



# Differential Pressure Molding (DPM)



A New, Patented Process from  
Vantage Technologies  
4645 Bree Road  
China Township, MI 48054  
248.709.2090

**Vantage Technologies**



# Background

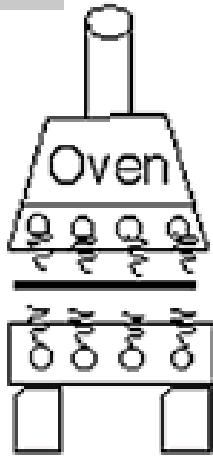
- Developed and patented in the late '90s
- Low cost production of auto interiors
- Invented for use at new locations in emerging markets
- Based on compression molding
- Started Vantage Tech in 2000
- Produced more than 75 molds with parts.
- 36 Production parts.
- Licensed 7 companies to produce parts.
- One company with exclusive rights in the automotive interior market.

# DPM Process

- Low-pressure compression molding process
- Force is applied over the total tooling surface
- Thermoplastic & thermoset substrate materials
- In-mold bonding of cover materials
- Reduced energy consumption
- Ideal for smaller volumes
- Excellent process for emerging markets and remote site manufacturing

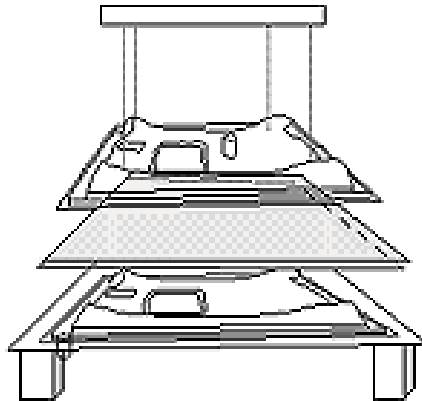
# DPM Process

## STEP 1



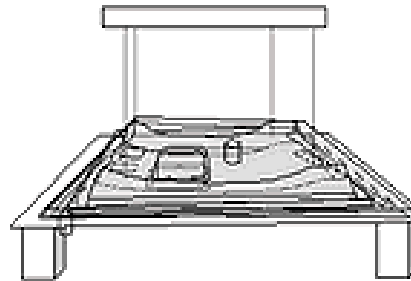
Heat Material or Heat Mold

## STEP 2



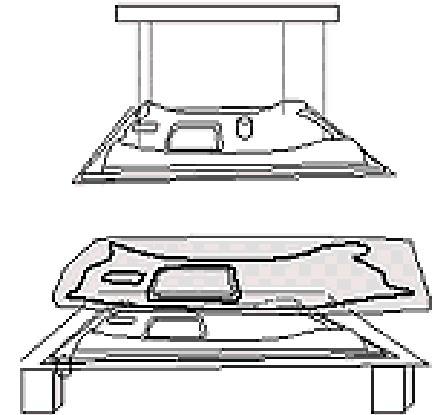
Load Material into Mold

## STEP 3



Close Mold and  
Apply Differential Pressure

## STEP 4

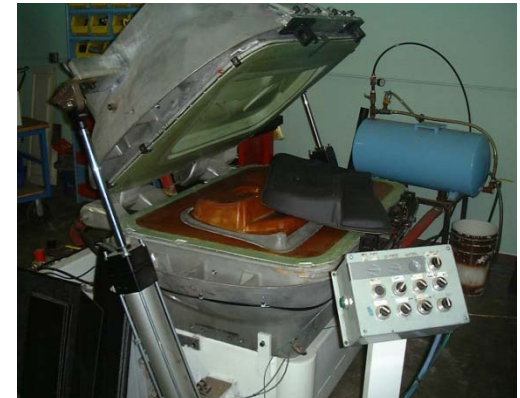


Remove Part

Vantage Technologies

# Molding Equipment

- The press is a simple clamp or lifting device
- Standard wall plug, 110 volt 20 amp
- No special site preparation
- Vacuum, air, or water pressure is used to generate the force needed to form the parts



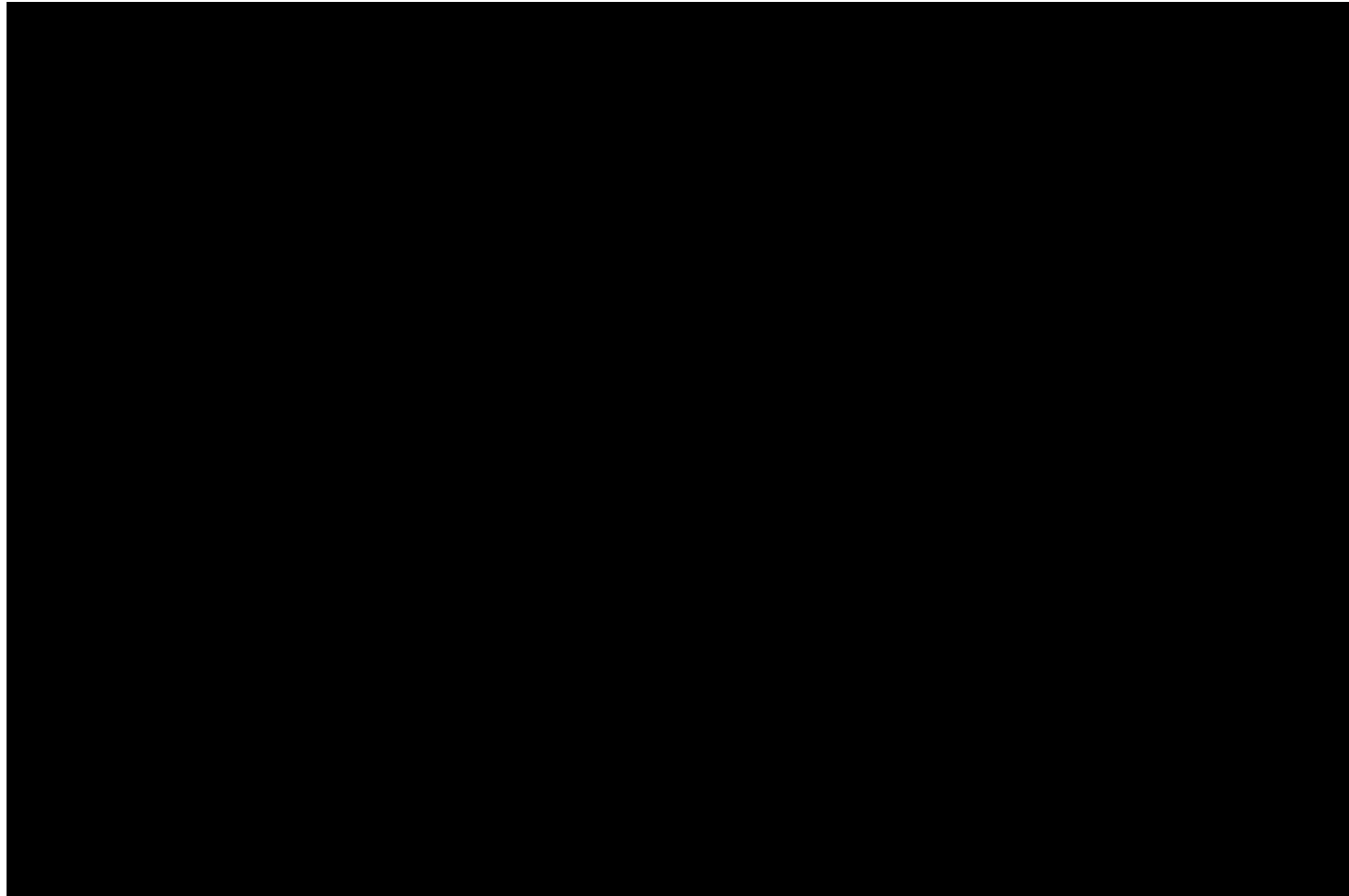
Vantage Technologies

# Tooling Innovations

- Molds are thin shells made of proprietary composite materials
- Thin shells transfer heat quickly and eliminate the need for cast-in water lines
- Tool reinforcements are eliminated because molding force is applied over the entire surface
- No forklift to change molds – they typically weigh less than 50 pounds/23 kilograms
- No special storage – tools can be kept on their side in the work cell area

- 
- 
- 

# Dual-Pivot DPM Molding Cell



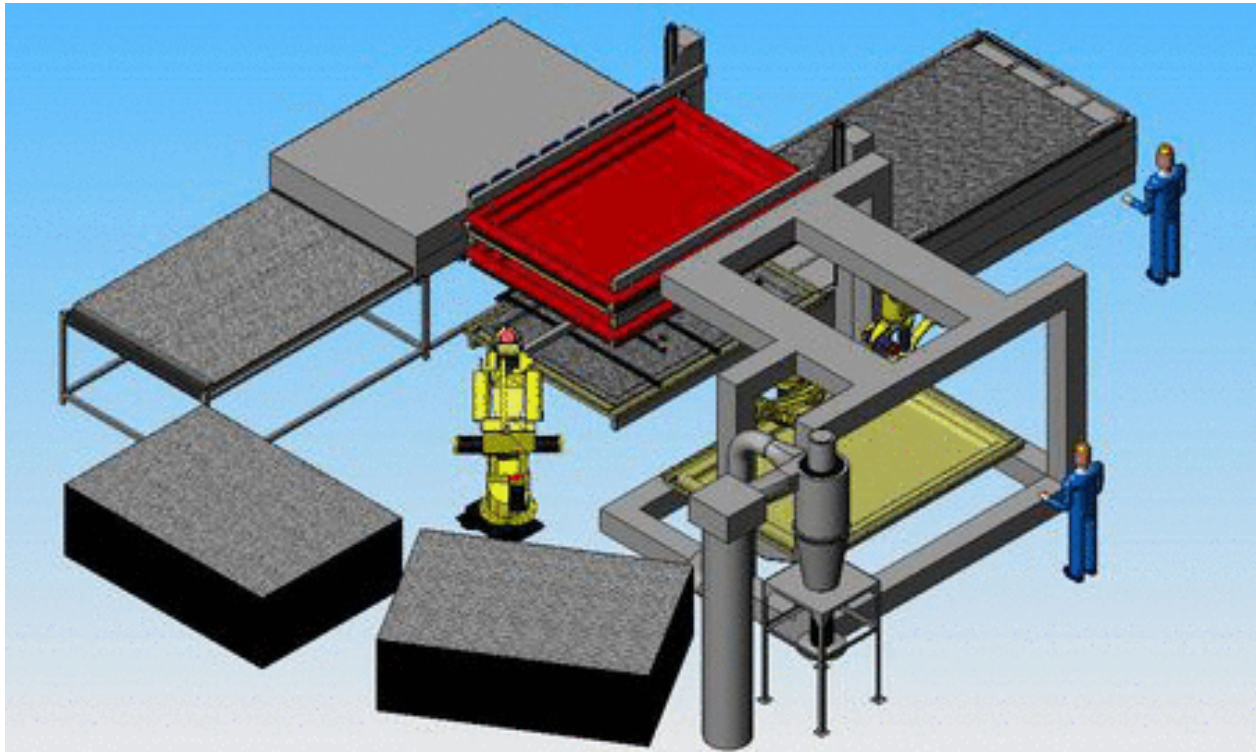
Vantage Technologies

# Typical DPM Process Savings

- 50 to 75% Mold Cost Reduction
- 1/2 the Tooling Time
- 2 to 4 times the Output per Square Foot
- No hydraulic press
- Simple & Rapid Tool Changes
- 5 to 10% Material Reduction



# Future Work Cell with Automatic Trimming



Vantage Technologies

# Potential & Commercial DPM Applications

- **Automotive**
  - Molded Interior Trim
  - HVAC Components and Ducts
  - Structural and Semi-structural Panels
  - Flooring
  - Storage Systems
- **Industrial and Commercial**
  - Packaging Systems
  - Architectural Products
  - Ceiling Tiles
  - Wall Systems
  - Wind Turbines
- **Consumer Products**
  - Organizational and Storage Products
  - Appliance Panels and Parts
  - Automotive Aftermarket Products
  - ATV/ Golf Cart/ Personal Transportation
  - Luggage and Cases
  - Lighting Fixtures
  - Contract and Residential Furniture Products



Vantage Technologies

# Summary of Advantages

- Compression molding at vacuum forming costs
- Processes both thermoplastic and thermoset
- Low cost, rapid tool fabrication
- Reduces equipment investment
- Reduces facility and energy requirements
- “New” process with 10 years of experience