



HUNTSMAN

Enriching lives through innovation

**Achieve the ideal
bond with IROSTIC®
and IROGRAN®**



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INTRODUCTION

IROSTIC® and IROGRAN® are Huntsman's trade names for a polyurethane based polymer for the manufacture of TPU products.

IROSTIC® and IROGRAN® systems have been produced by Huntsman GmbH in Osnabrück, Germany, for more than 40 years and are available with a broad range of polyol and isocyanate building blocks – depending on requirements.

IROSTIC® systems can be used as a one- or two- component adhesives and coatings alongside IRODUR® crosslinkers.

The product range is available world-wide in a range of packaging sizes.





TECHNICAL INFORMATION

Preparation

IROSTIC® adhesive systems should be dissolved in closed dissolvers. The time required depends on the solvent used and on the construction features of the equipment. Straining the finished solution is recommended. If fillers have been added to the system, then additional straining may be essential. The adhesive solution may be applied to prepared (roughened, solvent wiped) surfaces:

- Manually, via brush, roller or spatula
- Mechanically, via roller, knife, spray gun or air gun

The adhesive should be applied to both surfaces.

Surfaces must then be air dried until the solvent has evaporated. This takes between 30 and 60 minutes, depending on the quantity applied.

Excellent adhesion can be achieved when the surfaces are thoroughly dried. Dry surfaces should then be pressed together following the required activation procedure to create a stable bond.

Activation

IROSTIC® adhesive systems require heat activation. If used as a two-component adhesive, activation must be carried out within a 6 to 12-hour period. Activation can take place under infrared light or by using other sources of heat.

Pot Life

Where IROSTIC® systems are used as a two-component adhesive, pot life must be considered. Even at room temperature, the crosslinking reaction starts the moment the crosslinking agent is added (ie: IRODUR®).

The viscosity of the solution gradually increases over 8 to 12 hours.

Notes

- The adhesive solution should be applied evenly to both surfaces
- Surfaces must be thoroughly dried before being pressed together
- Activation temperature and time will vary depending on the specific adhesive system
- Pot life of the adhesive system will also vary depending on the system specified.

NB: Please take all required safety precautions when using solvents! Ensure good ventilation. Prevent formation of aerosols. Avoid repeated or long-term skin contact. Keep ignition sources away - Do not smoke. Protect against electrostatic charges. Fumes can combine with air to form an explosive mixture.





SOLVENT SYSTEMS

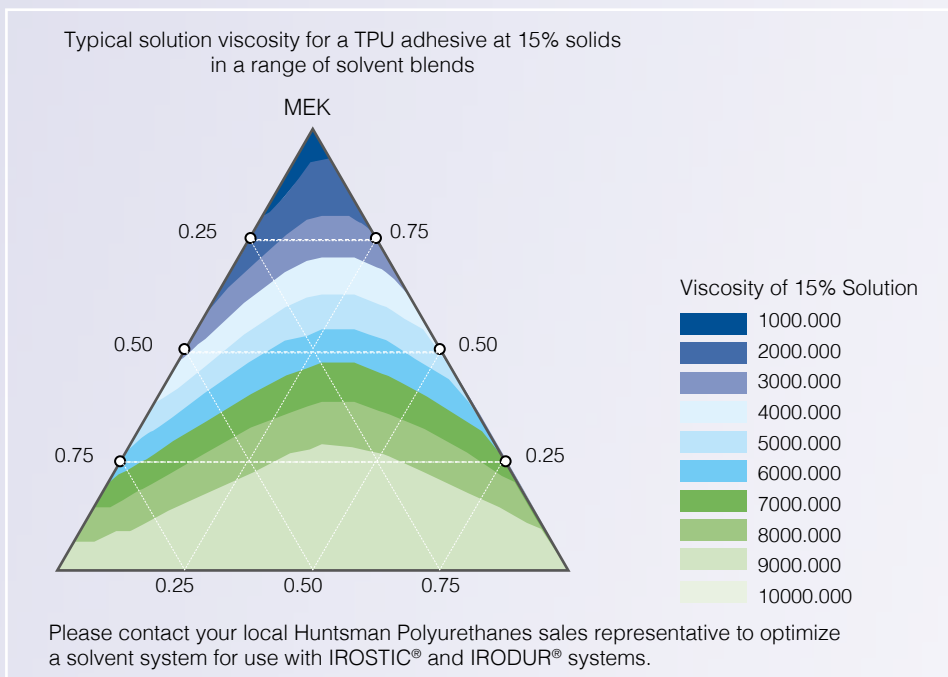
The choice of solvents is of great importance since both the evaporation rate and viscosity of the finished adhesive are linked to the solvent used. The following solvents may be used:

- Ketones
- Acetone, methyl ethylketone (MEK)
- Ester
- Methylacetate, ethylacetate, butylacetate
- Aromatics
- Toluene.

Toluene may be used in combination with many of the solvents described above and detailed information is available for each of the individual grades with various solvent blends. All solvents used should be free from water and alcohol (below 0.1%).

The viscosity of IROSTIC® solutions increases if, instead of ketones, esters or toluene are used. At the same solids content a low viscosity is obtained in ketone solvents (MEK, acetone) medium viscosity in blends of ketones / esters and high viscosity in blends of ketones and aromatics.

Please always consider the most environmental friendly solvent and use the correct PPE and extraction requirement.





TPU FOR SOLVENT-BASED ADHESIVES – PRODUCT

IROSTIC	MULTIPURPOSE GRADES				
	S 6148	S 6514	S 7514	S 7614	S 8743
Viscosity range (15% solid in MEK @ 20°C) [mPa*s]	200-20000	400-600	400-1200	50-2700	700-1800
# viscosities available within grade	4	1	3	5	3
Activation temperature [°C]	25-40	50-55	50-55	60-65	70-75
Performance characteristics					
Excellent heat resistance	X			X	X
Good hydrolysis resistance	X				X
Excellent green tack	X		X	X	X
Crystallisation rate (min) (internal method)	10-26	11-38	20-28	6-30	4-7
Solubility					
MEK	+	+	+	+	+
Ethylacetate	-	+	+	-	-
Toluene	-	+	+	-	-
MEK / Toluene (8:2)	+	+	+	+	+
MEK / Ethylacetate (1:1)	+	+	+	+	+
Methylene Chloride	-	-	+	+	-
Applications					
Do It Yourself	X		X	X	X
Rubber adhesive	X				X
Reactive Hot Melt		X	X		
Print industry					
Extrusion					
Textile industry	X	X	X	X	X
Foam bonding	X				X
Packaging industry	X				X
Suggested use					
1 component	X			X	X
2 component (add crosslinker / IRODUR)	X	X	X	X	
Modifier for other grades		X			
Physical properties					
Hardness Shore A (DIN 53505) @ average viscosity	91-95	85-94	93-96	94-98	91-95
Hardness Shore D (DIN 53505) @ average viscosity	35-40	25-32	43-46	40-43	39-42
Flow point [°C] (ASTM 28) @ average viscosity	125-170	92-162	113-160	122-168	145-165
Tensile strength @ break [MPa]	24-28	6-19	26-35	17-28	22-27
Tensile strength @ yield [MPa]	5-6	3-3.5	5-7	5-6	6-7
Elongation @ break [%]	850-1400	850-1200	1300-1400	940-1300	1000-1300
SAFT (internal method) cotton-cotton 0.5 kg load (°C)	96-154	40-149	116-152	108-164	142-160
Excellent adhesion to					
paper	X	X	X	X	X
PVC	X	X		X	X
wood	X	X		X	X
textile	X	X	X	X	X
rubber	X	X		X	X
leather	X	X		X	X
PE					
PP					

IROSTIC® is the Huntsman trade name for a range of polyurethane-based building blocks for the manufacture of TPU adhesives.

IROSTIC® systems are globally available in a broad range of base polyol and isocyanate chemistries and can be used as a one- or two-component system with

CT MAP

SPECIAL GRADES						
S 6440	S 6558	S 6560	S 7730	S 8612	S 9815	S 9827
400-1400	500-900	70-130	400-2700	60-1400	200-2700	1000-1400
2	2	1	7	3	5	1
40-45	50-55	50-55	70-75	60-65	80-85	80-85
	X				X	
			X	X	X	X
12-16	12-17	25	9-16	4-20	4-10	3-5
+	+	+	+	+	+	+
+	-	+	-	+	-	-
+	-	+	-	+	-	-
+	+	+	+	+	+	+
+	+	+	+	+	+	-
-	-	-	+	+	-	-
X	X		X	X	X	X
X	X					
X		X		X		
				X		
	X		X	X	X	X
X	X					
X	X	X				
	X		X	X	X	X
X		X		X		
X						
87-91	74-77	95	90-93	90-96	95-97	92-96
43-44	22-23	40	41-44	40-45	42-48	41-45
135-164	135-166	89	137-160	93-164	132-167	145-165
21-26	15-17	24	26-36	13-24	17-30	23-28
3-4	2-3	5	7-8	6-7	6-7	6-7
1500-1700	>1200	1400	1100-1400	850-1230	1100-1350	1000-1300
105-148	120-139	60	107-140	53-134	115-154	138-166
X	X	X	X	X	X	X
X	X		X	X	X	X
X	X		X	X	X	X
X	X		X	X	X	X
X	X					
X	X		X	X	X	X
		X				
		X				

with IRODUR® crosslinkers.

TPU FOR HOT MELT ADHESIVES – PRO

	IROSTIC M 8520	IROSTIC M 8304 NV	IROSTIC M 8304 HV	IROSTIC M 7030	IROSTIC M 7060	IROSTIC M 7090
Hardness (Shore A)	95	95	95	90	90	90
Polyol Type	Ester	Ester	Ester	Ester	Ester	Ester
Appearance	white granules	white granules	white granules	white pellets	white pellets	white pellets
MVR (cm ³ /10min) @ 150°C / 2,16 kg	56	42	1,2	0	2	5
MVR (cm ³ /10min) @ 170°C / 2,16 kg	114	240	18	2	5	10
Density (cm ³ /kg)	1.18	1.18	1.18	1.18	1.18	1.18
Melting Point TMA	66-68°C	65-70°C	62-80°C	45-125°C	80-120°C	45-125°C
Peak TMA	68°C	70°C	70°C	115°C	100°C	55°C
Lamination temp. (Peak TMA +10°C)	85°C	80°C	80°C	125°C	110°C	65°C
Softening temp. (Onset TMA)	70°C	65°C	62°C	45°C	80°C	80°C
Extrusion temp.	100 °C	120°C	130°C	130°C	155°C	135°C
Recrystallisation time	very fast	very fast	very fast	fast	fast	fast
Dry Clean capability	-	-	-	+/-	++	++
Thermal Stability of the adhesion	55°C	60°C	55°C	65°C	60°C	60°C
Main Application						
Reactive Hot melts	X	X	X			
Powder for technical appl.				X	X	X
Hot melt film						
Powder for belts						

Hot melt TPU adhesives are solvent-free and sustainable solutions that are solid at room temperature and melt to a low viscosity fluid when heated. They are used in a variety of applications including laminating, bonding fabrics, manufacturing shoes, books, sporting goods, and packaging materials. They can also be used as performance enhancers for other resin-based adhesives for example, to improve green strength in reactive hot melt systems.

PRODUCT MAP

Product							
IROGRAN CA 116-206	IROGRAN CA 117-200	IROGRAN PS 455-203	IROGRAN PS 455-209	IROGRAN PS 456-206	IROGRAN A 60 E 4902 N	IROGRAN A 85 E 4993 FCM	IROGRAN A 92 E 5670 FCM
95	90	78	75	84	60	85	92
Ester	Ester	Ester	Ester	Ester	Ester	Ester	Ester
white pellets	white pellets	transparent pellets	transparent pellets	transparent pellets	opaque pellets	opaque pellets	opaque pellets
0	3	5	3	18	2	0	0
2	6	15	7	34	13	6	3
1.18	1.18	1.19	1.19	1.18	1.14	1.21	1.21
100-141°C	85-110°C	131-149°C	130-149°C	81-103°C	100-151°C	145-160°C	153-169°C
120°C	95°C	145°C	140°C	90°C	120°C	155°C	160°C
130°C	105°C	155°C	150°C	100°C	130°C	165°C	170°C
100°C	85°C	130°C	130°C	80°C	100°C	145°C	155°C
180°C	175°C	160°C	145°C	135°C	180°C	180°C	210°C
fast	very fast	slow	fast	fast	slow	fast	fast
+/-	+/-	++	+/-	+/-	++	++	++
95°C	90°C	120°C	120°C	75°C	90°C	130°C	140°C
X	X	X	X	X	X		
						X	X

IROSTIC® adhesives have several advantages:

- Form a strong bond quickly and easily
- Compatible with most materials
- Easy to handle
- Less water sensitive than other thermoplastic polymers.





STORAGE INFORMATION

All IROSTIC® products must be stored in a cool and dry place. If stored correctly, under adequate conditions, products can be expected to remain stable for a minimum of six months.

All IROGRAN® products have a minimum expected shelf life of 12 months after shipment date.

The product should be stored in a dry and cool place in the manufacturer's original packaging.



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HUNTSMAN

Enriching lives through innovation

EUROPE

Hafenringstrasse 1
49090 Osnabrück
GERMANY
Phone: +49 541 914 10
Elastomers_EAIME@huntsman.com

USA

10003 Woodloch Forest Dr
The Woodlands, TX 77380
Phone: +1 281 719 6000
Elastomers_Americas@huntsman.com

CHINA

No 479 Wen Jing Road
Minhang Development Zone
Shanghai 200245
Phone: +86 21 3357 6527
Elastomers_APAC@huntsman.com

www.huntsman.com

About Huntsman:

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