



RECYCLE

INNOVATE

BENEFIT

# PET-M™ TECHNOLOGY

# Overview

- PTP Group Introduction and Mission Statement
- Process and Technology
- PET-M™ Material (Resin)
- Testing/Licensing
- Applications
- Business Partners/Customers
- Summary

# PTP Group

- Started in 2002
- Several subsidiaries and affiliated companies in Europe and North America
- Staff of ~80 people
- R&D focus
- Resin production – 10,000 MT/year
- Injection Moulding – 250 million pre-forms/year
- Patents and registered trademark PET-M™

# Mission Statement

- Provide effective food-grade PET recycling solution
  - Lowest processing costs
  - Ease of operations
  - Flexibility of technical and business solutions
  - Environmental friendliness
- Further development of innovative plastics recycling technologies and new packaging materials

# Features of PET-M™ Technology

- Decontamination efficiency
- Restoration of physical and mechanical properties of PET
- Minimized discoloration (“yellowing”)
- Constant quality control
- Process cost efficiency
- Low energy consumption
- Environmental safety of the process

# PET-M™ Process Overview

- Washing & grinding
- Mixing with modifying agent
- Drying
- Modification (melt phase)
- Extrusion / Degassing
- Melt filtration
- Underwater pelletizing
- Solid stating & crystallizing
- Quality control

# PET-M™ Material/Resin

- A new brand of PET
- Slightly different molecular structure
- Similar properties
- Standard performance
- Fully recyclable
- Competitive price



**a. Chemical Name**

Poly(ethylene terephthalate), modified with a derivative of hexamethyldisilazane and tetraethyl orthosilicate

**b. Common Name(s)**

PET-M

**c. Commercial Name**

PET-M

**d. CAS Registry Number**

882435-29-2

**e. Empirical Formula**

$(C_{10}H_{26}O_4Si_3)_n(C_{10}H_8O_4)_{42n}$



# PET-M™ Testing/Licensing

- SZU (Czech Health Ministry) permitted use of PET-M™ for food contact (since 2005)
- Extensive testing in preparation for the FDA FCN submittal
  - Migration/Surrogate Contamination studies by TNO Labs
- Recyclability Study (Petcore Protocol) by PFE
- Certification by PET-Cycle



DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Food and Drug Administration  
College Park, MD 20740

September 19, 2006

Susan Phillips, M.S.  
ENVIRON International Corporation  
4350 N. Fairfax Drive, Suite 300  
Arlington, VA 22203

Re: Food Contact Substance Notification FCN 000649

Dear Ms. Phillips:

This is in reference to your notification for the food contact substance as described as follows:

Food Contact Substance

Polyethylene terephthalate, modified with a derivative of hexamethylsilazane and tetraethyl orthosilicate

Notifier

PTP Plastic Technologies & Products B.V.

Manufacturer/Supplier

PTP Plastic Technologies & Products B.V.

Intended Use

For use as a basic resin in food-contact articles.

Limitations/Specifications

The modifier shall not exceed 5 percent by weight of the final polymer. Used in contact with all types of foods under conditions of use C through G as described at our website: <http://www.cfsan.fda.gov/~rdb/opa-fcn3.html>.

This is to inform you that as of October 3, 2006, FCN 000649 will become effective. It will be added to the list of effective notifications for food contact substances available on the agency's internet site at <http://vm.cfsan.fda.gov/~dms/opa-fcn.html>.

The agency has determined that allowing this notification to become effective will not have a significant impact on the quality of the human environment and therefore an environmental impact statement is not required. The agency's finding of no significant impact and the evidence supporting that finding, contained in an environmental assessment, will be publicly available after the effective date of the notification.

This effective notification is applicable only to polyethylene terephthalate, modified with a derivative of hexamethylsilazane and tetraethyl orthosilicate manufactured by PTP Plastic

APPROVED (FCN000649)

# PET-M™ Applications

- Pre-forms
- Thermo-forming
- Fibre
- Strapping
- Polymeric compounds for automotive industry
- Co-polymer development
- Industrial pipes and tubing



# Business Solution

- Lowest initial investment on the market
- Flexible operating model
- Equipment from the leading manufacturers
- Optimized modular capacity
- Attractive processing costs
- Competitive product (commodity)
- Sales support

# Environmental case

- Recovery of post-consumer packaging
- Processing and energy benefits
- Positive brand image
- Positive consumer perception
- Cost competitive
- Positive sales
- **1 tonne of PET bottles saves 2 tonnes of crude oil and 1.5 tonnes of CO<sub>2</sub> (emission)**

# Scope of PTP Group Services

- Complete recycling solution
- Technical support
- Business optimization advice
- Licensing & Certification
- Project funding assistance
- New polymer development
- Product promotion
- Product marketing

# Our Business Partners/Customers/Users

- **Leading European pre-form producers**
- **Retailers**
- **Bottlers**
- **Wineries**
- **Waste management companies**

# Summary

- **PTP Group has developed a new process for the recycling of post-consumer PET**
- **This innovative process includes chemical “modification” of the PET molecular structure**

PET-M™ (or a mix of PET-M™ and virgin PET in any proportion) is a polymer material that is technically and economically effective for any and all applications for which virgin PET or RPET are currently used, including and especially for food-contact packaging

- **PET-M™ is FDA-approved for food-contact applications**
- **PET-M™ is successfully used in Europe**