resoltech 2080M 17 & M25

Hardeners 2083M-2085M

Structural epoxy foaming systems

New hardener 2083M CMR Free

- Final density of 170 or 250 kg/m³
- Can be released from the mold without post curing
- T_G up to 110°C
- Excellent thermo-mechanical properties
- hydrophobic and rot-proof

INTRODUCTION

RESOLTECH 2080 M are liquid foaming epoxy casting systems formulated to produce **low density, closed cell, strutural cores**. Those systems have a (free) expansion coefficient from 4.5 to 6.6, enabling the production of **170 and 250 kg/m3 epoxy foams**.

The slow, controlled foaming reaction makes un-necessary the use of mixing machines like with PU foams. The low pressure of the foaming will enable direct casting in the final parts **without conforming moulds** and without alteration of the dimensions of the composite.

This system is available **in black or white** (to be pigmented with any RAL pigment paste available on request).

The main advantages of those epoxy foaming systems over existing systems are :

- No brittle stage after the foaming, making it un-necessary to cure before releasing from mould or to post-cure depending on the mechanical characteristics needed
- Perfect compatibility with prepregs and epoxy resins even during their polymerization
- Excellent resistance to water
- Major improvement of thermal and mechanical resistances compared to existing epoxy foams
- Homogeneous structure of the foam
- No VOC emission

MIXING RATIO

The mixing ratio must be accurately followed. It is not possible to change the ratio, it would result in lower mechanical properties. The mixture should be thoroughly stirred to ensure full homogeneity.

Systems	2080M 17 or 2080 M25/2083M	2080M 17 or 2080 M25/2085M
Mixing ratio by weight	100 /35	100/30

APPLICATION

- It is recommended to cast the mix at a temperature around 18°C to 25°C in order to ease the mixing and casting process. The foaming starts 2 minutes after mixing, allow 10% margin for losses during casting.
- Lower temperatures will increase the viscosity of the mix while higher temperatures will reduce the viscosity and the pot life. In both cases, this could have a negative impact on the quality of the foam obtained and the final density after foaming.
- At 23°C, the foam is hard and may be released from the mold after 24h when using 2085M hardener and after 72h when using the 2083M. Without post curing, parts can be used after 7 days at 23°C.
- The curing of the foaming systems is exothermic, considering the thermal insulative properties of the foam, it is mandatory to conduct testings prior to large castings. Anyway, for large castings the use of 2083M is recommanded.
- During cold periods, the 2085M may have tendency to crystallize (appearance of a cloudy effect with some crystals). Once crystallized the hardener should not be used. The phenomenon is reversible, and heating the hardener at temperatures between 50°C and 60°C is sufficient to recover a clear liquid. This will not affect the properties of the final product.
- In the case of deep cavities to be filled, it is wise to wet the walls with a liquid resin before foaming to promote foam expansion.

PHYSICAL CHARACTERISTICS

1 Visual aspect

2080 M17 or 2080 M25 :
Opalescent white gel

2083M & 2085M :
Transparent to yellow or black liquid

Mix :
White or black pourable gel

2 Density

Resin	2080 M17			2080 M25		
Hardener		2083M	2085M		2083M	2085M
Density at 23°C	1.17	0.96	0.96	1.17	0.96	0.96
Density of the mix before foaming at 23°C	-	1.12	1.12	-	1.12	1.12
Density of the mix after foaming	-	0.17	0.17	-	0.25	0.25
Free expansion coefficient	-	6.6	6.6	-	4.5	4.5

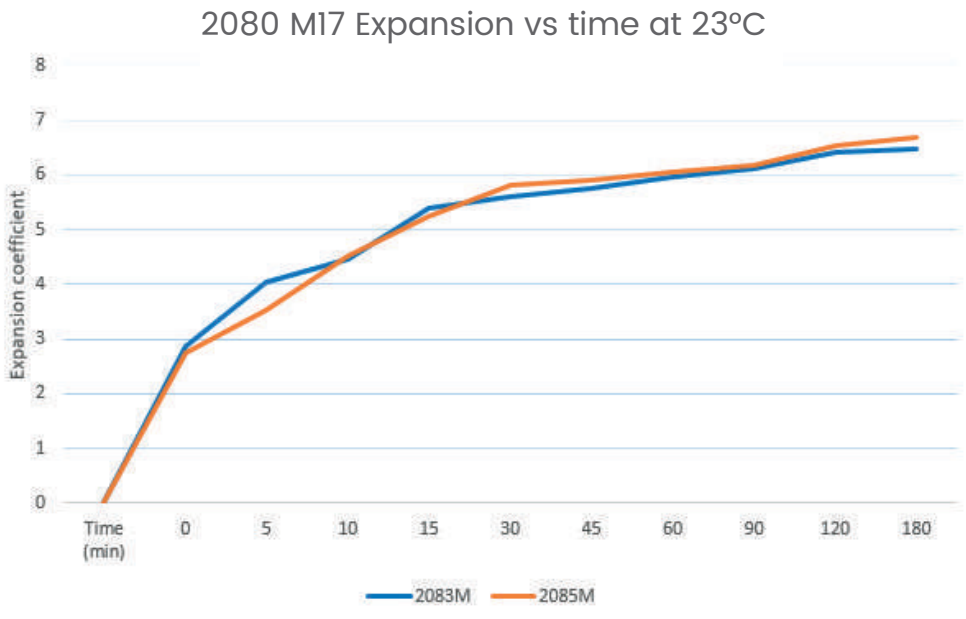
ISO 1675, ± 0.05 tolerance

3 Viscosity

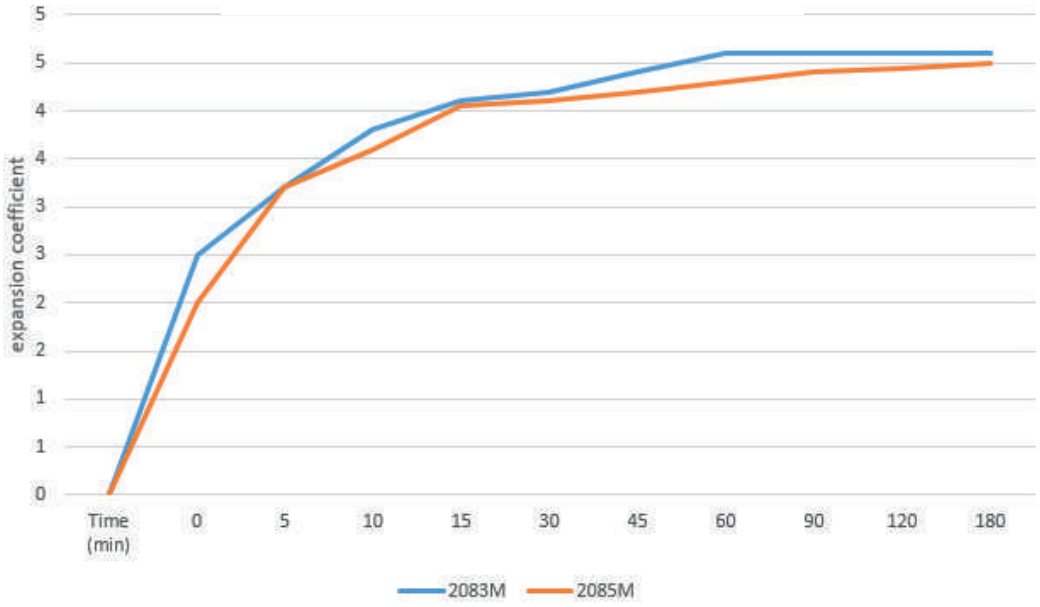
Resin	2080 M17		2080 M25	
Hardener	2083M	2085M	2083M	2085M
Resin viscosity at 23°C (mPa.s)	4000		9600	
Hardener viscosity at 23°C (mPa.s)	42	29	42	29

ISO 12058.2, ± 15% tolerance

FOAMING



2080 M25 Expansion vs time at 23°C



CURING AND POST-CURING

In order to obtain the maximum thermo-mechanical properties, it is necessary to respect the recommended curing cycle. The table below shows the glass transition temperatures (DSC) according to different curing cycles.

Resin	2080 M17 / 2080 M25	
Hardener	2083M	2085M
T_G after 14 days at 23°C	54°C	57°C
T_G after 16h at 60°C	76°C	81°C
T_G max after 6h at 60°C + 4h at 80°C	80°C	-
T_G max after 6h at 60°C + 4h at 80°C + 4h at 100°C	-	120°C

T_G measured by DSC, 10°C/min, inflection point

MECHANICAL PROPERTIES

Resin		2080 M17		2080 M25	
Hardener		2083M	2085M	2083M	2084M
14 days at 23°C	COMPRESSION Modulus Max strength	136 MPa 2..5 MPa	102 MPa 1.9 MPa	151 MPa 3.6 MPa	138 MPa 2.9 MPa
16h at 60°C	COMPRESSION Modulus Max strength	153 MPa 2.9 MPa	92 MPa 2.2 MPa	194 MPa 4.4 MPa	116 MPa 2.2 MPa

ISO 844

PACKAGING

- Box kit of 1kg + hardener
- Bucket kit of 5kg + hardener
- Bucket kit of of 25kg + hardener
- Drum kit of 200kg + hardener
- IBC kit of 1t + hardener

TRANSPORT & STORAGE

Keep containers sealed and away from heat and cold preferably between 10°C and 30°C in a well ventilated area. Our products are guaranteed in their original packaging (check expiry date on the label).

HEALTH & SAFETY

Skin contact must be avoided by wearing protective nitrile gloves & overalls or other protective clothing.
Eye protection should be worn to avoid risk of resin, hardener, solvent or dust entering the eyes. If this occurs flush the eye with water for 15 minutes, holding the eyelid open, and seek medical attention.
Ensure adequate ventilation in work areas. Respiratory protection should be worn with ABEKP coded filters.
Resoltech issues full Material Safety Data Sheet for all hazardous products. Please ensure that you have the correct MSDS to hand for the materials you are using before commencing work.

! The data provided in this document is the result of tests and is believed to be accurate. We do not accept any responsibility over the mishandling of these products and our liability is limited strictly to the value of the products we manufacture and supply.

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