

## Parts In Minutes<sup>®</sup>

### RenPIM<sup>®</sup> 5213-1 A / 5213-1 B

#### Fast Curing, Two Component, Polyurethane System for Rapid Prototyping

##### Key properties

- Flame retardant system
- Approved to UL 94V-0
- High impact strength
- High thermal resistance
- Good dimensional stability

##### Applications / Description

Parts In Minutes polyurethanes simulate the appearance and physical characteristics of engineering thermoplastics for prototyping and short production runs. They can be used to produce functional prototype parts suitable for use in all major industrial areas including automotive, aerospace, consumer goods, electronic and leisure applications.

RenPIM 5213-1 A/B is a buff coloured system and cured parts in their natural colour pass the flame retardant qualification UL94V-0 at 3.0mm minimum thickness. Coloured or pigmented material is not approved to UL94V-0. The parts have high impact strength, thermal resistance and good dimensional stability and simulate PP/ABS.

##### Product data

Property	Unit	RenPIM 5213-1 A	RenPIM 5213-1 B
Appearance Colour	visual	Liquid Brown	Liquid Cream
Viscosity at 25°C	m Pa s	ca. 190-210	ca. 1600-2400
Density	g/cm <sup>3</sup>	ca. 1.2	ca. 1.18

##### Processing

Mix ratio	Parts by weight	Parts by volume
RenPIM 5213-1 A	65	65
RenPIM 5213-1 B	100	100

Parts In Minutes polyurethanes are specifically formulated to be fast curing systems and therefore require 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.

##### Moulds

Huntsman Advanced Materials Parts In Minutes polyurethane systems are 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. Please ask your local sales representative for further information.

### Colouring of Parts In Minutes polyurethane systems

Huntsman Advanced Materials recommends the use of polyol based colouring pastes. These are available from various suppliers. Astorit AG, Kobiboden, 8840 Einsiedeln, Switzerland, Tel ++41 55 418 7500, Fax ++41 55 418 7501, for example offer a range of compatible products. These are supplied in 50 g and 1 kg pack sizes. Other polyurethane compatible pigments or dyes are also acceptable for the colouring of Parts In Minutes prototyping systems.

## Properties

Resin/Hardener mix:		Unit	RenPIM 5213-1 A/B
Gelation time at 25°C		sec	ca. 50-90
Min. Layer thickness		mm	3
Demoulding time (dependent on layer thickness)		mins	ca. 15-30

*After cure: 14 hours at 80°C or 7 days at 20-25°C*

Density	ISO 1183	g/cm <sup>3</sup>	ca. 1.2
Hardness	ISO 868	Shore D	78-83
Deflection temperature	ISO 75	°C	ca. 90
Tg	(DSC)	°C	ca. 99
Impact strength	ISO 179	kJ/m <sup>2</sup>	>27
Compressive strength	ISO 604	MPa	ca. 40-55
Tensile strength	ISO 527	MPa	ca. 35-40
Elongation at break	ISO 527	%	ca. 8-12
Flexural strength	ISO 178	MPa	>55
Flexural modulus	ISO 178	MPa	ca. 1300-1500
<sup>1</sup> Linear shrinkage		mm/m	ca. 4

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

## 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.

## 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.

## Packaging

System	RenPIM 5213-1 A	RenPIM 5213-1 B
Quantity and Weight	16.25 kg or 15.75 kg	25 kg
Quantity and Weight	4x3.3 kg	4 x 5 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**

All recommendations for the use of our products, whether given by us in writing, verbally, or to be implied from the results of tests carried out by us, are based on the current state of our knowledge. Notwithstanding any such recommendations the Buyer shall remain responsible for satisfying himself that the products as supplied by us are suitable for his intended process or purpose. Since we cannot control the application, use or processing of the products, we cannot accept responsibility therefore. The Buyer shall ensure that the intended use of the products will not infringe any third party's intellectual property rights. We warrant that our products are free from defects in accordance with and subject to our general conditions of supply.

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