

Infusion resin MGS[®] RIM 935

Hardeners MGS[®] RIMH 936 / 937

suter-kunststoffe ag
swiss-composite.ch

CH-3312 Fraubrunnen 031 763 60 60 Fax 763 60 61

	page	Content
Characteristics	23	
Application	24	
Specifications	25	
Viscosity development	26	
Processing details	26	
Mixing ratios	26	
Temperature development	27	
Viscosity of mixture	27	
Glass transition temperature (T _g) unconditioned	28	
DMA	28	

Approval	-
Application	application that require high heat resistances, boat- and shipbuilding, automotive, tooling and moulding
Operational temperature	-60 °C up to +130 °C (-76°F up to +266 °F) after suitable heat treatment
Processing	at temperatures between 15 °C and 50 °C (59 °F-122 °F) , preferably 25 °C - 35 °C (77 °F - 95 °F), infusion, hand lay-up and others
Features	very high heat resistance, low mixed viscosity, good mechanical properties potlife approx. 2-5 h short curing times at elevated temperatures
Special modifications	on request
Storage	shelf life of 24 months in originally sealed containers

Characteristics

In the process of international testing system harmonization, the national standards previously used are being increasingly replaced by ISO (DIN EN ISO) standards. All information, recommendations and suggestions offered by Hexion Specialty Chemicals GmbH, whether orally, in written form or in a database, are provided to the best of our knowledge and belief. However, they may not be construed as legally binding statements and do not represent either express or implicit assurances, or a guarantee of specific properties. The data parameters stated for products are specific values that may also be found in our technical information leaflets, and like these do not represent the basis of either a guarantee or specification. The same applies analogously to the data parameters stated for examples of cured binder systems; these represent analytical results and are only intended to simplify advance selection of the individual components of a binder. This information, these recommendations and suggestions describe our products and possible applications in general or exemplary terms, but do not refer to specific cases. Changes in the data parameters, texts and illustrations can result from the constant process of technical development and improvement of our products; possible changes are not specially mentioned in the text. Our support does not free the customer from the obligation to conduct its own review of our current informational literature, in particular our product data sheets, safety data sheets and our technical information leaflets. The customer must carry out tests of our products on his own responsibility to determine their suitability for the intended process and uses, as well as to establish whether their processing characteristics are appropriate in a specific case, since the technical uses of our products are numerous and can vary widely in a specific instance. Therefore, such factors do not fall within our control, and are the exclusive responsibility of the customer. If a specific assurance of data parameters should be required, an appropriate agreement must be reached to this effect. Any applicable patents, existing laws and regulations must be observed by the customer or user of our products on its own responsibility. This publication does not represent a license, nor does it intend to infringe or encourage infringement of any type of patent. Note: this edition voids and replaces all previous publications on the pertinent subject.

Am Ostkai 21/22
70327 Stuttgart
Germany
Phone: +49 (0) 711 - 3 89 80 00
Fax: +49 (0) 711 - 3 89 80 011
www.hexionchem.com

Infusion resin MGS® RIM 935

Low viscous infusion resin system for processing of woven and none crimp multiaxial fabrics of low to high areal weight. Due to its very good mechanical properties, these system is suitable for the production of components featuring high static and dynamic loadability and high heat resistance.

Infusion resin RIM 935 is based on bisphenol A/F resin. Hardener RIMH 936 and RIMH 937 are a modification of aliphatic and cycloaliphatic amines. As crystallisation of both A and B component is possible, special care should be given to this issue. It appears as a clouding or solidification of the contents of the container. Before processing, the crystallization must be removed by warming up.

Potlife (100 g mixed at 30 °C/86 °F) is approximately 2 hours for RIMH 936 and 3,5 h for RIMH 937. Optimum viscosities for infusion are realized at temperatures in the range of 25 - 35 °C (77 °F - 95 °F). Pot life is then between approx. 1 h (RIMH 236 at 40°C/104 °F) to 5 h (RIMH 937 at 25°C/77 °F). Following initial curing at room temperature, the parts are still brittle and require heat treatment at a min. temperature of 50 °C/122 °F before processing or demolding. Direct curing at Selevated temperatures (60 °C-100 °C/140 °F-212 °F) is possible . The curing time can be reduced to a few minutes by this.

Non-tacky, high-gloss surfaces are obtained even with unfavorable curing conditions, such as low temperatures or high relative humidity.

The Infusion resin systems does not contain any unreactive components. All raw materials and additives feature a very low vapor pressure, therefore permitting processing of the material under vacuum even at elevated temperatures. Compatibility problems are not to be expected in combination with suitable gelcoats, various paints (e.g. PUR-based), etc. However, comprehensive tests are indispensable.

These hardeners can be stored for at least 24 months in their carefully sealed original containers. Even though it is unlikely, these hardeners may crystallize at temperatures below +15 °C. The crystallization is visible as a clouding or solidification of the contents of the container. If crystallisation of either component should be observed, it can removed by warming up. Slow warming up to approx. 50 °C-60°C (122 °F-140 °F) in a water bath or oven and stirring or shaking will clarify the contents of the container without any loss of quality. Use only completely transparent products. Before warming up, open containers slightly to permit equalization of pressure. Caution during warm-up! Do not warm up over an open flame! While stirring up use safety equipment (gloves, eyeglasses, respirator equipment).

The relevant industrial safety regulations for the handling of epoxy resins and hardeners and our instructions for safe processing are to be observed.

Application

In the process of international testing system harmonization, the national standards previously used are being increasingly replaced by ISO (DIN EN ISO) standards. All information, recommendations and suggestions offered by Hexion Specialty Chemicals GmbH, whether orally, in written form or in a database, are provided to the best of our knowledge and belief. However, they may not be construed as legally binding statements and do not represent either express or implicit assurances, or a guarantee of specific properties. The data parameters stated for products are specific values that may also be found in our technical information leaflets, and like these do not represent the basis of either a guarantee or specification. The same applies analogously to the data parameters stated for examples of cured binder systems; these represent analytical results and are only intended to simplify advance selection of the individual components of a binder. This information, these recommendations and suggestions describe our products and possible applications in general or exemplary terms, but do not refer to specific cases. Changes in the data parameters, texts and illustrations can result from the constant process of technical development and improvement of our products; possible changes are not specially mentioned in the text. Our support does not free the customer from the obligation to conduct its own review of our current informational literature, in particular our product data sheets, safety data sheets and our technical information leaflets. The customer must carry out tests of our products on his own responsibility to determine their suitability for the intended process and uses, as well as to establish whether their processing characteristics are appropriate in a specific case, since the technical uses of our products are numerous and can vary widely in a specific instance. Therefore, such factors do not fall within our control, and are the exclusive responsibility of the customer. If a specific assurance of data parameters should be required, an appropriate agreement must be reached to this effect. Any applicable patents, existing laws and regulations must be observed by the customer or user of our products on its own responsibility. This publication does not represent a license, nor does it intend to infringe or encourage infringement of any type of patent. Note: this edition voids and replaces all previous publications on the pertinent subject.

Infusion resin MGS® RIM 935**Specifications**

		Infusion resin RIM 935
Density	[g/cm ³]	1,14 - 1,2
Viscosity	[mPas]	300 - 600
Epoxy equivalent	g/equivalent	155 - 165
Epoxy value	equivalent /100g	0,61 - 0,64
Refractory index		1,5350-1,5450

Measuring conditions:

measured at 25 °C / 77 °F

		Hardener RIMH 936	Hardener RIMH 937
Density	[g/cm ³]	0,92 - 0,97	0,95 - 0,96
Viscosity	[mPas]	10 - 50	30 - 100
Amine value	[mg KOH/g]	550 - 650	450 - 500
Refractory index		1,4850 - 1,4920	1,485 - 1,505

Measuring conditions:

measured at 25 °C / 77 °F

In the process of international testing system harmonization, the national standards previously used are being increasingly replaced by ISO (DIN EN ISO) standards. All information, recommendations and suggestions offered by Hexion Specialty Chemicals GmbH, whether orally, in written form or in a database, are provided to the best of our knowledge and belief. However, they may not be construed as legally binding statements and do not represent either express or implicit assurances, or a guarantee of specific properties. The data parameters stated for products are specific values that may also be found in our technical information leaflets, and like these do not represent the basis of either a guarantee or specification. The same applies analogously to the data parameters stated for examples of cured binder systems; these represent analytical results and are only intended to simplify advance selection of the individual components of a binder. This information, these recommendations and suggestions describe our products and possible applications in general or exemplary terms, but do not refer to specific cases. Changes in the data parameters, texts and illustrations can result from the constant process of technical development and improvement of our products; possible changes are not specially mentioned in the text. Our support does not free the customer from the obligation to conduct its own review of our current informational literature, in particular our product data sheets, safety data sheets and our technical information leaflets. The customer must carry out tests of our products on his own responsibility to determine their suitability for the intended process and uses, as well as to establish whether their processing characteristics are appropriate in a specific case, since the technical uses of our products are numerous and can vary widely in a specific instance. Therefore, such factors do not fall within our control, and are the exclusive responsibility of the customer. If a specific assurance of data parameters should be required, an appropriate agreement must be reached to this effect. Any applicable patents, existing laws and regulations must be observed by the customer or user of our products on its own responsibility. This publication does not represent a license, nor does it intend to infringe or encourage infringement of any type of patent. Note: this edition voids and replaces all previous publications on the pertinent subject.

Am Ostkai 21/22

70327 Stuttgart

Germany

Phone: +49 (0) 711 - 3 89 80 00

Fax: +49 (0) 711 - 3 89 80 011

www.hexionchem.com

Infusion resin MGS® RIM 935

	Injection resin RIM 935	Hardener RIMH 936	Hardener RIMH 937
Average EP - Value	0,63	-	
Average amine equivalent	-	45	59

Processing details

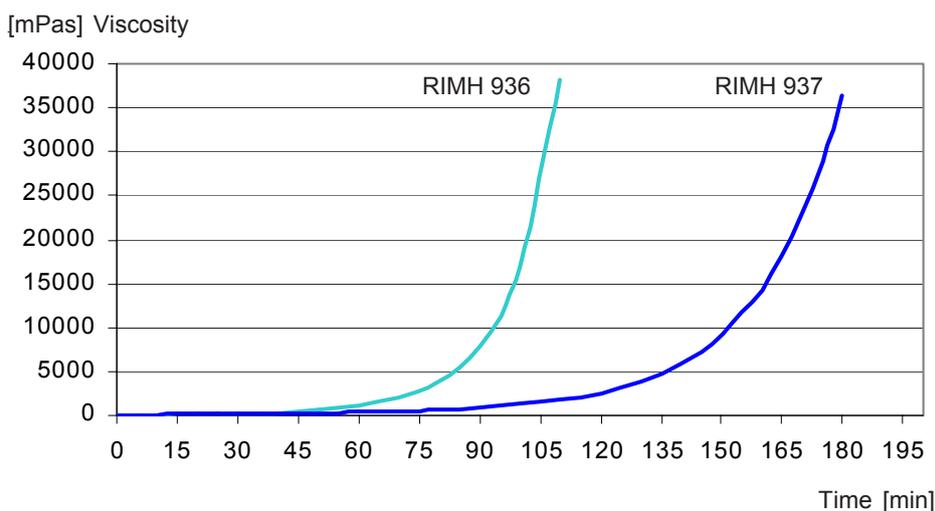
	RIM 935 : RIMH 936	RIM 935 : RIMH 937
Parts by weight	100 : 29 ± 2	100 : 38 ± 2
Parts by volume	100 : 35 ± 2	100 : 45 ± 2

Mixing ratios

The specified mixing ratios must be observed as exactly as possible. Adding more or less hardener will not result in a faster or slower reaction - but in incomplete curing which cannot be corrected in any way.

Resin and hardener must be mixed very thoroughly. Mix until no clouding is visible in the mixing container. Pay special attention to the walls and the bottom of the mixing container.

Viscosity development at 40°C in thin layer

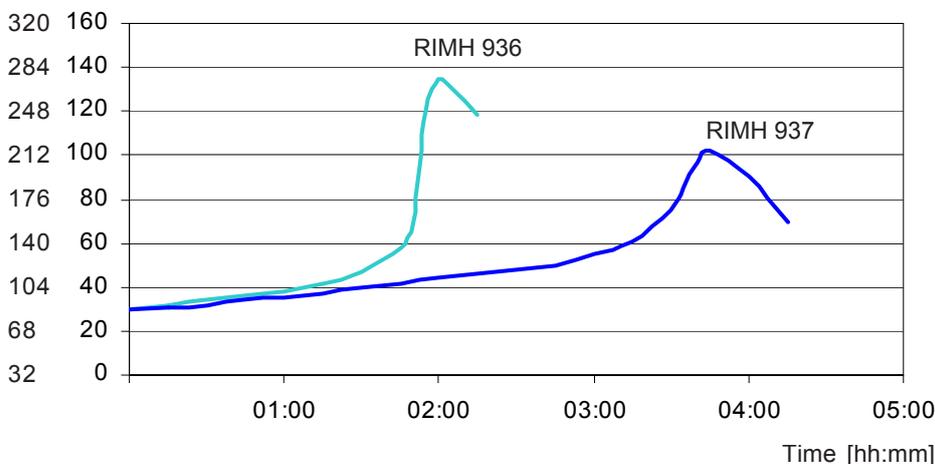


Viscosity development

In the process of international testing system harmonization, the national standards previously used are being increasingly replaced by ISO (DIN EN ISO) standards. All information, recommendations and suggestions offered by Hexion Specialty Chemicals GmbH, whether orally, in written form or in a database, are provided to the best of our knowledge and belief. However, they may not be construed as legally binding statements and do not represent either express or implicit assurances, or a guarantee of specific properties. The data parameters stated for products are specific values that may also be found in our technical information leaflets, and like these do not represent the basis of either a guarantee or specification. The same applies analogously to the data parameters stated for examples of cured binder systems; these represent analytical results and are only intended to simplify advance selection of the individual components of a binder. This information, these recommendations and suggestions describe our products and possible applications in general or exemplary terms, but do not refer to specific cases. Changes in the data parameters, texts and illustrations can result from the constant process of technical development and improvement of our products; possible changes are not specially mentioned in the text. Our support does not free the customer from the obligation to conduct its own review of our current informational literature, in particular our product data sheets, safety data sheets and our technical information leaflets. The customer must carry out tests of our products on his own responsibility to determine their suitability for the intended process and uses, as well as to establish whether their processing characteristics are appropriate in a specific case, since the technical uses of our products are numerous and can vary widely in a specific instance. Therefore, such factors do not fall within our control, and are the exclusive responsibility of the customer. If a specific assurance of data parameters should be required, an appropriate agreement must be reached to this effect. Any applicable patents, existing laws and regulations must be observed by the customer or user of our products on its own responsibility. This publication does not represent a license, nor does it intend to infringe or encourage infringement of any type of patent. Note: this edition voids and replaces all previous publications on the pertinent subject.

Infusion resin MGS® RIM 935

[°F] [°C] Temperature



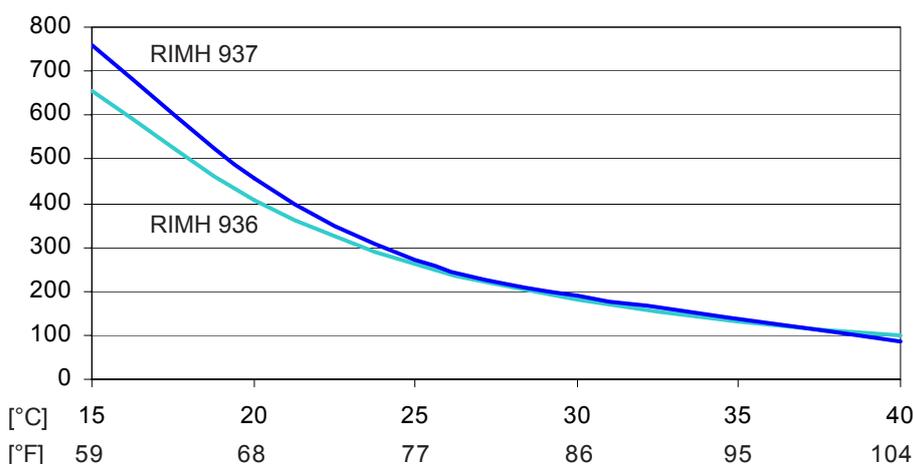
Temperature development

Quantity: 100g in air at 30 °C (86 °F)

The optimal processing temperature is in the range between 20 and 25°C (68 - 77°F). Higher processing temperatures are possible, but will shorten pot life. A rise in temperature of 10 °C (18°F) will halve the pot life. Water (for example very high humidity or contained in fillers) causes an acceleration of the resin/hardener reaction. Different temperatures and humidities during processing have no significant effect on the strength of the cured product.

Viscosity of the mixture at different temperatures

[mPas] Viscosity



Viscosity of mixture

In the process of international testing system harmonization, the national standards previously used are being increasingly replaced by ISO (DIN EN ISO) standards. All information, recommendations and suggestions offered by Hexion Specialty Chemicals GmbH, whether orally, in written form or in a database, are provided to the best of our knowledge and belief. However, they may not be construed as legally binding statements and do not represent either express or implicit assurances, or a guarantee of specific properties. The data parameters stated for products are specific values that may also be found in our technical information leaflets, and like these do not represent the basis of either a guarantee or specification. The same applies analogously to the data parameters stated for examples of cured binder systems; these represent analytical results and are only intended to simplify advance selection of the individual components of a binder. This information, these recommendations and suggestions describe our products and possible applications in general or exemplary terms, but do not refer to specific cases. Changes in the data parameters, texts and illustrations can result from the constant process of technical development and improvement of our products; possible changes are not specially mentioned in the text. Our support does not free the customer from the obligation to conduct its own review of our current informational literature, in particular our product data sheets, safety data sheets and our technical information leaflets. The customer must carry out tests of our products on his own responsibility to determine their suitability for the intended process and uses, as well as to establish whether their processing characteristics are appropriate in a specific case, since the technical uses of our products are numerous and can vary widely in a specific instance. Therefore, such factors do not fall within our control, and are the exclusive responsibility of the customer. If a specific assurance of data parameters should be required, an appropriate agreement must be reached to this effect. Any applicable patents, existing laws and regulations must be observed by the customer or user of our products on its own responsibility. This publication does not represent a license, nor does it intend to infringe or encourage infringement of any type of patent. Note: this edition voids and replaces all previous publications on the pertinent subject.

Infusion resin MGS® RIM 935

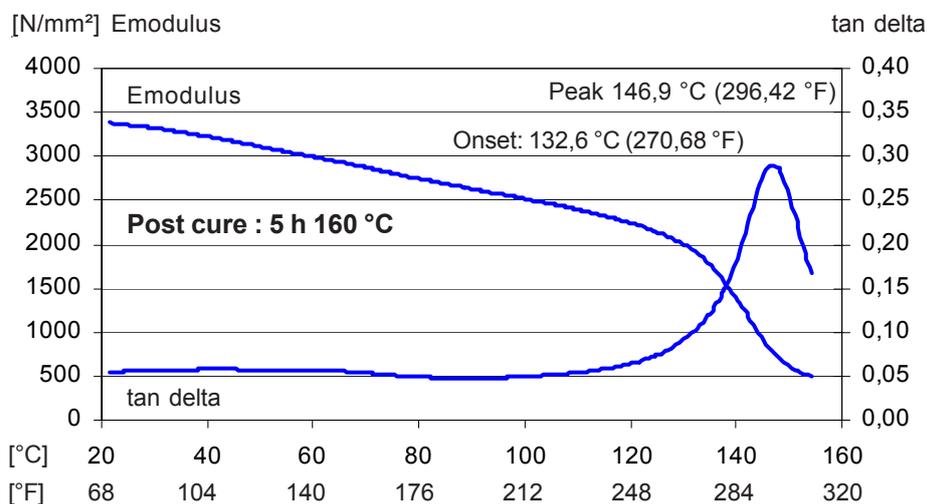
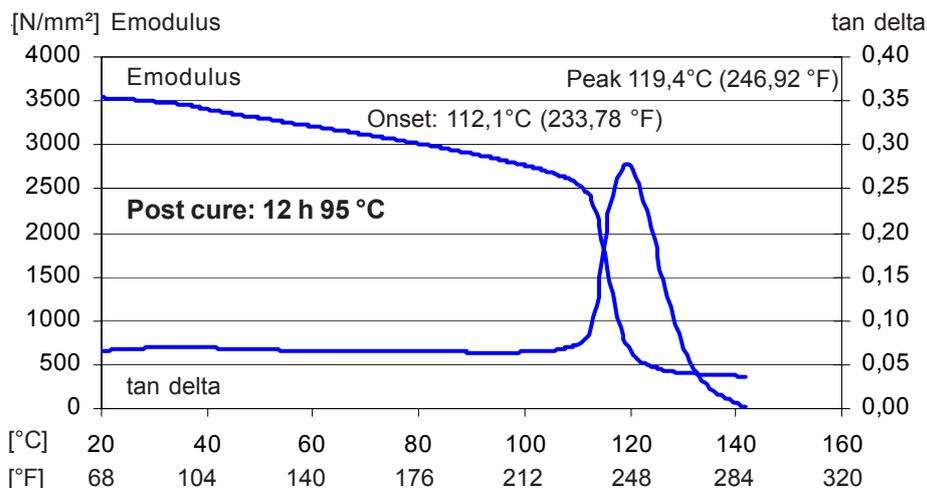
Max. T _g at 80 °C (176 °F) post cure	90-100 °C (194-212 °F)
Max. T _g at 100 °C (212 °F) post cure	105-120 °C (221-248 °F)
Max. T _g at 140 °C (284 °F) post cure	135-150 °C (275-302 °F)

Glass transition temperature (T_g) unconditioned

DMA-Measuring after heat treatment

DMA-T_g(peak) tan delta: Infusion resin RIM 935 with hardener RIMH 937

DMA



Measuring conditions:

Frequency: 1Hz
Coupon thickness: 2mm
Heating rate: 2K/min

In the process of international testing system harmonization, the national standards previously used are being increasingly replaced by ISO (DIN EN ISO) standards. All information, recommendations and suggestions offered by Hexion Specialty Chemicals GmbH, whether orally, in written form or in a database, are provided to the best of our knowledge and belief. However, they may not be construed as legally binding statements and do not represent either express or implicit assurances, or a guarantee of specific properties. The data parameters stated for products are specific values that may also be found in our technical information leaflets, and like these do not represent the basis of either a guarantee or specification. The same applies analogously to the data parameters stated for examples of cured binder systems; these represent analytical results and are only intended to simplify advance selection of the individual components of a binder. This information, these recommendations and suggestions describe our products and possible applications in general or exemplary terms, but do not refer to specific cases. Changes in the data parameters, texts and illustrations can result from the constant process of technical development and improvement of our products; possible changes are not specially mentioned in the text. Our support does not free the customer from the obligation to conduct its own review of our current informational literature, in particular our product data sheets, safety data sheets and our technical information leaflets. The customer must carry out tests of our products on his own responsibility to determine their suitability for the intended process and uses, as well as to establish whether their processing characteristics are appropriate in a specific case, since the technical uses of our products are numerous and can vary widely in a specific instance. Therefore, such factors do not fall within our control, and are the exclusive responsibility of the customer. If a specific assurance of data parameters should be required, an appropriate agreement must be reached to this effect. Any applicable patents, existing laws and regulations must be observed by the customer or user of our products on its own responsibility. This publication does not represent a license, nor does it intend to infringe or encourage infringement of any type of patent. Note: this edition voids and replaces all previous publications on the pertinent subject.