

Milliken®

# DeltaMax™

Performance Modifiers for Polypropylene



Milliken™

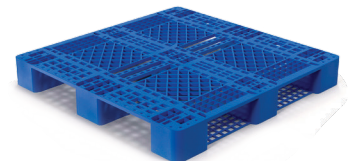
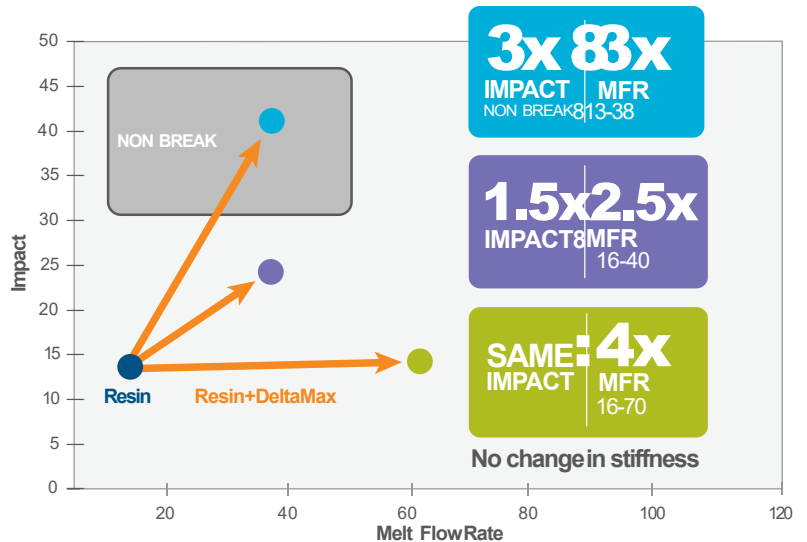
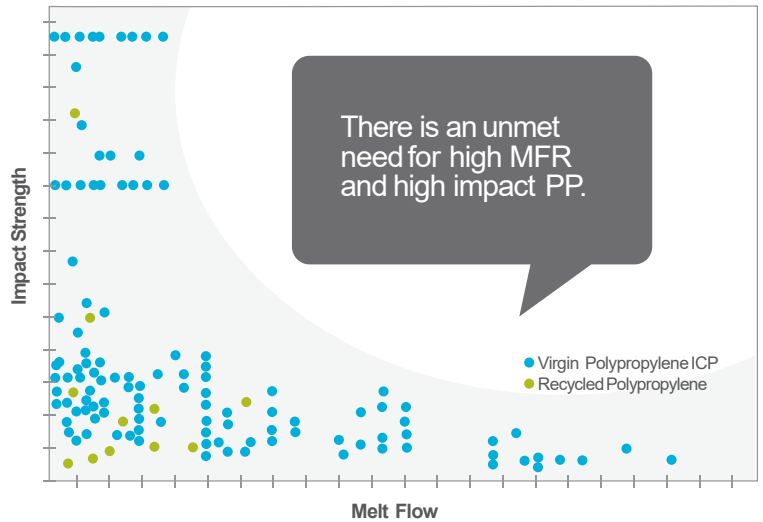
# DELTAMAX™

## PerformanceModifiers for Polypropylene

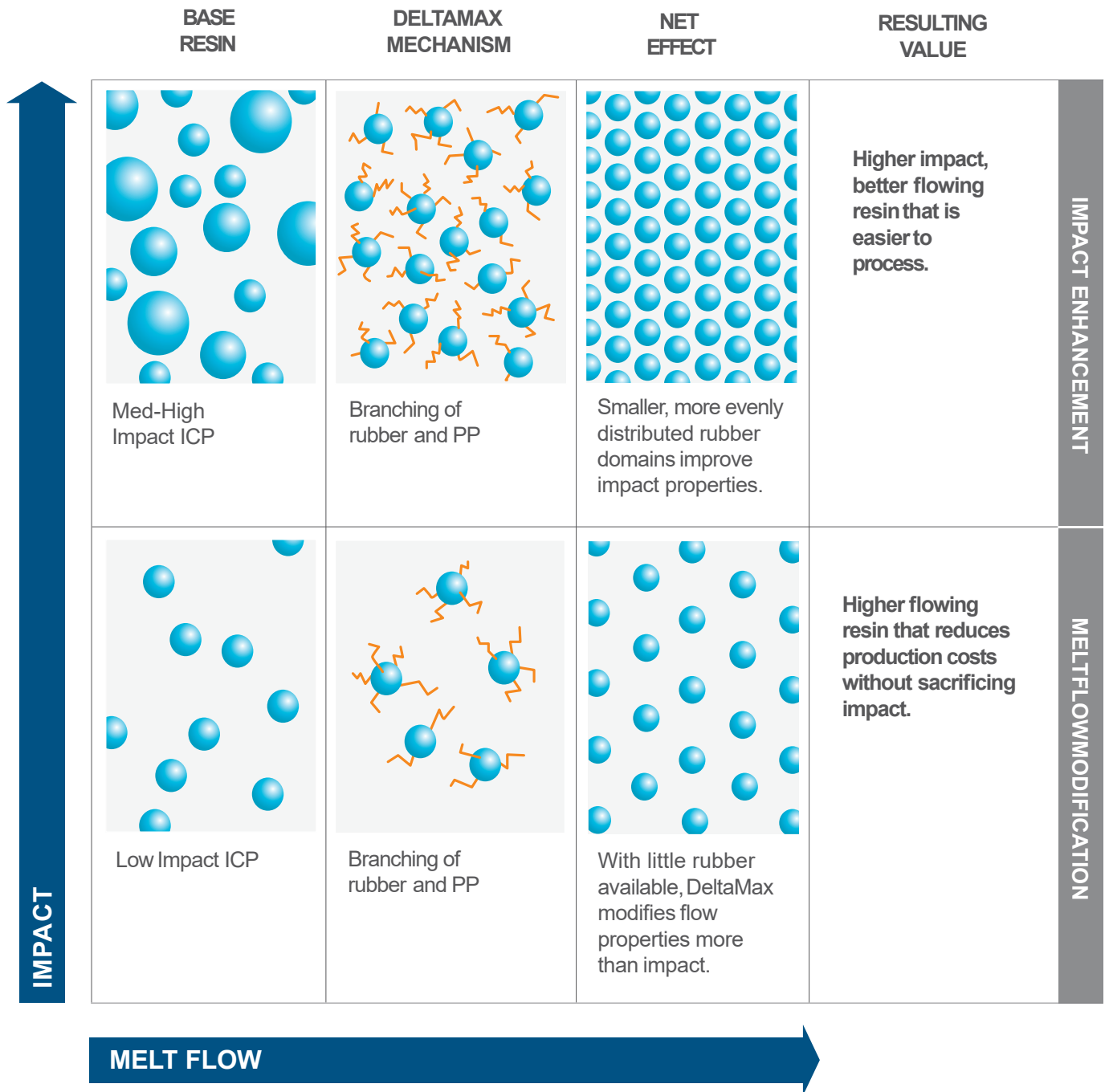
DeltaMax™ PerformanceModifiers are a family of masterbatch products designed for use in injection molded applications of virgin polypropylene impact copolymers and recycled polypropylene resins. While polypropylene is a cost-effective material, it is limited with respect to providing a balance of high impact with stiffness and melt flow making it difficult to cost-effectively formulate, design, and process parts. This is particularly the case for recycled polypropylene resins, which typically lack high melt flow and impact properties required for many injection molded applications within consumer, industrial, and automotive markets.

DeltaMax PerformanceModifiers maximize the physical properties and processability of polypropylene in a way that transforms the virgin and recycled PP markets. The technology enables converters to enhance the impact and melt flow of their ICP or rPP resins by adding a masterbatch at injection molding machine-side. The net effect is the ability to design parts with higher impact and thinner profiles, run machines with faster cycle times or lower temperatures, reduce the use of costly impact modifiers, and reduce inventory of multiple ICP resins. Additionally, DeltaMax PerformanceModifiers allow for the use of recycled PP at equal or better performance levels compared to virgin resins. This creates an opportunity to improve the circular economy and promotes more sustainable manufacturing practices.

### DeltaMax PerformanceModifiers extend the performance boundaries of PP impact copolymers



# HOW IT WORKS

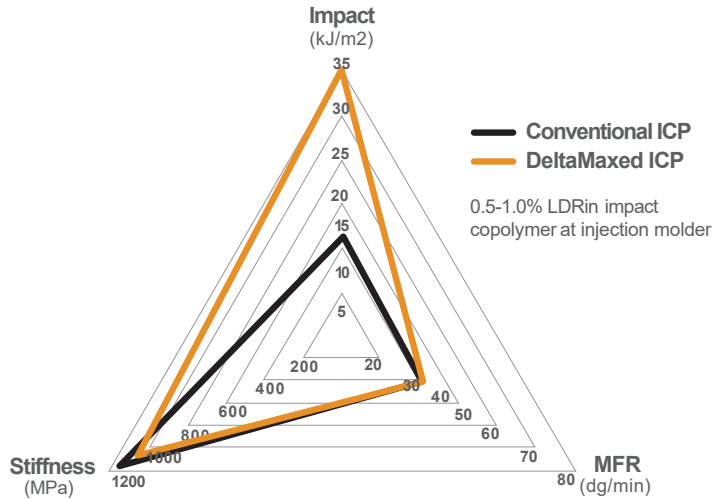


## MASTERBATCHES DEFINED



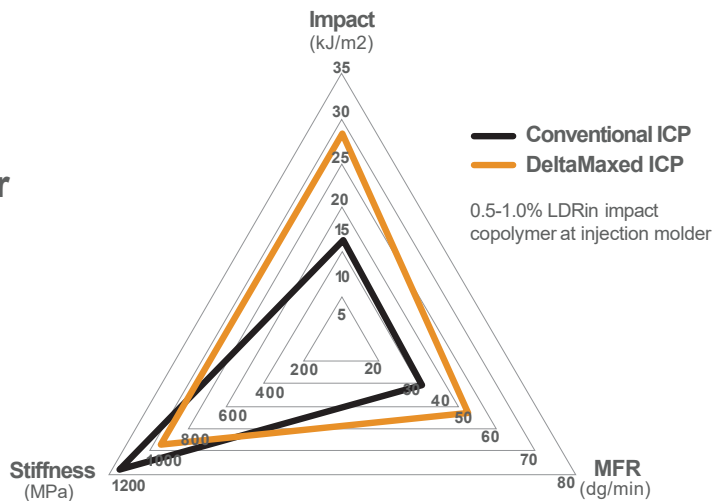
### DeltaMax™ i300 Impact Enhancer

DeltaMax™ i300 is a high performance impact enhancer designed for use in injection molded applications of polypropylene impact copolymers and recycled polypropylene resins. DeltaMax i300 maximizes impact performance while optimizing melt flow rate (MFR) for improved physical properties and processability of polypropylene.



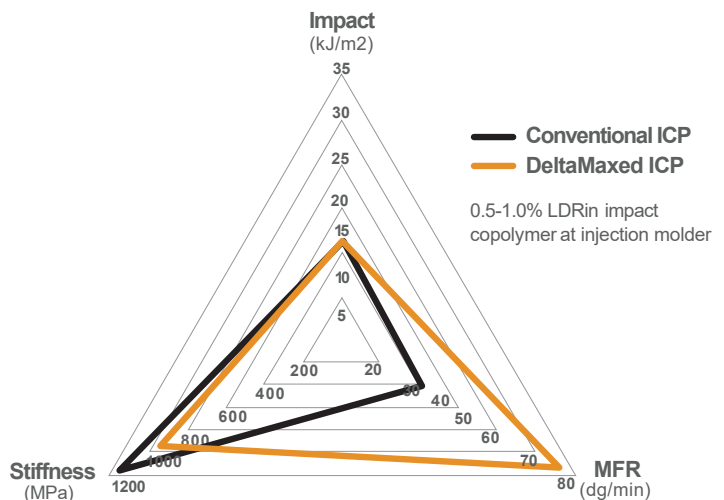
### DeltaMax™ a200 All Purpose Modifier

DeltaMax™ a200 is a high performance impact and melt flow modifier designed for use in injection molded applications of polypropylene impact copolymers and recycled polypropylene resins. DeltaMax a200 provides a strong balance of impact, stiffness, and melt flow rate (MFR) to maximize the physical properties and processability of polypropylene.



### DeltaMax™ m100 Melt Flow Modifier

DeltaMax™ m100 is a high performance melt flow modifier designed for use in injection molded applications of polypropylene impact copolymers and recycled polypropylene resins. DeltaMax m100 increases the melt flow rate (MFR) while providing equal or better impact performance to maximize the physical properties and processability of polypropylene.



## CASE STUDIES



### Maximize Impact Properties

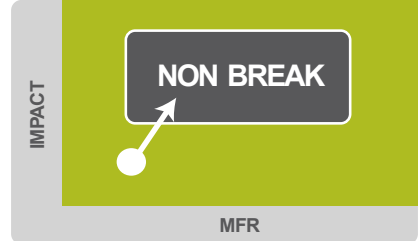
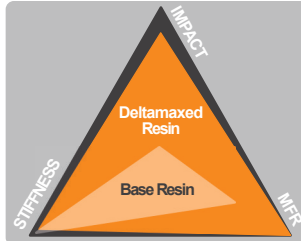
An industrial bucket and pail manufacturer is attempting to formulate a high impact, non break solution for a leading retailer.



IMPACT FROM  
**13 TO 43**  
**3X**  
IMPROVEMENT  
IN IMPACT

MFR FROM **17-30**  
**2X**  
IMPROVEMENT  
IN MFR

STIFFNESS FROM **630-800**  
MINIMAL CHANGE IN STIFFNESS



### Maximize Melt Flow Properties

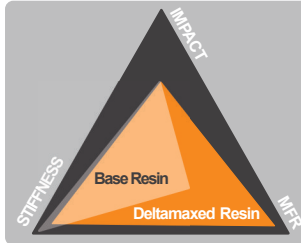
A housewares manufacturer must reduce production costs by optimizing operating efficiencies and increasing processing speeds.



DECREASED  
MOLDING  
TEMPERATURE  
**6%**  
FROM **425°F**  
TO **400°F**

IMPROVED COST SAVINGS/  
PROFIT IMPROVEMENT  
**\$190/T**

CYCLE  
TIME  
REDUCTION **11%**



### Maximized Sustainability

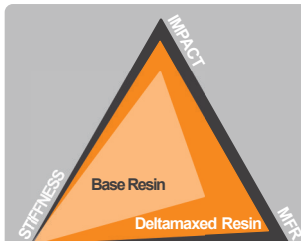
Based on a new sustainability initiative, a leading housewares manufacturer has been tasked with increasing the amount of recycled plastics being used without sacrificing physical properties.



IMPACT FROM  
**75 TO 91**  
**20%**  
IMPROVEMENT  
IN IMPACT

MFR FROM **11-26**  
**2.5X**  
IMPROVEMENT  
IN MFR

STIFFNESS FROM **1176-1090**  
MINIMAL CHANGE IN STIFFNESS



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NORTH AMERICA  
**Spartanburg, SC, USA**  
P. 1.800.910.5592  
F. 864.503.2430  
[millichem@milliken.com](mailto:millichem@milliken.com)

EUROPE  
**Gent, Belgium**  
P. 32.9.265.1100  
F. 32.9.265.1195  
[eurochem@milliken.com](mailto:eurochem@milliken.com)

LATIN AMERICA  
**Sao Paulo, Brazil**  
P. 55.11.3043.7942  
F. 55.11.3043.7096  
[lachem@milliken.com](mailto:lachem@milliken.com)

**Mexico City, Mexico**  
P. 52.55.3088.3600  
F. 52.55.9000.2643  
[lachem@milliken.com](mailto:lachem@milliken.com)

ASIA  
**Singapore**  
P. 65.6377.0770  
F. 65.6377.0990  
[asiachem@milliken.com](mailto:asiachem@milliken.com)

**Shanghai, China**  
P. 86.21.6145.5555  
F. 86.21.6145.5558  
[asiachem@milliken.com](mailto:asiachem@milliken.com)

**Pune, India**  
P. 91.20.6730.7501  
F. 91.20.6730.7514  
[asiachem@milliken.com](mailto:asiachem@milliken.com)

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