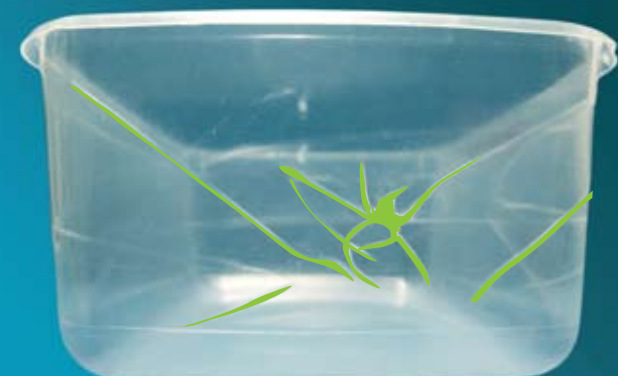


USING C-RCP\* WITHOUT AN IMPACT MODIFIER  
Brittle fracture after impact / Safety risk from sharp edges



USING C-RCP WITH ETHYLENE-BASED IMPACT MODIFIER  
Crack formation after impact / Stress whitening



USING C-RCP WITH VERSIFY™ IMPACT MODIFIER  
No fracture after impact / No stress whitening

\*c-RCP: clarified polypropylene random copolymer



## ABOUT VERSIFY™

VERSIFY™ Plastomers and Elastomers are a versatile family of specialty propylene-ethylene copolymers produced with an innovative catalyst in combination with Dow's proprietary INSITE™ Technology and Solution Process.

The remarkable molecular architecture of these specialty polymers provides films, fibers, and molded parts with an exceptional combination of excellent optics, sealing and hot tack performance, plus elasticity, flexibility, softness and compatibility in blends.

Different VERSIFY™ grades are available and suitable for impact modification of polypropylene depending on specific process needs.

VERSIFY™ Plastomers and Elastomers are contributing to Dow's commitment to innovation and to delivering interesting solutions designed to respond to market requirements and address customers' needs.

Visit [www.dow.com/versify](http://www.dow.com/versify) to find out how using VERSIFY™ Plastomers and Elastomers can open minds and markets.



## ABOUT DOW

For more information on products, innovations, expertise, and other services available to you from Dow, visit [www.dow.com](http://www.dow.com) or contact us using these numbers:

<b>North America</b>		<b>Europe/Middle East</b>	
U.S. & Canada	1-800-441-4369		+800-3694-6367
	1-989-832-1426		+32-3-450-2240
Mexico	+1-800-441-4369	Italy	+800-783-825
<b>Latin America</b>		<b>South Africa</b>	
Argentina	+54-11-4319-0100		+800-99-5078
Brazil	+55-11-5188-9000	<b>Asia Pacific</b>	
Colombia	+57-1-219-6000		+800-7776-7776
Mexico	+52-55-5201-4700		+603-7965-5392

The principles of Responsible Care® and Sustainable Development influence the production of printed literature for The Dow Chemical Company ("Dow"). As a contribution towards the protection of our environment, Dow's printed literature is produced in small quantities and on paper containing recovered/ post-consumer fiber and using 100 percent soy-based ink whenever possible.

NOTICE: Any photographs of end-use applications in this document represent potential end-use applications but do not necessarily represent current commercial applications, nor do they represent an endorsement by Dow of the actual products. Further, these photographs are for illustration purposes only and do not reflect either an endorsement or sponsorship of any other manufacturer for a specific potential end-use product or application, or for Dow, or for specific products manufactured by Dow.

NOTICE: No freedom from infringement of any patent owned by Dow or others is to be inferred. Because use conditions and applicable laws may differ from one location to another and may change with time, the Customer is responsible for determining whether products and the information in this document are appropriate for the Customer's use and for ensuring that the Customer's workplace and disposal practices are in compliance with applicable laws and other governmental enactments. Dow assumes no obligation or liability for the information in this document. **NO WARRANTIES ARE GIVEN; ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED.**

Published March, 2010. Printed in Switzerland.  
© 2010 The Dow Chemical Company

@™Trademark of The Dow Chemical Company ("Dow") or an affiliated company of Dow.  
©Responsible Care is a service mark of the American Chemistry Council.  
Dow is a partner in the American Chemistry Council Responsible Care initiative.

NOTICE: If products are described as "experimental" or "developmental": (1) product specifications may not be fully determined; (2) analysis of hazards and caution in handling and use are required; (3) there is greater potential for Dow to change specifications and/or discontinue production; and (4) although Dow may from time to time provide samples of such products, Dow is not obligated to supply or otherwise commercialize such products for any use or application whatsoever.

NOTICE REGARDING MEDICAL APPLICATION RESTRICTIONS: Dow will not knowingly sell or sample any product or service ("Product") into any commercial or developmental application that is intended for:

- long-term or permanent contact with internal bodily fluids or tissues. "Long-term" is contact which exceeds 72 continuous hours;
- use in cardiac prosthetic devices regardless of the length of time involved ("cardiac prosthetic devices" include, but are not limited to, pacemaker leads and devices, artificial hearts, heart valves, intra-aortic balloons and control systems, and ventricular bypass-assisted devices);
- use as a critical component in medical devices that support or sustain human life; or
- use specifically by pregnant women or in applications designed specifically to promote or interfere with human reproduction.

Dow requests that customers considering use of Dow products in medical applications notify Dow so that appropriate assessments may be conducted. Dow does not endorse or claim suitability of its products for specific medical applications. It is the responsibility of the medical device or pharmaceutical manufacturer to determine that the Dow product is safe, lawful, and technically suitable for the intended use. **DOW MAKES NO WARRANTIES, EXPRESS OR IMPLIED, CONCERNING THE SUITABILITY OF ANY DOW PRODUCT FOR USE IN MEDICAL APPLICATIONS.**

Form No. 746-08001



# VERSIFY™ A clear choice for impact modification

Would you like to produce clear polypropylene containers that are **less likely to break?**

Do you want to see your raw materials deliver **better transparency?**

Could your business benefit from faster **processing and shorter cycle times?**

Do your customers prefer to see more **creative packaging designs?**

The benefits are clear. See how **VERSIFY™** could change your view of impact modifiers – for good.

## Core Features

- Fully compatible with polypropylene
- Enhanced optics
- Toughness down to -10°C
- No stress whitening
- Fast processing
- Loading freedom for tailored toughness

## Core Benefits

- No need to pre-compound
- Transparency of end-product
- Reduced brittleness
- Enhanced display of packaged goods
- High productivity
- Maximum performance at low elastomer loading

If you've answered yes to any of these questions, why not take a look at **VERSIFY™** – impact modifier from The Dow Chemical Company (Dow) for products with impact!

# NEW GENERATION VERSIFY™ ELASTOMER – TAKING ON YOUR CHALLENGES

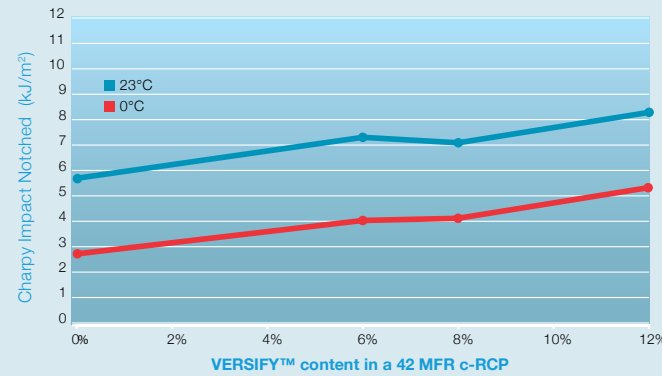
## YOUR CHALLENGE: “TOUGHNESS”

Breakage during handling is unacceptable for customers, particularly where safety is concerned – *you know achieving container toughness along with achieving lighter weight can be challenging with high melt flow clarified random copolymer, particularly at low temperatures.*

Figure 1: VERSIFY™ offers higher toughness for reduced brittleness, and loading can be adapted at press depending on performance requirements. Source: VERSIFY™ in a 42 MFR c-RCP matrix. Measured according to ISO 179. Typical values, not to be construed as specification limits.

## DOW'S SOLUTION

VERSIFY™ allows molders to increase toughness through addition of rubber rather than adding to wall thickness – allowing downgauging opportunities and saving on raw materials.



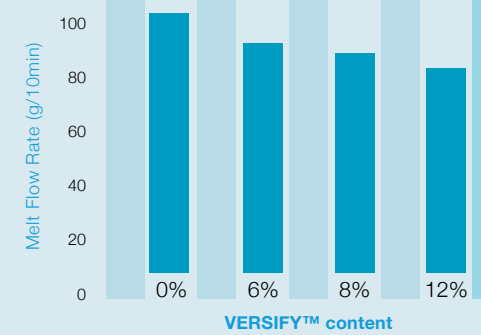
## YOUR CHALLENGE: “PROCESSING”

You know that using an impact modifier could improve mechanical performance and you're getting increased demands for high productivity on production lines along with a need to maintain performance – *you know new catalyst technologies have enabled development of high melt flow rate clarified random copolymer which reduce injection molding cycles, but they can result in decreased toughness. You don't want to slow down production and need to balance varying performance demands with cost efficiency.*

Figure 4: Source: VERSIFY™ in a 100 MFR c-RCP matrix. Typical values at 230°C / 2.16kg conditions, not to be construed as specification limits.

## DOW'S SOLUTION

Unlike ethylene-based elastomers, VERSIFY™ is fully polypropylene-compatible with no need for pre-compounding, reducing time and costs. Normally dry-blending is sufficient and loading can be adapted at press depending on performance requirements.



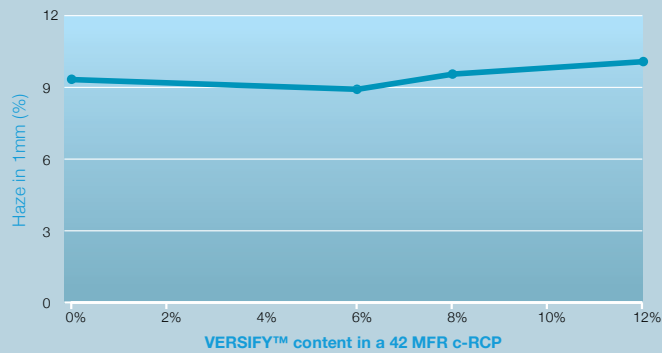
## YOUR CHALLENGE: “OPTICS”

A customer wants packaging with high transparency for a sparkling display of their finished goods – *clarified random copolymer delivers high clarity but its impact resistance is limited. With VERSIFY™ your customers will not need to compromise.*

Figure 2: Optics (haze) are not affected by using VERSIFY™ as an impact modifier. Source: VERSIFY™ in a 42 MFR c-RCP matrix. Measured according to ASTM D1003. Typical values, not to be construed as specification limits.

## DOW'S SOLUTION

Using propylene-based elastomer as an impact modifier can deliver excellent optics for 'see-through' appearance. VERSIFY™ has superior optics with low haze and no gels.



Injection molders of clear polypropylene containers have specific challenges to overcome – which is why Dow designed VERSIFY™ with you in mind.

VERSIFY™ elastomer is a propylene-based impact modifier for injection molders wanting to produce storage containers with reduced brittleness and improved transparency without compromising on processing efficiency.

If you produce clear injection molded polypropylene containers – and you want the processing advantages of high melt flow polypropylene (>25 Melt Flow Rate) as well as properties such as toughness and enhanced optics – VERSIFY™ could be a solution.

## VERSIFY™

A clear choice for impact modification in injection molded polypropylene containers.

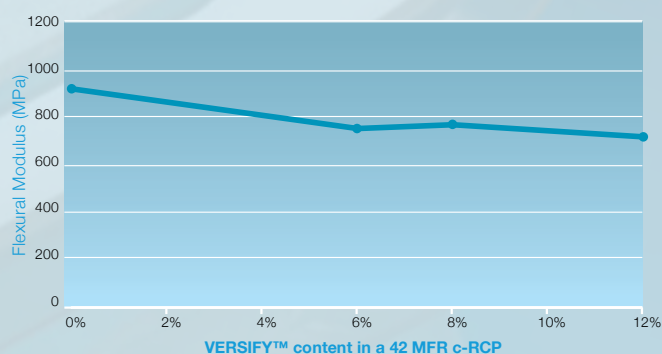
## YOUR CHALLENGE: “FREEDOM OF DESIGN”

Brand owners jostling for position on crowded shelves want more flexibility of design to help their products stand out – *lack of material toughness may limit design choices.*

Figure 3: VERSIFY™ can help to improve toughness without adding haze compared to alternatives. Source: VERSIFY™ in a 42 MFR c-RCP matrix. Measured according to ISO 178. Typical values, not to be construed as specification limits.

## DOW'S SOLUTION

Using VERSIFY™ at 6-12 weight (wt) % can increase toughness to appropriate levels. Some alternatives are limited in melt flow rate due to multiple-reactor technology, meaning less productivity for the mold. VERSIFY™ can improve container toughness offering more design freedom. It can also be dry-blended and added at press, meaning molders can better address specific customer needs without having to buy-in extra pre-compounding equipment or having to rely on 'ready-to-use' solutions that limit flexibility.



Technology	VERSIFY™	Metallocene Polyethylene	Competitor 1	Competitor 2
Formulation flexibility	++	+	-	-
Toughness > -10°C	++	+	++	++
Optics / Haze	+	-	+	+
Stress whitening	++	-	+	+

Table 1: VERSIFY™ provides flexibility as well as superior mechanical performance compared to alternatives. Source: Dow laboratory tests

Want to know more?

[www.dow.com/versify](http://www.dow.com/versify)

[www.dowelastomers.com](http://www.dowelastomers.com)