NUMBER 5169

Pliogrip™ Impact 3540 / 3.5

Introduction

Pliogrip Impact 3540 is a series of two component room temperature curing polyurethane adhesive systems offering a unique combination of flexibility and strength. The systems distinguish themselves with excellent specific adhesion to thermoplastic materials as well as to coated metals.

Amongst the advantages in plastic bonding and repair applications they offer a well-balanced profile of easy application, gap filling and optimised trimming (sanding) properties. Greatly enhanced impact toughness sets it apart from other commercial two-component plastic bonding and repair systems.

Pliogrip 3540 is available in reactivity variants from 30 sec to 45 min open time. Unlike most other two-component polyurethane adhesives, Pliogrip 3540 systems are not H351 (former R40) classified.

The unique chemistry of these polyurethane adhesives systems allow non-yellowing white variants.

PLIOGRIP IMPACT	3540 / 0.5	3540 / 1.5	3540 / 3.5	3540 / 5	3540 / 10	3540 / 45
Open Time (Bead Gel)	20-30 sec	70-115 sec	3-4 min	4-6 min	8-12 min	45-60 min
Handling Time (0.7MPa)	3-4 min	8-10 min	15-20 min	20-30 min	40-50 min	4-5 h
Sanding Time	5-6 min	10-12 min	30-40 min	40-60 min	1-1.5 h	8-10 h

Colour versions: generally available in Black (B) or White (W)
All data refer to 23˚C ambient temperature. Lower temperatures will prolong the cure; higher temperatures will accelerate the cure..

Product Benefits

- Excellent specific adhesion to thermoset composite materials such as SMC, BMC, CFRP, RTM, to thermoplastic materials such as PUR-RIM, ABS-PC, PA, PC and coated metals.
- Enhanced adhesion to PE and PP (non-structural)
- Structural bonding, sealing and repair in one product
- Fact cure response at room temperature
- Heat acceleration optional to achieve short cycle times
- Excellent impact resistance
- Contains no MDI, improved health and safety classification
- Easy processing from cartridge

Nominal Component Properties

	Pliogrip™ 35	**Pliogrip™ 40**
Chemistry**:**	Isocyanate Pre-polymer	Polyol Curative
Colour:	White	black or white
Viscosity mPa s at 100 s-1:	11.000	8.000
Specific Gravity:	1.3	1.3
Ratio by weight:	100	100
Ration by volume:	100	100

Typical Cure Characteristics of the Mixed Adhesive

	Temperature	**Time**
Open Time* (Ashland PGDEV-022, Bead Gel Time	@ 23˚C	3-4 min
Handling Time** (0.7 MPa in cross-peel strength)	@ 23˚C	15-20 min
Sanding Time	@ 23˚C	30-40 min

*Open Time – also “wet time” or “pot life”, the maximum time the adhesive maintains wet / tacky properties that allow a serviceable bond between 2 substrates. The open time is temperature depending. All data given was measured at 23˚C.

**Handling Time – Time when the adhesive is hard enough to hold on its own. The handling strength of freshly bonded parts depends on type and height of outside forces that impact the bond. In all cases, peel forces that affect the bind need to be reduced as far as possible.

Physical Properties of the Cured Adhesives

	Value	**Test Method**
Tensile strength, MPa @ 23˚C	18	ASTM D-638
Young’s Modulus, MPa @ 23˚C	160	ASTM D-638
Elongation, %	55	ASTM D-638
Poisson Ratio, @ 23˚C	0.44	ASTM E-132
Water Absorption, %	0.5	ASTM D-570
Shore Hardness, D	73	ASTM D-2240
CLTE, 10-6/˚C @ -30˚C to 30˚C	112.6	ISO MAT-2208
CLTE, 10-6/˚C @ 30˚C to 80˚C	203.6	ISO MAT-2208
Glass Transition Temperature, ˚C		
G’ Onset	15	ASTM E-1640
G’ Peak	18	ASTM E-1640
Tan Delta Peak	30	ASTM E-1640

Physical properties are typical values, based on material tested in our laboratories, but are subject to a standard deviation from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot.

Impact Resistance

ISO 179/1eU: CHARPY Impact, Un-notched	
7,5 J Pendulum	Non breakable
15 J Pendulum	>1 MJ/m³

Application Guide

Cure	Ambient or heat accelerated cure (max 120˚C)
Optimum Bondline Thickness	0.5mm to 1,5mm
Maximum Bondline Thickness	app 5mm
Paint Bake	max 150˚C
Gap Filling	Very Good
Sag Resistance	For vertical applications
Consumption, ¼" Diameter Round Bead	app 40g / m
Consumption, ½" Diameter Round Bead	app 160g / m

Bonding Guide

Substrate	Surface Preparation–Ambient Cure	Surface Preparation-Heat Cure	General Adhesion*	Expected Failure mode*
SMC, BMC, RTM, Gel Coat, Wood, HPL, PUR-RIM	Sanding	None	Excellent	Substrate Failure
Carbon Fiber Reinforced Plastics (CRFP)	Sanding or peel ply	None	Excellent	Substrate Failure
Coated or primed Metals and Metal alloys	None	None	Excellent	Coating Failure
HLU (Hand lay up) HSU (Hand spray up)	Sanding	Mostly Sanding	Good	Mixed Failures
Thermoplastics A (ABS, PA, PC/PBT, PPO/PA PET)	Sanding or solvent wipe	Mostly None	Very Good	Substrate failure
Thermoplastics B (PPO,PC/ABS, PP/EPDM)	Solvent, detergent or primer	Solvent, detergent or primer	Good / Fair	Mixed Failures
Thermoplastics C (PTFE, PP, PE, PVC, PPS, POM)	Physical pretreatment (flame, plasma, corona)	Physical pretreatment (flame, plasma, corona)	Limited	Adhesive failure

* General adhesion and expected failure mode WITHOUT adhesion enhancing surface preparation

**Metal surfaces should be protected with a primer or coating prior to bonding with polyurethane adhesives. Even though the initial adhesion is very good, water migration can cause the "bond line corrosion" and failure overtime.

Handling and Precautions

Ashland Specialty Ingredients maintains Safety Data Sheets (SDS) on all of its products. Users should consult the latest SDS for Pliogrip™ 3540 to familiarise themselves with product hazards and the precautions to be taken when handling or using these products.

Packaging

Pliogrip™ 3540 adhesive systems are supplied in cartridges of 50ml or 220ml. Please contact your local sales representative for supply options.

Shelf Life and Storage

Pliogrip 3540 cartridges have a shelf life of 12 months from date of filling, when stored indoors between 15˚C to 32 ˚C. After dispense, the used mixer should be left attached to the cartridge to ensure sealing from humidity.

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