EMS FORCE® Threadlocker TL-90

General information

EMS FORCE® anaerobic adhesive and sealants are advanced materials with single component and solvent free feature. The products are specifically formulated for sealing, retaining, locking and bonding of metal or metal plated assemblies.
Anaerobic adhesives are stable when in contact with oxygen in air. As the product is placed between two mating metallic surfaces, where oxygen contact is vanished, polymerization starts and forms strong, vibration and pressure proof polymer layer.

Product description

EMS FORCE® TL-90 is a single component, high strength (permanent) anaerobic threadlocker. TL-90 is formulated to be a very low viscosity anaerobic threadlocker, which means it can be used as a post-assembly adhesive to wick into preassembled parts. Because of its very low viscosity, TL-90 can be used for some interference fit retaining applications. TL90 can also be use a porosity sealant for cast components.

Ideal for locking preassembled fasteners, e.g. instrumentation fasteners, electrical connectors and set screws

Main constituent	:	Methacrylate ester
Appearance (uncured)	:	Liquid
Colour	:	Green
Viscosity	:	Very Low
Strength	:	Medium-High

Physical properties of uncured adhesive

Specific gravity Conditions: 22°C	:	1.045
Flash point Method: ASTM D56-05	:	>93°C
Temperature range	:	-50°C to 150°C
Corrosivity	:	Non-corrosive
Gap filling	:	up to 0.10mm
Viscosity Conditions: 22°C Method: ISO 2555 Apparatus: Brookfield RVT, spindle 1	:	50 - 200 cPs (@50 rpm)

Typical curing performance of adhesive

- Curing time at room conditions

Various type of curing time of adhesive on several substrates are given as follows. Note that results can differ due to distance of bond gap and temperature.

Specimens	:	M10x25 bolt and proper nut
Conditions	:	22°C

Handling time

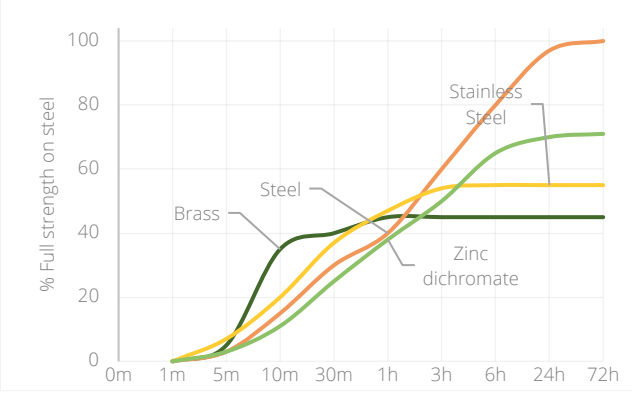
Material of specimen	Duration
Brass	<120 secs
Steel	8 to 15 mins
Stainless steel	10 to 15 mins
Zinc plated steel	10 to 15 mins
Aluminium	30 to 60 mins

Average functional curing time: 2 to 5 hours
Average full curing time: 8 to 12 hours

- Curing speed with different substrates

The curing rate of anaerobic adhesive greatly depends on type of surface material, substrate. The curing rate developed in time is determined by measuring breakaway torque of bolt and nut specimens. Test details and resultant graphs are given below.

Test method	:	ISO 10964
Bolt and nut specs.	:	M10x25
Conditions	:	22°C



Typical cured performance of adhesive

Performance of cured anaerobic adhesive is examined and resultant torque values are given below.

Test method	:	ISO 10964
Conditions	:	22°C
Specimens	:	Different type of nuts and bolts

Unseated assembly cured for 24 hours

TDS

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Type of specimen	Breakaway Torque (T_{BA})	Prevailing Torque (T_P)
Zinc plated, M10	20 N.m	10 N.m
Stainless steel, M10	24 N.m	15 N.m

Unseated assembly cured for 1 week

Type of specimen	Breakaway Torque (T_{BA})	Prevailing Torque (T_P)
Zinc plated, M10	25 N.m	15 N.m
Stainless steel, M10	25 N.m	20 N.m

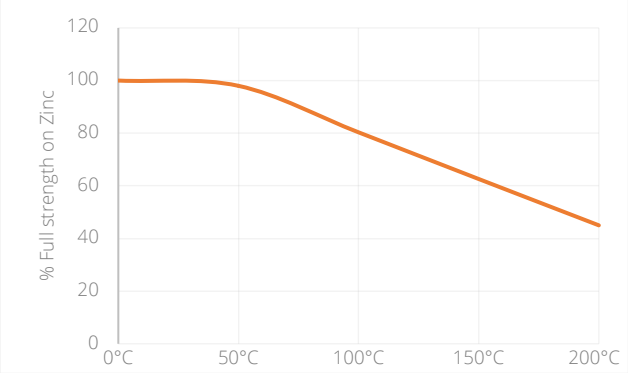
Environmental resistance of cured adhesive

Environmental resistance of cured adhesive is measured after curing by applying ISO 10964 preloaded assembly test at different conditions.

Test method	:	ISO 10964
Bolt and nut specs.	:	Zinc plated, M10x25
Curing condition and duration	:	22°C, 1 week
Torque test conditions (exception is hot strength test)	:	22°C
Torque type	:	Breakloose Torque (T_{BL})

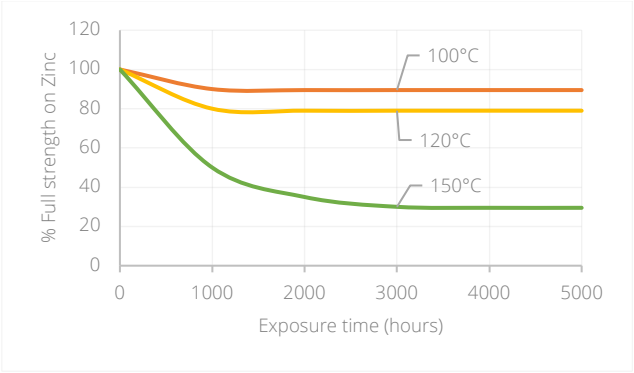
- Hot strength

Strength is examined at various temperatures. The reference value of '% Full strength on zinc plated' is taken from previous tables corresponding 24 hours curing.



- Heat aging

Strength is examined on specimens that are aged at different temperatures. The reference value of '% Full strength on zinc plated' is taken from previous tables corresponding 24 hours curing.



Directions for use

- Clean male and female threads before assembly with an absorbent tissue paper to remove any cutting oil.
- Apply the adhesive with a 360 turn to leading threads of the male and female fittings.
- Use an absorbent tissue paper to wipe off excess jointing compound in the direction of the thread.
- Assembly parts and hold on for 24 hours at 22-24°C to ensure full curing of jointing compound.
- For disassembly, use hand tools to remove mating parts. When it is hard to dissemble at room temperature, apply local heat until reaching 250°C and disassemble while hot. Then, remove any residual cured adhesive mechanically and clean parts with a proper solvent, acetone.

Packaging

Bottles: 15, 50mL and 250mL
Bulk: 1kg and 10kg

Storage and shelf life

Keep product in its original container at 22°C and avoid to contact with direct sunlight. Storage below 5°C and above 30°C can negatively affect product properties.
Material removed from its original container can be contaminated during usage which affects both adhesive performance and storage life. Therefore, do not return contaminated product to the original container.
Metsan cannot take any responsibility for product which has been contaminated or stored under conditions different then previously indicated.

Shelf life: 24 months at 22°C

Health and safety

The product contains methacrylate esters.
For further information, please consult Safety Data Sheet (SDS) before use.

Disclaimer

The data contained herein are furnished for informational purposes only and are believed to be reliable. However,

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Metsan Endüstriyel Yapıştırıcılar Ticaret Anonim Şirketi
Birlik Organize Sanayi Bölgesi Batı Caddesi 1. Sokak No:1
Aydınlı-Tuzla İstanbul / Turkey
Telephone: +90 444 0 649
Telefax: +90 212 253 42 12
www.metsan.gen.tr