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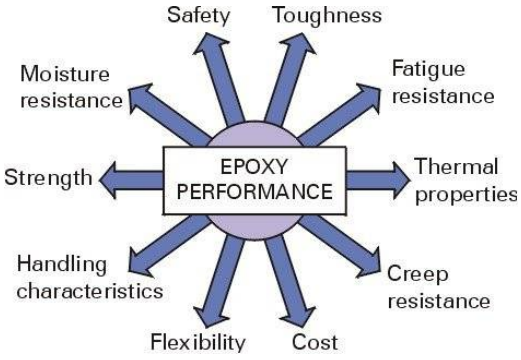
EPOXY MOULDS

Building a mould is the most crucial aspect of any composites part that is manufactured from a mould, purely due to every part that will look directly inverted from your mould. Special care is to be given during the process of manufacturing.

The question is why would you consider paying a premium price for Epoxy resin compared to a Polyester as the reinforcement material is what offers the strength of the mould?

BTCAP outlines the vast variances and benefits that could assist you with your choice of resin by focussing on the following three main topics, benefits, physical properties of the resin types and costs comparatives.

Benefits:



Epoxy offers the following features making moulding processes easier, effective and offering superior durability:

- Virtually ZERO shrinkage
- Higher reinforcement content offering higher strength
- Zero creeping or crocodiling
- Ultimate high flexural and tensile strength
- Longer shelf life of uncured product
- Low to no VOC's
- Resistant to peeling, cracking, chemical corrosion and moisture

In comparison to Epoxy, Polyester resins are brittle and therefore prone to Micro-cracking with lower shelf life of the uncured product, shrinks up to 8% volumetric, have strong VOC's and flammable fumes and is subject to osmosis as they can absorb moisture.

Physical properties:

Property	Typical Moulding Epoxy PROSET LAM 125 – 249HT	Typical Moulding Polyester
Viscosity (cP @ 25 °C)	589	950
Filler	Unfilled	Pre-filled (50% ATH)
Working time (min)	120-180	20-25
Shelf life (months)	24	3
Density (g/cm³)	1.07	1.47
Tg (With Post cure, °C)	121	60-115
Linear Shrinkage	0%	0.3%
Resin to glass content	50:50	80:20
Tensile Strength (MPa)	80	60
Tensile Elongation (%)	3.3-6.1	2.5
Flexural Strength (MPa)	114-128	110

It is quite clear that the not only is the PRO-SET Epoxy Cured density lower but so is the viscosity compared to a general Polyester tooling compound, this would result in much lower resin consumption and easier workability and laminating of the resin over a larger working time frame and offering a stable product that will achieve much higher physical property results than the conventional Polyester tooling compound.

Cost Comparatives:

Assuming that a typical mould with the following layers were to be used, the following costs would apply per square meter:

1 x Layer 300g/m^2 Chopped strand mat (Surface Finish)
4 x Layers 450g/m^2 Woven Roving
Epoxy Resin priced at ZAR 220/kg and Polyester tooling resin at ZAR 100/kg

Material	Cost per KG or per hour	Mould using a Typical Moulding Epoxy PROSET LAM 125 – 249HT		Mould using a Typical Moulding Polyester	
		Weight (KG)	Cost (ZAR)	Weight (KG)	Cost (ZAR)
Glass CSM	R30.00	0.3	R9.00	0.3	R9.00
Glass WR	R40.00	1.8	R72.00	1.8	R72.00
Resin	As above	2.55	R561.00	8.4	R840.00
Consumables	n/a	n/a	R200.00	n/a	R200.00
Catalyst	R60.00	0		0.168	R10.00
Finishing (Sand & Polish)	n/a	n/a	R200.00	n/a	R200.00
Labour (8 hours)	R500.00		R4000.00		R4000.00
TOTAL RAW WEIGHT & COST		4.65KG	R5042.00	10.668KG	R5331.00

The figures above indicate clearly that the cost of the PRO-SET epoxy system is lower than that of a typical Polyester whilst also providing superior physical properties and durability.
Had an ordinary Polyester resin been used at an assumed price of ZAR40.00/kg and a resin to glass ratio of 2.5:1, the outcome of the Polyester moulding would be 5.6kg by weight minimum and R4631.00 by cost, only offering an 8% saving. (Tabular Information can be provided)
Without any doubt it is the opinion of BTCAP that Epoxy is ultimately the best option for any tooling or moulding purposes by a long shot.

Visit our Website for further information regarding PRO-SET LAM-125/249HT laminating system.