Provisional Technical Data Sheet

Advanced Materials

Araldite® CW 30407		**100**	**pbw**
Aradur® HW 30408		**50 • a**	**pbw**
Aradur® HY 30409		**9 • (1-a)**	**pbw**

* a can vary between 0 and 1.

High performance resin system for e-motor potting in e-mobility with adaptable heat conductivity and viscosity.

Application	Electrical motors and power electronics
Processing methods	Automated Pressure Gelation (APG) (Vacuum) Casting
Key Properties	Adaptable thermal conductivity between 0.8 and 1.1 W/(m·K) Excellent flow and gap filling with adaptable viscosity Fast processing and curing Suitable for thermal class 180 (H) applications Very good thermal shock resistance

Product Data (Guideline Values)

Araldite® CW 30407 (LME 11567-1)

Modified, solvent free epoxy resin with inorganic filler

Appearance	Visual		Anthracite viscous liquid
Viscosity at 60°C, $30s^{-1}$	ISO 3219	mPa·s	3'000 – 8'000*
Specific gravity at 25°C	ISO 2811-3	g/cm^3	2.020 – 2.120*

* Specified Value

Aradur® HW 30408 (LME 11568)

Liquid amine hardener with inorganic filler

Appearance	Visual		White grey viscous paste
Viscosity at 60°C, $30s^{-1}$	ISO 3219	mPa·s	2'300 – 7'000*
Specific gravity at 25°C	ISO 2811-3	g/cm^3	1.940 – 2.070*

* Specified Value

Aradur® HY 30409 (LME 11316)

Liquid amine hardener

Appearance	Visual		Clear transparent liquid
Viscosity at 25°C	ISO 12058	mPa·s	10
Specific gravity at 25°C	ISO 2811-3	g/cm^3	0.95

Processing Data (Guideline Values)

Mix Ratio

	filled CW 30407 HW 30408	*partly-filled* CW 30407 HY 30409	*3k-system*** CW 30407 CW 30408 HY 30409
Parts by weight (pbw)	100 : 50	100 : 9	100 : (50 · a) : 9 · (1-a)
Parts by volume (pbv)	100 : 52	100 : 20	100 : (52 · a) : 20 · (1-a)

** a can vary between 0 and 1.

Gel Time, Viscosity and Curing

			CW 30407 *(100 pbw)* HW 30408 *(50 pbw)*	CW 30407 *(100 pbw)* HY 30409 *(9 pbw)*
Mix viscosity	ISO 3219			
at 50°C	Rheomat 300 MS DIN 125 D=10s^{-1}	mPa·s	6'500	1'600
at 60°C		mPa·s	4'500	1'000
Pot life *(Time to double initial viscosity)*	ISO 3219			
at 50°C	Rheomat 300 MS DIN 125 D=10s^{-1}	min	34	28
at 60°C		min	21	17
Gel time	ISO 9396			
at 60°C		min	65	95
at 80°C		min	25	31
at 100°C		min	11	11
at 120°C		s	330 – 450*	330 – 450*
Standard cure cycle for test plates		2 h at 120°C		

* Specified Value

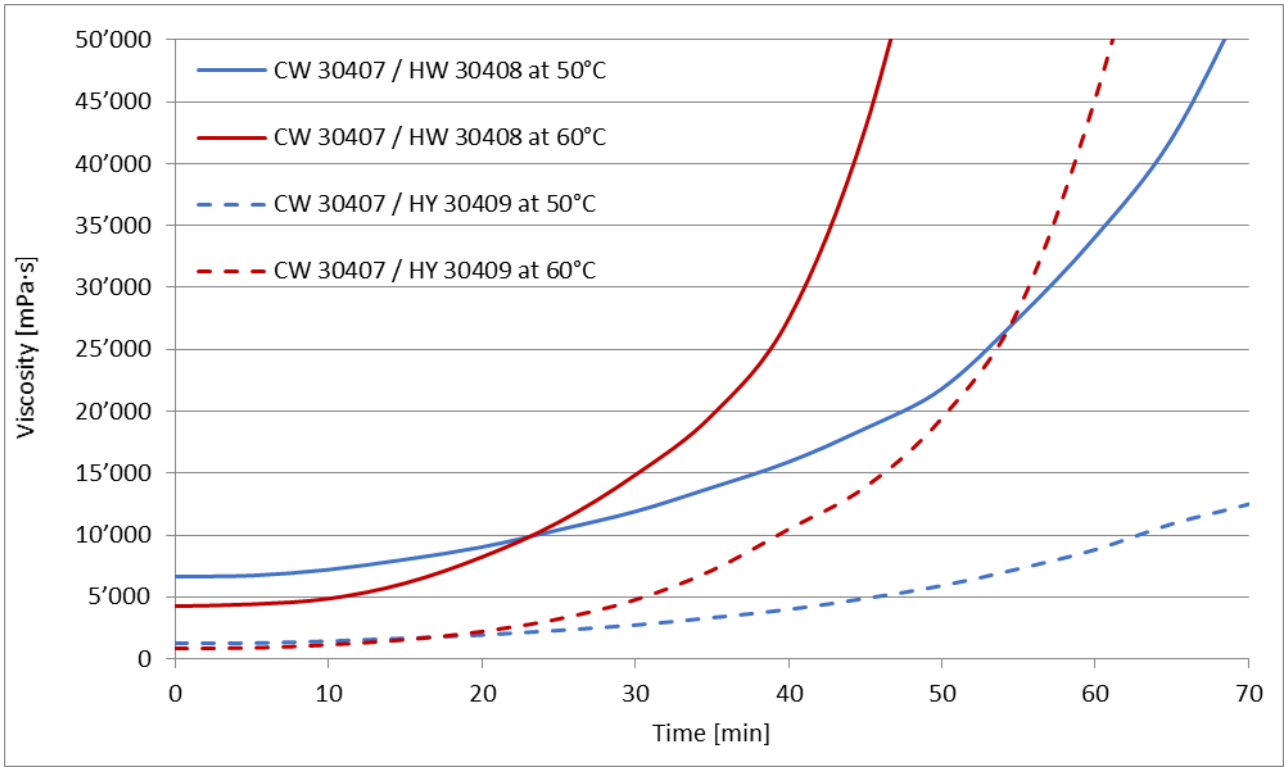


Fig.1 Viscosity increase at 50°C and 60°C (Rheomat 300 MS DIN 125 D= 10s-1)

Processing and Storage (Guideline Values)

Preparation

Because of the tendency to sedimentation of the filled resin and hardener in principle require stirring before removal from the original containers. To avoid errors in dosage this step is especially important when removing only part of the contents.
To facilitate stirring and removal, highly filled components are heated to 60 to 80°C in the original container (e.g. overnight in an oven).

Process Parameters APG and Vacuum Casting processes

To prepare the casting mix, the resin component should be homogenized in holding tank A at 60 to 80°C under a vacuum of 1 to 5 mbar, the hardener component in holding tank B at 20 to 50°C and a vacuum of 5 to 10 mbar.

Process	**Resin mix temperature**	**Mold / Part temperature**	**Demolding time**	**Cure cycle**
APG	50 – 60°C	90 – 120°C	10 – 40 min	Post-Cure: Minimum 1h at 140°C
Vacuum Casting	55 – 70°C	70 – 80°C	-	1h/70°C + 1h/140°C

To determine whether cross-linking has been carried to completion and the final properties are optimal, it is necessary to carry out relevant measurements on the actual object or to measure the glass transition temperature. Different gel and cure cycles in the customer's manufacturing process could lead to a different degree of cross-linking and thus a different glass transition temperature.

Storage Conditions

Store the components in a dry place in tightly sealed original containers. Under these conditions, the shelf life will correspond to the expiry date stated on the label. Partly emptied containers should be tightly closed immediately after use. For information on waste disposal and hazardous products of decomposition in the event of a fire, refer to the Material Safety Data Sheets (MSDS) for these particular products.

Mechanical and Physical Properties (Guideline Values)

Determined on standard test specimen at 23°C. Cured for 2 h at 140°C.

			CW 30407 *(100 pbw)* HW 30408 *(50 pbw)*	CW 30407 *(100 pbw)* HY 30409 *(9 pbw)*
Color of castings			Dark grey	Dark grey
Glass transition temperature (DSC - midpoint)	ISO 11357	°C	60	65
Density at 28°C	ISO 1183-3	g/cm³	2.15	2.0
Shore D hardness	ISO 868	-	87	86
Tensile properties at 23°C	ISO 527			
Strength		MPa	55	55
Elongation at break		%	1.5	2.0
E-Modulus		GPa	11	9
Flexural properties at 23°C	ISO 178			
Strength		MPa	110	110
Elongation at break		%	1.2	2.0
E-Modulus		GPa	15	9
Fracture Toughness at 23°C	PM 216-0/89			
Critical stress intensity factor K_{IC}		MPa·√m	4.0	4.0
Specific energy at break G_{IC}		J/m²	1’000	1’500
Coefficient of linear thermal expansion (CTE below Tg)	ISO 11359-2	ppm/K	20	30
Thermal conductivity	ISO 8894-1	W/(m·K)	1.1	0.8
Water absorption	ISO 62/80			
10 days at 23°C		% by wt.	0.2	0.2
30 min at 100°C		% by wt.	0.2	0.2

Electrical Properties (Guideline Values)

Determined on standard test specimen at 23°C. Cured for 2 h at 140°C.

			CW 30407 *(100 pbw)* HW 30408 *(50 pbw)*	CW 30407 *(100 pbw)* HY 30409 *(9 pbw)*
Dielectric loss factor (tan δ, 50Hz, 25°C)	IEC 60250	%	6.0	6.0
Dielectric constant (ε_r, 50Hz, 25°C)	IEC 60250	-	6.0	5.8
Volume resistivity (ρ_D, 25°C)	IEC 60093	Ω cm	$2.5*10^{14}$	$1.3*10^{15}$
Tracking index (CTI)	IEC 60112	grade	>600 – <1 mm	>600 – <1 mm
Dielectric strength (3 mm specimen)	IEC 60243-1	kV/mm	23	23

Legal Notice

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