PEQUIVEN

VINILEN® P.V.C. 140

Vinilen 140 is a vinyl chloride homopolymer of medium molecular weight and it is produced at Complejo Petroquímico El Tablazo (Venezuela) by Petroquímica de Venezuela, S.A. (PEQUIVEN). This resin has been designed to satisfy the need for rigid PVC.

In all the industrial tests conducted, this resin has shown an outstanding performance in the following process stages and final product properties:

Mixing

Vinilen 140's porosity and particle size help an easy absorption of all additives needed giving a dry mix with high homogeneity. Suggested conditions for mixer discharge are a temperature between 110 and 120°C and mixing times not higher than 10 min. This will give an excellent compromise between cycle time and final properties.

Extrusion

Due to higher bulk density, **Vinilen 140** gives more production rate at the same extrusion conditions (screw RPM).

Comparison with other resins

When compared with competitive resins available in the market (figure 1), it is noticeable that all the common extrusion and final product properties of **Vinilen 140** are within the limits determined by the performance of other resins. For example, it can be shown that **Vinilen 140** has higher thermal resistance (higher crosslinking and stability time) than all the other resins studied. In other properties, such as elasticity modulus, deflection temperature, heat deflection temperature (HDT) and yield strength, **Vinilen 140** falls within the low and high limits of other competitive resins. On the other hand, its low stabilization and fusion torque are comparable to their competitive products, meaning that **Vinilen 140** will not require extra energy for transformation in final consumer products.

Lab tests show that **Vinilen 140**, complies with all ASTM D 1784 norm specifications, where different classifications for rigid PVC compounds are established.

Appearance

Due to its low fish eye count and excellent thermal stability, this resin is recommended for both opaque and transparent applications.

Applications:

- ✓ Pipes
- ✓ Profiles

Presentation

Vinilen 140 comes in 25-kg bags or 625-Kg bigbags.

Comercial Office: Gerencia de Clorovinilos – PEQUIVEN. Ave. Francisco de Miranda. Torre Pequiven, piso 14. Chacao, Caracas/Venezuela Telfs.: 582-2014513 Fax: 582-2014886

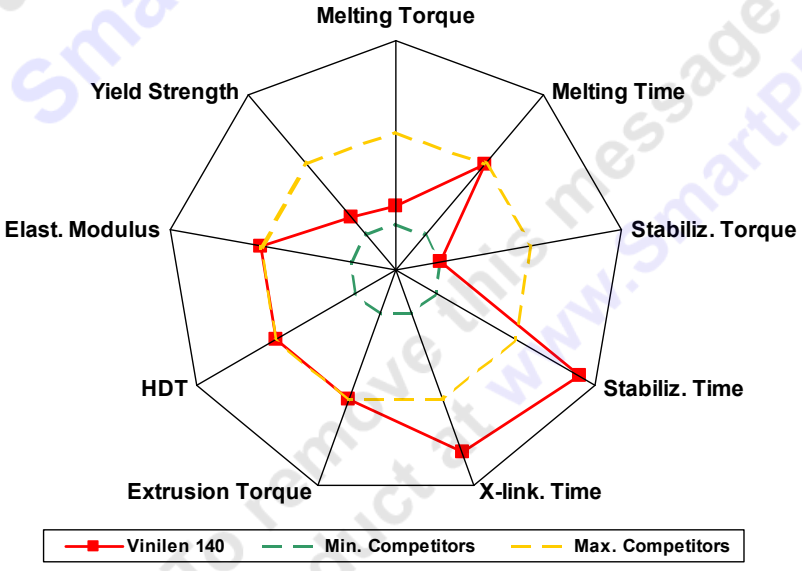
PEQUIVEN

VINILEN® P.V.C. 140

Physical Properties

PROPERTY	VALUE	METHOD
Presentation	White powder	
K-Value	65-67	DIN 53726 Covenin 1735
Bulk density (g/cm³)	0.53-0.59	ASTM 1895 Covenin 1736
Volatile content (%)	0.3 % max.	ASTM D 3030 Covenin 1842
Particle size:		ASTM D 1921 Covenin 2202
– **% Through mesh 40M**	99.5 min.	
– **% Through mesh 200M**	3.0 max.	
Residual Monomer (RMVC)	≤ 1.0 ppm	ASTM D 3749

FIGURE 1. VINILEN 140 AGAINST COMPETITIVE RESINS.



Note: Information provided in this technical sheet is given in good faith and it is reliable to the best of our knowledge. However, this information should not be taken as implicit or explicit guarantee of performance. PEQUIVEN assumes no responsibility for the use of information presented herein and the results obtained through the use of this information.

Comercial Office: Gerencia de Clorovinilos – PEQUIVEN. Ave. Francisco de Miranda. Torre Pequiven, piso 14. Chacao, Caracas/Venezuela Telfs.: 582-2014513 Fax: 582-2014886

PEQUIVEN

VINIlen® P.V.C. 140

TROUBLESHOOTING GUIDE

Rigid Pipes and Profiles

Problem	Probable Cause	Recommended action
Wrinkles	✓ Too much fusion	✓ Lower melt temperature. ✓ Lower extrusion speed.
	✓ Surface whirls	✓ Use breaker plate ✓ Use mixing pins in screw
	✓ Scrap excess added	✓ Check scrap quality
	✓ Excessive cold die	✓ Use die temperature up to 5°C above melt temperature
	✓ Melt fracture	✓ Decrease die temperature up to 5°C below melt temperature. ✓ Decrease melt temperature ✓ Decrease RPM and take-over speed
Fragility	✓ Poor melting	✓ Increase melt temperature ✓ Use breaker plate with smaller holes ✓ Decrease production rate
	✓ Melt fracture	✓ Decrease die temperature up to 5°C below melt temperature. ✓ Decrease melt temperature ✓ Decrease RPM and take-over speed
	✓ Bubbles	✓ See "Bubbles".
Bubbles	✓ Degradation ✓ Humidity ✓ Trapped Air	✓ Check all temperature controllers ✓ Use screw cooling ✓ Decrease melt temperature ✓ Dry the mix at 93°C for 1 hour. ✓ Increase barrel temperature ✓ Decrease production rate
High pressure at the die	✓ Improper die design ✓ High melt viscosity ✓ Improper breaker plate	✓ Open die clearance. ✓ Increase internal lubricant dose ✓ Increase melt temperature ✓ Decrease production rate ✓ Use breaker plate with bigger holes ✓ Check for stuck holes in breaker plate
Black vein in pipe surface	✓ Melt degradation	✓ Increase barrel temperature to reduce abrasion
Flow rate inconsistency (surging)	✓ Improper extrusion feed ✓ Low temperature profile ✓ Excess of external lubricant	✓ Check temperature near feeding – it is possible that the throat is stuck with material ✓ Increase temperature profile ✓ Reduce external lubricant concentration and check lubricant quality, specially fatty acid content.
Plate-out	✓ Material accumulation at the die ✓ Additive migration	✓ Check die chromation and polish ✓ Increase extrusion temperature. ✓ Check external lubricant specs.

Comercial Office: Gerencia de Clorovinilos – PEQUIVEN. Ave. Francisco de Miranda. Torre Pequiven, piso 14. Chacao, Caracas/Venezuela Telfs.: 582-2014513 Fax: 582-2014886

PEQUIVEN

VINILEN® P.V.C. 140

TROUBLESHOOTING GUIDE

Rigid Pipes and Profiles

Problem	Probable Cause	Recommended action
Warpage	✓ Non uniform contraction	✓ Check cooling bath temperature distribution. Keep it as uniform as possible.
Dust attraction	✓ Static charges	✓ Clean product with soap water at 5%
Bad surface finish	✓ Poor melting ✓ Small quantities of external lubricant ✓ Bad surface finish in die	✓ See melting problems ✓ Increase external lubricant dose ✓ Chrome and polish die and lips
Tear at profile sides	✓ Low speed near profile sides	✓ Check velocity profile ✓ Use higher melting temperatures ✓ Decrease screw RPM
Poor resistance to hydrostatic pressure	✓ Poor melting ✓ Mandrel comes out of die ✓ Material degradation ✓ Stretch rate too high	✓ See poor melting ✓ Mill mandrel ✓ See degradation ✓ Decrease pulling speed
Pipe buckling	✓ Vacuum or insufficient air pressure during calibration. ✓ Low residence time in calibrator ✓ High melt temperature	✓ Increase vacuum or air pressure ✓ Reduce production rate ✓ Lower melt temperature
Opaque surface	✓ Low temperature profile ✓ Bad surface finish in die ✓ Non homogeneous melting ✓ Excess of external lubricant	✓ Increase temperature profile ✓ Chrome and polish die and lips ✓ See poor melting ✓ Reduce external lubricant dose
Lines in the surface	✓ Low die temperature ✓ Dirty die ✓ Improper spider-die design	✓ Increase die temperature ✓ Clean the die ✓ Increase the temperature near spider legs
Big thickness	✓ High RPM ✓ High feed speed to screw ✓ Low pulling speed	✓ Decrease rpm ✓ Decrease feed speed. ✓ Balance pulling speed till desired thickness is achieved
Small thickness	✓ Low RPM ✓ Low feed speed to screw ✓ High pulling speed	✓ Increase rpm ✓ Increase feed speed. ✓ Balance pulling speed till desired thickness is achieved
High amperage	✓ Low melt temperature ✓ High feed speed to screw ✓ High screw RPM ✓ Screw with high compression ratio	✓ Increase melt temperature ✓ Decrease feed speed to screw ✓ Decrease screw RPM. ✓ Use a screw with lower compression ratio.

Comercial Office: Gerencia de Clorovinilos – PEQUIVEN. Ave. Francisco de Miranda. Torre Pequiven, piso 14. Chacao, Caracas/Venezuela Telfs.: 582-2014513 Fax: 582-2014886