



DIVERSE URETHANES

DATA SHEET HC PT 110

1. **INTRODUCTION**

HC PT 110 is an isocyanate terminated prepolymer which when processed with methylene bis-2-chloroanilene (MOCA) yields medium performance elastomers of 92 - 97 Shore A hardness, with good low temperature properties and hydrolytic stability.

2. **APPLICATIONS**

HC PT 110 is suitable for the preparation of hard, medium performance polyurethane elastomers.

3. **CONSIDERATIONS**

As with all polyurethane products, the product should not be exposed to very strong acids or bases. The highest temperature at which the product should be used is 80 - 85°C in order to maintain the full physical properties. The material can tolerate short periods of exposure to temperatures up to approximately 120°C without permanently impairing any of the physical properties.

During processing the material will experience around 2% volume shrinkage due to the heat of reaction.

4. **PREPOLYMER PHYSICAL PROPERTIES**

Appearance	:	Viscous, clear liquid
Free NCO content (%)	:	6,1 - 6,5
Viscosity at 80°C (cps)	:	350 - 550
Stability	:	Excellent
Specific gravity at 25°C	:	1,02 - 1,14

5. **CURATIVE PHYSICAL PROPERTIES**

Appearance	:	Water to yellow solid pellets
Melting point (°C)	:	110°C
Solubilities	:	water (almost insoluble)
	:	Methylene chloride (very soluble)
	:	Acetone (very soluble)

6. **ELASTOMERS**

The following range of physical properties are attained when HC PT 110 is cured with MOCA at 95% stoichiometry and subjected to the correct part-curing cycle.

HC PT 110 at 80°C (NCO content 6,2%) : 100 parts
MOCA at 110 - 115°C (at 95% stoichiometry): 18,8 parts

Mix ratio is calculated by weight.

(Exact mix ratio depends upon free NCO content and must be calculated for each consignment; see calculations in Appendix 1).

Pot life at 60°C (minutes)	:	4 - 5
Demould at 80°C (minutes)	:	±45 - 60
Density at 20°C (gcm ⁻³)	:	1,09 - 1,15
Hardness Shore A	:	92 - 97
100% Modulus (MPa)	:	6 - 7
Tensile Strength (MPa)	:	11 - 12
Elongation (%)	:	430 - 510
Co-efficient of friction		
dry (Ng ⁻¹)	:	0,018 - 0,025
wet (Ng ⁻¹)	:	0,001 - 0,002
Abrasion loss (mg)	:	65 - 75
Compression Set (%)	:	42 - 44

7. **PROCESSING:**

- 7.1 Melt out the HC PT 110 overnight at 80°C. HC PT 110 is heated to 80 - 85°C and the MOCA is heated to 120 - 125°C. Avoid prolonged and/or excessive heating.
- 7.2 Degas HC PT 110 under vacuum (2-5 mm Hg) until bubble free.
- 7.3 Mix the components together thoroughly without entraining air.
- 7.4 Pour the mixture into preheated moulds which have been treated with a suitable release agent. The mould temperature should be approximately 10°C higher than that of the elastomeric mixture.
- 7.5 Allow the mixture to gel or partially cure in the mould at a temperature of ~80°C. The time required for this operation will vary according to mould design and size, but will be in the region of 45-60 minutes.
- 7.6 The demoulded article is post-cured for a minimum of 3 hours at 100°C. Optimum properties are attained after a further seven days at room temperature.

8. **PACKAGING**

8.1 **HC PT 110**

25kg and 200og drums

8.2 **MOCA**

Standard 60kg packs - smaller quantities are made available on request.

9. **STORAGE**

9.1 **HC PT 110**

Should be stored in a dry environment at ambient temperatures. Prolonged or repeated heating of this material will reduce the shelf life.

9.2 **MOCA**

Twelve months minimum in sealed undamaged drums, stored in areas isolated from all sources of fire and excess heat.

10. **HANDLING**

10.1 **HC PT 110**

HC PT 110 is a polyisocyanate containing material and normal standards of industrial hygiene should be observed during its handling. Safety goggles, gloves and overalls should be worn and the material should be preferably used in a well ventilated area.

10.2 **MOCA**

Control of exposure is achieved by preventing the material from coming into contact with the skin or being inhaled as a dust or vapour. Skin contact should be avoided by careful handling and by use of suitable personal protective clothing.

Inhalation of dust or vapour should be avoided by use of the highest standard of local exhaust ventilation.

It is recommended that the effectiveness of exposure control measures be monitored by using analysis.

11. **TOXICITY**

MOCA

Lowest oral toxic dose for a rat is 27mg/kg. Recent work has shown that the substance is a relatively weak bladder carcinogen in dogs, and should be considered a suspect human carcinogen. Absorption can occur either by dust inhalation or through the skin.

12. **FIRST AID MEASURES**

12.1 **HC PT 110**

HC PT 110 is believed to be a non-dermatitic and to exhibit a low order of oral toxicity. However, since it is possible that certain individuals may be unusually sensitive to these materials, it is recommended that all users wash thoroughly and avoid prolonged and repeated skin contact. Eye contamination will cause severe irritation and pain. Immediate rinsing with water must be initiated and continued for at least 10 minutes. (see attached Safety Data Sheet). Seek medical assistance.

12.2 **MOCA**

If substance has entered the eyes, irrigate with water repeatedly for at least 15 minutes. Contaminated clothing should be removed and affected skin washed with soap and tepid water.

Medical advice must be sought for anyone who has symptoms due to contact with the substance.

13. **FIRE**

Keep containers cool by spraying them with water if they are exposed to the fire. Extinguish with dry chemical, sand, foam or water spray.

14. **SPILLAGES AND WASTE DISPOSAL**

14.1 **HC PT 110 - Decontamination of Equipment**

HC PT 110 can be decontaminated by overnight contact with liberal amounts of a solution containing methanol (30 parts), water (70 parts), concentrated ammonia (1 part). Drums must not be resealed until decontamination is complete. (see attached Safety Data Sheet on details for dealing with longer spills)

14.2 **MOCA**

14.2.1 **Spillage Treatment**

Cordon off spillage area, put on protective clothing; butyl rubber unit with hood and wellingtons attached, asbestos type full face respirator and PVC on butyl rubber gloves.

Damp down product with a minimum amount of water to prevent dust, sweep up material and place in sealed containers. Clean affected area and equipment thoroughly with butyl cellusolve acetate solvent, detergent and copious amounts of water.

14.2.2 **Waste Disposal**

Customers are advised to check their local, provincial or national legislation governing the disposal of waste materials.

The information provided in this data sheet and otherwise supplied to users, is based on our general experience and upon tests which are believed to be reliable. However, because we have no control over the exact manner in which the information is used, we cannot guarantee the results to be obtained. Furthermore, we make no express or implied warranty of merchantability or fitness of the product for a particular use.

All sales of this product shall be subject to Diverse Urethanes' Standard Condition of Sales.

The information contained in this data sheet is correct and accurate to the best of our knowledge but without warranty or liability.

SAFETY DATA SHEET

Chemical Family	:	Polyurethane
Product Type	:	Prepolymer
Major Components	:	Polyether Polyol with Terminal - NCO groups (99%)
Appearance	:	Clean, viscous liquid
Boiling Point	:	> 200°C
Vapour Pressure	:	2,5 and 10 ⁻⁵ mmHg @ 25° C
Specific Gravity	:	1,05 - 1,15
Flash Point	:	> 200°C
Auto ignition	:	> 200°C

Health Hazard Information

Eyes	:	Irritation. Causes watering and discomfort.
Skin	:	Slight to mild irritation of the skin and in rare cases, dermatitis. Temporary brown skin discolouration may also occur. It may cause sensitisation.
Ingestion	:	Irritation and pain.

Reactivity Data

Stability	:	Stable
Conditions to avoid	:	Water ingress
Hazardous Decomposition Products	:	Carbon Dioxide

Spillages

Treat spillages with wet earth or sand. Leave material to react for 15 minutes. Shovel into bags.

Waste Disposal

Land tipping after consultation with local authorities.

Protective Equipment

Eyes	:	Goggles
Gloves	:	PVC/Rubber
Overalls	:	Cotton

APPENDIX 1

CALCULATION OF MIX RATIO OF HC PT 110 TO MOCA

FNCO = The NCO value found on the drum label of HC PT 110

Calculation

$X = 3,13 \times \text{FNCO}$ (100% stoichiometry)

$X = 3,02 \times \text{FNCO}$ (95% stoichiometry)

(95% stoichiometry yields the best properties)

The mix ratio is:

100 parts by weight HC PT 110 to X parts by weight MOCA.