

INJECTION GUIDE REPSOL HEALTHCARE ® POLYPROPYLENE

PROCESSING. INJECTION MOULDING

For melting the material, screws with 3 zones are used, with approximately 20D of length and from 1:3 to 1:4 of compression ratio.

The **normal temperatures of injection** oscillate between 200°C and 260°C. This rank is so high because the section of the optimal temperature depends on the melt flow rate of the polypropylene as much as on the design of the mould cavity.

Products with a high melt flow rate can be processed with lower temperatures. In exceptional cases some products can be processed until 280°C, avoiding long product residence times in the injection cylinder.

By increasing the injection temperature, better superficial brightness is ensured and the internal tensions in the piece are reduced. Therefore, the post-moulding shrinkage falls and the impact resistance is improved.

For the **mould** temperatures between 30°C and 60°C are recommended, having a great influence on the surface aspect, brightness, weld lines and the dimensional stability of the injected piece.

Regarding **injection pressures**, the minimum pressure that permits to fill the mould must be used in order to manufacture easy-demoulding pieces. By using high and constant injection rates, minimum distortions and internal tensions are avoided. This parameter is especially important in articles in which weld lines appear, where a very fast injection allows a good welding of the flow fronts.

Normally and depending on the piece, medium **injection rates** (40-70%) are recommended. High injection rates along with relatively low mass temperature can cause flow lines (tiger skin). A mass temperature increase together with a high injection rate implies a better texture piece the mould and improves the union lines.

For a 3 mm thickness, **holding pressure** should be applied between 10 and 20 seconds followed by a refrigeration period of 10-20 seconds. A high holding pressure value improves "shrinkage cavities" in piece, but depending on the mould conditions can cause "flashes".

The total shrinkage undergone by the piece injected with polypropylene with mineral load oscillates between **0,5% and 1,5%**, whereas the natural polypropylene varies between **1,7% and 2,2%**. This phenomenon is very influenced by the pressure conditions and injection temperatures, having to be considered at the mould designing stage.

PRE-TREATMENT

The product should be stored in a dry atmosphere.

COLORATION

The REPSOL HEALTHCARE ® PP products are provided in natural colour, but they can be easily coloured with stables pigments in the processing temperatures by means of dry coloration techniques or concentrates.

*This product(s) may not be used in:

- (i) any U.S. FDA Class I and/or European Union Class I Medical Devices (Non-invasive devices), without prior notification to Seller for each specific product and application
- (ii) the manufacture of any of the following, without prior written approval by Seller for each specific product and application: U.S. FDA Class II and/or European Union Class II Medical Devices:
 - Category IIa: Invasive devices with limited risk: e.g. syringes, lancets, insulin pens.
 - Category IIb: Invasive devices with higher risk: e.g. pouches for dialysis processes.
- (iii) in U.S. FDA Class III, and/or European Class III Medical Devices; Category III: Very high risk devices: long-term (> 29 days) or permanent implants, long term (> 29 days) applications in direct contact with any body part or any body fluid.

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