

# EMS FORCE® SI-4011 Cyanoacrylate Adhesive (for Acidic Surfaces)

## General information

EMS FORCE® cyanoacrylate adhesives are high quality series of single component and solvent free liquids that are specially formulated for rapid bonding of mated metals, plastics, rubbers and wooden parts. The products are specifically formulated for sealing, retaining, locking and bonding of metal or metal plated assemblies.

Cyanoacrylate adhesives reach high bond strengths at room temperature without applying pressure. Curing rate can be enhanced by weak alkaline materials including trace amount of moisture on the surface of parts to be bonded. Since the adhesives have solvent-free feature, shrinkage of cured material is negligible. Also, solvent resistance is very good.

## Product description

EMS FORCE® SI-4011 is low viscosity, improved ethyl cyanoacrylate adhesive. It is formulated for high-strength, high-speed, bonding of leather, paper, wood, plastic, rubber and metal surfaces.

It can bond to a number of substrates, including acidic substrates, such as wood, cardboard, veneer, fabric, cork, paper and leather.

Main constituent	:	Ethyl cyanoacrylate
Appearance (uncured)	:	Liquid
Colour	:	Colourless / Transparent
Viscosity	:	Low
Strength	:	High

## Physical properties of uncured adhesive

Specific gravity Conditions: 22°C	:	1.05
Flash point Method: ASTM D56-05	:	85°C
Corrosivity	:	Non-corrosive
Gap filling	:	0.10 mm
Solvent content	:	0%
Viscosity Conditions: 22°C	:	80-120 cPs

TDS

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## Typical curing performance of adhesive

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, temperature and relative humidity.

Conditions : 22°C and 50% relative humidity

### Clamp(handling) time

Material of specimen	Duration
Rubber to rubber	<5 seconds
Plastic to plastic	<10 seconds
Metal to metal	<25 seconds
Wood to wood	<60 seconds

Average full curing time: 12 to 24 hours



## Typical properties of cured adhesive

Ultimate tensile strength ( $\sigma_U$ ) : 20 N/mm<sup>2</sup>  
(2900 psi)

Temperature range : -54°C to +82°C



## Environmental resistance of cured adhesive

Environmental resistance of cured adhesive can be examined by referring values given table below.

Motor oils	:	Good resistance
Alcohols	:	Good resistance
Water	:	Moderate resistance
Acids and alkali	:	Moderate resistance for dilute solutions. Continued contact decrease half of strength.



## Directions for use

- Remove cap and apply small amount of EMS FORCE® cyanoacrylate adhesive to one surface It is recommended to apply only 1 dab per 3 cm<sup>2</sup>. Set time can vary based on the amount of glue and type of surface glued. Excess glue can cause delayed or failed bond.
- Press the two surfaces together for about 10–30 seconds.
- Wait 24 hours for a full cure.



## Packaging

Bottles	Pieces in a carton	Pieces in a box
20gr	30	360

TDS

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50gr	30	240
250gr	6	24
1kg	1	6



## 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 25°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 than previously indicated.

Shelf life: 12 months at 5°C



## Health and safety

The product contains ethyl cyanoacrylate.

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, Metsan does not assume responsibility for any results obtained by persons over whose methods Metsan has no control. It is the user's responsibility to determine the suitability of Metsan products or any production methods mentioned herein for a particular purpose, and to adopt such precautions as may be advisable for the protection of property and persons against any hazards that may be involved in the handling and use of any Metsan products. Metsan specifically disclaims all warranties express or implied, including warranties of saleability and suitability for a particular purpose arising from sale or use of Metsan products. Metsan further disclaims any liability for consequential or incremental damages of any kind including lost profits.

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