



Building Biofuels Infrastructure
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Petroleum Equipment Institute



Fueling Station & Dispensing Equipment

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E-85

A Discussion on Materials Compatibility

What is PEI?

Who Cares About E-85 Compatibility?

- State underground tank regulators
- Fire service
- Underwriters Laboratories
- Tank owners
- Ethanol producers
- Equipment sellers
- Equipment installers
- Equipment manufacturers
- Anyone around E-85

What Kind of Equipment Is Involved?

- Tanks
- Tank linings
- Product piping
- Vapor recovery piping
- Filters
- Submerged turbine pumps
- Fittings
- Meters
- Dispensers
- Hoses

What Kind of Equipment Is Involved?

- Nozzles
- Swivels
- Breakaways
- Automatic tank gauges/probes
- Sensors
- Adhesives
- Water finding paste
- Air eliminators
- Line leak detectors
- Spill buckets

Issues with E-85

- Solvency
- Metal Corrosion
- Permeation
- Operational problems: Affinity for Water
 - Phase separation

Solvency

Metal Corrosion

Metal Compatibility in E-85

Recommended	Not Recommended
Bronze	Brass
Black iron	Lead
Mild steel	Lead solder
Stainless steel	Magnesium
Unplated steel	Lead-tin alloy (tin-plated steel)
Nickel-plated aluminum or brass	Zinc
	Aluminum

Permeation Through Non-Metals

Elastomer Compatibility Issues in E-85 Fuels

Recommended	Not Recommended
Acrylonitrile	Natural rubber
Nitrile rubbers	Cork gasket material
Polychloroprene	Leather
Polytetrafluoroethylene	
Fluorocarbon	

Polymer Compatibility for E-85 Fuels

Recommended	Not Recommended
Polyamide	Alcohol-based pipe dope
Polyethylene	Methyl-methacrylate
Polypropylene	Polyamide
Polyester bonded fiberglass laminates	Polyurethane
	Polyvinyl chloride

Affinity for Water

Special Issues

- Equipment already in place
- Lined tanks
- New Equipment
 - Underwriters Laboratories
 - <http://resource.pei.org/altfuels/>
- Brazil's experience
- Regulators

Converting to E-85

- Assess all equipment for E-85 compatibility
- Consult with UST and fire code regulators
- Remove water and sediment
- Test system for tightness (0.1 gallons/hour)
- Color code fill manhole cover
- Label dispenser
- Check dispenser calibration
- Daily walk-by inspection
- Document