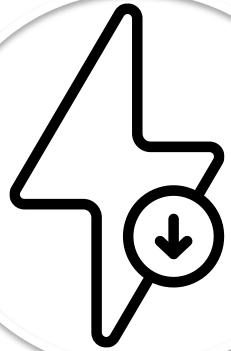


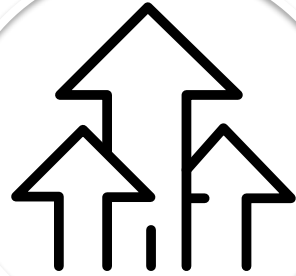
Value Added Solutions for Rotational Molding



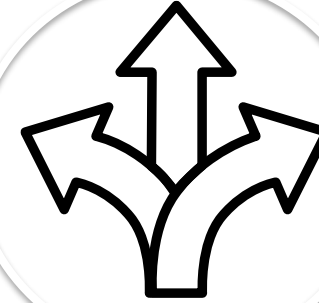
Market Trends & Drivers



Energy Efficiency



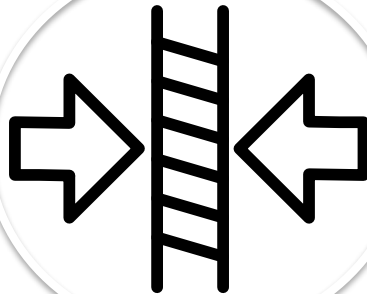
Increasing PCR*
Incorporation



Blow Molding
Alternatives



Improving
Productivity



Raw material
efficiency



Cost
optimization

*PCR = Post Consumer Recycled content

Requirements for Rotomolding Applications

- ✓ Impact Resistance
- ✓ Efficient Cooking and Cooling
- ✓ ESCR
- ✓ Structural Stability-Flex Modulus
- ✓ Tensile Properties

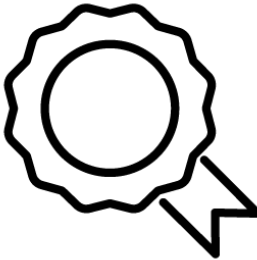


**Balanced Performance
Toughness & Stiffness**

ExxonMobil Signature Polymers for Rotational Molding



Performance
PE



25+ years of
expertise



Global supply
capability

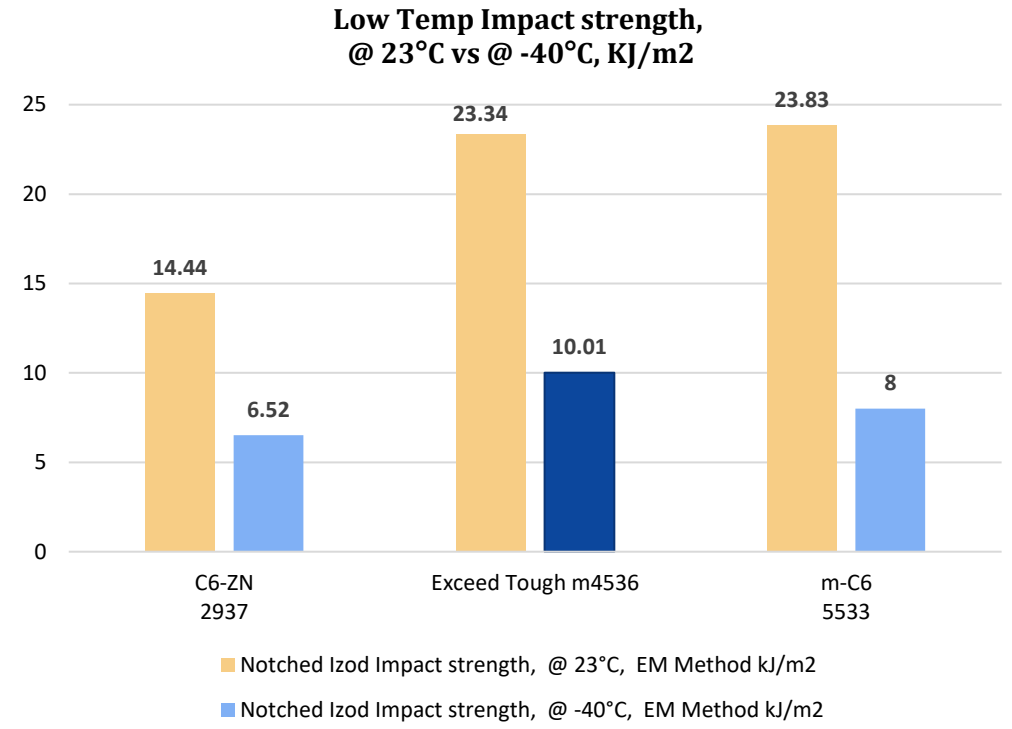
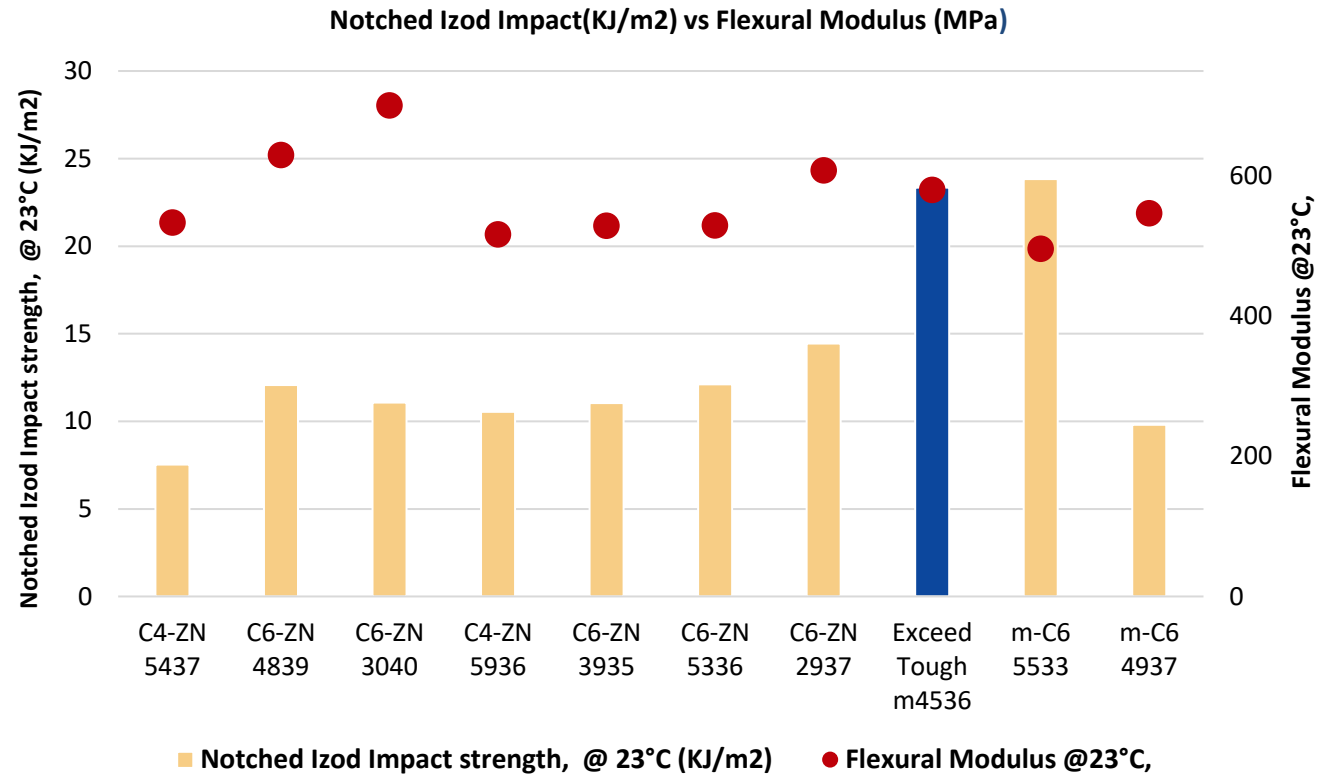
Exceed™ Tough m 4536.UV12 performance PE
Ethylene-1-hexene copolymer

MI	4.5 g/10min	Density	0.937 g/cm³
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Data from tests performed by or on behalf of ExxonMobil



Performance Benchmark (Notched Izod & Flexural Modulus)



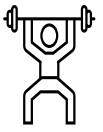
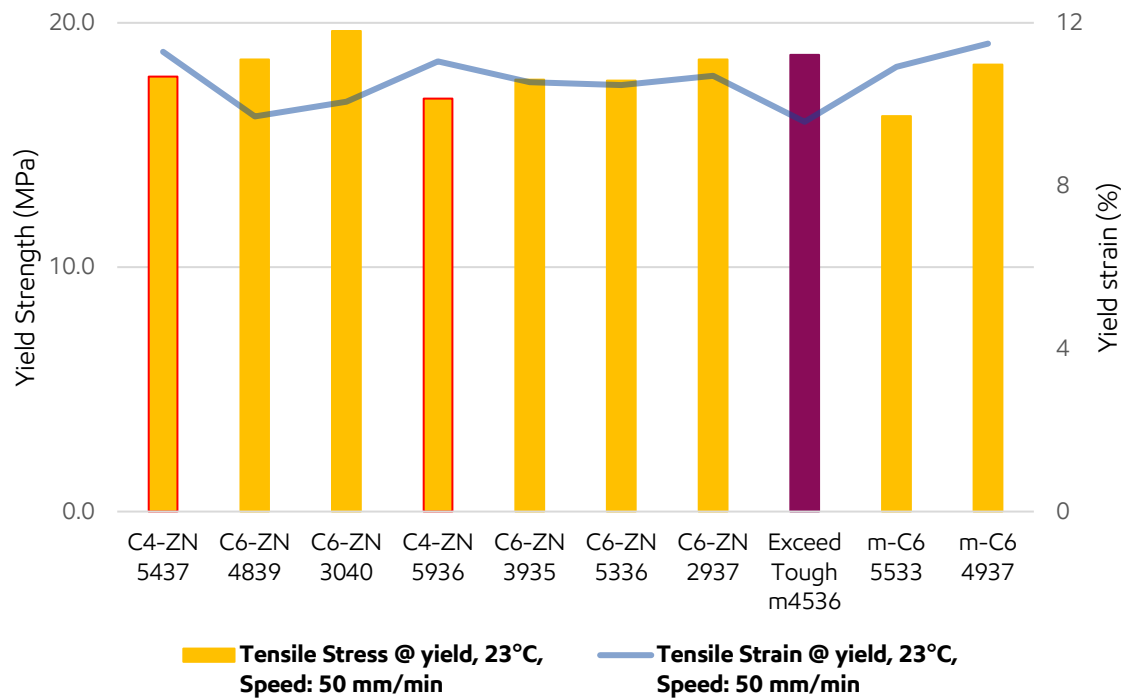
Exceed™ Tough m 4536PA can provide superior **Stiffness-Toughness balance**



Exceed™ Tough m 4536PA can provide an excellent **Low Temperature Toughness**

Performance Benchmark (Tensile, ESCR)

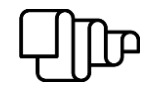
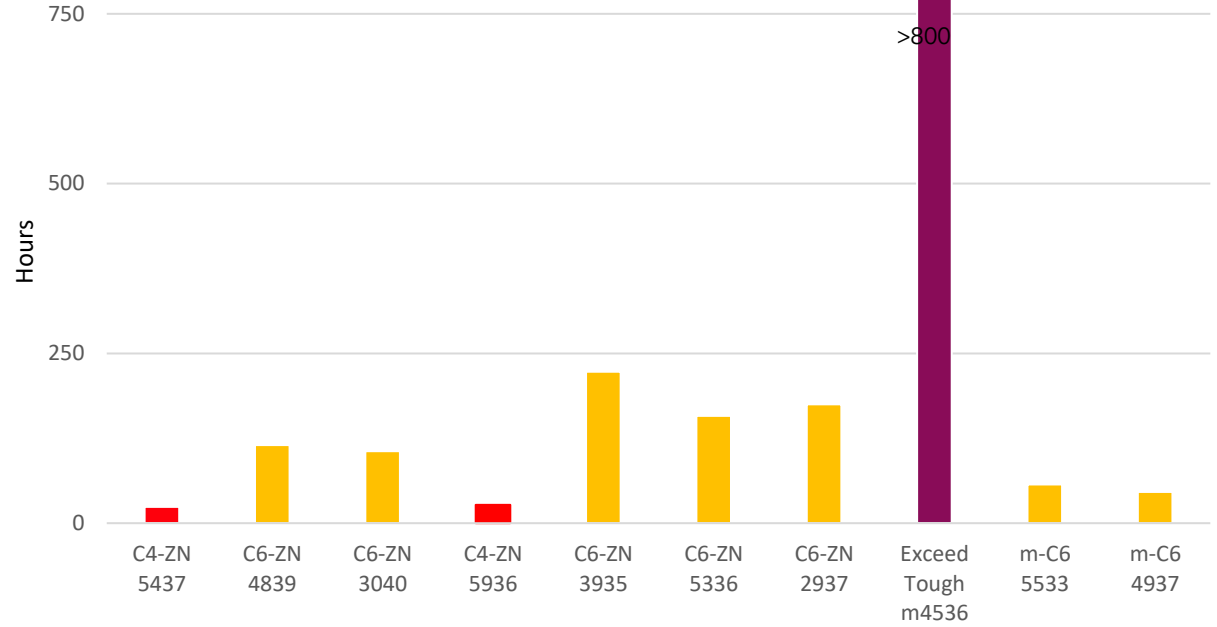
Tensile Performance



Competitive Tensile performance

ESCR F₅₀ (Hours) Condition B*

*10% Igepal, Bath Temperature: 50°C



Excellent **ESCR** performance with **Exceed™ Tough m 4536PA**

Requirements by Application

WATER TANKS



UNDERGROUND TANKS



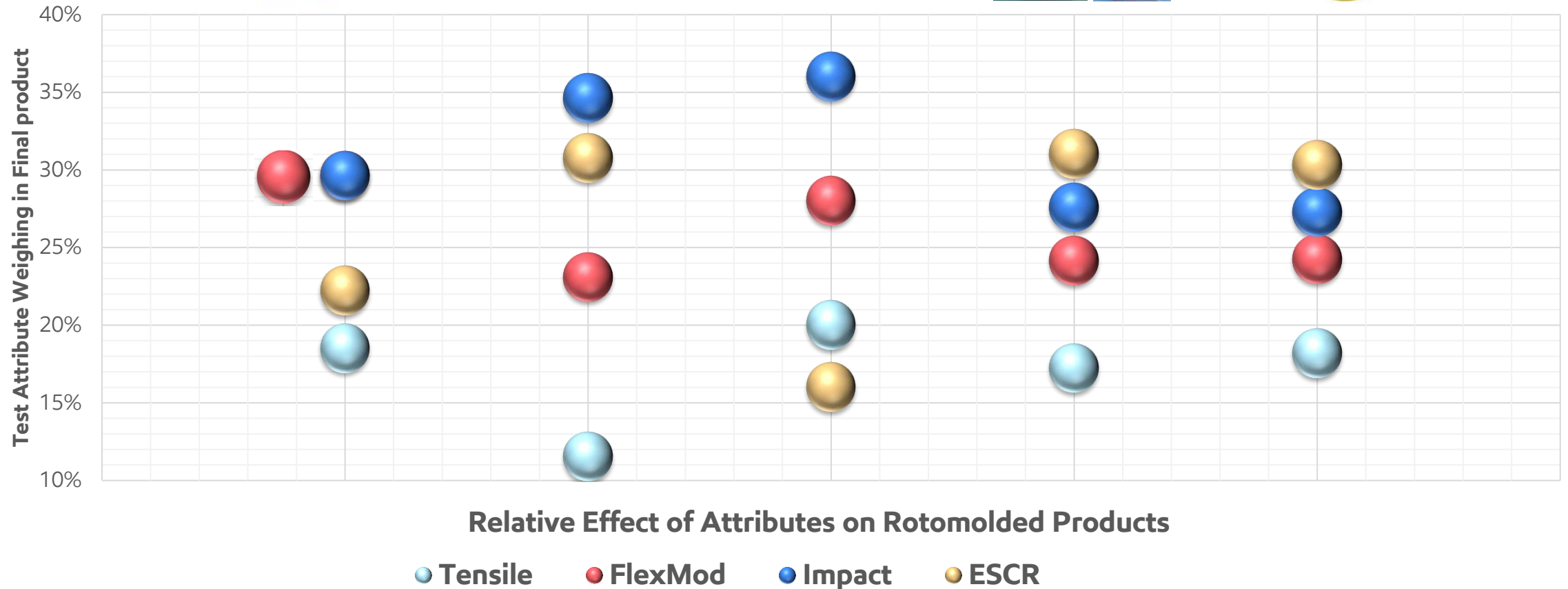
ROADBLOCKS



MARINE FLOATERS, BUOYS

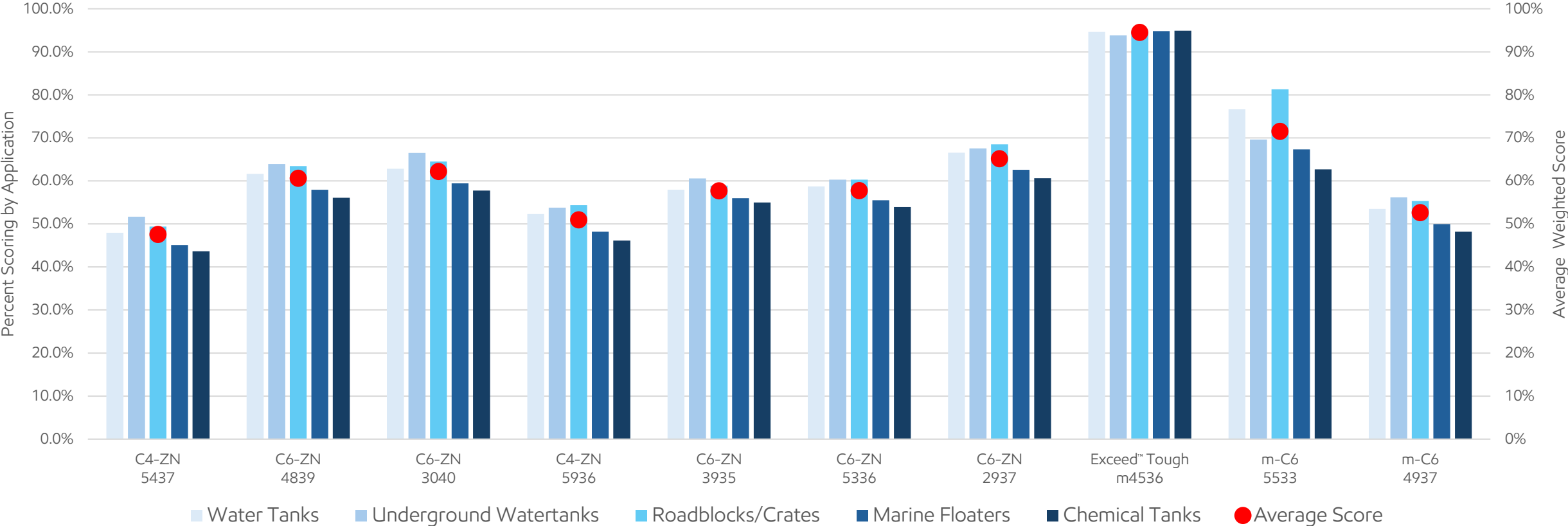


CHEMICAL TANKS



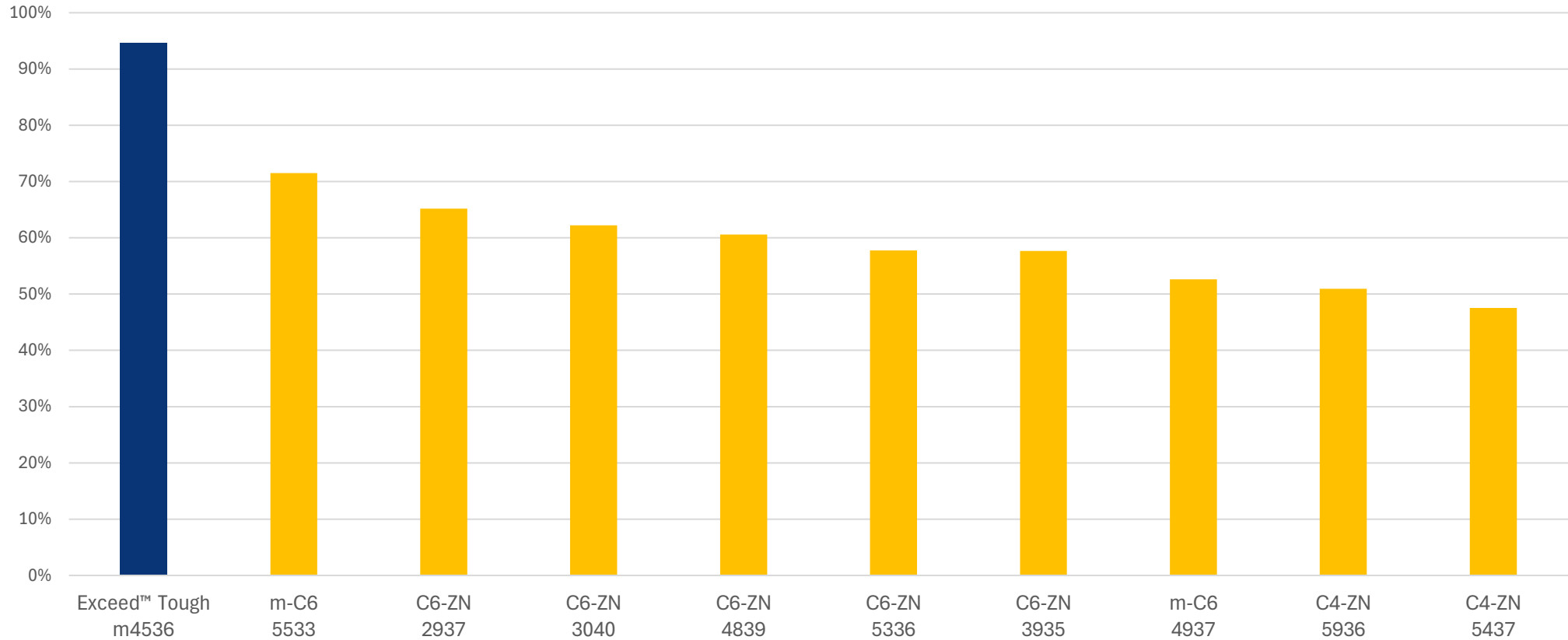
Application Weighted Scoring

Rotomolded Product Attributed Testing Results



Total Average Scoring

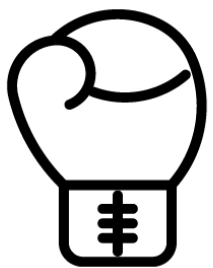
Average Attribute Weighted Score



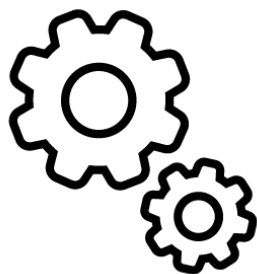
Driving Processing Efficiency & Performance

Exceed™ Tough m 4536 can deliver:

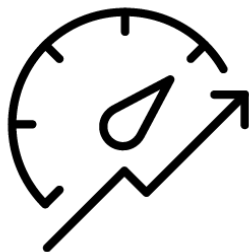
- Superior ARM impact performance
- High ductility
- Broad processing window (196°C - 233°C)
- Shorter oven cycles



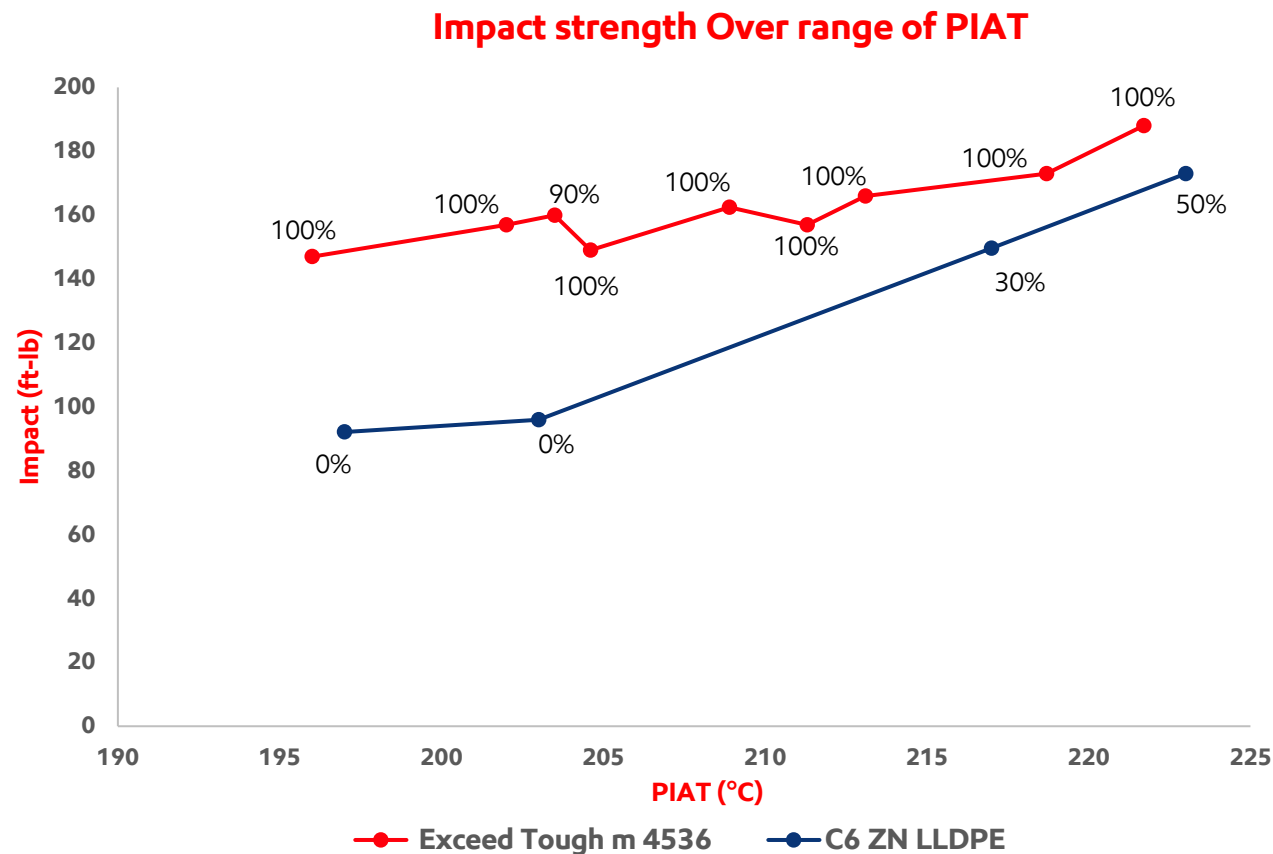
Extreme
Toughness



Broad Process
Window





Reduced cycle
time





















*Percentage values in the chart depict ductility values

*C6ZN LLDPE(0.937 density, 5 MI)
Testing condition: -40°F (-40°C), 0.250 in (6.35 mm)

Customer Validation - Exceed™ Tough m 4536 vs C6 ZN LL

Pass 
 Did not pass 

Rotational molding – 4 arms	
OEM	Reinhardt Teknik
Oven Type	Electric Heater
Product Details	
Dimensions	455 × 455 × 365 mm
Thickness	5 ± 1 mm
Weight	4 kg
Constant Parameters	
Oven Temp	350 C
Cooling Time	19 minutes

Material	PIAT window	Remarks			
		Cooking	Visual	Impact	Failure type
C6 LLDPE <small>(0.939 d, 3.2 MI)</small>	195 °C (supplier recommended)				100% Brittle
	~200°C				75% Brittle & 25% Ductile
	208 °C				50% Brittle & 50% Ductile
Exceed Tough m 4536.UV12	162 °C				100% Ductile
	184-221 °C				100% Ductile
	>229-245 °C				100% Ductile

Potential Solutions Summary



Stiffness-Toughness balance



Excellent ESCR performance



Superior ARM impact performance



Downgauging potential*



Based on trial testing, a tank incorporating Exceed Tough maintained performance properties with 10% downgauging compared to a C6 ZN LLDPE market reference or similar

Test methods

Test item	ExxonMobil test method based on
Tensile properties	ExxonMobil test method
Flexural Modulus	ExxonMobil test method
Notched Izod Impact	ExxonMobil test method
Low Temperature Notched Izod Impact (-40°C)	ExxonMobil test method
Notched Izod Impact	ExxonMobil test method
ESCR Test (Condition-B; 10% Igepal, Bath Temperature: 50°C) F50	ExxonMobil test method

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