Association of Rotational Molders Conference

New Orleans, Louisiana

September 27,2016

Tom Wyszynski A. Schulman

POLYPROPYLENE

FOR ROTATIONAL MOLDING

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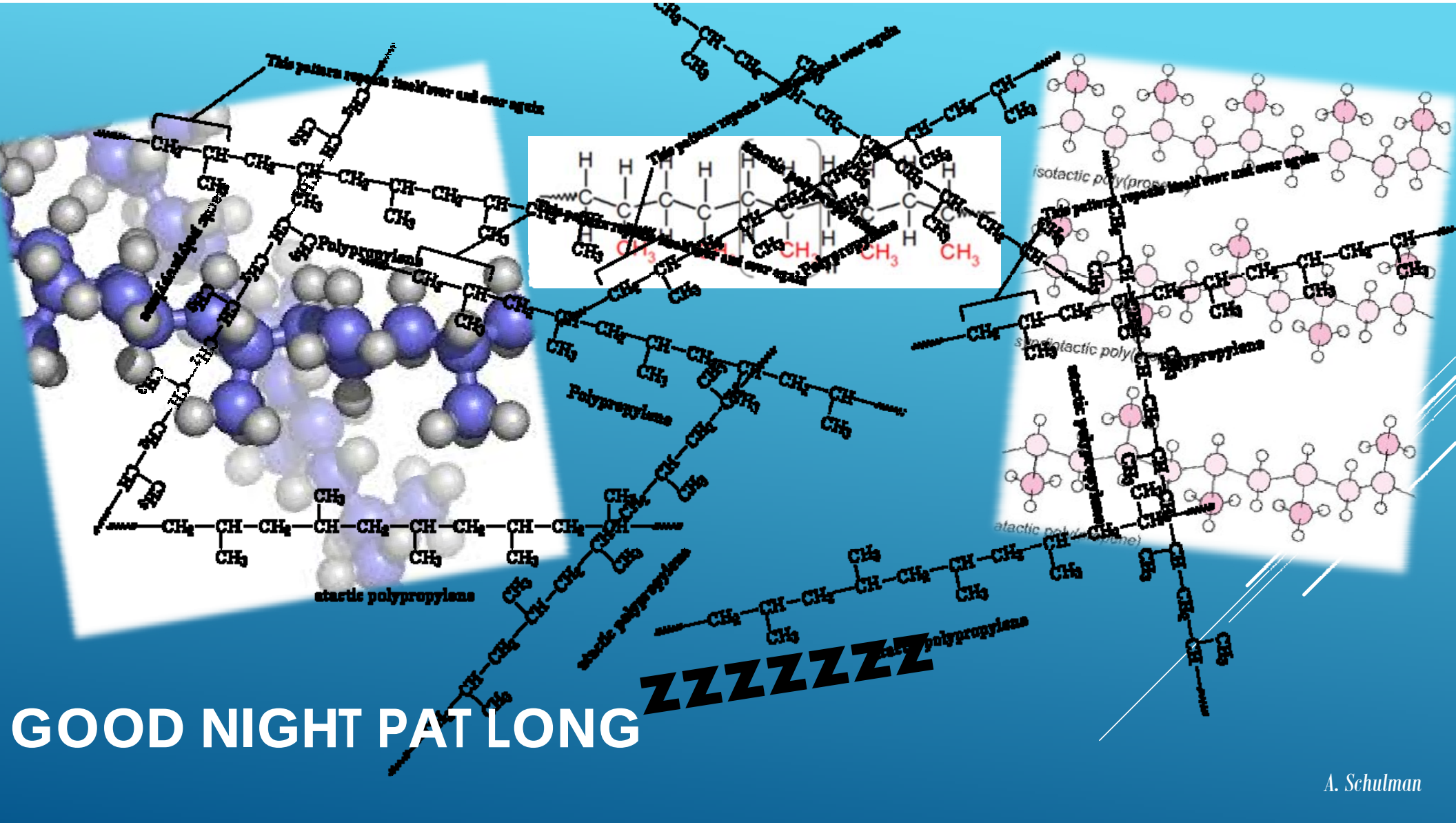
GOOD NIGHT PAT LONG
ZZZZZZZ
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“IF GOD WANTED US TO ROTO MOLD POLYPROPYLENE HE WOULD HAVE MADE CRYOGENIC GRINDING CHEAPER”

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- Homo Polymer
- Co Polymer

POLYPROPYLENE

Chemical Tanks – 0.5 - 3000 gallons

Wine Fermentation Tanks

High Temperature Applications

Duct work - heat

Pipe Joint / Valve Lining

Hoppers Bins

Autoclave - Cleaning

Biopharmaceutical Containers

High purity applications

APPLICATIONS

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TANKS

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HIGH TEMPERATURE TANKS

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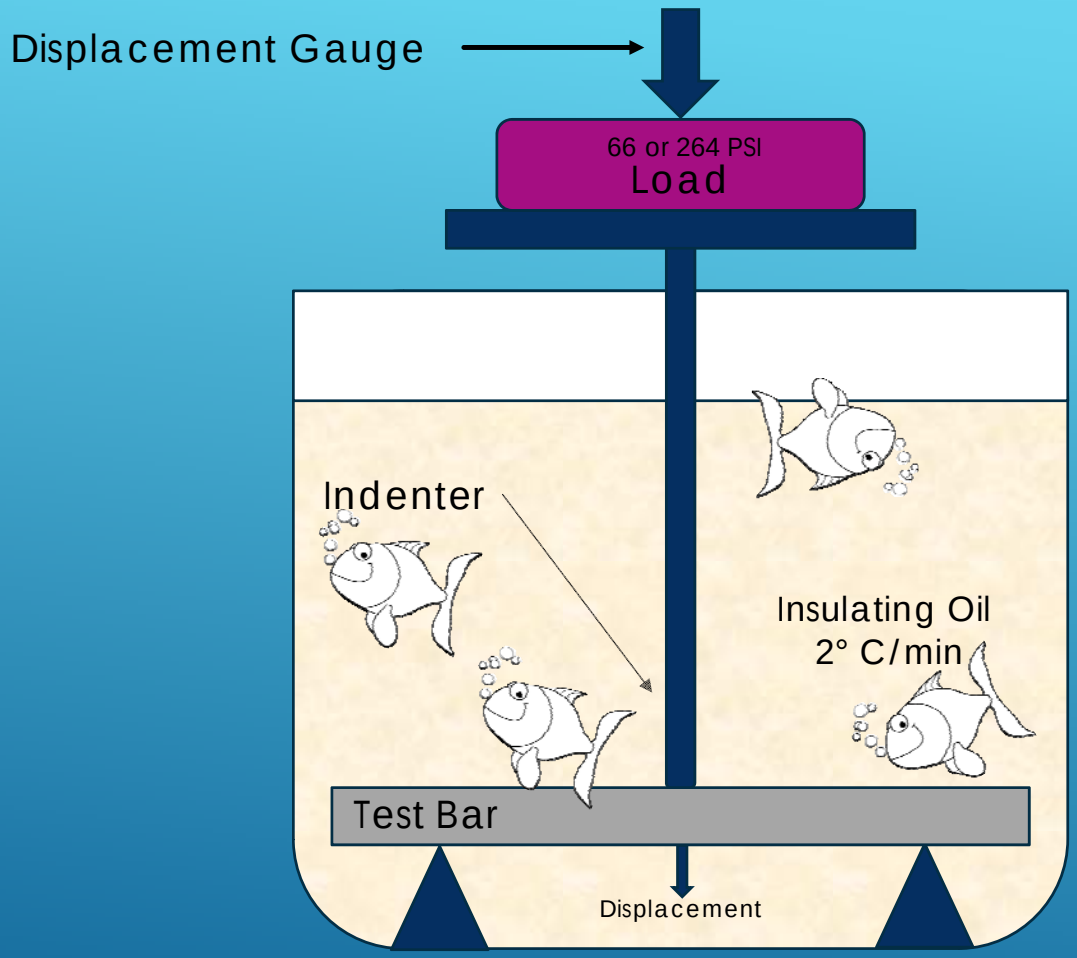

HEAT DISTORTION TEST

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REAL TANKS

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FORMED PLASTICS

Food

Medical

Industrial

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DUCT WORK

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AUTOCLAVE

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Hells Rotomolders
Turn and Burn


BIOPHARMACEUTICAL
BINS/CONTAINERS
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WOODEN WINE CONTAINER

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STEEL WINE CONTAINERS

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PLASTIC WINE CONTAINER

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HUMAN WINE CONTAINER

WINE FERMENTATION TANKS

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LINING PIPE FITTINGS

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	HDPE	PP
Melt Index	5 g/10 minutes	20 g/ 10 minutes
Melt Point	~265F	300+F
Tensile @ Yield	3200 psi	3800 psi
Heat Distortion Temperature	153F	248F
Flexural Modulus	150,000	187,000
Elongation @ Break	~ 300%	~ 40%

EXAMPLE OF PROPERTIES

PROS AND CONS

	PP	HDPE
Impact 23C		X
Impact -40C		X
Stiffness	X	
Chemical Resistance	X	X
HDT	X	
Ease of Molding	X	X
Cost		X
Melt Point	X	
Dry Blend		X

STRESS WHITENING OR BLUSH

Stress whitening starts when stress is created by impact or tension upon a polymeric surface. This stress leads to the creation of microcrazes and/or microvoids, which are essentially the microscopic beginnings of cracks that result when stresses overcome the forces bonding particles together.

Unlike surface cracks, you cannot feel microcrazes or microvoids, but you can see them. This is because these tiny aberrations reflect light slightly differently than the surfaces around them, which in turn gives them different coloration as perceived by the human eye.

STRESS WHITENING

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MOLDING CONSIDERATIONS

- Molds similar to HDPE - slightly hotter
- Little shrink
- Thickness limits
- Part geometry

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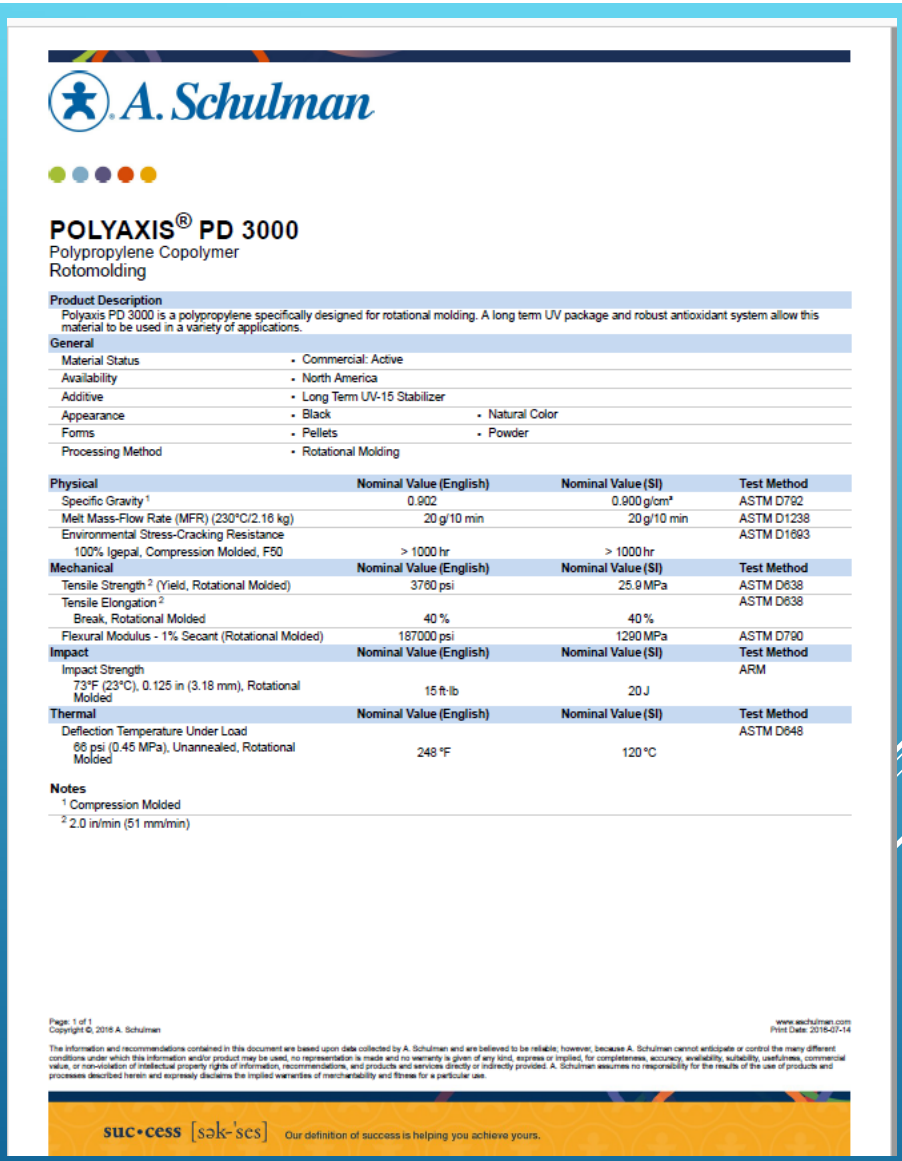
Thank you for your attention.

If you would like to discuss how polypropylene can benefit your applications please stop by our display.



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POLYAXIS® PD 3000

Polypropylene Copolymer
Rotomolding

Product Description

Polyaxis PD 3000 is a polypropylene specifically designed for rotational molding. A long term UV package and robust antioxidant system allow this material to be used in a variety of applications.

General		
Material Status	• Commercial: Active	
Availability	• North America	
Additive	• Long Term UV-15 Stabilizer	
Appearance	• Black	• Natural Color
Forms	• Pellets	• Powder
Processing Method	• Rotational Molding	

Physical	Nominal Value (English)	Nominal Value (SI)	Test Method
Specific Gravity [1]	0.902	0.900 g/cm³	ASTM D792
Melt Mass-Flow Rate (MFR) (230°C/2.16 kg)	20 g/10 min	20 g/10 min	ASTM D1238
Environmental Stress-Cracking Resistance			ASTM D1693
100% Igepal, Compression Molded, F50	> 1000 hr	> 1000 hr	
Mechanical	**Nominal Value (English)**	**Nominal Value (SI)**	**Test Method**
Tensile Strength [2] (Yield, Rotational Molded)	3760 psi	25.9 MPa	ASTM D638
Tensile Elongation [2]			ASTM D638
Break, Rotational Molded	40 %	40 %	
Flexural Modulus - 1% Secant (Rotational Molded)	187000 psi	1290 MPa	ASTM D790
Impact	**Nominal Value (English)**	**Nominal Value (SI)**	**Test Method**
Impact Strength			ARM
73°F (23°C), 0.125 in (3.18 mm), Rotational Molded	15 ft·lb	20 J	
Thermal	**Nominal Value (English)**	**Nominal Value (SI)**	**Test Method**
Deflection Temperature Under Load			ASTM D648
66 psi (0.45 MPa), Unannealed, Rotational Molded	248 °F	120 °C	

Notes

[1] Compression Molded

[2] 2.0 in/min (51 mm/min)

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suc•cess [sək-'ses] Our definition of success is helping you achieve yours.