

RMPP141

Rotational Moulding Processing Guide

OVEN CONDITIONS:

Polypropylene has a higher melting point than polyethylene; therefore, higher oven temperatures are required to ensure proper sintering of the powder during moulding.

The photo below shows the internal surface of a part moulded at the same conditions as used to mould LMDPE (oven 250⁰C). The internal surface has not been sintered and unmelted powder is evident. By increasing the oven temperature to 300⁰C a good internal surface was obtained.



As a guideline, the recommended oven temperature is 280⁰C to 300⁰C.

PIAT: (Peak Internal Air Temperature) - an important tool for the moulder.

The optimum mechanical properties and best surface finish (internal and external) are realised when the **PIAT is in the range of 225⁰C to 235⁰C.**

TIME IN OVEN:

The oven time is typically **4 mins/millimetre of part thickness**. It is suggested that this oven time is initially chosen then adjusted accordingly depending on the moulded part appearance and properties.

A starting point is to **increase the oven time by 15%** compared with PE for the same shot weight.

When de-moulding, if the internal air has a strong smell, the material is probably “overcooked” so reduce the oven time.

MOULD VENTING:

Effective venting is required. It is suggested that the “**Supavent^R**” type products are used.

The use of this type of “automatic” vent increases the internal mould pressure during heating, improving the external surface finish. It also minimises the vacuum during cooling ensuring no parting line “blow Holes”.



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COOLING TIME:

The cooling time required is similar to that of polyethylene.

RMPP141 crystallizes at a temperature of about **125⁰C** which is much higher than LMDPE, therefore, **the part can be removed from the mould at a higher temperature.**

Insulated gloves should be worn and care taken when handling parts at these temperatures.

Do not measure mechanical properties until polymer crystallisation is complete. It can take two to three days after moulding before optimum surface and mechanical properties are achieved.

OPTIMISING WEIGHT:

Shot weight can be reduced by up to 30% vs C6 LMDPE and still yield satisfactory performance.

This will depend on the attribute you seek to achieve when using **RMPP141** instead of PE. This lower shot weight will result in a thinner wall section, so the total cycle time will be similar to moulding of PE.

MOULDING PROCESS:

Mould release agent is **not normally** required with **RMPP141**. It releases from the mould more readily than PE.

Cleaning the mould of release agent deposits prior to moulding **RMPP141** is recommended to minimize "ghosting" of the external surface of the part.

PP is known to "stress whiten" when impacted, particularly when hot. This can generally be removed by applying a flame heat gun lightly for a few seconds to the whitened area. Be careful not to leave the heat in one spot as this will melt the polymer.

It is good practice **not** to hit the moulding to remove it from the mould, also avoid dropping it on to the floor.

After a few shots the PP part should release with only the need to assist by prising the part out.

SHRINKAGE.

RMPP141 shrinkage is typically **1.5% - 2.5%** and around 3.0% -3.5% for PE.

COLOURING:

As relatively high oven temperatures are needed to process **RMPP141** this limits the number of pigments that can be used. The pigment chosen must be stable during moulding. If the part is for outside use then light stability and weatherability must also be considered.

Although inorganic pigments typically have good heat and weathering characteristics, their poorer chroma and colour tint capability compared with organic pigments requires higher amounts to be used.

To obtain optimum dispersion and mechanical properties, we strongly recommend compounding.



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If dry colouring is essential; the recommendation is to use a maximum of .05% pigment dispersed in a high speed mixer with a pigment wetting agent (Licocene).

A suggested method is to mix: **30 parts pigment with 70 parts Licocene 6102FG.** (This is a metallocene PP wax from Clariant), in a high speed mixer. This concentrate should then be dispersed at a maximum of 5gms / kg (0.05%) with natural RMPP141 powder. High pigment concentrations will result in lower mechanical properties, particularly ARM impact.

CONTACT:

If you have any concerns relating to the processing of **RMPP141**, please contact sales@psdrotoworx.com



Important

The information contained in this document is of a general nature only and is intended to provide an indication of the potential properties and benefits of a particular polypropylene compound. The statistical and other information provided in this document has been determined in laboratory test conditions. Accordingly, there may be differences in performance in a production environment including having regard to the materials used.

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