



PLASTIC TECHNOLOGIES, INC.

Training Catalog

Training Seminars

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Packaging Technology

The PET packaging industry growth has slowed somewhat in recent years. However, due to its excellent mechanical and barrier properties, and its established recycling infrastructure, PET remains the packaging of choice for new products and new technologies.

Filling technologies are evolving rapidly to meet the demands of filling products like beer, wine, dairy products, and pure fruit juices.

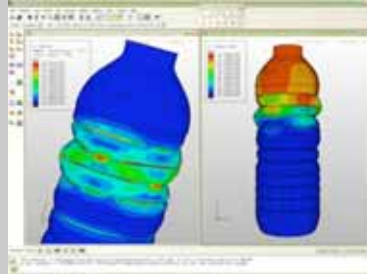
These seminars provide state-of-the-art information on PET and other packaging technologies, and offer the opportunity to discuss your specific applications and questions.

Most seminars are conducted in small groups which allow interaction and networking, and include both classroom and hands-on education. The instructors from Plastic Technologies and PTI-Europe have many years of experience in the fields of packaging, barrier, recycling, and aseptic technologies.

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**Comprehensive
Packaging
Technology**



**This series is
Constantly
updated to
reflect changing
technologies.**

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**Operator
Training
Courses**



**Classroom and
hands-on
training by
experts.**

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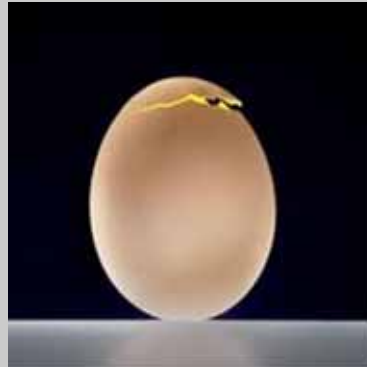
**Quality
Improvement
Instruction**



**Practical
applications of
DoE and SPC to
improve
packaging
quality.**

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17 Emerging Technologies



**Biopolymers,
Recycling, OPP,
Health and
Environment**

18 PTI Webinars,
Onsite Training



**Customized for
your needs:
Innovative and
Flexible.**

19 Course Index



**Course Numbers
and Session
Lengths**

Comprehensive Packaging Technology Courses

PET 101 Seminar – Standard PET Training 1440HA

This detailed course provides a basic foundation in polyethylene terephthalate resin, and its processes, and the packages created. This seminar starts with PET chemistry and continues through injection molding, blow molding, drying and material handling, preform and bottle design, and the unique properties of PET.

- PET Manufacturing
- PET Resin Properties
- Preform Injection Molding
- Blow Molding Processing
- Preform and Container Development

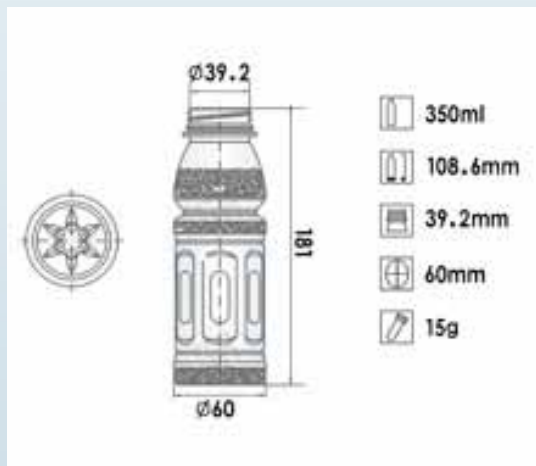


Comprehensive Packaging Technology Courses

Heatset Containers and Hotfill PET Packaging

1440HC

Heatset technology explained, how to design a heatset container to meet requirements of hotfill applications. Shrinkage, vacuum resistance, PET crystallinity and process controls.



Heat-set technology has been described as “forcing a PET bottle to do something that you shouldn’t do to a PET bottle”, namely, raising the crystallinity of the PET to the point where you risk making a container that is not clear.

The advantage conferred by heat-setting, however, is to produce a container that can be filled with very hot product without shrinking or losing its shape; conditions which would give a “normal” PET container nightmares.



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Comprehensive Packaging Technology Courses

Aseptic Packaging with PET

1440HE

Current state of Aseptic packaging process and the use of PET as packaging material. Special package requirements of Aseptic filling.



Long an established technology in European markets, aseptic packaging has had only very limited exposure in the U.S. But as markets continue to segment and the number of custom markets increases, aseptic packaging is starting to come into its own.

Using the classic examples of non-refrigerated juice and milk in aseptic packages, this course explores the technologies and economies of aseptic packaging.



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Comprehensive Packaging Technology Courses

PET Resin Production and Chemical Processing

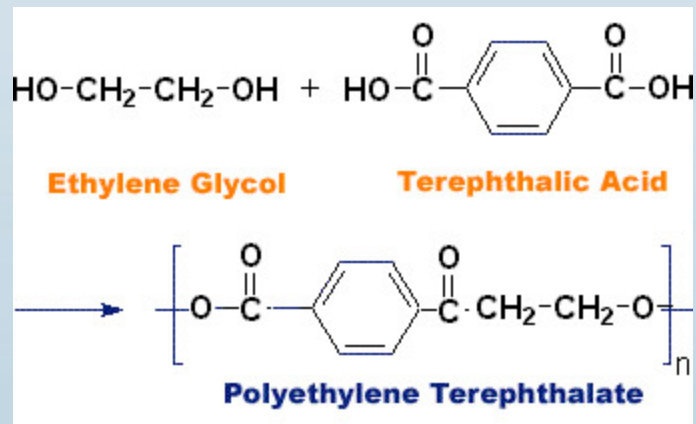
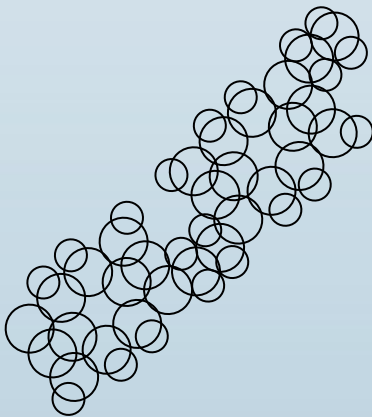
1440HG

Advanced course in PET resin chemistry and resin manufacturing. New trends and technologies.



Modern PET copolymers have greatly improved the desirable properties of PET and minimized many of the processing challenges.

It is important to understand that PET chemistry directly effects processability and characteristics like re-heat time, processing temperature, crystallization rates, barrier properties, AA generation, intrinsic viscosity, and stress crack resistance.



Comprehensive Packaging Technology Courses

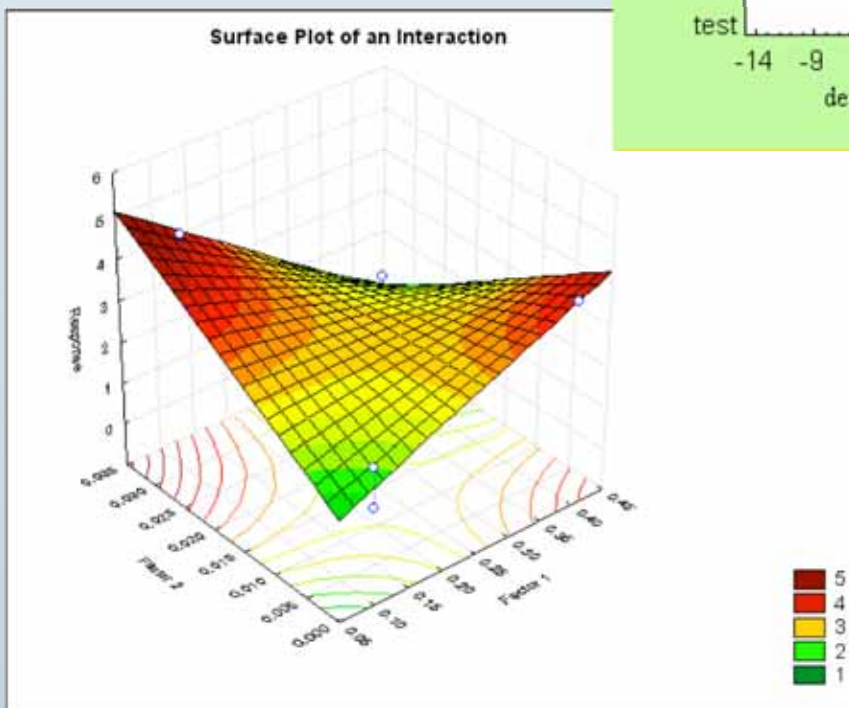
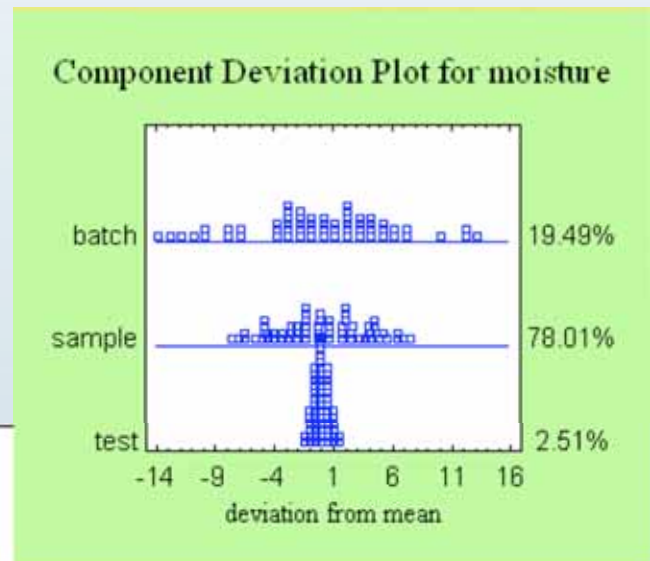
Design of Experiment (DOE)

1440HJ

Design of Experiment Specific for PET packaging and PET properties.

DOE can be a practical methodology of data-gathering and experimentation. A key principle of experimental design is *factorial experiments*, which looks at the interactions of several factors, instead of the one-factor-at-a-time method commonly employed.

Analysis of variance is a DOE foundation in which the observed variance is separated into its component factors which can then be tested.

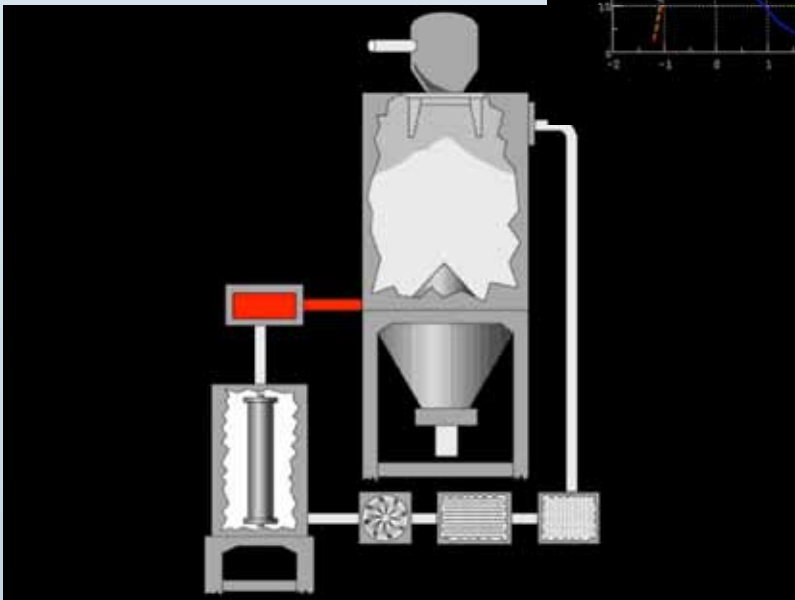
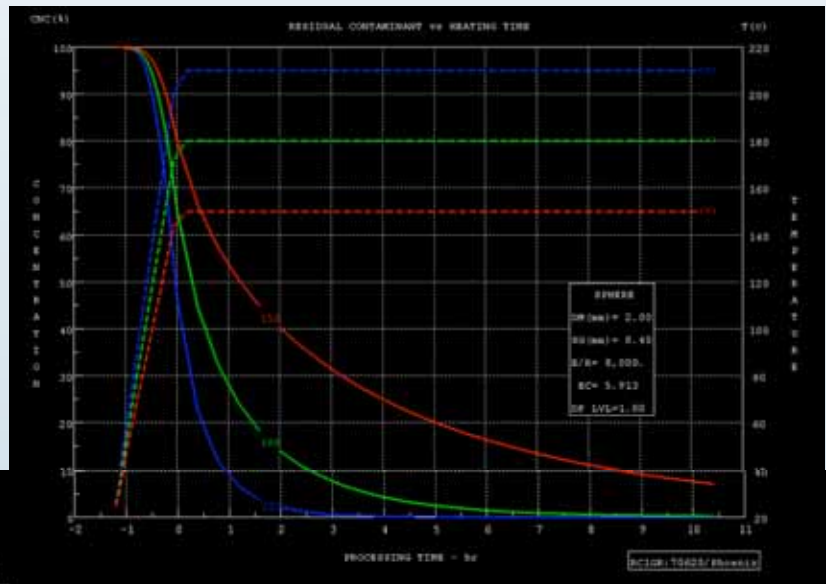


Comprehensive Packaging Technology Courses

Advanced PET Drying Seminar

1440HA

A comprehensive review of the chemistry considerations of PET Drying, technology review, cost reduction, quality improvement, and reducing IV losses in extrusion.



Hygroscopic PET must be very dry prior to melt processing in order to minimize hydrolytic degradation.

If your PET is not sufficiently dry, quality is lost which can never be regained in subsequent processing.

Comprehensive Packaging Technology Courses

PET Recycling

1440HC

Recycling is a fast-changing field of high-technology and market-driven economics. PET retains value even after the package has served its initial purpose.

PET Recycling and US Regulations

PET Recycling Organizations

Principles of Recycling

RPET Applications

Collection Systems

Sorting Technologies

Washing Technologies

Upgrading Technologies

Food Contact Regulations

Design Considerations with RPET



Comprehensive Packaging Technology Courses

Barrier Technologies for PET Packaging

1440HO

Current state of the art barrier technologies must meet extended shelf-life requirements as well as economic and recycling issues. There are numerous solutions out there – which one is best for you?



The quest for improved barrier performance continues to expand technologies. Some of the diverse methods to improve the barrier of rigid plastic packaging include internal coatings of silicon, amorphous carbon, and diamond-like carbon, external coatings of silicon, sol-gels, and other polymers, multilayer technologies utilizing polyamines, PVDC, PGA and EVOH, PET blend resins which include a nylon component., nano-composite and scavenger technologies, barrier label methods, and more.

Each technology has its limitations, drawbacks, and advantages.

Comprehensive Packaging Technology Courses

Quality Assurance and Testing

1440HR

PET has unique properties and characteristics. The best and most effective quality assurance programs will understand how these properties translate into package performance.

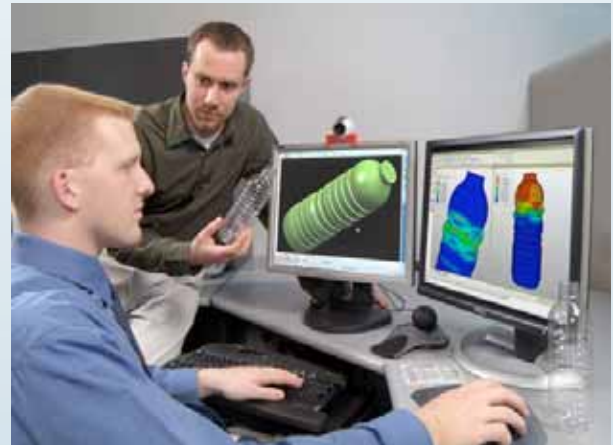


Comprehensive Packaging Technology Courses

Package Development

1440HT

How do you apply the know-how and fundamentals to design a package to meet specific customer requirements in an increasingly pragmatic and cost-conscious marketplace?



Comprehensive Packaging Technology Courses

PET for Sensitive Beverages

1440JT

The *PET for Sensitive Beverages* training seminar will give an overview of the whole question of sensitive beverages – what they are, why they are sensitive and how they can be filled.

The training outline is technical, but is designed to be presented to both technical and business / marketing personnel in order to provide a broad basis for understanding of Non-carbonated beverages definition, compatibility of the packages with sensitive beverages and associated filling technologies such as Cold Aseptic Filling.

Note: It is necessary for attendees to have a basic knowledge of resins used for packaging and ISBM packaging manufacturing conditions, as those subjects will not be covered with this seminar. Ideally, previous attendance to a PTI – *PET Training Seminar* would be considered as a good basis for this course.



Operator Training Courses

Comprehensive Operator Training

1440KA

A comprehensive review of the fundamentals of PET processing. What needs to be monitored and controlled, and why.

PET Technology Seminar

1440KC

Current state of PET technologies and processes. Emerging applications. Resin formulations and enhanced properties.

Blow Molding Operator Training

1440KE

No longer a “black art”, blow molding is predictable, the process is controllable, and the operator needs to be trained and educated to operate today’s state-of-the-art machines.

Injection Molding Operator Training

1440KG

Attendees will learn detailed process kinetics and spend time operating injection machines to practice the classroom revelations.

Heat Set Operator Training

1440KK

The heat set process involves the precise control of PET crystallinity, in addition to all the usual blow molding parameters for package performance. Attendees will learn how to control these parameters, and more importantly, they will learn why.

Quality Improvement

Environmental Stress Cracking

1440MA

Improving PET package quality. Stress cracking is still a common failure mode of PET packaging, and yet there are few places where you can learn the detailed causes and effects of stress cracks in your PET package. Test the ESCR of the PET package, and learn how to avoid stress crack problems.

PET Technology Seminar

1440MC

Current state of PET technologies and processes. Emerging applications. Resin formulations and enhanced properties.

Practical SPC – Quantify the Benefits

1440ME

Statistical Process Control, applied to your critical process variables, can prevent downtime, reduce product defects, and save money. A critical few PET parameters will tell you the health of your process and products.

Emerging Technologies

OPP Containers

1440PA

Oriented polypropylene blow molded containers have excellent hot-fill properties. In addition, PP has traditionally sold for 20% less than PET. But challenges with long cycle times and slow production rates, as well as a tight process window, mean that OPP may not be right for everybody. This course goes into detail of OPP design and process.

BioPolymers for Packaging

1440PB

The quest for sustainability has many markets looking at biopolymers as possible alternatives to traditional plastics like HDPE and PET. This course explains biopolymer chemistry, the properties and characteristics of the most common biopolymers, and what role biopolymers will play in the future.

Xeno-Estrogens and Plastic Packaging

1440PC

Environmental and health issues with plastic packaging. The current concern around phthalates, BPA, and estrogen mimics. We separate urban myth from chemistry facts.

Food-Grade Recycling and the FDA

1440PE

The USFDA has a comprehensive set of directives, guidelines, and recommendations related to the use of recycled plastic in food-contact applications. The process of getting your recycling process approved for food-contact use can be very frustrating and expensive. This course sets out the steps one must take before applying to the FDA for approval.

Acetaldehyde and Health Issues

1440PG

Acetaldehyde exposure in the workplace – Do you know the regulations and exposure limits? Do you know how to test for AA in air? Is acetaldehyde hazardous? Learn the facts in this detailed course which looks at the results from real-world acetaldehyde monitoring by industrial hygienists.

PTI Webinars & On-Site Training

PET Recycling	1440WA
Reheat Stretch Blow Molding 101	1440WC
PET Resin Chemistry	1440WE
BioPolymers and their Role in Packaging	1440LA
The PTI Story and History	1440LC
On-Site Training	1440OST

Customized training targets your specific needs. PTI experts will design a course or series of courses to assist you in your market segment, for your machinery, your package, and your processes.

W – Webex Webinar

L – Lecture

Visit www.plastictechnologies.com to see current schedules

PET 101	3 days	1440HA	C,H,O
Heatset Containers and Hotfill PET Packaging	2 days	1440HC	C,H
Aseptic Packaging with PET	1 day	1440HE	C
PET Resin Production & Chemical Processing	2 days	1440HG	C
Application of Design of Experiment (DOE)	3 days	1440HJ	C,H
Advanced PET Drying Seminar	2 days	1440HK	C
PET Recycling	1 day	1440HK	C,H
Barrier Technologies for PET Packaging	2 days	1440HO	C
Quality Assurance and Testing	2 days	1440HR	C
Package Development	2 days	1440HT	C,H
Comprehensive Operator Training	3 days	1440KA	C,H
PET Technology Seminar	2 days	1440KC	C,H
Blow Molding Operator Training	2 days	1440KE	C,H
Injection Molding Operator Training	2 days	1440HG	C,H
Heat Set Operator Training	2 days	1440KK	C
Environmental Stress Cracking	1 day	1440MA	C
PET Technology Seminar	2 days	1440MC	C,H
Practical SPC – Quantifying the Benefits	1 day	1440ME	C
OPP Containers	1 day	1440PA	C, H
Biopolymers for Packaging	1 day	1440PB	C
Xeno-Estrogens and Plastic Packaging	1 day	1440PC	C
Food-Grade Recycling and the FDA	1 day	1440PE	C
Acetaldehyde and Health Issues	1 day	1440PG	C, H
PET for Sensitive Beverages	1 day	1440JT	C
PET Recycling Webinar	1 hr	1440WA	W
Reheat Stretch Blow Molding 101	4 hrs	1440WC	W
PET Resin Chemistry	4 hrs	1440WE	W
BioPolymers and their Role in Packaging	2 hrs	1440LA	L
The PTI Story and History	2 hrs	1440LC	L
Custom On-Site Training	-varies-	1440OST	

C = Classroom

C,H = Classroom with Hands-on Labs

O-Online Training

W = Webinar

L = Lecture

Contact



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