

Opportunity for Rotomoulding in India and The Role of High Performance Resins

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The Role of High Performance Resins

Agenda

- Evolution of PE in Rotomoulding
- Resin Producers' Philosophy
- SURPASS® Rotomoulding Resins
- RMs341-U Resin Design & Technical Data
- Customer Evaluations

Evolution of PE Resins in Rotomoulding



1950

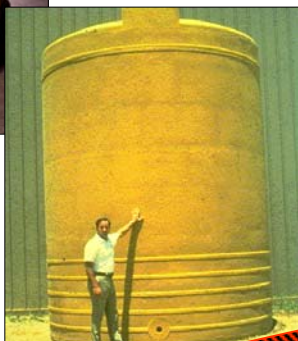
1960

1970

1980

1990

Evolution of PE Resins in Rotomoulding



????

SSC
LM/HDPE

PERFORMANCE

2000

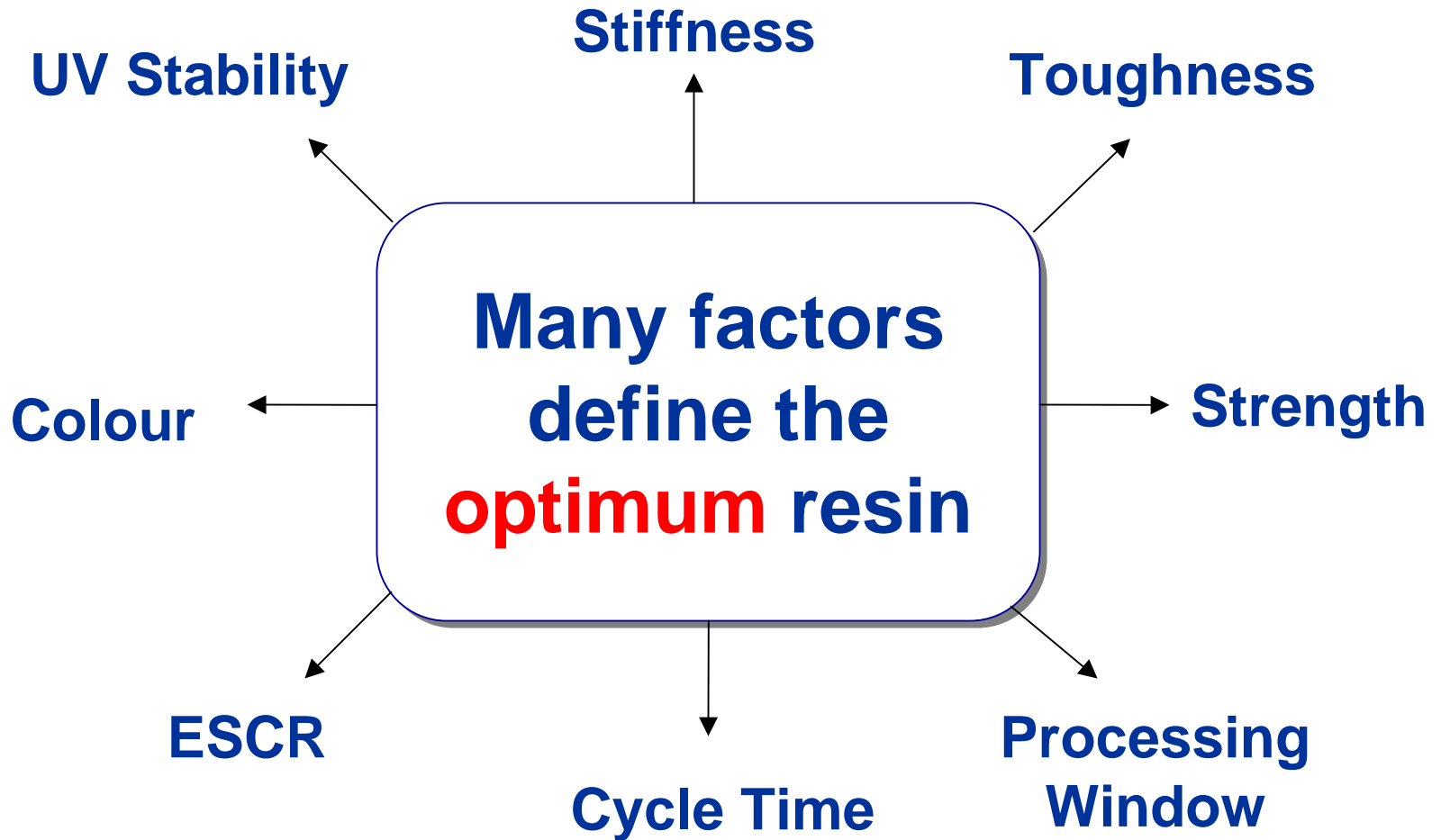
2010



Enhanced PE Resins to Grow the Market

A Resin Producer's View

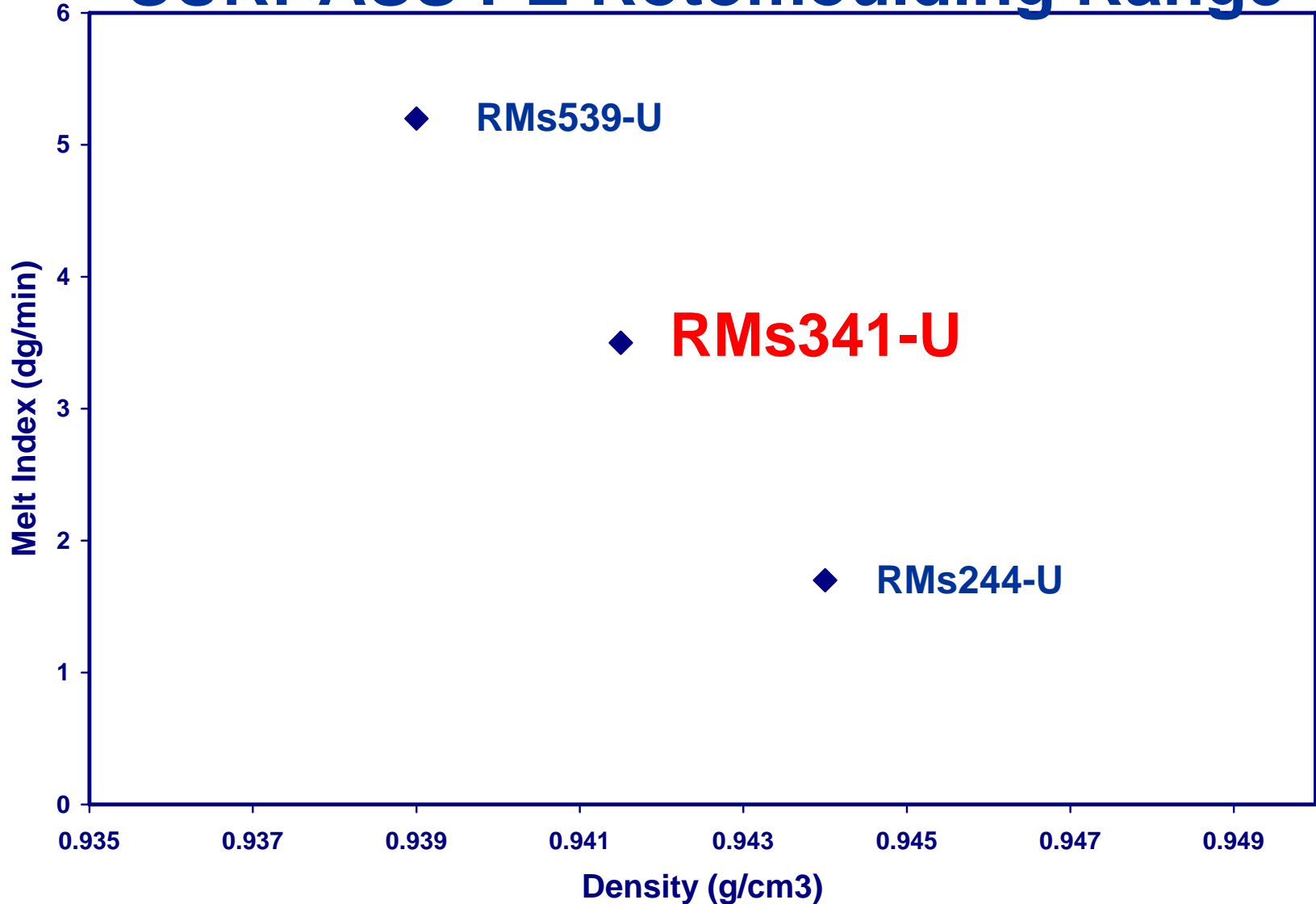
- Design and deliver new and innovative products
 - Catalyst advancements
 - Reactor innovations
- Deliver balance of performance
 - Processing, Stiffness and Toughness
- More than just resin
 - Development and Application Support
 - New Business Models



NOVA Chemicals Resin Approach SURPASS PE Resins

- Based on
 - Proprietary Single Site Catalyst
 - Reactor innovations
 - Octene Comonomer
 - Flexible Solution Phase Technology
- Deliver balance of performance
 - Processing, Stiffness and Toughness

SURPASS PE Rotomoulding Range



SURPASS RMs341-U Resin Technical Data

Grade	Melt Index (g/10min)	Density (g/cm ³)
RMs341-U	3.5	0.941

- Solution Phase Polymerization
 - Tailored Molecular Weight Distribution
- Octene Comonomer
 - Stiffness
 - Toughness
- Single-Site Catalyst
 - Low Catalyst Residue (good colour)
 - Narrow Molecular Weight Distribution (faster processing)

Breaking Rotomoulding Resin Traditions

RM341-U =



Breaking Rotomoulding Resin Traditions

RM341-U =



RMs341-U Resin Design



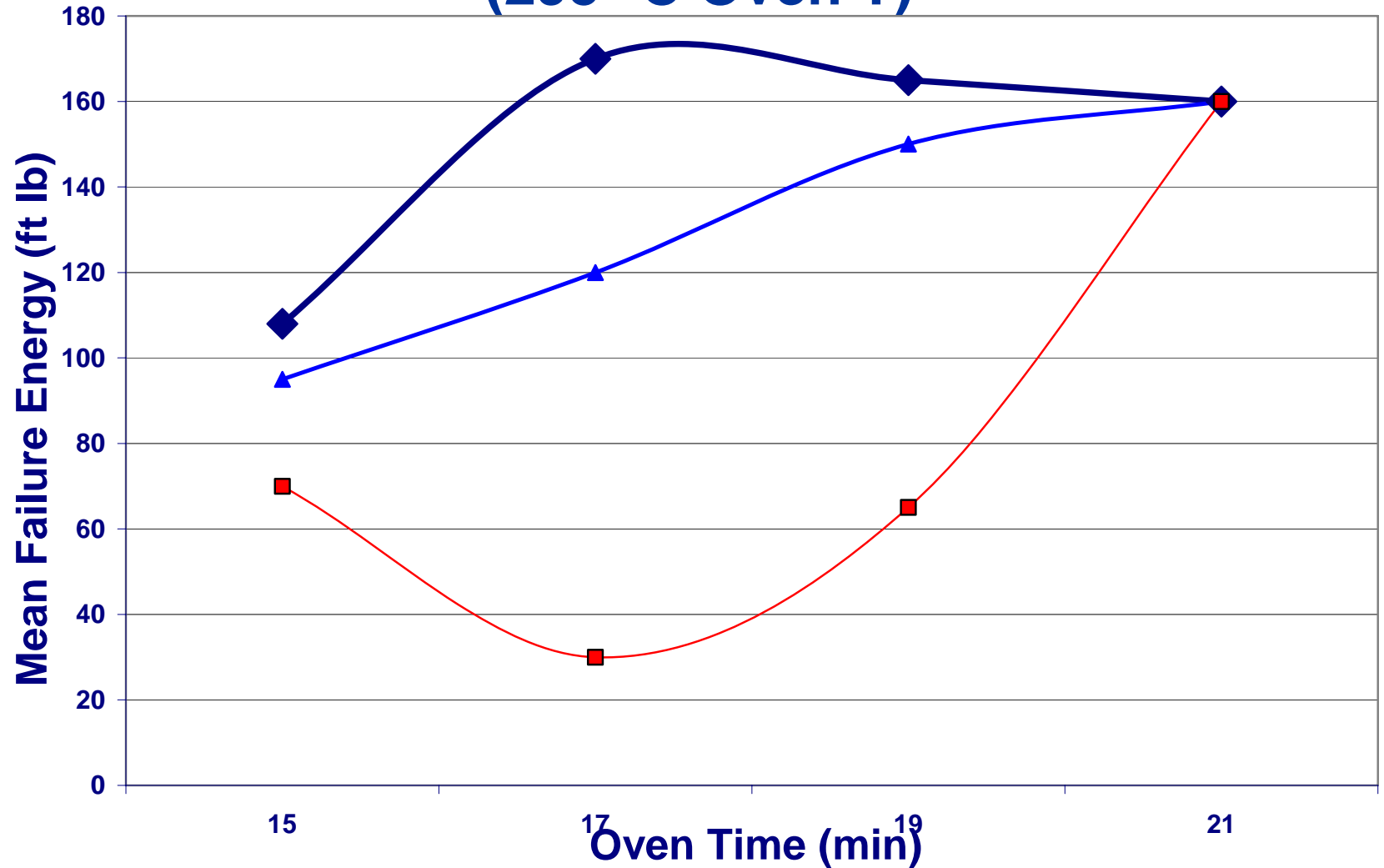
Processability

Stiffness

ESCR



Enhanced Processing Cycle and Window ARM Impact at -40°C for 6 mm Rotomoulded Cubes (295 °C Oven T)



◆ RMs341-U

▲ RMs244-U

■ Competitive Hexene Tank Grade

Customer Evaluations

RM341-U as a Tank Resin

20% cycle time reduction
over incumbent 2 MI
resins

Evaluated in 38,000 litre
storage tanks and 9,500
litre septic tanks

With no sagging



Customer Evaluations

RM341-U as a Custom Resin



15% cycle time reduction
over incumbent 3.5 MI
resins

Evaluated in spas,
materials handling, fuel
carts and structural foam

Flow characteristics fill
threads and other tight
design features

Innovative Resins Enhance Results for Processor and End User

- Leverage Comonomer, Catalyst and Reactor Technology
- Unique new resin that spans the performance field from large tanks to custom applications
 - Enhanced Performance
 - Potential New Applications
 - Potential Resin Rationalization
- SURPASS RMs341-U Resin: Latest of an ongoing effort by NOVA Chemicals to deliver superior products to the rotational moulding marketplace

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