (104-140°F) before removing from fixture

POST CURE CYCLE

The recommended maximum free standing post cure cycle for AeroPaste® 1003 is as follows:

Segment	Recommendation
Heating rate	1-2°C/min (2-5°F/min)
Post cure cycle	1 hour at 120°C -0/+5°C (250°F -0/+9°F)
Cool down	Maximum of 5°C/minute (9°F/minute) to 40-60°C (104-140°F) before removing from fixture



MECHANICAL PROPERTIES OF AEROPASTE® 1003

Substrate: Composite

Cure Cycle: 7 days at 21°C (70°F)

Property	Test method	Test condition °C (°F)	MPa (psi)	Conditioning
Single Lap Shear Strength	AITM 1-0019 (S13)	21 (70)	26.0 (3770)	None
		80 (176)	16.6 (2410)	
		120 (250)	11.9 (1725)	
		150 (302)	4.8 (700)	

Cycom®985-37%-T300-145 UD. Cure cycle: Autoclave heating 2°C(4°F)/min to 180°C(356°F), 2h/180°C(356°F)/90psi.

Surface preparation: removal of co-cured dry peel ply, light IMS wipe, dry air blast

Bondline controlled by addition of glass spheres of average diameter 100-200µm

Substrate: Metal

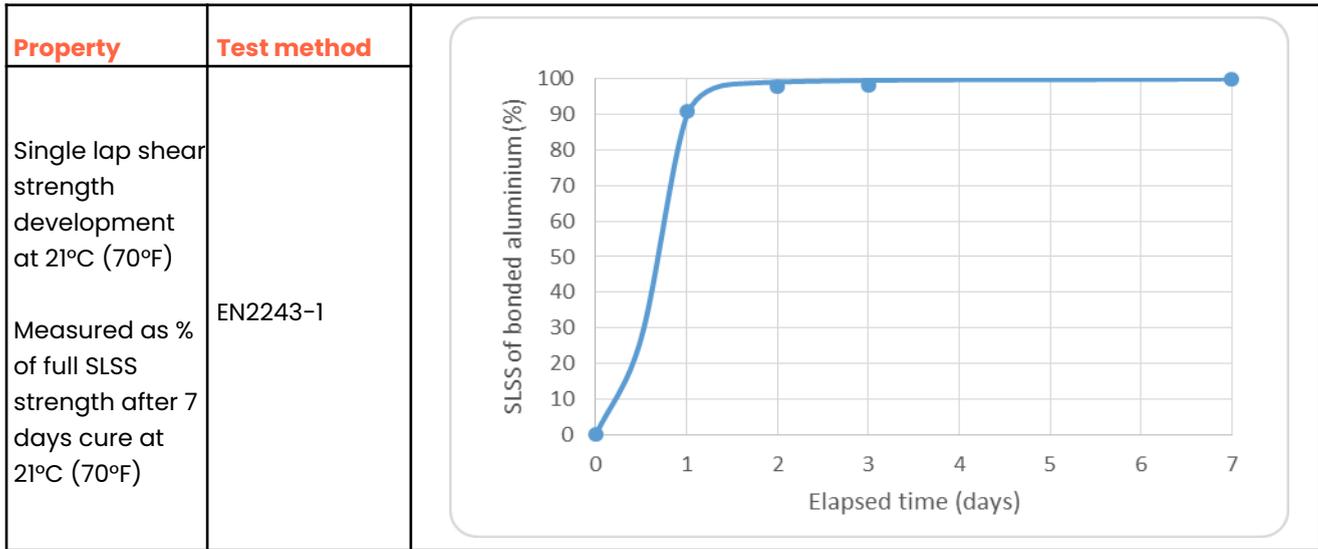
Cure Cycle: 7 days at 21°C (70°F)

Property	Test method	Test condition °C (°F)	MPa (psi)	Conditioning
Single Lap Shear Strength	EN2243-1	21 (70)	32.6 (4730)	None
		80 (176)	19.2 (2785)	
		120 (250)	14.4 (2090)	
		150 (302)	5.4 (840)	
		21 (70)	31.2 (4525)	1h/120°C (250°F) post cure
		120 (250)	13.5 (1958)	
		21 (70)	32.4 (4700)	14 days/70°C (158°F) water immersion
		120 (250)	7.2 (1045)	
		21 (70)	33.6 (4875)	1h/120°C (250°F) post cure, 14 days/70°C (158°F) water immersion
		120 (120)	10.7 (1550)	
Property	Test method	Test condition °C (°F)	N/25mm (lbf/in)	Conditioning
Metal-metal peel	EN2243-2	21 (70)	250 (56)	None
		80 (176)	150 (34)	

Substrate: Alclad aluminium 2024-T3 alloy, FPL etch, BR127 primer (2-5µm thick)

Bondline controlled by addition of glass spheres of average diameter 100-200µm





Substrate: Alclad aluminium 2024-T3 alloy, FPL etch, BRI27 primer (2-5µm thick)

Bondline controlled by addition of glass spheres of average diameter 100-200µm

EXOTHERM

AeroPaste® 1003 adhesive system is a reactive formulation which can undergo exothermic heat up during the curing process if incorrect curing procedures are followed. Great care must be taken to ensure that safe heating rates, dwell temperatures and lay-up/bagging procedures are followed. The risk of exotherm increases with material bulk and increasing cure temperature. It is strongly recommended that trials, representative of all the relevant circumstances, are carried out by the user to allow a safe cure cycle to be specified. It is also important to recognise that the model or tool material and its thermal mass, combined with the insulating effect of breather/bagging materials can affect the risk of exotherm in particular cases.

Property	Test method	Mass tested g (lb)	Maximum Temperature °C (°F)	Maximum Temperature rise °C (°F)	Time to Max Temperature (min)
Exotherm potential	ASTM D2471 in air at 22°C (72°F)	100 (0.22)	30 (86)	7 (14)	60
		200 (0.44)	105 (221)	83 (149)	117

MIXING

- Combine Part A and Part B in the correct ratio in a clean pot and mix thoroughly just prior to use, ensuring there is a uniform and consistent colour with no streaks
- Some heat build up during cure is normal
- Care should be taken when mixing quantities greater than 200g at a time as heat build-up and exotherm can occur if left in a bulk state
- Actual temperature rise will vary based on amount of paste mixed and container shape and size



SURFACE PREPARATION

- Surfaces to be bonded should be clean, dry and properly prepared depending on the type of substrate material
- Consult your Syensqo Technical Service representative for information on surface preparation

CLEAN UP

- It is important to remove any excess adhesive from the work area and application equipment before it hardens
- Excess uncured adhesive may be removed using most standard industrial solvents such as acetone and MEK

HEALTH & SAFETY

Please refer to the product SDS for safe handling, personal protective equipment recommendations and disposal considerations.

