



## HYBTONITE® CNT pastes

### CNT modified epoxies and CNT modified pastes for all epoxy systems

The systems are low viscosity solvent free 100 % reactive CNT modified epoxy systems tailor-made for the composites industry. It is suitable for RTM, filament winding, laminating, pultrusion, infusion and

many other applications. The systems are made with patented HYBTONITE® technology. These systems can be tailor-made with different curing agents and accelerators to meet required cure

rate, pot life and properties. These systems will give increased impact resistance, elongation to break and fatigue compared to any traditional epoxies.



TABLE 1: Process data

Before mixing	Mixing and processing	Curing
Clear the surface from dust, grease and moisture.	Mix the resin with curing agent properly for minimum 1–2 min.	The product cured even at + 5 °C but higher temperatures give better properties.
The higher the temperature of the object the better flow and wetting are achieved.	Let the air come out and settle for min 2–5 min (even vacuum if possible).	Heat cure range is from 4 hours at 60 °C to 5 minutes at 200 °C.
If possible preheat the resin component to 40 °C before use or use vacuum for air release.	For the best results, consult with Amroy Europe Oy.	

#### Vertical surfaces in hand laminating:

The system can be thickened with 2 % HDK / Aerosil for laminating vertical surfaces. This helps especially against sagging/drainage. Also available in all RAL colours.

The system does not crystallize and has a long storage stability of at least 3 years when properly stored in closed containers.

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**TABLE 2: Technical Data of HYBTONITE® Pastes**

	Universal	High Modulus	Low Modulus	ESD	Tg
Mix ratio (by weight) Resin / Paste	95/5	80/20	80/20	70/30	70/30
Minimum / Maximum % addition	2–8 %	10–40 %	10–40 %	20–50 %	20–50 %
Viscosity, (mPa•S) 20 °C	1500–2500	3000–4000	2500–3500	5500–6500	2000–3000
Density, (kg/l)	1,02	1,15	1,15	1,15	1,12
Colour	Black			Black	Black
Resin type	Phenolic, Epoxy, Urethane etc	Epoxy	Epoxy	Epoxy	Epoxy
EGC	-----	5500	5500	5500	6500
Storage stability	min 6 months	min 6 months	min 6 months	min 6 months	min 6 months
Modulus area	All	3–4 GPa	2–3 GPa	2–4 GPa	2–4 GPa
Max Tg, °C	170	170	150	150	250
Max Modulus improvement	10 %	20 %	20 %	10 %	10 %
Max Elongation at break improvement	50 %	50 %	100 %	100 %	25 %
Max fatigue improvement	50 %	100 %	200 %	200 %	50 %

**TABLE 3: Viscosity temperature profiles at different injection temperatures for HYBTONITE® Pastes**

Viscosity/temperature profile	25 °C	40 °C	60 °C
HYBTONITE® Universal	2000 mPa•S	1000 mPa•S	500 mPa•S
HYBTONITE® High Modulus	3500 mPa•S	1500 mPa•S	750 mPa•S

**TABLE 4: Examples**

	Epikote 828+IPDA	Epikote 862+ Epi-Cure W	40 % High Modulus	50 % ESD	50 % Tg
Flexural Modulus, GPa	3,1	2,5	3,5/2,8	3,3/2,7	3,2/2,6
Max Flexural Strength, MPa	80	95	100/120	95/115	90/110
Elongation at break, %	5,5	4	10/8	11/8	6/5
Resistivity, Ωm	10 <sup>^12</sup>	10 <sup>^14</sup>	10 <sup>^8</sup>	10 <sup>^1</sup>	10 <sup>^10</sup>
Capacitance, nF/m	15	10	30	120	20
Tg, °C	160	130	150/140	145/135	175/150

### Storage Data

The products can be stored at temperatures between 0–60 °C in closed containers in dry place protected from direct sunlight. Storage time is at least 3 years.

**TABLE 5: Sales Packages**

Package	IBC	Drum	Can
HYBTONITE® Pastes	1000 kgs	225 kgs	20 kgs

### Amroy Europe Oy

Postal address

Fax

Homepage

VAT No: FI19869654

P.O. Box 144, FI – 15101 Lahti, FINLAND

+358 20 711 8609 (production & orders)

www.amroy.fi

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