

## Ultramoll® IV

Ultramoll® IV is a high viscosity polymeric acrylonitrile-butadiene rubber (NBR), plasticiser for a large number of polymers, e.g. polyurethane (PU) etc. polyvinyl chloride (PVC), VC copolymers,

**Chemical composition:** adipic polyester

**Supply form:** almost colourless, high viscosity liquid

**Health and safety information:** Relevant safety data and advice and information on the necessary warning labels can be found in Safety Data Sheet No. 165607.

**Labelling required by law:** Ultramoll® IV does not require labelling according to the relevant German and EU regulations on dangerous goods transport.

### Specified properties:

Property	Nominal value	Unit	Test method
Refractive index $n_{D20}$	1.4670 ± 0.0015	-	DIN EN ISO 6320 (method based on)
Acid value	max. 1.0	mg KOH/g	DIN ISO 2114
Gardner colour value	max. 6	-	DIN 6161
Viscosity at 50 °C	1000 ± 200	mPas	DIN 53 015

### Additional product information:

Property	Nominal value	Unit	Test method
Density at 23°C	ca. 1.128	g/cm <sup>3</sup>	DIN 51 757
Viscosity at 23°C	6000 ± 1000	mPas	DIN 53 015
Pour point	ca. - 13	°C	ISO 3016
Flash point (open cup)	ca. 270	°C	ISO 2592
Dissolution temperature	ca. 167	°C	DIN 53 408 (method based on)
Volatility after 6h, 130°C	1.1	%	Brabender

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## Storage stability

When stored in its sealed original container, Ultramoll® IV has a shelf life of 1 year.

## Solubility

Soluble in all common organic solvents, practically insoluble in water, aliphatic hydrocarbons and vegetable, animal and mineral oils and common monomeric plasticisers.

## Packaging

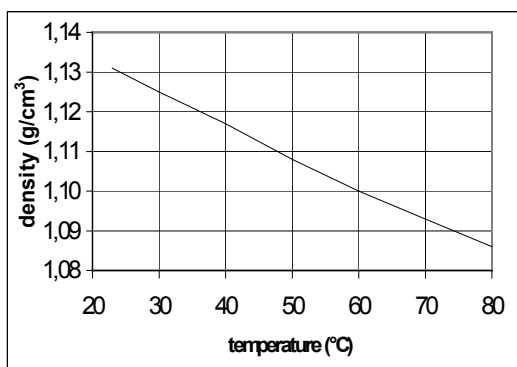
Road tankers  
Polyethylene containers, contents 1,000 kg  
Drums, contents 200 kg

These raw material properties are typical properties and, unless specifically indicated otherwise, are not to be considered as delivery specification.

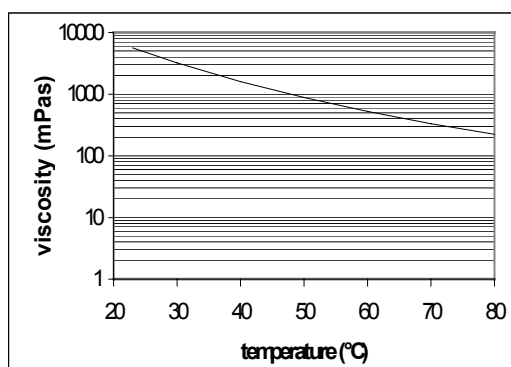
## Instructions and recommendations for use

Density and viscosity are important variables determining storage, the design of the storage tanks and the dimensions of pipelines and

delivery pumps. Figures 1 and 2 show the values for these properties.



**Fig. 1:** Density (DIN 51 757) of Ultramoll® IV as a function of temperature



**Fig. 2:** Viscosity (DIN 53 015) of Ultramoll® IV as a function of temperature



## General properties

Ultramoll® IV shows:

- good extraction resistance to oils, (Table 1)
- good thermostability
- good processibility

The migration of Ultramoll® IV in plasticised PVC compounds in contact with other thermoplastic polymers is low (Table 2). Ultramoll® IV meets a large number of European and US food regulations (further information is available on request from the address below).

**Table 1: Change in weight of a PVC / Ultramoll® IV compound after immersion in various media, unconditioned:**

		Change in weight (%) after immersion
		10 days unconditioned
ASTM-Oil I	at RT	- 0.4
ASTM- Oil I	at 60°C	- 2.3
IRM 902	at RT	- 0.2
IRM 902	at 60°C	- 0.4
IRM 903	at RT	0.4
IRM 903	at 60°C	1.0
Olive oil	at RT	- 0.6
Olive oil	at 40°C	- 3.4
Olive oil	at 60°C	- 8.1

### Guide recipe \*

60 pbw S-PVC, K-value 70  
40 pbw Ultramoll® IV  
2 pbw Ba/Zn stabiliser

### Processing conditions:

Mixing roll: 165 °C / 10 min  
Press: 170 °C / 10 min



**Table 2: Plasticiser migration (to DIN 53 405) from a PVC / Ultramol<sup>®</sup> IV compound into various thermoplastics:**

Plasticiser migration into		Change in weight (%) after 12 d at 70°C
Rigide- PVC	PVC-U	1.50
Polystyrene	PS	0.40
High-pressure-polyethylene	HDPE	0.17

Guide recipe \*

60 pbw S-PVC, K-value 70  
 40 pbw Ultramol<sup>®</sup> IV  
 2 pbw Ba/Zn stabiliser

Processing conditions:

Mixing roll: 165 °C / 10 min  
 Press: 170 °C / 10 min

**Table 3: Mechanical properties acc. to the above guide recipe**

Properties	Unit	Method	Value
Shore Hardness A	-	DIN 53 505	77
Tensile strength	MPa	DIN 53 504	19
Tension at 100% extension	MPa	DIN 53 504	9
Elongation at break	%	DIN 53 504	367

## PVC- films for packaging foodstuffs

Guide recipe\*

78 pbw S-PVC, K-value 70  
 11 pbw Ultramol<sup>®</sup> IV  
 11 pbw Adimoll DO  
 2 pbw Ca/Zn Stabilisator  
 3 pbw ESBO

Processing conditions:

Mixing roll 165°C / 10 min  
 Press 170°C / 10 min

**Table 4: Mechanical properties acc. to the above guide recipe**

Properties	Unit	Method	Value
Shore Hardness D	-	DIN 53 505	44
Tensile strength	MPa	DIN 53 504	26
Tension at 100% extension	MPa	DIN 53 504	18
Elongation at break	%	DIN 53 504	278

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## Applications

Ultramoll® IV was specially developed for films based on polyvinyl chloride (PVC) for example clingfilms, which are expected to have good migration resistance in combination with a good processibility.

Ultramoll® IV is used in applications where foodstuff regulations and recommendations need to be met.

Possible areas of applications are:

### Extrusion

oil and petrol-resistant film, hoses, cables and conveyor belts, conveyor belts for the foodstuffs

industry, milking hoses, blown film (cling film and microwave film) for packaging foodstuffs

### Injection moulding

Boots, shoes and soles for applications requiring petrol and oil resistance, safety shoes, film for the automotive, packaging and office article industry

### Coatings industry

oil-resistant protective clothing for industrial use, oil and petrol-resistant tarpaulins

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