

Milliken®
Millad® NX® 8000 ECO
 Sustainable Clarifying Agent for Polypropylene

CASE STUDY

Durable, reusable polypropylene (PP) cups help reduce single-use plastics

Millad® NX® 8000 ECO clarifier for PP yields clear, lightweight end products

Those wishing to lower their environmental impact and overall carbon footprint aim to find ways to reuse products over and over again, as a means of reducing the amount of single-use plastics that get used once and tossed in the trash.

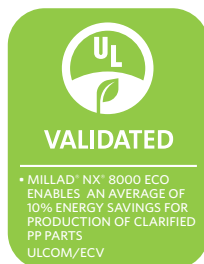
Milliken Chemical wants to play its part. Helping molders to manufacture durable drinking cups that have a clean, bright, clear appearance help to make those products more likely to be retained and reused. Cups produced with NX UltraClear™ PP resin — which can only be made with Milliken's Millad NX 8000 ECO clarifier — do just that. The highly recyclable material yields products that are strong, transparent and lighter weight than those made of many competitive materials.

As an added bonus, injection molders running NX UltraClear PP also will save energy and money in the process. This is because the clarifier used has been shown to help shorten cycle times by up to 7 percent, which in turn reduces energy use and CO2 emissions compared. In fact, the savings achieved by processing 1,000 metric tons of PP with Millad NX 8000 versus traditional clarifiers can save a molder 730 hours in manufacturing — equal to an estimated value an \$46,800 or €39,500.

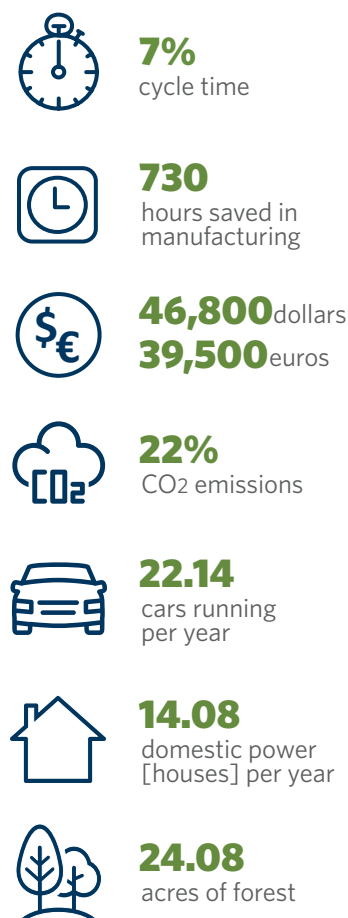
Using the same baseline of 1,000 metric tons processed, our research indicates that this translates to a lowering of such emissions by 22 percent, or the equivalent of running 22 cars per year, powering 14 domestic houses per year, or 24 acres of forest.

These eco-advantages allow brand owners, if they wish, to apply the much desired UL Environmental Claim Validation label to their product's package, providing a marketing advantage by helping to communicate the company's sustainability commitment to its customers.

In addition to the clarity and energy savings, brand owners also can brighten up their range of reusable cups with Milliken's ClearTint colorants, which lend bright hues while retaining the end product's clarity and transparency.



SAVINGS/1000MT PP EXPRESSED AS



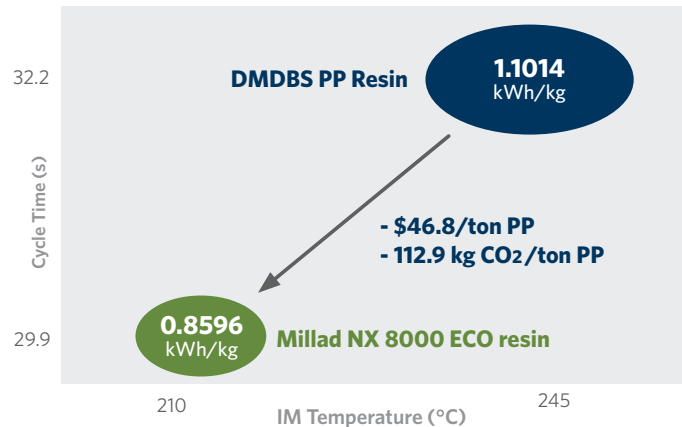
SAVINGS ACHIEVED BY PROCESSING PP WITH MILLAD NX 8000 ECO VERSUS TRADITIONAL CLARIFIERS

Milliken®
Millad® NX® 8000 ECO
 Sustainable Clarifying Agent for Polypropylene

CASE STUDY

Savings achieved by processing PP with Millad NX 8000 versus traditional clarifiers

Reusable cups made with NX UltraClear PP offer superb clarity, while also being lightweight, durable and highly recyclable. Additionally, injection molders using the material can save both energy and money, due to lower processing temperatures and cycle times that can be as more than 7% faster than with resin formulated using traditional clarifiers.



Part	Cup
Machine	Hydraulic
Shot weight	54.7 g/part ; 16 cavity mould
Traditional clarifier resin	12 MFR RCP
Millad NX 8000 ECO resin	12 MFR RCP

Parameter	Assumptions
Energy cost	\$0.10/kWh
Machine Cost	\$25/hour
Labour cost	\$6/hour
Sustainability	0.467 kg CO ₂ /kWh

Please contact your Milliken representative for further product information including chemical registrations, food contact status, and other regulatory details.

PLEASE NOTE: As each customer's use of our product may be different, information we provide, including without limitation, recommendations, test results, samples, care/labeling/processing instructions or marketing advice, is provided in good faith but without warranty and without accepting any responsibility/liability. Each customer must test and be responsible for its own specific use, further processing, labeling, marketing, etc. All sales are exclusively subject to our standard terms of sale posted at www.milliken.com/terms (all additional/different terms are rejected) unless explicitly agreed otherwise in a signed writing.

NORTH AMERICA
 Spartanburg, SC, USA
 Tel: 800-910-5592
 Fax: 864-503-2430
millichem@milliken.com

EUROPE
 Gent, Belgium
 Tel: 32-9-265-1100
 Fax: 32-9-265-1195
eurochem@milliken.com

LATIN AMERICA
 Sao Paulo, Brazil
 Tel: 55-11-3043-7942
 Fax: 55-11-3043-7096
lachem@milliken.com

LATIN AMERICA
 Mexico City, Mexico
 Tel: 52-55-3088 3600
 Fax: 52-55-9000 2643
lachem@milliken.com

ASIA
 Singapore
 Tel: 65-6377-0770
 Fax: 65-6377-0990
asiachem@milliken.com

ASIA
 Shanghai
 Tel: 86-21 6145-5555
 Fax: 86-21 6145-5558
asiachem@milliken.com

ASIA
 Pune, India
 Tel: 91.20.6730.7501
 Fax: 91.20.6730.7514
asiachem@milliken.com