Provisional technical data sheet

Advanced Materials

Araldite® CW 2710-1 100 pbw

Aradur® HW 2711-1 100 pbw

Liquid, prefilled, flame retardant, hot-curing two-component epoxy casting system with excellent thermal conductivity.

Application	Potting of motors, generators, actuators, modules and sensors.
Processing Methods	Automatic pressure gelation process (APG) Conventional gravity casting process under vacuum.
Key Properties	High thermal conductivity. Flammability: UL 94 V-0 (12 mm). Good thermal resistance. Good resistance to atmospheric and chemical degradation.

Product Data (Guideline Values)

CW 2710-1
High viscosity, highly filled bisphenol A epoxy resin.

Viscosity at 25°C	ISO 2555	Pa*s	120 – 185 *
Specific gravity at 25°C	ISO 2811	g/cm^3	1.95 - 2.20 *
Appearance	Visual		Brown

HW 2711-1
High viscosity, highly filled pre-accelerated anhydride hardener.

Viscosity at 25°C	ISO 2555	Pa*s	25 – 60 *
Specific gravity at 20°C	ISO 2811	g/cm^3	1.95 - 2.20
Appearance	Visual		Grey

* Specified range (provisioinal)

Processing Data (Guideline Values)

Mix Ratio

		Parts by weight	Parts by volume
CW 2710-1	Resin	100	100
HW 2711-1	Hardener	100	100

Gel Time, Viscosity and Curing

Mix viscosity at 60℃	Rheomat MC 20	mPa*s	5’800
Pot life at 60℃ (Time to reach 100 Pas)	Rheomat MC 20	min	400
Gel time at 90℃	Gelnorm	min	35
Gel time at 100℃	Gelnorm	min	20
Gel time at 120℃	ISO 9396	min	6 – 10 *
Minimum curing cycle	1hour at 90℃ + 1.5 hour at 140℃		

*Specified range (provisional)

Processing and Storage (Guideline Values)

Preparation and Mixing

CW 2710-1 / HW 2711-1 contain fillers, which tend to settle over time.
It is therefore recommended to carefully homogenize the complete contents of the container before use.
The use of ceramic materials is recommended, due to the abrasiveness of the filler.

Measure (by weight or volume) the resin and the hardener. Add the hardener to the resin, making sure that the required amount of hardener is transferred to the resin. Stir thoroughly until mixing is complete.
Air entrainment during mixing results in pores in the cured resin. Mixing under vacuum or in a metering-mixing machine is the most effective way to prevent air entrainment. Alternatively the static resin – hardener mixture may be degassed in a vacuum chamber – allowing at least 200 % ullage for the foam to expand.

General instructions for preparing prefilled resin systems

The two components will be mixed in the desired quantity under vacuum and at slightly elevated temperature (50 - 60°C). For the mixing of medium- to high viscous casting resin systems and for mixing at lower temperatures, we recommend special thin film de-gassing mixers that may produce additional self-heating of 10-15 °C as a result of friction. Depending on quantity, mixer device, mixing temperature and application, the mixing time is 0.5 to 1h, under a vacuum of 1 to 8 mbar.
The premixed components packed according to their mixing ratio, could be used per container. In case of filler sedimentation, it is recommended to empty the container completely. Before partial use, the content must be carefully homogenized at elevated temperature. We recommend the same preheating temperature to prevent air enclosures when discharging the components.
In automatic mixing and metering installations, both components will be degassed and homogenized under a vacuum of about 2 mbar in the holding tanks. When degassed, the prefilled products are stirred up from time to time to avoid any sedimentation. After dosing and mixing with a static mixer, the system is fed directly to the vacuum chamber or, in the automatic pressure gelation process, directly into the hot casting mould. By using circular feeding tubes, several casting stations can be served.

Curing

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 1h / 90°C and 1.5h / 140°C.

Color of casting			brownish
Glass transition temperature	ISO 11359-2	°C	120
Thermal class	IEC 60085		H
Density	ISO 1183	g/cm^3	2.1
Flexural strength	ISO 178	MPa	78
Elongation at break	ISO 178	%	0.6
Flexural modulus	ISO 178	MPa	13'000
Hardness	ISO 868	Shore D	92
Critical stress intensity factor	PM 216-0'/89	$MPa*m^{1/2}$	2.7
Specific energy at break	PM 216-0'/89	J/m^2	300
Coefficient of thermal expansion	ISO 11359-2		
Alpha 1 < Tg		ppm/K	24
Alpha 2 > Tg			67
Thermal conductivity	ISO 8894	W/m*K	1.7
Flammability	UL 94	E96722	V-0 (12mm)

Electrical Properties (Guideline Values)

Determined on standard test specimen at 23°C. Cured for 1h / 90°C and 1.5h / 140°C.

Dielectric strength (2 mm specimen)	IEC 60243-1	kV/mm	25
Dielectric loss factor (tan δ, 50Hz, 25°C)	IEC 60250	%	1.2
Dielectric constant (ε_r, 50Hz, 25°C)	IEC 60250		4.7
Volume resistivity (ρ, 25°C)	IEC 60093	Ω cm	10^{14}

Legal Notice

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