FINIXA
paint processing products

TDS

TECHNICAL DATA SHEET

TECHNICAL SHEET
PLI 50 – Finixa metal bonding 60 min. black - 220ml

Description

PLI 50 is a two-component structural epoxy adhesive system intended for use in metal and composite panel bonding. Bond line thickness is controlled by 0,25mm glass beads comprised in the adhesive. The 2:1 adhesive system is available in 220ml side by side. The universal cartridge can be used with PLI 60, the Finixa applicator gun.

Features and benefits

- Room Temperature curing, heat acceleration possible
- Long open time of 60 min, handling within 4 hours @ 23°C, full cure in 24 hours
- Bond line thickness is controlled by 0,25mm glass beads
- Withstands automotive e-coat, powder prime, and paint oven temperatures up to 230°C
- Spot-weldable (uncured!)
- Excellent corrosion protection
- High energy absorption and very good crash performance

Nominal component properties

	PLI 50 (A-Part)	PLI 50 (B-Part)
Chemistry	Epoxy	Amine
Color	Black	Tan
Consistency	Viscous Paste	Viscous Paste
Specific Gravity, g/ml	1,08	1,13
Ratio by Weight	1,9	1,00
Ratio by Volume	2,0	1,00
Odor	none	slight amine

Typical cure characteristics of the mixed adhesive

	Temperature	**Time**
Open Time	@ 23°C	60 min
Working time	@ 23°C	90 min
Handling time	@ 23°C	4 hours
Full cure	@ 23°C	24 hours

Open Time - also "wet time" or "pot life". The time the adhesive is wet enough to bond to a second substrate being mated in the bed of adhesive. The open time is temperature depending. All data given was measured at 23°C.

Working Time - During working time the already joined part can still be re-positioned. Do not take the bonded assembly apart.

Chemicar Europe nv
Baarbeek 2
2070 Zwijndrecht
België-Belgium

T.: +32 3 234 87 80
F.: +32 3 234 87 89
info@chemicar.eu
www.chemicar.eu

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. Typically 0.75 to 1MPa is needed. In all cases peel forces, that effect the bond need to be reduced as far as possible. The part needs to be clamped or fixed until ha dling strength is reached.

Physical properties of the cured adhesive

	Value	Test Method
Tensile strength, MPa @ 23°C	30	ASTM D-638
Young's Modulus, MPa @ 23ºC	4550	ASTM D-638
Elongation, %	3	ASTM D-638
Poisson Ratio, @ 23ºC	0,28	ASTM E-132
Water Absorption, %	2,9	ASTM D-570
Shore Hardness, D	80	ASTM D-2240
CLTE, 10-6/°C @ -30°C to 0°C	67	ISO MAT-2208
CLTE, 10-6/°C @ 100°C to 130°C	155	ISO MAT-2208
Glass Transition Temperature, ºC		
G' Onset	49	ASTM E-1640
G" Peak	-80, -50, 57	ASTM E-1640
Tan Delta Peak	-80, -49, 73	ASTM E-1640

Physical properties are 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.

Application Guide

Cure	Ambient or heat accelerated cure (max 150°C)
Optimum Bondline Thickness	0,25mm (glass bead incorporated)
Gap Filling	Very Good
Sag Resistance	For vertical applications
Consumption, 1/4'' Diameter Round Bead	app 35g / m
Consumption, 1/2'' Diameter Round Bead	app 141g / m

Surface Preparation

Substrate	Surface preparation Ambient Cure	Surface preparation Heat Cure
Metal	Abrasion & Degreasing	Abrasion & Degreasing
Composite (SMC, RTM, CFRP)	Abrasion	Solvent wipe

Lap Shear Strength

Substrate	Lap Shear Value [MPa]	Failure Mode
Cold Rolled Steel (1,5mm)	27,8	Cohesive Failure
Cold Rolled Steel (0,8mm)	23,7	Steel Deformation
Hot Dipped Galvanized Steel (0,7mm)	12,6	Steel Deformation
Alloyed Galvanized Steel (0,7mm)	18,5	Cohesive Failure
6111 Aluminium Alloy (0,9mm)	11,3	Mixed Failure (COH/ADH)
5052 Aluminium Alloy (0,6mm)	12,4	Mixed Failure (COH/ADH)
ABS	3,0	Substrate Failure
SMC	8,8	Substrate Failure

Test Conditions: preparation: Solvent wipe, Orbital Abrasion (80rgd), Bond Line: 0,25mm, Cure: 1w@23°C, Test temperature: 23°C, Crosshead speed: 13mm/min

Handling

Chemicar Europe nv
Baarbeek 2
2070 Zwijndrecht
België-Belgium

T.: +32 3 234 87 80
F.: +32 3 234 87 89
info@chemicar.eu
www.chemicar.eu

PLI 50 Adhesive System contains ingredients which could be harmful if improperly handled. Contact with skin and eyes should be avoided and necessary protective equipment and clothing should be worn. Material Safety Data Sheets contain health and safety information for your development of appropriate product handling procedures to protect your employees and customers.

Packaging

PLI 50 adhesive system is supplied in cartridges 220ml.

Shelf Life and Storage

Store indoors between 15° to 32°. After dispense the used mixer should be left attached to the cartridge to ensure sealing from humidity.
Shelf life: 3 years

Laboratory test report

Substrate	SMC (2,7mm)
Adhesive	Pliogrip 5761B
Surface preparation	IPA wipe
Bond line thickness	0,5mm
Cure condition	C.f. table
Lap shear test condition	@ RT, 2 samples per conditions

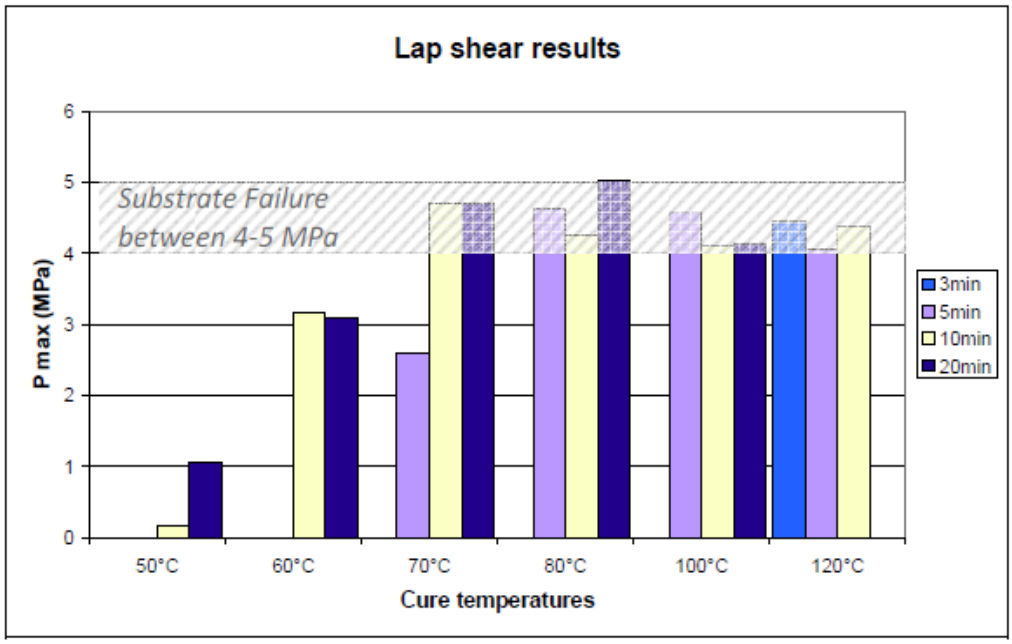
Lap shear test are performed (according to European norm EN-1465) after removing the pieces from a heated coupon press (two sided heat)

Results:
Lap shear

Nr	ID	F max (N)	P max (MPa)	Failure Mode
1	SMC – 4hrs @23°C	782,2	2,20	10% ADH/90% COH
18	SMC – 24hrs @23°C	1922,45	5,25	95% FT/5%ADH
2	SMC –10min @50°C	60,3	0,17	100% COH
3	SMC –10min @50°C	381,6	1,06	100% COH
4	SMC –10min @60°C	1259,55	3,17	5% ADH/95% COH
5	SMC –10min @60°C	1230,9	3,08	35% ADH/47,5% COH/17,5% FT
6	SMC –5min @70°C	954,3	2,60	2,5% ADH/97,5% COH
7	SMC –10min @70°C	1902,65	4,71	35% ADH/65% FT
8	SMC –20min @70°C	2000,4	4,71	45% ADH 55% FT
9	SMC –5min @80°C	1658,4	4,64	100% FT
10	SMC –10min @80°C	1603,45	4,26	100% FT
11	SMC –20min @80°C	1736,8	5,03	100% FT
12	SMC –5min @ 100°C	1633,5	4,57	5% ADH/95% FT
13	SMC –10min @ 100°C	1394,85	4,10	100% FT
14	SMC –20min @ 100°C	1725,4	4,13	100% FT
15	SMC –5min @1200°C	1929,65	4,46	100% FT
16	SMC –10min @1200°C	1700,75	4,06	100% FT
17	SMC –20min @120°C	1725,15	4,38	100% FT

Where: FT = Fiber tear COH= Cohesive failure & ADH = Adhesive failure

Chemicar Europe nv
Baarbeek 2
2070 Zwijndrecht
België-Belgium
T.: +32 3 234 87 80
F.: +32 3 234 87 89
info@chemicar.eu
www.chemicar.eu



Recommendations/Guide:

Based on the conducted Lap shear tests on SMC (Coupon press, two sided heating), save handling can be achieved after the following time/temperature dwell times:

16°C	Clamp time app 6h. Bonding is not recommended at lower temperature*
23°C	Clamp time 4h confirmed Full process strength after 24h confirmed
50°-60 C	Clamp time app 20 min
70-80°C	Clamp time app 10 min
100°C	Clamp time app 5 min
120°C	Clamp time app 3 min

Note: the conditions of heat transfer into the bond line (energy source, substrate type and thickness) have a major influence on the cure. Please conduct cure response validation on your assembly setup. This reference table can just serve as guide.

* Below app 5°C the Epoxy cure reaction will completely stop. It will though continue after the assembly is brought back to ambient conditions. Bonding below app 15/16°C is not recommended due to the decreased ability of the adhesive to flow. Conditioning of the adhesive cartridge in a warm office can be a solution if the work shop cannot be heated to these temperatures or if the bonding needs to take place outside. In this case the use of an IR lamp or a heat gun is recommended.

Chemicar Europe nv
Baarbeek 2
2070 Zwijndrecht
België-Belgium

T.: +32 3 234 87 80
F.: +32 3 234 87 89
info@chemicar.eu
www.chemicar.eu