MECHSTER 5310

Vinyl Ester Resin (General Purpose)

Mechster designates a variety of unsaturated polyester resins synthesized at ***Mechemco Industries***. These resins are specially engineered to meet the most diverse needs of fibreglass reinforced plastic moulding industry. Our R & D is geared to tailor **Mechster Resins** for the customers' most specific end applications. In fact we take pride in suitably formulating the resin to improve your production efficiency as also the field performance of the FRP product.

Mechster 5310 is a vinyl ester resin developed specially for the manufacture of reinforced plastic components for use in corrosive environments.

Mechster 5310 is based on a polymer which has an epoxy backbone with terminal ethylenic unsaturation.

Mechster 5310 is a high performance resin which combines excellent mechanical, thermal and chemical properties of epoxy resins with the ease of processing and rapid curing of polyester resins.

Mechster 5310 is designed to have

- excellent wetting and adhesion to glass fibres
- higher glass to resin ratio
- rapid and complete cure
- fast moulding cycles
- high heat deflection temperature

Fibreglass reinforced **Mechster 5310** laminates display excellent physical, mechanical and chemical resistance properties.

Articles moulded out of Mechster 5310 are:

- heat resistant
- chemical resistant particularly to many acids, alkalies and solvents over a temperature range
- dimensionally stable at elevated temperature
- hydrolytically stable
- light weight

Physical Properties

Appearance	: Yellowish brown coloured liquid
Specific Gravity @ 25°C	: 1.05 ± 0.01
Viscosity @ 25°C	
Brookfield Viscometer, cP	: 450 ± 50
Acid Value, mg KOH/g	: 8 ± 2
Volatile Content, (w/w) %	: 44 ± 2

Curing Behaviour

Gel time, minutes @ 25°C with 1.5% v/w promoter, (P 125)[1] 1.5% v/w accelerator (A 103)[2] 1.5% v/w catalyst (C 109)[3]	: 15 - 20
Peak Exotherm Temperature, °C	: 140 - 145

Typical Properties of Cured Mechster 5310

	Cast[4]	Laminate[5]
Glass Content, (w/w) %	—	40 - 45
Specific Gravity @ 25°C	1.12	1.48
Tensile Strength, MPa	75	160
Tensile Modulus, MPa	3200	8500
Tensile Elongation at break, %	5.0	2.6
Flexural Strength, MPa	120	220
Flexural Modulus, MPa	3300	10500
Compressive Strength, MPa	120	200
Izod Impact Strength, kJ/m² (unnotched)	16	50
Heat Deflection Temperature, °C	102	—
Volume Shrinkage, %	~6-7	—
Barcol Hardness	35	—
Coefficient of Linear Thermal Expansion, (0-60°C), m/m • °C	110×10^{-6}	30×10^{-6}
Water Absorption, (w/w) % @ 25°C		
1 day	< 0.10	0.10
7 days	0.10	0.16
28 days	0.24	0.25
Electrical Volume Resistivity, Ohm-cm	$>10^{16}$	$>10^{15}$

[1]P 125 : Solution of Tertiary Amine in Styrene monomer [2]A 103 : Cobalt Octoate solution containing 3% Cobalt
[3]C 109 : Methyl Ethyl Ketone Peroxide containing 9% active Oxygen [4]Unfilled [5]Reinforced with fibreglass CSM

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The cast and glass reinforced laminates were prepared from **Mechster 5310** catalysed with 1.0% v/w promoter, 1.0% v/w accelerator (A 103) and 1.5% v/w catalyst (C 109). The specimens were first allowed to cure at room temperature for 24 hours and subsequently post-cured at 80°C for six hours.

The mechanical properties of the glass reinforced **Mechster 5310** laminates can be greatly improved by ensuring complete wetout and incorporation of directional reinforcements like rovings, woven rovings, glass cloths, etc.

(Test Methods : IS 6746/1972, ASTM and BS where IS not available)

Uses

Mechster 5310 is specially suitable for high performance chemical resistant process equipments, storage and transporation tanks, pipes, ducts, hoods, etc. particularly used in handling of :

- alkalies
- chlorinated compounds and solvents
- oxidising acids
- wide range of inorganic and organic corrosive chemicals

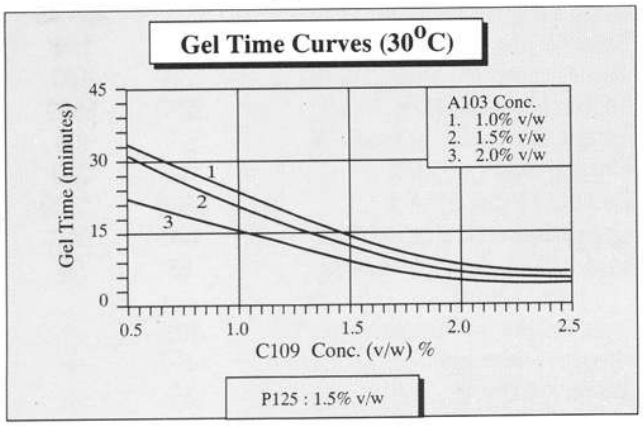
Mechster 5310 is also recommended as a material for flooring in chemical industries.

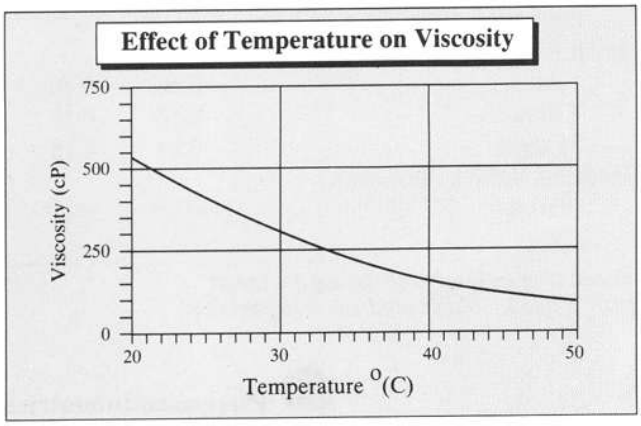
Mechster 5310 can be used in any of the following moulding process,

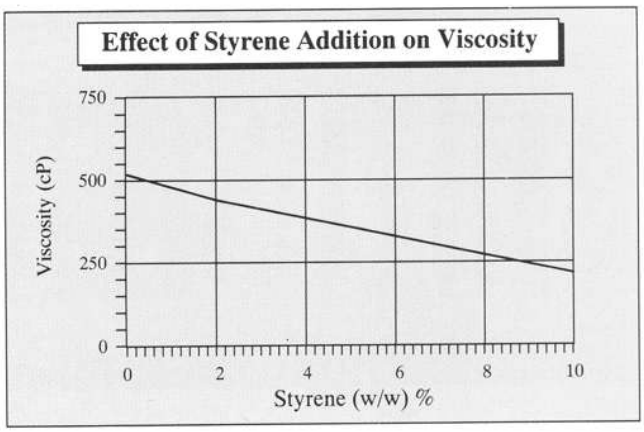
- Hand lay-up
- Resin transfer moulding
- Filament winding
- Pultrusion, etc.

Packing

Mechster 5310 is supplied in non-returnable M.S. drums containing 200 kgs. net and HDPE carbouys containing 35 kgs. net.







Storage

Mechster 5310 should be stored in a cool and dry place away from the sunlight, preferably below 25°C. Under these conditions, the shelf life is 3 months. The storage stability could be further improved by aerating the resin stored in barrels at an interval of about a fortnight.

Handling

Mechster 5310 has a flash point of 34°C and is classified as flammable. Containers should be kept in a cool and ventilated place away from sunlight and sources of ignition. "No Smoking" rules should be strictly enforced. In case of fire, use dry chemical, foam, carbon dioxide or water spray to extinguish the flame.

Spillages may be absorbed onto sand or earth and shovelled off and disposed according to local disposal regulations.

Caution

Store catalyst and accelerator separately. Do not allow them to come in contact with each other as they form an explosive mixture. Carry out separate addition of accelerator and catalyst to the resin mix for avoiding accidents.

Physiological & Toxicological behaviour of Mechster 5310

Skin contact and vapour inhalation should be avoided during moulding because of the presence of styrene monomer. In case of irritation in the eye or skin, wash with copious amount of water. In extreme case, seek immediate medical advice. The moulding area should be sufficiently ventilated for reducing the vapour levels in the air while moulding.

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