Mission Statement

The Polymers Center of Excellence (PCE) is dedicated to providing timely technical assistance to the polymers processing industry, as well as technical education for the industry’s current and future work force. PCE will strive to assist in the development of emerging technologies, and facilitate economic development while preserving the environment.
ISO Quality Statement

The Polymers Center of Excellence (PCE) is committed to meeting or exceeding our customers' requirements in the areas of polymers processing, physical testing, educational products, and consulting. This is in addition to the ongoing evaluation for the continual improvement in the effectiveness of the PCE quality management system.

We have been certified ISO 9001:2000 by BSI, since 2002
Dennis L. Hayford, Executive Director

BS Mechanical Engineering, Auburn University, with 35 years in the industry, mostly in resin sales.

Board of Directors member for PEP and PCE since 1994, and became Executive Director in 2001.
1. 1994, NC Legislature allocates funds for the creation of a Polymers Extension Program (PEP) as part of NC State University-Industrial Extension Service. (NCSU-IES)

2. 1995, PEP established on campus of UNC-Charlotte, because of its central location.

3. 1999, cramped campus quarters cause the creation of the Polymers Center of Excellence {501(c)6} and the Polymers Foundation {501(c)3} at an off campus facility.

5. off campus facility.
HISTORY

4. 1999, PEP contracts PCE to do the extension work.

5. 2001, Culture change begins! From university to industry, purchase of equipment and self sufficiency.


7. 2006, PCE purchases it’s building and ~20 acres.

8. Renovations begin and continue.

9. 2007, purchase of new extrusion equipment.
TRAINING MANAGER-Joe Henz

MS Degree, Chemical Engineering, University of Louisville, with 20 years in the industry most recently with GE’s part and mold design, and flow analysis.
Training Courses

On PCE’s Campus or at Plant locations.

Injection Molding, Instructor Joe Henz

101-Basics
Training Courses

On PCE’s Campus or at Plant locations.
Injection Molding, Instructor Joe Henz
101-Basics
102-Operator level
Training Courses

On PCE’s Campus or at Plant locations.
Injection Molding, Instructor Joe Henz
101-Basics
102-Operator level
Extrusion, Instructor Dan McWilliams
101- Basics
Training Courses

On PCE’s Campus or at Plant locations.
Injection Molding, Instructor Joe Henz
101- Basics
102- Operator level
Extrusion, Instructor Dan McWilliams
101- Basics
102- Operator level
Training Courses

Design of Plastic Parts, Joe Henz
Part Design Course

- Examples of gussets:
  - Gusset design guidelines
  - Gusset with thinning added for bending and stability

- Too thin a boss:

- A boss needs a tough life!

- Boss design considerations:
  - Thicker bosses for higher loads
  - Thinner bosses for lower loads

- A boss that is too thin:

- Ways to contact boss to sidewall:

- Right way to contact boss to sidewall:

- But even good bosses form weld lines!
  - (More about this later...)
Training Courses

Design of Plastic Parts, Joe Henz

Choosing the Right Plastic,

Joe Henz/Dan Fuccella

In-plant courses tailored to suit customer needs,

Joe Henz/Dan Fuccella/Scott Bogue/Dan McWilliams/Others
Product Development, Dan Fuccella

BS Mechanical Engineer from Ohio Northern University, with 40 years in the industry, Dow, Thermofil, Applied Technologies, and at PCE as our Product Development Manager.

Registered Professional Engineer
Nanodynamics Golf Ball

- Modified 432 dimples increase lift and distance
- High strength "Proprietary Metallic Core" provides structural base enabling high moment of inertia
- High performance polymer layer maximizes energy transfer between club face and steel core
- Tough ionomer cover for durable performance
Tennessee Mat industrial floor mats
Vacuum Formed Food Tray
FEA Analysis of Food Tray Rim Alternatives

Film Force is on inner edge
Non linear Geom is set to 0

STEP=1
SIN = 7
TIME=10
USUN
TOP
RPO=0
DRX = 1.29537
EXP=19.999
GEO = 1.29537

\variant1_FEA_010_Mesh

Film Force is on inner edge
Non linear Geom is set to 0

STEP=1
SIN = 7
TIME=10
USUN
TOP
RPO=0
DRX = 1.29537
EXP=19.999
GEO = 0.001987
GEO = 1.29537

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MS Degree in Chemical Engineering, from Cornell University, 40 years with Dow and Carolina Compounding, joined PCE in 2005 as Materials Science Manager.

Constant upgrading of services:

Centralized server just for lab test data

In the plan is ISO 17025 certification, constant temperature and humidity room for some tests.
Perkin Elmer Pyris 1 DSC
30. Ceast VICAT Softening/HDT
Goettfert
Melt Indexer
Other Laboratory Equipment:

- Moisture analyzer
- IZOD & Falling Dart Impact
- Melt Flow & Capillary Rheometry
- QUV (fluorescent light & moisture)
- Tensile & 3 Point Flex
- Heat aging
- Hardness (Shore)
Operations Manager
Tom McHouell

- Processing Team
- Facilities
- Extrusion
- Injection Molding
Thomas P. McHouell, Operations Manager

BS Electrical Engineering, NC State University. 14 years in the industry, with Collins & Aikman R & D, joined PCE in 1999
### Processing Team

**Brandon Burnette**, Team Leader, BS Physics, UNC Charlotte, 6 years experience.

**Shawn Hux**, 20 years experience

**Steve Burnette**, 5 years experience

**Dexter McCallum**, 2 years experience

**Derek Stiller**, 2 years experience

**Barrett Smith**, UNC Charlotte Student
Engel 165 Ton All Electric Injection Molding Machine
1” Single Screw Extruder
40. 1 ½” Single Screw Extruder
1 ½” Extruder Screw Inventory

General Purpose Screw

Barrier Screw

Two Stage Barrier Mixing Screw
21 mm Screw Elements

Kneading

Conveying

Gear Mixing

Elements (21 mm)
21 mm Extruder Inside Action
45 mm Twin Screw Extruder
45 mm Screw Elements
Conveying Elements (45 mm)
Kneading Elements (45mm)
Gear Mixing Elements (45 mm)
51. Gala Pelletizer
52. Gala Cutter & Die Face
Just Arrived!
Rieter Sphero 70 Underwater Pelletizer
Sphero 70 Die Face
Sphero 70 Cutter
Now, on the floor at PCE
What can we do for you?