



VICIR S 950

WINDOW PROFILE PVC RESIN

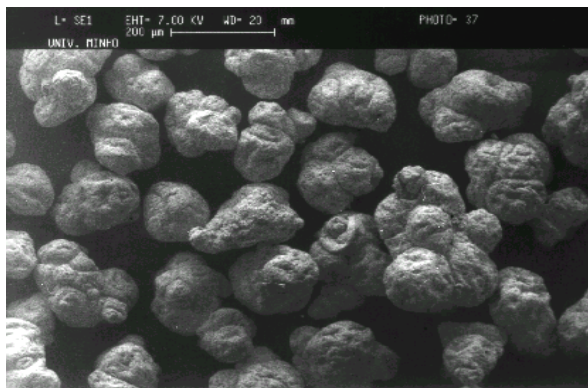


2002

TECHNICAL SERVICE

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VICIR S 950 is a PVC homopolymer produced by the suspension polymerization process.



1. TYPICAL VALUES

PROPERTY	UNIT	REF. METHOD	VALUE
Inherent Viscosity		ASTM D 1243	0.86-0.92
K Value		DIN 53 726	65-67
Bulk Density	g/cm ³	ASTM D 1895	0.51-0.59
Particle Size Distribution		CIRES 03.03 ⁽¹⁾	
D > 250 µm	%		Max. 10.0
D < 63 µm	%		Max. 5.0
Volatile Matters	%	CIRES 03.05 ⁽²⁾	Max. 0.3

Remarks: (1) Determination by laser diffraction with the Malvern Particle Sizer.

(2) 1 hour at 100 °C

2. RELEVANT PROPERTIES FOR WINDOW PROFILES

PROPERTY	UNIT	REF. METHOD	VALUE
Colour Test		Dr. Lange Colour Machine	
L	-		95.2
a	-		-0.1
b	-		0.9
Black spec	nr	Internal Test Method	Max. 10
Powder Flow	s/140 g	Internal Test Method	Max. 20

3. PROCESSING AND APPLICATIONS

VICIR S 950 is a medium-high molecular weight resin, with high bulk density, no fish eyes and very narrow particle size distribution.

Due to its high density, it allows for higher output rates, therefore resulting in productivity gains.

This resin is also porous and has very good fusion properties, which allows for a better melt homogeneity, and for good final properties of the profiles.

The particle size of this resin gives good free-flowing properties.

This grade was developed specially for the manufacture of rigid products, such as extruded profiles.



4. COMPOUNDS CHARACTERIZATION

Specific compounds were produced in laboratory and in industrial plant in order to characterize important parameters of the resin.

4.1 RHEOLOGY

Mixer: Laboratory Papenmeyer mixer, standard operating conditions

Composition:	S 950	100.0
	One-pack	2.5 phr
	Filler	5.0 phr

Rheometer: Brabender torque rheometer

Rheometer operating conditions: Temperature = 190 °C

Rotor speed = 60 rpm

Sample weight = 65.0 g

PROPERTY	UNIT	VALUE
Melt time	s	90
Melt torque	mg	3200
Equilibrium torque	mg	2700



4.2 TORQUE

Mixer: Industrial turbo mixer

Composition:	S 950	100.0
	One-pack	2.1 phr
	Filler	5.0 phr
	Stearic acid	0.2 phr

Extruder: Haake conical twin-screw

Temperature profile: 170 - 175 - 180 - 190 °C

SCREW SPEED (rpm)	TORQUE (mg)
25	5400
30	5800
35	6100

4.3. COLOUR

Mixer: Industrial turbo mixer

Composition:	S 950	100.0
	One-pack	4.5 - 6.0 phr
	Filler	4.0 - 6.0 phr
	Ti O ₂	4.0 - 5.0 phr
	Impact modifier	7.0 - 8.0 phr

COMPOUND CHARACTERIZATION

PROPERTY	UNIT	REF. METHOD	VALUE
Colour Test ⁽¹⁾		Dr. Lange Colour Machine	
L	-		89.64
a	-		-1.29
b	-		2.57
Bulk Density	g/cm ³	Internal Test Method	0.61 - 0.65
In sieve (aperture 425 µm)	g/200g	Internal Test Method	0.35

⁽¹⁾ Measurement made in laboratory extruded profile.

5. PROFILE EXTRUSION TEST

Extruder: Krauss Maffei twin-screw

OPERATING CONDITIONS		RANGE	UNIT
Barrel temperatures	Zone 1 to 5	165 – 170	°C
	Zone 6	120 – 155	°C
Screw oil temperature		120 – 155	°C
Die temperatures	Zone 1	190 – 195	°C
	Zone 2	190 – 200	°C
	Zone 3 to 4	195 – 200	°C

OUTPUT RESULTS		RANGE	UNIT
Screw torque		87-90	%
Melt temperature		187 – 188	°C
Melt pressure		320 – 325	bar

6. WINDOW PROFILE CHARACTERIZATION

The following data concerning colour properties of the extruded profiles, was determined:

PROPERTY	UNIT	REF. METHOD	RANGE	
			TOP	BOTTOM
Colour Test		Dr. Lange Colour Machine		
L	-		89.60 - 89.93	89.43 - 90.05
a	-		-1.30 / -1.16	-1.28 / -1.15
b	-		2.70 - 2.74	2.54 - 2.89
Gloss	%	Dr. Lange Colour Machine	56 - 57	45 - 48

Other comparative tests like Reversion, Could Impact at -10°C, Heat Ageing at 150°C, Colour, Gloss, Charpy Notched and Pinking were made, showing superior characteristics when VICIR profile resin was used.



TECHNICAL SERVICE

Assistance in the processing of VICIR resins, as well as in the development of specific applications, will be provided on request to CIRES clients, charge free.

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