



PVC/U Polyvinyl Chloride Rigid

Description

Commonly known as UPVC has physical and mechanical properties, which make it ideally suited to a wide range of uses. Grades have been developed for high flow injection moulding and rigid extrusion. Grades can be easily formulated for specific applications. Very advantageous where excellent UV and flame retardant properties are required in a specific colour compound and requires chemical resistance.

Applications

Typical applications include guttering, pipes, toys, automotive trims and fascia boards, bottles, storage tanks, conservatory parts and windows. Ventilation fittings, tile edging, lawn edging.

Types of grade available

Injection moulding High flow Calcium zinc
 Injection Moulding High Impact Tin
 Extrusion Calcium zinc Medium/High impact
 Injection Moulding Transparent Tin
 Extrusion Transparent Tin
 Grades matched to specific colours

Optical Properties

Transmission	80% Rigid Tin
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General Processing

Drying Time	N/A
Drying Temperature	N/A
Type of Drier	N/A
Purging	DYNAPURGE V
Moisture Absorption	N/A
Other Considerations	Paste consistency when molten

Processing Injection Moulding

Barrel Settings	Rear 165°, Middle 170°, Front 175°, Nozzle 175°
Injection speed	Low to Medium
Injection Pressure	Low
Back Pressure	Low
Screw Speed	Low to Medium
Tool Temperature	20 - 40°
Melt Temperature	185°

Processing Stability	Residence time to be kept to a minimum
Gate Considerations	Large gates preferred such as tab gate
Sprue & Runner Considerations	Full round runners preferred. Runners to be streamlined with sharp corners to be avoided.
Processing Extrusion	
Barrel Settings	150° to 180° (do not exceed 200°)
Screw Speed	Dependant on out put/finish required generally medium/fast
Screen Packs	Yes dependant on extruder
Haul-off / Cooling	Important to cool as quickly as possible water bath temp 10-20c
Calibration	Can use calibration dies or calibration plates
Purge	Green Freeze
Mechanical Properties	
The properties of PVC are dependant on formulation due to the wide range of grades available the information can only be used as a guide. Many of the properties can be enhanced by re formulation; also processing condition can affect the properties at gellation.	
Shrinkages	0.4° – 0.6°
Flexural Strength	28 -100 MPa
Tensile strength at Yield	35 – 50 MPa
Physical Properties	
Density	1.35 – 1.5
Cold Bend	N/A
Cold Flex	N/A
Elongation at Break	3 -120%
Flexural Modulus	2000 - 4000 MPa
General Impact Strength	Medium to High dependant on grade, mixing and heating in the barrel.
Material Finish	High gloss
Thermal Properties	
Vicat Softening Temperature	Standard 65c High Vicat – 78c Chlorinated 100c
Heat Deflection Temperature	65c
Flammability	
Flammability Rating	Inherently Flame Retardant most rigid grades will meet VO @ 2 mm.
Weatherability	
Suitability for outdoor use	PVC/U in both moulding and extrusion grades can be formulated to give excellent long-term weatherability. White

	out door grades can offer a 10 year warranty of colour fastness a Delta E of no more than 5 in Northern European climate, which is dependent on a number of factors.
Fillers & Additives	Tin, Calcium Zinc stabilisers and calcium carbonate fillers
Chemical Resistance	
Resistant to	Mineral acids, alkalis, oil & grease
Not resistant to	Solvents
Food Contact Status	Food contact grades are available
Colouring	Universal masterbatches can work with rigid PVC although the use of PVC specific masterbatch is recommended
WEEE & ROHS Compliance	Lead stabilised grades do not comply although calcium zinc and tin grades do comply
Bonding	Solvent bonding is a popular method for joining rigid PVC to itself or another plastic soluble in the same solvent. It can also be bonded to other materials such as metal, glass, other plastics and wood. A variety of adhesives work well such as epoxy's, urethanes, contact glues and two-part adhesive systems.
Welding	Ultrasonic, spin and vibration welding work very well with rigid PVC

This information has been provided as a general guide and we suggest that you carry out your own specific tests to be sure that this material is suitable for your application.