Structural

LONG OPEN TIME, TWO-PART, INSTANT ADHESIVE

TECHNICAL DATA SHEET

Revised August 2019

PRODUCT DESCRIPTION

Born2Bond™ Structural is a high strength hybrid adhesive that provides a fast fixture time at room temperature while maintaining good processability and bond gaps up to 5mm. This product offers excellent bonding characteristics to a large variety of closed substrates, including aluminum, plastics and elastomers, but also porous substrates, such as woods, chipboard, leather, etc. Born2Bond Structural is formulated for applications that require mechanical and in-use environment resistance, and where a complete cure of excess adhesive (squeeze-out) is required. The gel consistency of the mixing, adapted for manual and automatic (robotic) dispensing, helps deliver a precise deposit and prevents adhesive flow (drips), even on vertical surfaces.

KEY FEATURES

- → High strength
- → Humidity and temperature resistance
- → Structural bonding
- → Up to 20 MPa Lap Shear depending on substrate and joint thickness
- → Instant bonding (<1 min) and long open-time (>20 min)
- → Gap filling (gel appearance)

DIRECTIONS FOR USE

1. Before applying Born2Bond Structural, make sure the surface is clean, dry and grease-free.
2. To use, Part A and Part B must be blended.
   - → Product can be applied directly from the syringe using the plunger supplied and dispensed through the recommended mixing nozzle.
3. Hold the syringe upright and insert the plunger.
   - → While keeping the syringe in an upright position, remove the cap, attach the mixing nozzle, and begin dispensing the adhesive upward until any bubbles present in the smaller component have been removed.
4. Dispense and discard a bead as long as the mixing nozzle, to ensure sufficient mixing.
5. Apply the mixed adhesive to one of the bond surfaces to be joined.
   - → Parts should be assembled immediately after the mixed adhesive has been applied.
   - → Bonds should be held by fixing or clamping until the adhesive has cured. Prevent assembled parts from moving during cure.
   - → The bond should be allowed to develop to full strength before being subjected to any service load (typically 24 hours).

APPLICATIONS

Typical applications for this product are structural bonding, magnet bonding, gap filling, sensor bonding in automotive tires, and bathroom accessory bonding (plastic to metal).

STORAGE/SHELF LIFE

Optimal storage: 2°C to 8°C (35.6°F to 46.4°F). Storage below 2°C (35.6°F) or greater than 8°C (46.4°F) can adversely affect the product's properties. If stored properly, this product has a shelf life of 12 months from the packaging date.

HEALTH/SAFETY

The Safety Data Sheet is available on the Bostik website and should be consulted for proper handling, cleanup and spill containment before use. Keep containers covered to minimize contamination.

LIMITATIONS

This product is not recommended for use in pure oxygen and/or oxygen-rich systems and should not be selected as a sealant for chlorine or other strong oxidizing materials. Material removed from containers may be contaminated during use. Do not return product to the original container. Bostik will not assume responsibility for product that has been contaminated or stored under conditions other than those previously indicated. If additional information is required, please contact your local Technical Service Center or customer service representative.

PRODUCT CHARACTERISTICS

Base Technology - Part A/B	Methoxyethyl cyanoacrylate (A) Acrylate (B)
Components - 1k/2k	2k
Mix Ratio	4:1
Appearance/Color	Transparent
Gap Filling Capacity	5mm (0.02in)
Temperature Use Range	-40°C to 120°C (-40°F to 248°F)
Open Time	25 - 35 mins
Mixer Life	25 - 35 mins (23°C / 73.4°F)
VOC Content - Part A (ISO 11890-2)	67 g/L
VOC Content - Part B (ISO 11890-2)	1 g/L

UNCURED PHYSICAL PROPERTIES

Viscosity at 25°C (77°F)* - Part A	100000 - 150000 cP @ 1.5 rpm 4000 - 7000 cP @ 50 rpm
Viscosity at 25°C (77°F)* - Part B	40000 - 80000 cP @ 1.5 rpm 1000 - 3000 cP @ 50 rpm
Specific Gravity (ASTM D1875: 23°C / 73.4°F)	1.06 g/mL (A) 1.10 g/mL (B)
Refractive Index, ABBE	1.49 - 1.50

*Based on Brookfield viscometer

CURED PHYSICAL PROPERTIES

Shore Hardness D (ISO 868-2003)	65
Soft Point - HDT (ASTM E2092-18a)	55°C (131°F)
Tensile Strength (ISO 527)	16 MPa
Elastic Modulus (ISO 527)	781 MPa
Elongation at Break (ISO 527)	17%
Glass Transition Temperature (ISO 6721)	91°C (195.8°F)
Coefficient of Linear Thermal Expansion (ISO 10545-8)	60 x 10^{-6}
Linear Shrinkage (ISO 10563)	11.5%
Water Absorption (after 24 hrs) (ASTM D-542)	1.3%
Impact Resistance (after 24 hrs) (ISO 9653)	26.6 kJ/m^2
Electrical Properties of Resistivity IEC 60093	
Surface resistivity DC 500 V (Ohm)	$3.3 \cdot 10^{14}$
Volume resistivity DC 1kV (Ohm.m)	$4.6 \cdot 10^{11}$

Corrected Dissipation Factor, Dielectric Constant IEC 60250	
D @ 1 kHz	0.01
k' @ 1 kHz	1.96
D @ 1 MHz	0.01
k' @ 1 MHz	1.84
DC breakdown voltage according to IEC 60243-2	93 kV/mm

CONVERSIONS

(°C x 1.8) + 32 = °F
kV/mm x 25.4 = V/mil
mm / 25.4 = in
µm / 25.4 = mil
N x 0.225 = lb
N/mm x 5.71 = lb/in
N/mm^2 x 145 = psi
MPa x 145 = psi
N·m x 8.851 = lb·in
N·mm x 0.142 = oz·in
mPa·s = cP

FIXTURE TIME

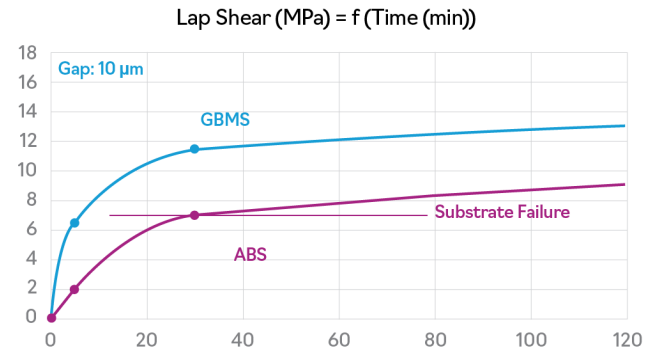
Fixture Time* (0.1N/mm)	
Stainless Steel (A316)	30 - 90 seconds
Steel (Mild Steel)	15 - 45 seconds
Aluminum (A5754)	15 - 100 seconds
Neoprene	60 - 100 seconds
EPDM	30 - 75 seconds
Rubber, Nitrile	30 - 60 seconds
ABS	35 - 100 seconds
PVC	15 - 80 seconds
Polycarbonate	40 - 120 seconds
Phenolic	120 - 150 seconds
Wood (Oak)	>15 minutes
Wood (Pine)	100 - 150 seconds
Chipboard	20 - 60 seconds
Leather	60 - 80 seconds
PC/ABS	35 - 100 seconds
Paper	45 - 90 seconds

*if stored in proper conditions

CURING SPEED VS. SUBSTRATE

The rate of cure depends on the substrate used.

The graph below shows the lap shear strength built over time on Grit-Blasted Mild Steel (GBMS) and ABS (tested according to ISO 4587).



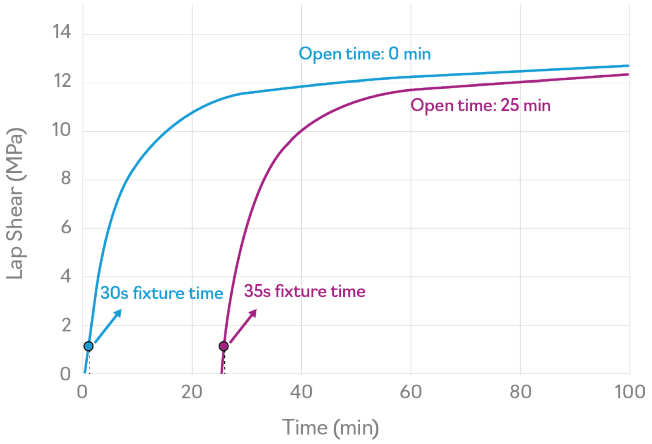
CURING SPEED VS. OPEN TIME

The rate of cure depends somewhat on the open time.

The following graph shows the fixture time (time to achieve a shear strength of 0.1 N/mm²) developed depending on the open-time (tested on grit-blasted mild steel, according to ISO 4587).

After a few seconds, the curing profile (shear strength developed over time on grit-blasted mild steel, as evaluated by lap shear strength (ISO 4587)) remains the same, and allows for the same level of performance.

The graph below shows the shear strength developed over time on grit-blasted mild steel lap shears, compared after 0 and 25 minutes of open time (tested according to ISO 4587).



CURING SPEED VS. TEMPERATURE AND HUMIDITY

The rate of cure depends on the ambient temperature.

The temperature can quicken the curing speed. Born2Bond Structural has been designed to be applied at room temperature (23°C +/- 2°C / 73.4°F +/- 3.6°F). Boundary conditions for performance bonding are between 10°C (50°F) and 40°C (140°F), with ideal conditions between 20°C (68°F) and 30°C (86°F).

Humidity can also quicken the curing speed. Boundary conditions for performance bonding are between 30%RH and 70%RH, with ideal conditions between 40%RH and 60%RH.

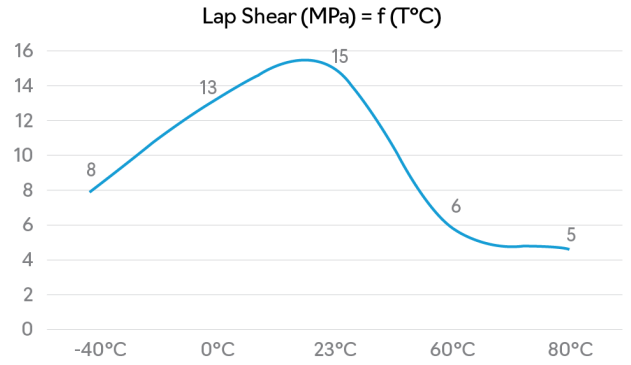
BONDING PERFORMANCE

Lap shear strength (ISO 4587) @ 23°C (73.4°F) (MPa)

@ 2 mm/min after 24 hours curing @ RT			
Grit-Blasted Mild Steel (GBMS)	14	+/- 1	
Aluminum (A5754)	12	+/- 1	
ABS	6	+/- 1	SF
PVC	5	+/- 1	
Phenolic	8	+/- 1	
Polycarbonate	7	+/- 1	SF
@ 100 mm/min after 24 hours curing @ RT			
Nitrile	0.5	+/- 0.1	SF
Neoprene	0.3	+/- 0.1	SF
@ 2 mm/min after 1 week curing @ RT			
Steel (grit-blasted)	15	+/- 1	

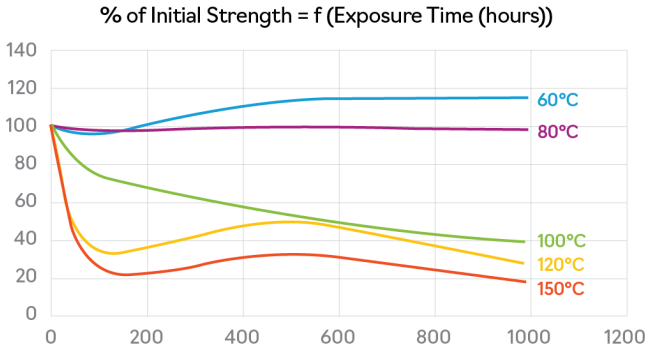
TYPICAL ENVIRONMENTAL RESISTANCE

The graph below shows the adhesive performance on grit-blasted, mild steel (GBMS) at various temperatures. The adhesive was cured for one week at 22°C (71.6°F). The lap shear strength was tested according to ISO 4587. The strength test was performed in a climatic chamber that was set up for 30 minutes before testing at the indicated temperatures.



HOT STRENGTH

The graph below shows the heat aging results. The adhesive was aged at the temperature indicated, tested at 22°C (71.6°F) and cured for one week. The lap shear strength was tested according to ISO 4587 on grit-blasted, mild steel (GBMS).



CHEMICAL/SOLVENT RESISTANCE

Aged under conditions indicated and tested @ 23°C (73.4°F).

% of Initial Strength vs. Exposure Time (hours) and vs. Type of Contaminant				
Testing on GMBS		% of Initial Strength		
ENVIRONMENT	TEMP	100 H	500 H	1000 H
Motor Oil	23°C (73.4°F)	104	103	95
Ethanol	23°C (73.4°F)	92	62	51
Gasoline	23°C (73.4°F)	91	82	82
IPA	23°C (73.4°F)	98	87	85
Water	23°C (73.4°F)	91	83	83
95% rH	40°C (104°F)	84	82	69

HEAT/HUMIDITY RESISTANCE

Aged under conditions indicated and tested @ 23°C (73.4°F).

% of Initial Strength vs. Exposure Time (hours)			
	% of Initial Strength		
ENVIRONMENT - 95% RH & 40°C (104°F)	100 H	500 H	1000 H
GBMS	84	82	69
Polycarbonate	62	82	71

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