

## Parts In Minutes<sup>®</sup>

### RenPIM<sup>®</sup> 5221-1 A / 5221-1 B

## Fast Curing, Two Component, Polyurea System for Rapid Prototyping and Short Series Production Applications

#### Key properties

- Very High Impact system
- Black system
- Low flexural modulus
- Suitable for Crash Testing
- Optimised for short series production applications

#### Applications / Description

This Parts In Minutes polyurea simulates the appearance and physical characteristics of engineering thermoplastics for prototyping and short production runs. It can be used to produce functional parts and prototypes suitable for use in all major industrial areas including automotive, aerospace, consumer goods, electronic and leisure applications. The Ureol 5221-1 A/B system has also been used to produce parts that are required for crash testing purposes.

RenPIM 5221-1 A/B is a black system which simulates high density polyethylene. It has low flexural modulus, high impact strength and is specially formulated for production of automotive and electronic parts.

#### Product data

Property	Unit	RenPIM 5221-1 A	RenPIM 5221-1 B
Appearance Colour	visual	Clear pale yellow	Liquid Black
Viscosity at 25°C	m Pa s	2600-2800	150-350
Density	g/cm <sup>3</sup>	ca. 1.12	ca.1.05

#### Processing

Mix ratio	Parts by weight	Parts by volume
RenPIM 5221-1 A	100	100
RenPIM 5221-1 B	32	30

This Parts In Minutes polyurea is specifically formulated to be a fast curing systems and therefore requires processing via application equipment. Huntsman Advanced Materials are pleased to advise on all types of suitable dispensing and mixing equipment for the processing of these materials. Hand mixing or manual processing of these materials is not recommended.

Thorough stirring to ensure uniform dispersion of materials is **critical**, prior to processing. Whilst processing through static mixers can be achieved, best results are obtained when using Rotostat or Dynamic mixing. **Caution** under no circumstances should the A & B components be reversed in your machine to accommodate the mix ratio.

### Moulds

Best results are achieved by warming the mould to at least 30°C to achieve the short demould time thus eliminating brittleness at time of demould. Full mechanical properties will only be achieved upon full curing,

This Huntsman Advanced Materials Parts In Minutes polyurea system is compatible with most major silicone suppliers products. Further information is available on request.

Huntsman Advanced Materials can also offer alternative polyurethane and epoxy materials for the production of moulds, with appropriate release agents. These are particularly suitable for making short series production runs. Please ask your local sales representative for further information.

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## Properties

Resin/Hardener mix:		Unit	RenPIM 5221-1 A/B
Gelation time at 25°C		sec	45-55
Max. Layer thickness		mm	4
Demoulding time (dependent on layer thickness)		mins	15-20
<b>Caution</b> this is a polyurea system and as such will go through a brittle stage during curing in room temperature moulds.			

**After cure: 7 days room temperature or 24 hours RT + 16 hours @ 80 °C**

Density	ISO 1183	g/cm <sup>3</sup>	ca. 1.1
Hardness	ISO 868	Shore D	70-74
Deflection temperature	ISO 75	°C	ca. 58
Tg	(DSC)	°C	ca. 60
Impact strength Charpy	ISO 179	kJ/m <sup>2</sup>	170-190
Compressive strength	ISO 604	MPa	On Test
Tensile strength	ISO 527	MPa	30-40
Elongation at break	ISO 527	%	160-190
Flexural strength	ISO 178	MPa	15-18
Flexural modulus	ISO 178	MPa	300-400
<sup>1</sup> Linear shrinkage		mm/m	3.4

<sup>1</sup>Test specimen 500x50x5 mm at 25 °C

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## Storage

The resin and hardeners described in this instruction sheet have the shelf lives shown provided they are stored at 6 - 28°C in a dry place and sealed containers, preferably those in which they are supplied.

During prolonged storage these products may crystallize, either fully or partly. If they have turned cloudy, granular or semi-solid, they should be conditioned overnight in their original containers at 50-60°C (e.g in a temperature controlled oven), stirred or dispersed fully and allowed to cool to room temperature before use.

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## Equipment and maintenance

### Application equipment

Huntsman Advanced Materials is able to recommend equipment suppliers and provide technical help and assistance with respect to selection and operation of application equipment. A list of recommended suppliers is available on request.

### Maintenance

Maintenance and cleaning of equipment is expected to be minimal but daily cleaning of mixers may be necessary, depending on the type of mixer used. Huntsman Advanced Materials responsibility for the environment means we do not recommend the use of solvents for cleaning. Static mixers can be discarded directly when the product has gelled, and dynamic mixers should be flushed through with the pure polyol component. Please also refer to the recommendations of the equipment supplier.

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## Packaging

System	RenPIM 5221-1 A	RenPIM 5221-1 B
Quantity and Weight	25 kg	8 kg

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## Handling precautions

### Caution

Our products are generally quite harmless to handle provided that certain precautions normally taken when handling chemicals are observed. The uncured materials must not, for instance, be allowed to come into contact with foodstuffs or food utensils, and measures should be taken to prevent the uncured materials from coming in contact with the skin, since people with particularly sensitive skin may be affected. The wearing of impervious rubber or plastic gloves will normally be necessary; likewise the use of eye protection. The skin should be thoroughly cleansed at the end of each working period by washing with soap and warm water. The use of solvents is to be avoided. Disposable paper - not cloth towels - should be used to dry the skin. Adequate ventilation of the working area is recommended. These precautions are described in greater detail in the Material Safety Data sheets for the individual products and should be referred to for fuller information.

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## Huntsman Advanced Materials (UK) Limited

Duxford, Cambridge  
England CB2 4QA

Tel: +44 (0) 1223 493 000  
Fax: +44 (0) 1223 493 002

[www.renshape.com](http://www.renshape.com)

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