

# Daron® 45

## High performance resin system for elevated heat resistance and mechanical strength

Daron® 45 is the A component of an innovative 2-component high performance resin system. The resulting composite components feature excellent mechanical properties and heat resistance, so far only possible with high performance thermosetting resins.

### Benefits

- Excellent mechanical performance through superior fiber wetting
- Compatibility with multiple fiber types, including Carbon, Glass and Basalt
- Great resistance to elevated temperatures, also for longer time periods
- Track record of performance in high end composites applications

## Major Applications

The innovative Daron® resin systems are based on two components, i.e. Daron® 45 and Isocyanate. For example Lupranat® M20R is a polymeric methylene phenyl isocyanate resin supplied. In this PDS the two component system is referred to as Daron® 45 plus Isocyanate. The use of Daron® 45 resin systems reinforced with fibers results in composite parts with excellent chemical and thermal resistance combined with good mechanical properties. In addition, these parts show outstanding long-term heat resistance and very good resistance to long-term mechanical loading.

Daron® 45 with 38 parts of Isocyanate has been optimized for yielding excellent pot life. The thickening reaction occurring after mixing the two components has been extended to 2.5 h. Within this long time, the reactivity can be easily varied by playing with the quantity of peroxide and accelerator, and/or by adjusting the curing temperature. This great pot life, enables this resin to be used in most open and closed mold processing techniques, e.g. hand lay-up, filament winding, and pultrusion.

### Product Specifications

Property	Value	Unit	TM
Appearance	clear		TM 2265
Solids content	66,5 - 69,5	%	TM 2033
Viscosity 23 °C, 100 s <sup>-1</sup>	175 - 225	mPa.s	TM 2313
Gel time 25 until 35 °C	22 - 29	min	TM 2625
Peak time	25 - 33	min	TM 2625
Peak temperature	150 - 180	°C	TM 2625
Stability 120 °C	60	min	TM2300C
Water content	0,01 - 0,07	%	TM 2350

Viscosity measurement: Z2/100 s-1, 23°C

Reactivity determination: Resin 100g + 2.0g BP 50 + 2.0 g PQ A3 X

## Liquid

Property	Value	Unit	TM
Density 23 °C	1080	kg/m <sup>3</sup>	TM 2160
Flash point	33	°C	TM 2800
Stability (no initiator, dark, 25°C)	2	month	

## Solid

Property	Value	Unit	TM
Density 23 °C	1180	kg/m <sup>3</sup>	TM 2160
Tensile strength	70	MPa	ISO 527-2
Tensile modulus	2.5	GPa	ISO 527-2
Elongation at break	3.2	%	ISO 527-2
Flexural strength	140	MPa	ISO 178
Flexural E-Modulus	3.4	GPa	ISO 178
Fracture Toughness K1c	0.5	MPa/m	ISO 13586
HDT	210	°C	ASTM D648
Tg	200	°C	ISO 6721
Metric volume shrinkage	6	%	
Impact strength	15	kJ/m <sup>2</sup>	ISO 179
Water absorption	1.2	wt%	ISO 175

Cure system: 38 phr Lupranat M20R, 2 phr (CHP) Medium Cyclohexanone peroxide + 2 phr DEA (10%) or (100%)

Cure time: 24 hrs at room temperature , Post cure: 4 hrs 200°C

## Application Guidelines

Combining Daron® 45 plus 38 parts of Isocyanate provides a resin system suitable for open and closed mold processing. Standard reinforcement materials for Unsaturated Polyester resins can be used.

The processing properties of Daron® 45/B38 are similar to standard UP resins, with respect to impregnation and

wetting of the reinforcement.

Here are some typical starting formulations:

Pultrusion: Processing speeds of Daron 45 plus 38 parts of Isocyanate are substantially higher than for traditional unsaturated polyester and vinyl ester resins. The formulation as described in the following table has a pot-life of approximately 1 hour. Cooling of the resin bath may increase the pot-life by a factor 2. Two-component injection systems enable significant pot-life extension up to a minimum of 8 hours.

First, a premix of Daron® 45, peroxide and moisture scavenger is prepared. This premix is typically stable for approximately 8 hours. The moisture scavenger is necessary to absorb the water in the system before it reacts with the isocyanate component (e.g. Lupranat® M20R). Secondly, to 100 parts of premix 38 parts of Isocyanate and 2 parts diethyl aniline-10% Accelerator are added. After mixing, this gives a pot life of approximately 40 minutes at 20°C.

## Storage Guidelines

The resin should be stored indoors in a dry place at temperature and undamaged packaging.

The properties of the resin may change slightly during storage.

## Material Safety

A Safety Data Sheet (SDS) of this product is available on request.

## Test Methods

Test methods (TM) referred to in the table(s) are available on request.

## ISO 9001:2015 Certified

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### Contact us for more information

We will help you choose the right resin solution.

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