Deep Draw Tooling Technology
In-Plant Training Agenda (Sample)

Full Day Training
Designed for Engineers, Die Makers, Die Repair, Die Tryout Personnel and Apprentices

Morning Session (3-1/2 hours)
Introduction(s)

Drawing Cylindrical Cups
• Draw Die Nomenclature
• Design Principles
• Limiting Drawing Ratios
• Blank Size Calculations
• Draw Reduction Ratios
• Punch Nose and Die Entry Radii
• Constancy of Volume
• Blankholder Pressure

Redrawing Cylindrical Cups
• Redrawing Ratios
• Beveled Draw Edges
• Internal Pressure Rings
• Redrawing without Internal Pressure
• Special Cases: Elliptical, Flat Side and Conical Cups
• Wall Ironing

Effects of Material Type, Temper and Alloys
• Mild Steel and High Strength Steel
• Aluminum Alloys
• Stainless Steel Alloys

PMA in-plant training programs are fully customizable. Subjects in this agenda can be removed, replaced or additional topics added from other PMA in-plant training programs.
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**Afternoon Session (3- hours)**

**Drawing and Redrawing Rectangular Boxes**
- Design Principles
- Drawing and Redrawing Ratios
- Application of the Formability Curve
- Developing the Box Corner Size for Redrawing
- Developing the Punch Nose Radii for Redrawing
- Application of Draw Beads
- Corner Flange Spotting

**Drawing Irregular Shapes**
- Addendum Development
- Addendum Features
- Blankholder Development
- Draw Bead Layout
- Optimizing Material Flow & Blank Shape

**Effects of Material Type, Temper and Alloys**
- Important Sheet Metal Properties for Deep Drawing
- Mild Steel and High Strength Steel
- Aluminum Alloys
- Stainless Steel Alloys

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