

EPIKOTE™ Resin MGS® RIMR035c
EPIKURE™ Curing Agent MGS® RIMH036, -0366, -037, -038, -038F

CHARACTERISTICS

Approval	DNV
Application	Rotor blades for wind energy turbines, boat and shipbuilding, sports and recreation equipment, model construction, tooling
Operational temperature	-40°C – +70°C after post cure
Processing	At temperatures between 15°C and 50°C, depending on production parameters
Features	Low viscosity, extremely long pot life, excellent cost performance ratio
Storage	Shelf life of 24 months in originally sealed containers

APPLICATION

EPIKOTE™ Resin MGS RIMR035C is a low-viscous infusion resin system and can be used for processing of glass, carbon, and aramid fibers. The optimum processing temperature is in the range of 20°C to 35°C. Higher temperatures are possible but will shorten pot life. A temperature increase of 10°C will approx. halve the pot life. Different temperatures during processing are not known to have significant impact on the mechanical properties of the cured product.

All available curing agents except of RIMH038F (F = free of color) are colored blue to facilitate an easier identification of a homogenous mixture. The color is only a visual aid and is therefore not exactly specified, therefore variations from batch to batch are possible. Furthermore, the color is not stable and can change over time. This can be especially observed for higher reactive curing agents and in general due to UV radiation. Accordingly, depending on reactivity of curing agent and storage conditions (like exposure to sunlight) the color will change over time, but this has no known effect on the overall performance of the material and does not constitute a quality complaint.

Due to the chemical characteristics of this system, we do not expect any problems concerning compatibility (e. g. blistering, tearing or changes in color), when it is processed with gelcoats. However, comprehensive tests are indispensable.

For epoxy resins crystallization is immanently possible. In an early stage, crystallization is visible as a clouding, and can progress to a stage, where the resin becomes a wax- like solid. Crystallization can be reversed by slow heating of the product to approx. 40 - 60 °C. without restriction to quality after removal, in fact a high purity of material will increase a tendency for crystallization. Although RIMR035C has very low tendency to crystallize at lower temperatures, storage conditions of 15-30 °C are recommended.

After dispensing material, the containers must again be closed carefully, to avoid contamination or absorption of water. All amine hardeners show a chemical reaction when exposed to air, known as „blushing“. This reaction is visible as white carbamide crystals, which could make the materials unusable.

The materials have a shelf life of minimum 2 years, when stored in their originally sealed containers.

The relevant industrial safety regulations for the handling of epoxy resins and curing agents are to be observed.

TYPICAL PROPERTIES

Property	Unit	Resin RIMR035C	Curing agent			
			RIMH036	RIMH0366	RIMH037	RIMH038(F)
Density ¹⁾	g/cm ³	1.125	0.935			
Viscosity ¹⁾	mPa·s	1250	10			
Pot life ²⁾	min		140	200	240	285
Ultimate T _g ³⁾	°C		85	90		

These are typical values and should not be construed as specifications.

Measuring conditions:

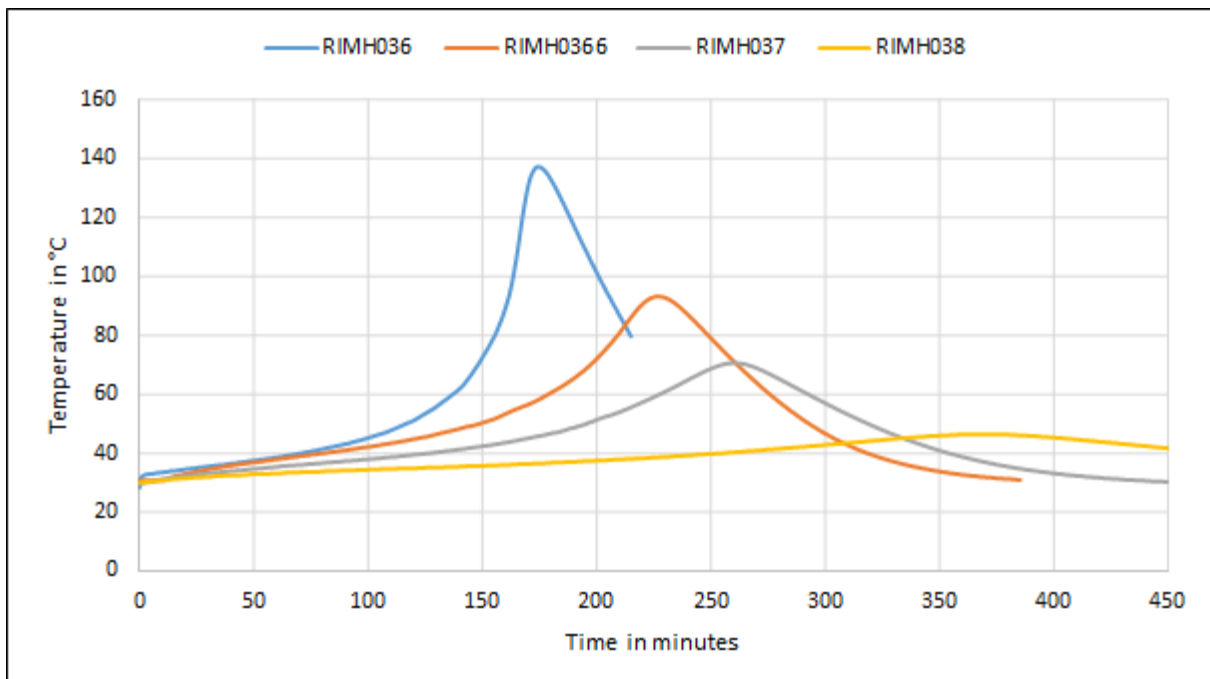
- 1) measured at 25°C
- 2) 100g mixture in water bath at 30°C
Pot life is a standardized lab test under fixed conditions which does not necessarily reflect real process conditions. The usage or working time varies depending on real processing conditions (environmental temperature, quantities, etc.)
- 3) DSC 20K/min, midpoint

MIXING

Mixing ratio	Parts curing agent per 100 parts resin RIMR035c
Parts by weight	28 ± 2
Parts by volume	33.7 ± 2

The mixing ratio stated must be observed carefully. Adding more or less curing agent will not result in a faster or slower cure, only incomplete curing with limited performance, that cannot be corrected at all. Resin and curing agent must be mixed carefully. Mix until no clouding is visible in the mixing container. Special attention must be paid to the walls and bottom of the mixing container.

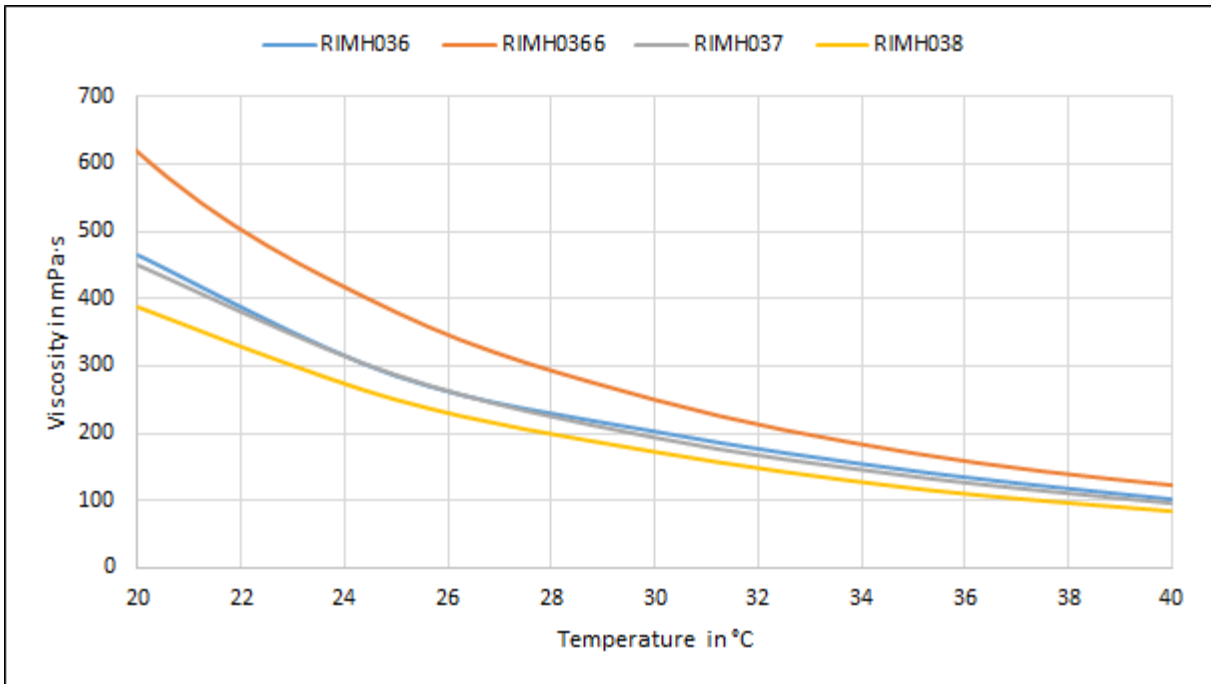
TEMPERATURE DEVELOPMENT



Measuring conditions: 100g mixture at 30°C in a water bath

Water (e.g. high humidity or contained in the fabrics) can cause an acceleration of the reaction and influence mechanical properties. Do not mix large quantities – particularly of higher reactive systems – at elevated processing temperatures. As the heat dissipation in the mixing container is very slow, the contents will be heated up by the reaction heat rapidly. This can result in temperatures of more than 200°C in the mixing container, which may cause smoke-intensive burning of the resin mass.

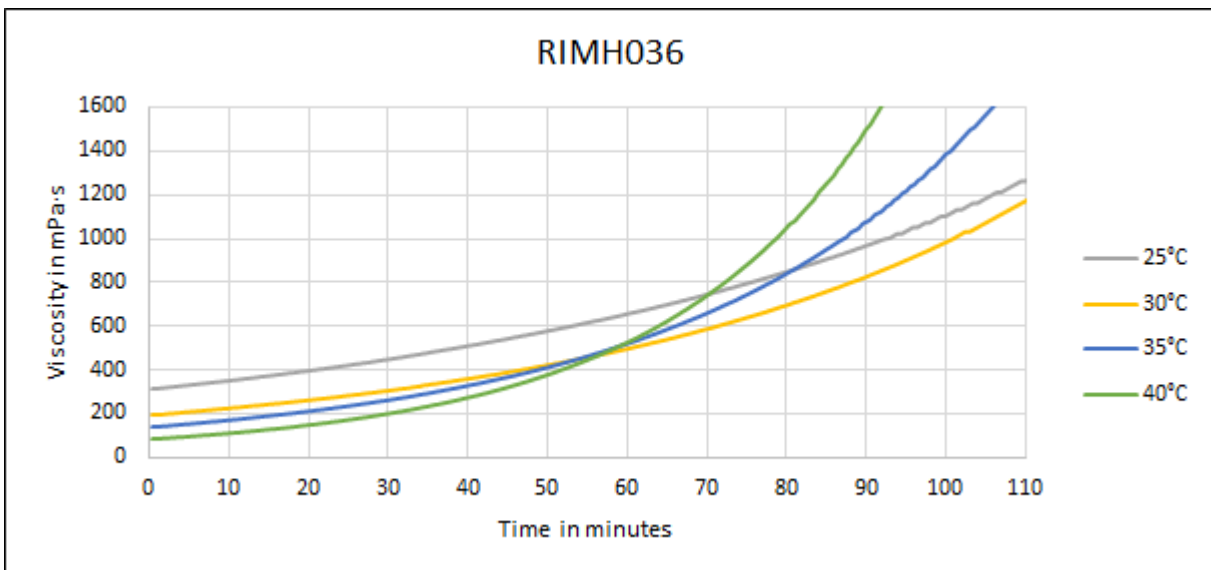
VISCOSITY OF MIXTURE

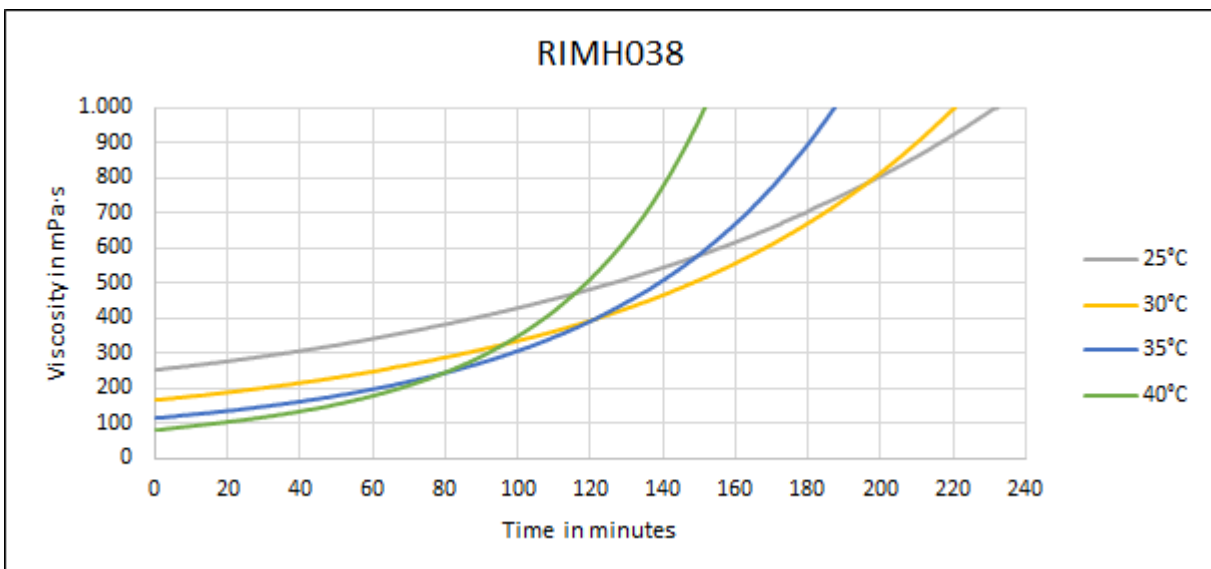
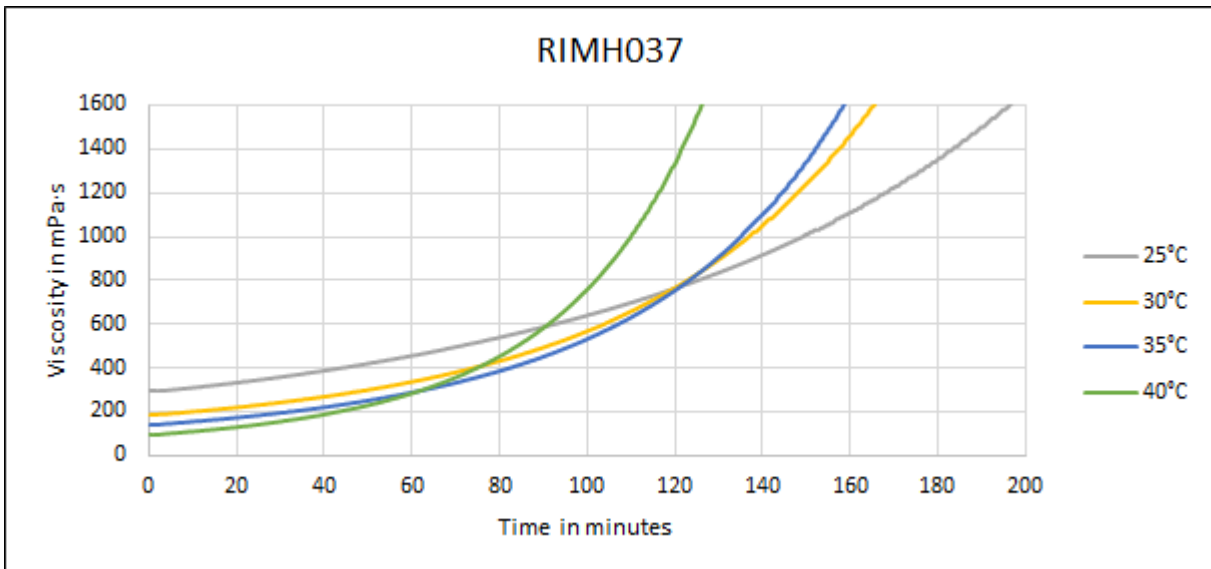
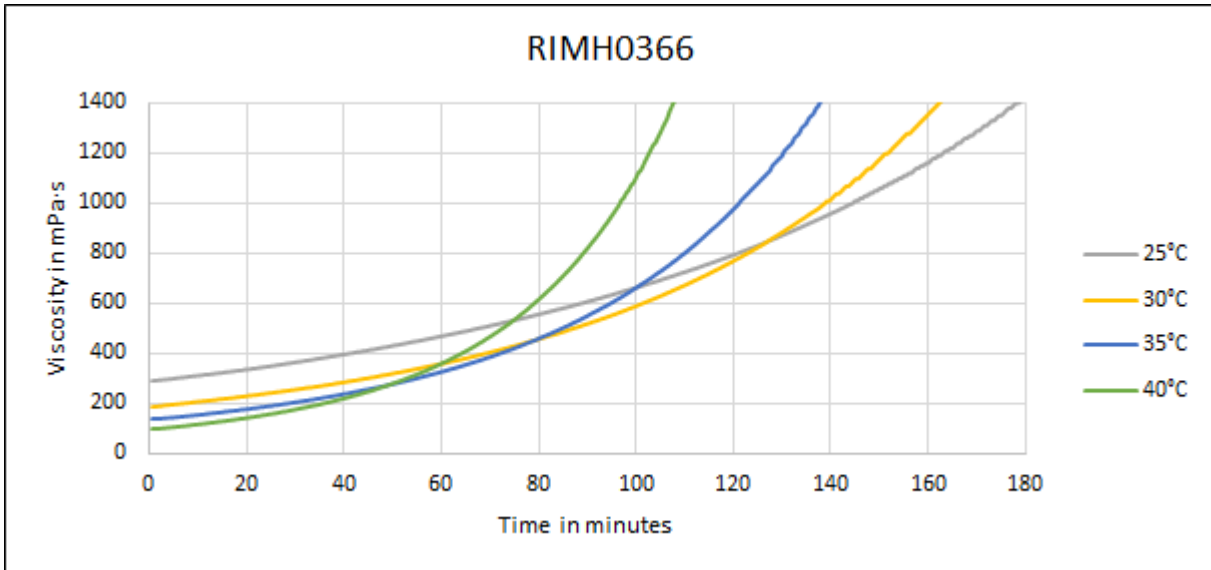


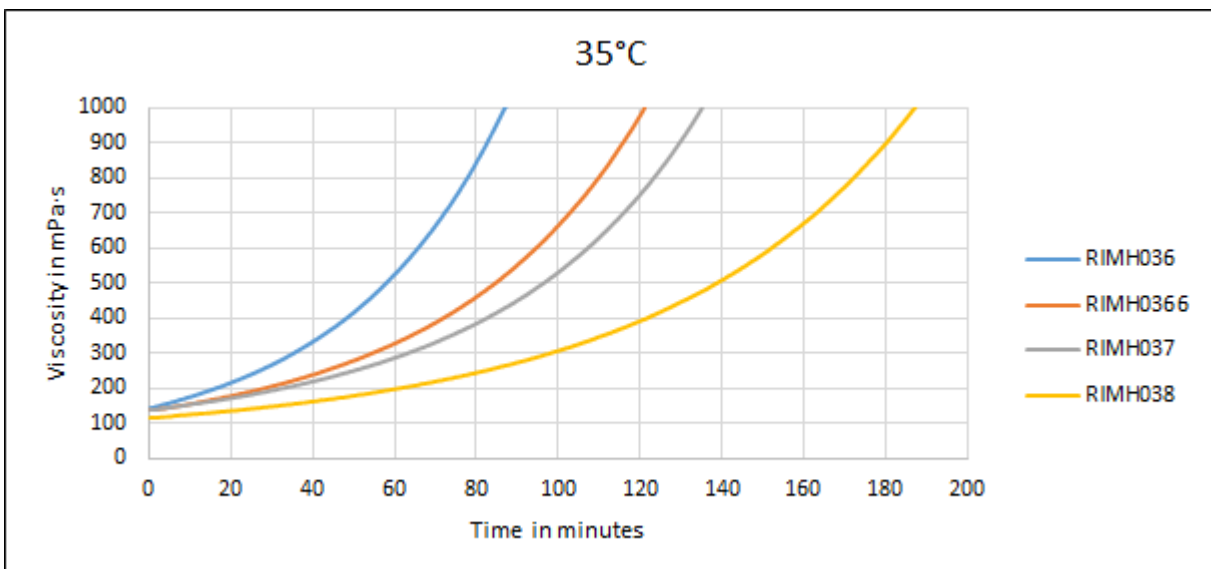
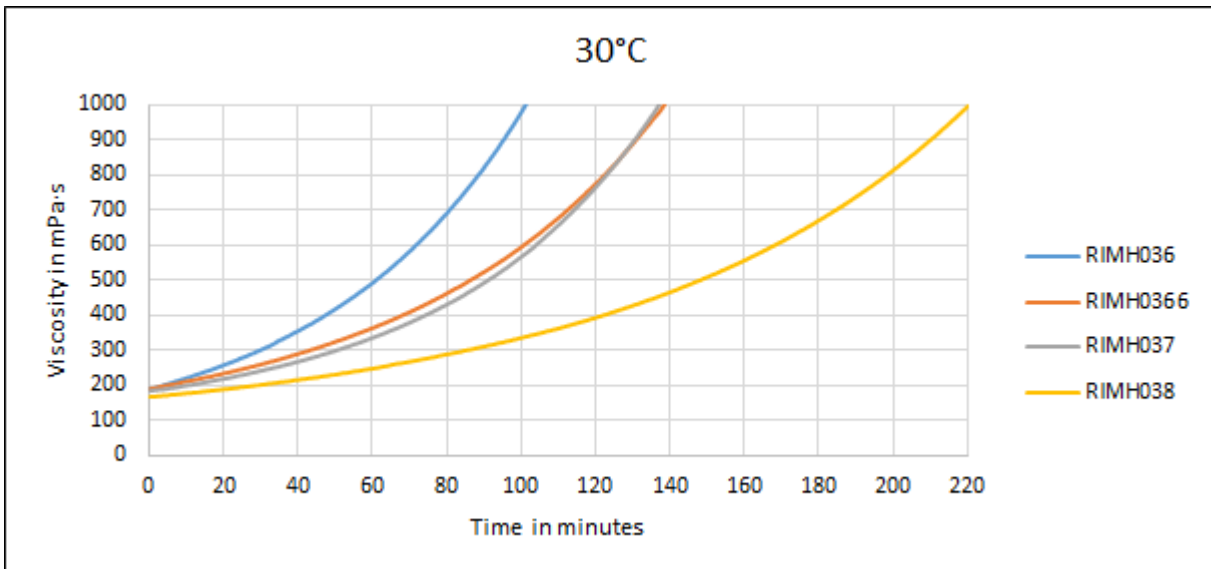
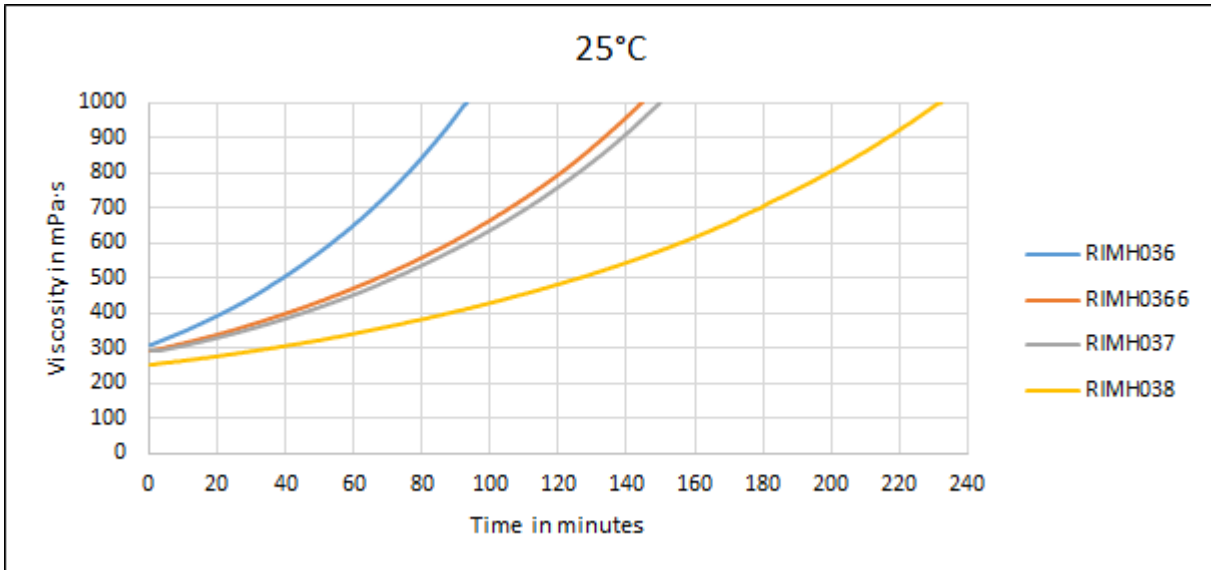
Measuring conditions: Viscometer, cone-plate 50 mm, measuring gap 0.1 mm

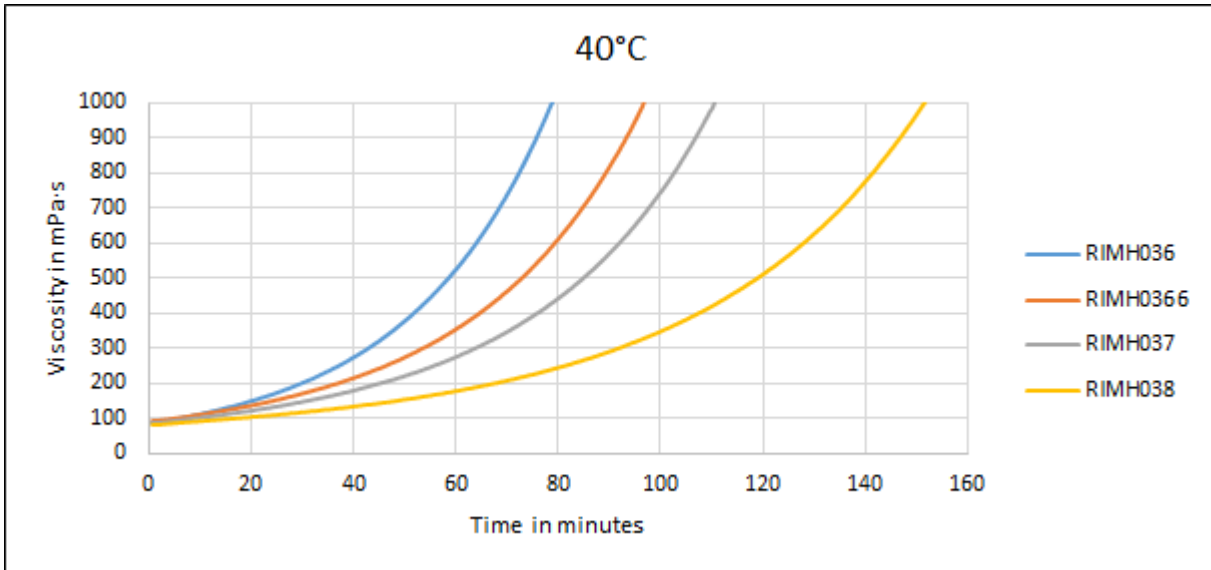
VISCOSITY DEVELOPMENT

Measuring conditions: Viscometer, cone-plate 50 mm, gap d=0,1mm



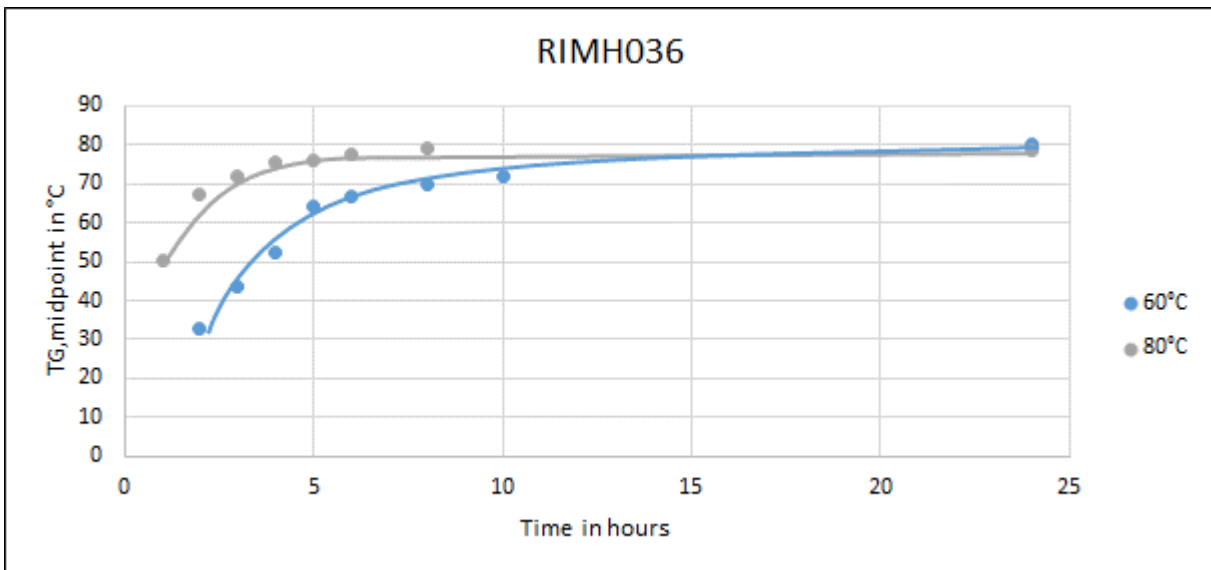


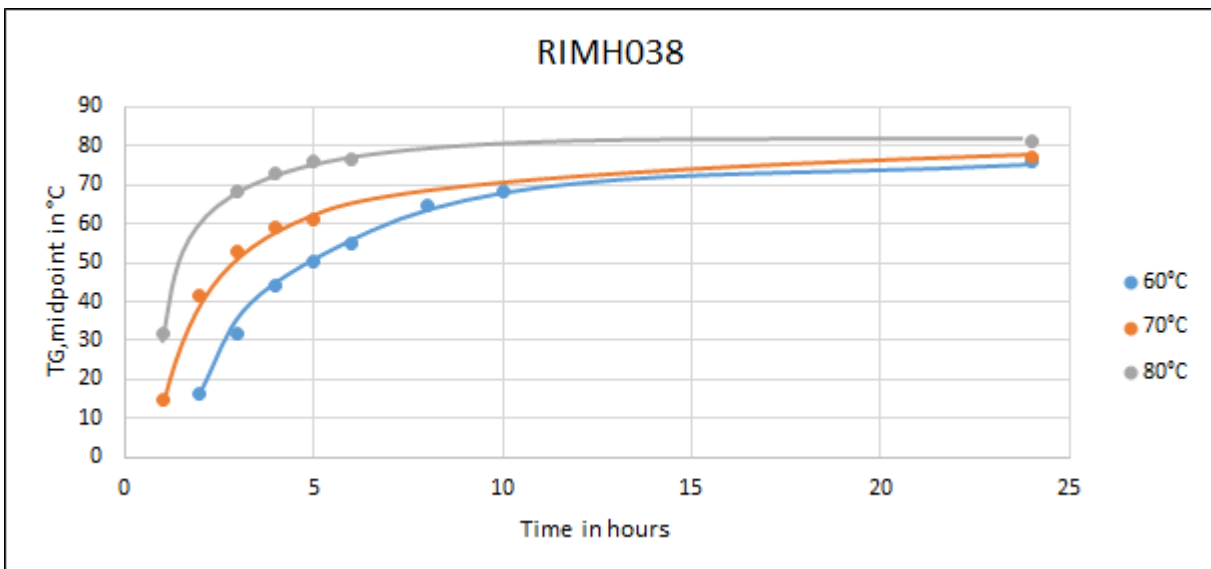
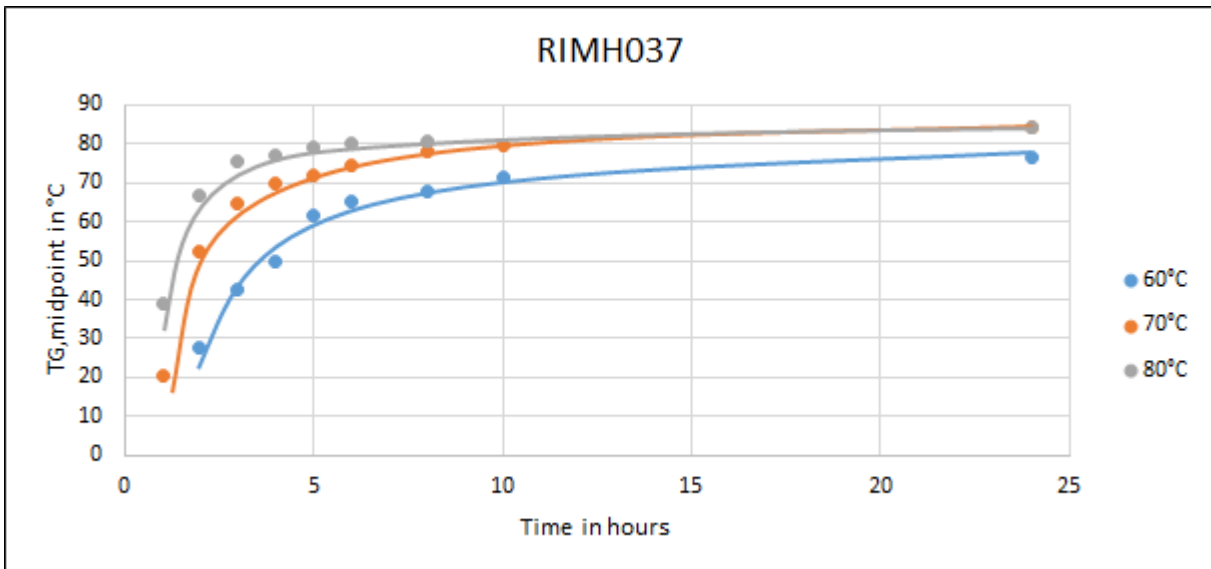
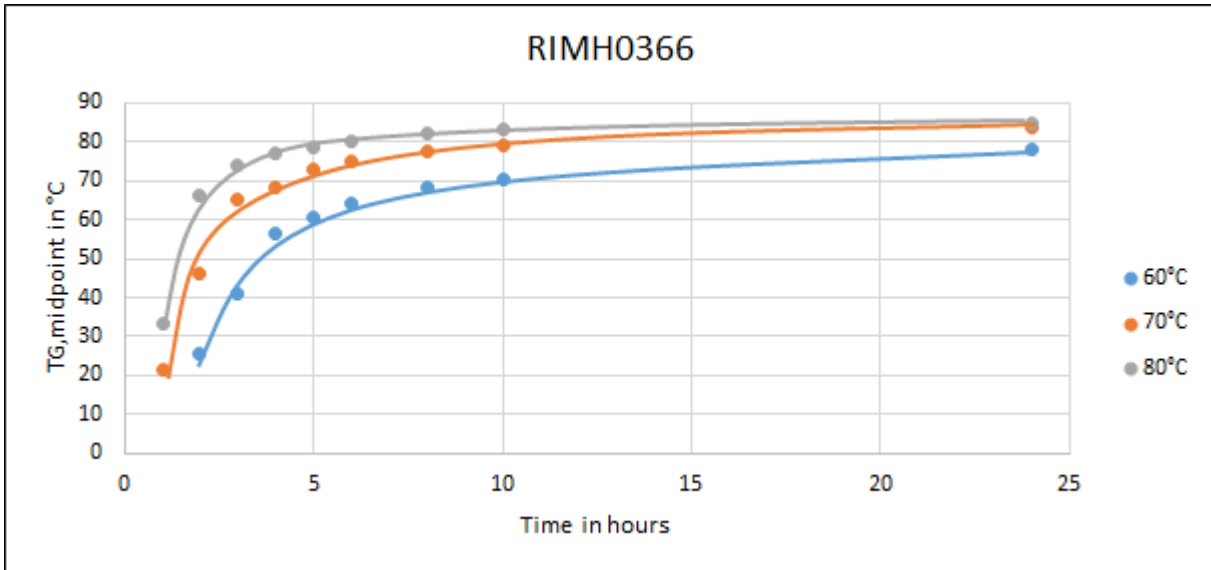


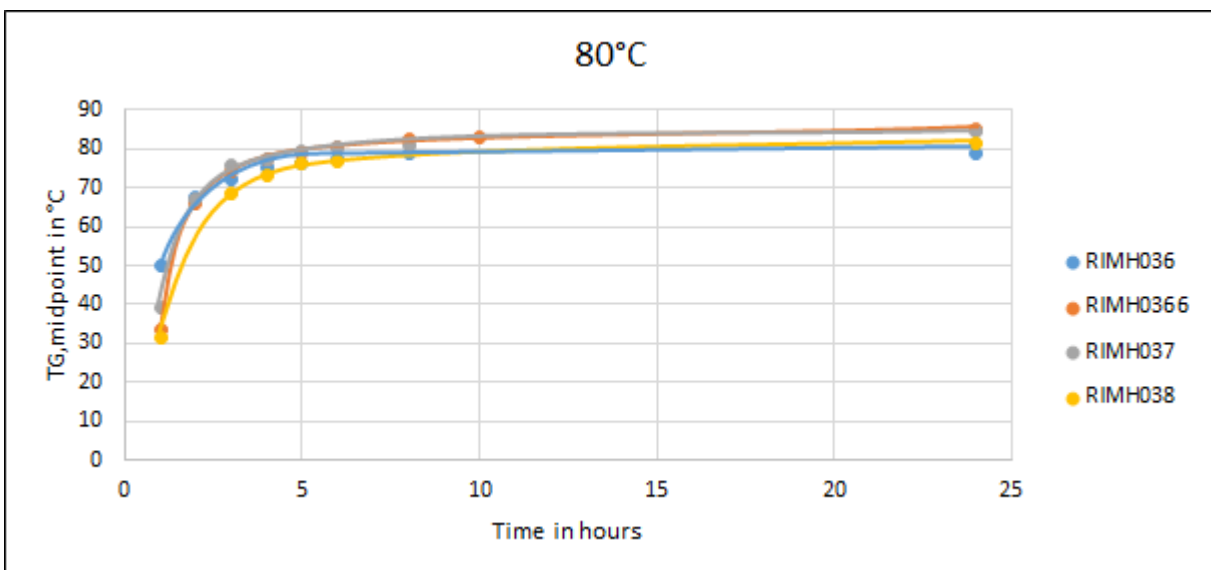
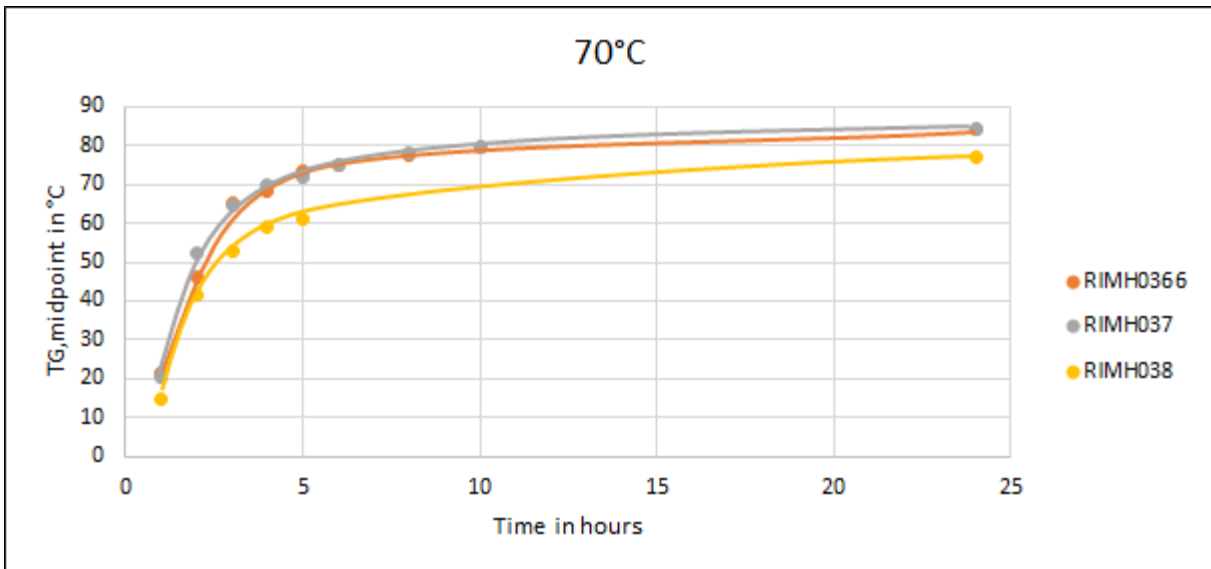
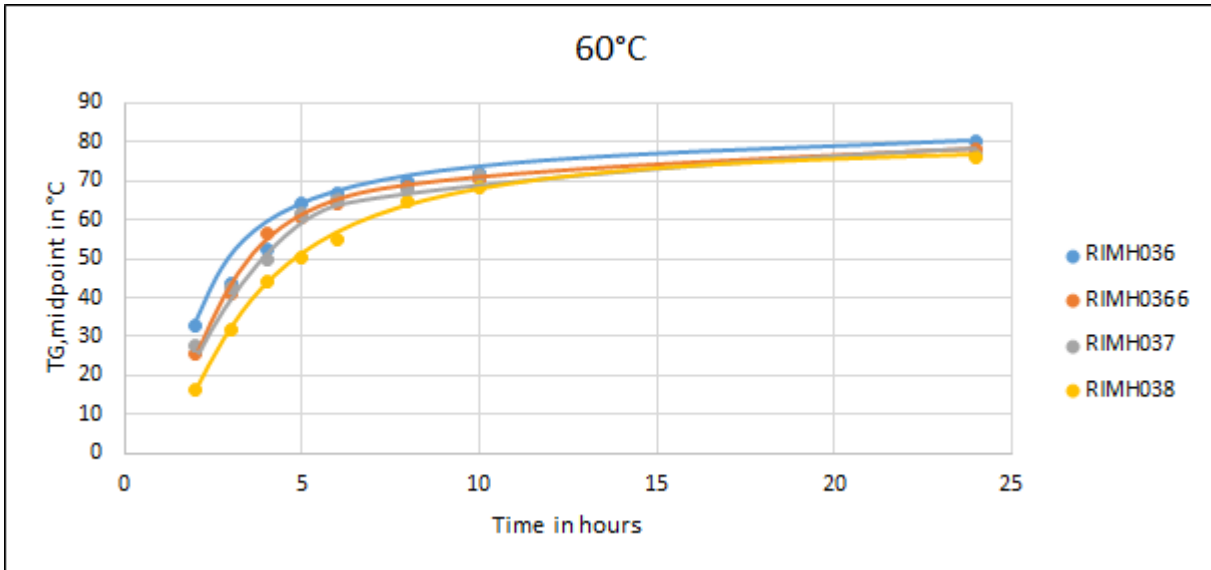


T_g DEVELOPMENT

Measuring conditions: DSC-measuring heat rate: 20°C/min, sample mass 10-20 mg







PHYSICAL AND MECHANICAL DATA

Cured density DIN EN ISO 1183-1	Density [g/cm³]	1.15
Tensile test DIN EN ISO 527-2	Tensile strength [MPa]	70
	Tensile modulus [GPa]	3.0
	Tensile strain at break¹⁾ [%]	8
Flexural test DIN EN ISO 178	Flexural strength [MPa]	~ 115
	Flexural modulus [GPa]	3.1

¹⁾ Tensile strain at break results strongly depends on specimen quality, especially void content
 All tests accomplished at standard climate; specimens cured up to a T_G midpoint of approx. 75°C

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