February 2019

WALL FORMATION IN ROTATIONAL MOULDING, ITS RELATIONSHIP TO MATERIAL EXTERNAL PROCESSING AIDS TO CONTROL WALL THICKNESS

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INTELLIGENT APPROACH TO ROTOMOULDING INDUSTRY

SINCE 2012

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INSIDE THE MOULD THERE IS A COMPETITION FOR ATTRACTING THE MATERIAL, AND A RACE TO FORM A SKIN/WALL

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Exploring the formation of the wall in relation to materi...

- The amount of heat which is required to melt a single PE particle is related to its density and its size

- The speed which a particle reaches a points depends on its physical shape and size

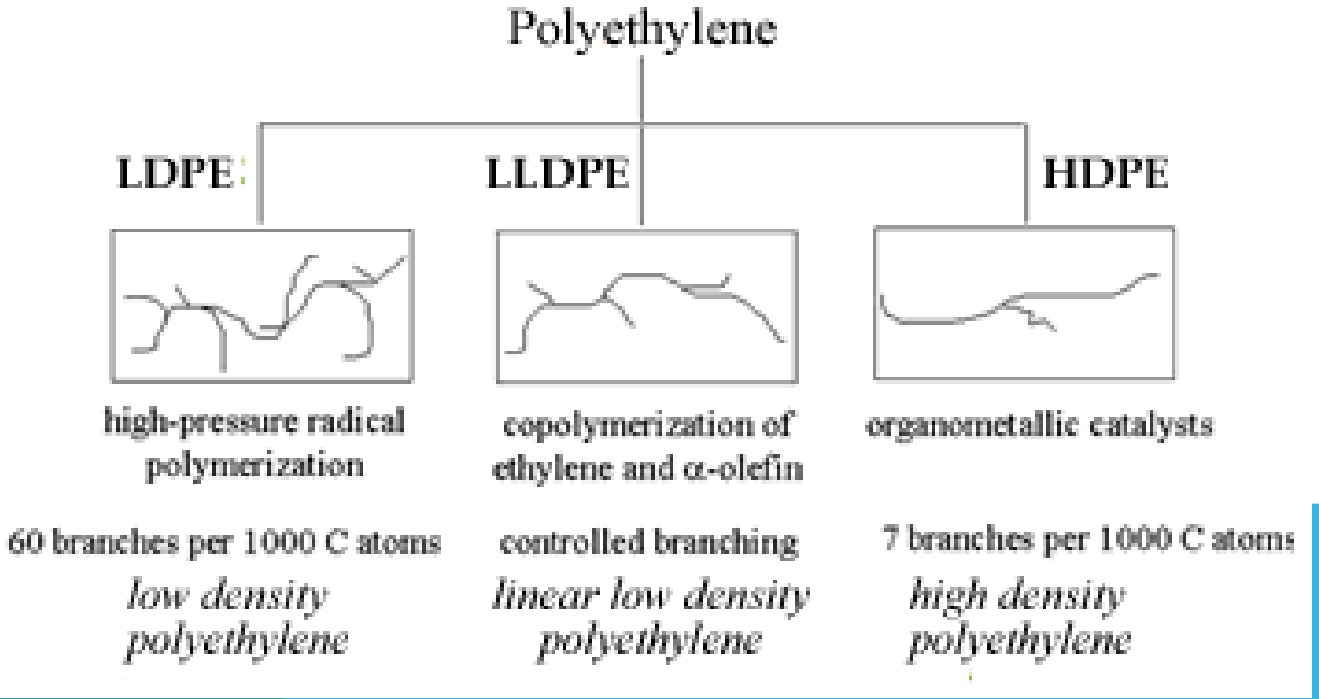
- The chances of the particle to stay on that point and form a skin is depend on how hot, that point is , and again how big is that particle size

DENSITY

PE is the only polymer which comes in a range of densities. 0.857-0.975 g/cm3

The higher the density higher the melting point

- Melting point of HDPE is typically around 126 ºC
- Melting p



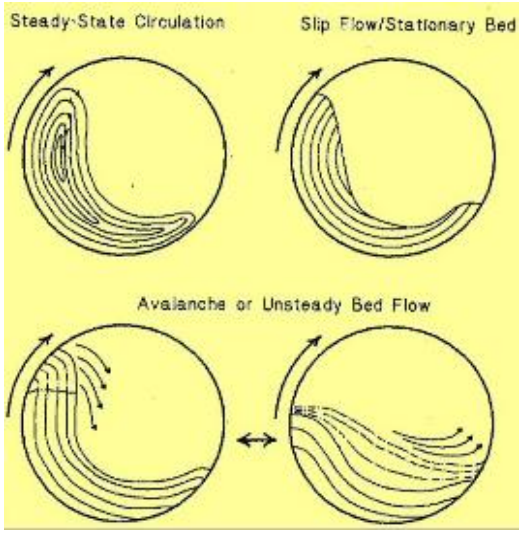
POWDER PROPERTIES

Steady-state circulation

- Ideal flow, with freely flowing powders
- Spherical or squared egg particle shape
- Smooth powder surfaces
- High friction between mould surface and powder
- Avalanche flow
- Adequate powder flow
- Mixture of Spherical and tailed particles
- friction between mold surface and powder bed is OK

Slip flow

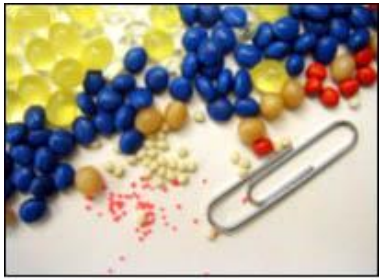
- Poor powder flow, with high powder cohesion
- Mainly tailed particles

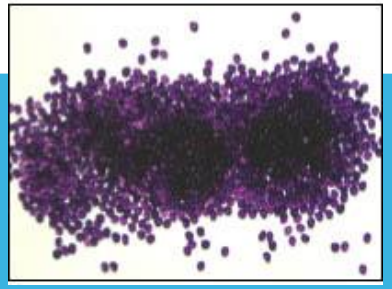


PARTICLES CHARACTERISTICS

Size matters

- Effects the way powder moves in the mould
- Effects the melting rate of the powder
- Bigger particle size can cause wall variations
- Bigger particle size causes pinholes





PARTICLES CHARACTERISTICS

Particles size Distribution

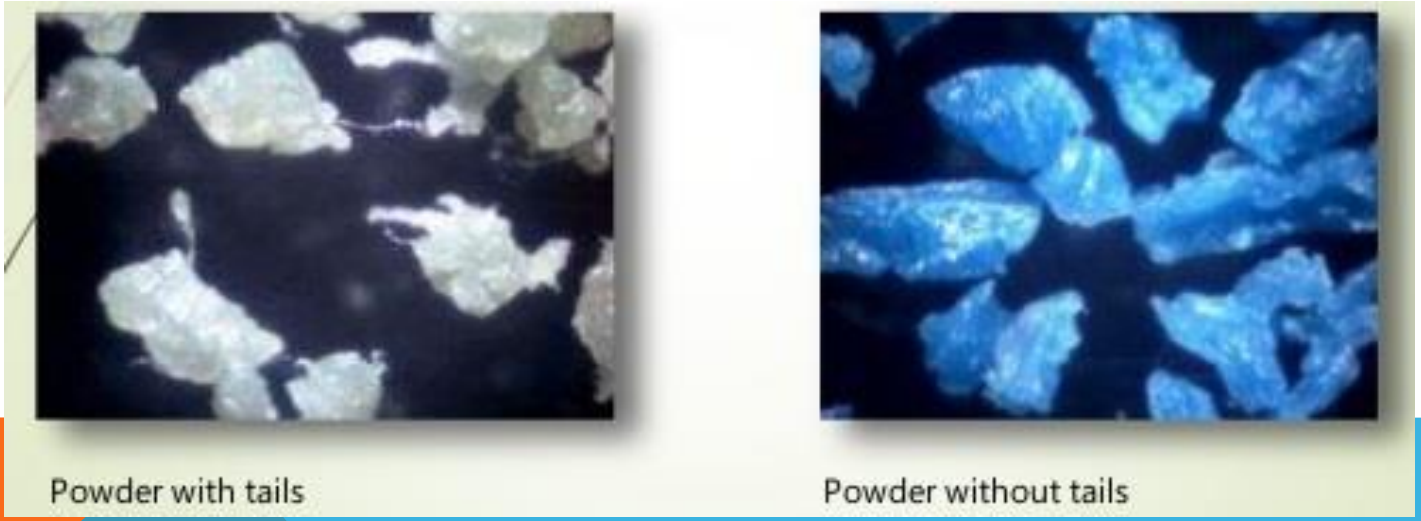
- Effects the final finish
- Effects the dry flow of the material

Mesh Aperture	Sample 1 % Mass Powder	Sample 2 % Mass Powder
0	1.39	3.28
90	0.85	2.25
106	7.91	19.09
212	7.48	14.26
300	14.31	20.17
425	9.17	8.94
500	11.35	8.46
600	22.18	10.28
850	11.32	3.08

PARTICLES CHARACTERISTICS

Particles Shape

Effects the Dry flow



GETTING A HEAD START

Air Amplifiers

https://www.youtube.com/watch?v=t1h8al5lcdM

These devices are a clean and economical way to direct heat to desired spots

Surface enhancers, Flow Promoters and heat accelerators

Few different versions are in the market in form of surface enhancers or Heat accelerators

Pre heating

Least effective, dangerous, expensive and inconsistent

PROTOLITTE ® PASTE

A REGISTERED BRAND OF C4 POLYMERS LIMITED

The Idea

- To be effective, by way of precision moulding, hence high coverage rates
- Stop wasting, by spraying an expensive product in the air
- Safe to use
- Safe to store
- Safe to transport
- No expensive aerosol disposal

Draw backs

- Slower to apply
- Possible contamination

https://www.youtube.com/watch?v=R9FCDwnj3PE

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PROTOLITTE ® SPRAY

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The idea

- To improve on what was in the market
- To use a carrier which its job wasn't just delivering to active part, and be part of the solution
- To use a carrier which is a non-volatile solvent, hence much safer to use
- By changing the a carrier, to fill the can with a much higher content of the active ingredient
- We Claim
- Protolitte® is the safest of all the sprays in the market
- Protolitte® has a coverage rate of 2 to 1, in comparison to other products
- Challenges we face
- To re train the operators to learn with this product LESS IS MORE

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