

ART-TO-PART



polySMART

Perfection *in* Plastics

# Company Background

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- Backed by a well established industrial product designer and manufacturer of plastic components having over 50 years of domain experience in metal and import substitution with engineering plastics in the Automotive, White Goods, Water Treatment, Fluid Engineering, Process and Electrical/Electronic industries and having CRISIL SE 1A rating indicating excellent financial status.
- Processes followed for responding to RFQ, Time estimation, project planning and report submission
- Client appreciations for professionalism and cost optimization
- Offices in Mumbai and Pune with representatives in USA

# Our Mission

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## “Mission is Perfection”

‘Perfection may never be attainable but in chasing Perfection we will achieve Excellence.’

Our goal is to be recognized as a world leader in **Plastics Engineering Services**, by leveraging over 50 years of trusted domain **Competencies**, and creating a compelling competitive advantage for our customers by offering outstanding value in terms of **Quality, Cost, Delivery and Services**.

# Our Strengths

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- Customized and dedicated project management teams.
- World class in-house product design and development infrastructure.
- Proven, new product development process using Design for Six Sigma methodology.
- Well established processes for product design, tool design, tool manufacturing and plastics part production.
- In-house “Concept-to-commerce” facilities which include Injection molding, Composite Molding , Plastic Fabrication, Tool Room and Component Testing.

# Our Achievement

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## Moldflow Silver Certification

- Polysmart is an authorized and certified Moldflow Consulting Partner. We have achieved Silver Certification, which is the highest certification level held by any consulting partner.
- This certification is in addition to the many years of analysis and various consulting projects completed by Polysmart.
- This endorsement by Moldflow Corporation is your assurance that Polysmart 's analysts have completed a rigorous training and testing program. Authorized consultants are proficient in the latest versions of Moldflow software.
- As part of this program, Moldflow Corporation enforce strict standards for the quality of services offered.
- Analysis is only as good as the analyst. Silver Certification is the measure of our skills and the accuracy of your results.

# Services Offered

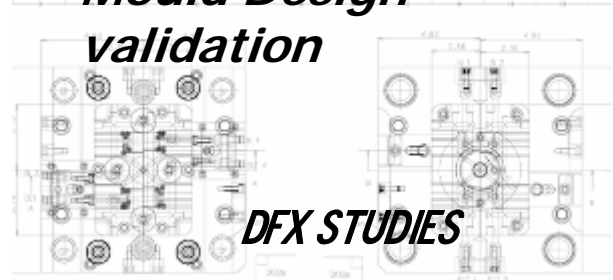
**Concept Design**  
**Product Detailing**  
 Design Optimization  
 Product Re-Engineering  
**Metal To Plastic Conversion**  
 Design For Manufacturing

**Moldflow Services**  
 MPI Midplane, Fusion, 3D  
 MPI Flow, Cool, Warp  
 MPI Stress, Fibre, Gas assisted  
 MPI overmolding, Co- Injection  
 Valve Gate Optimization  
 Tool Design & Moldflow Simulation  
 Validation

**Analysis**  
 Hyper Mesh Services  
 Radioss Structural Analysis

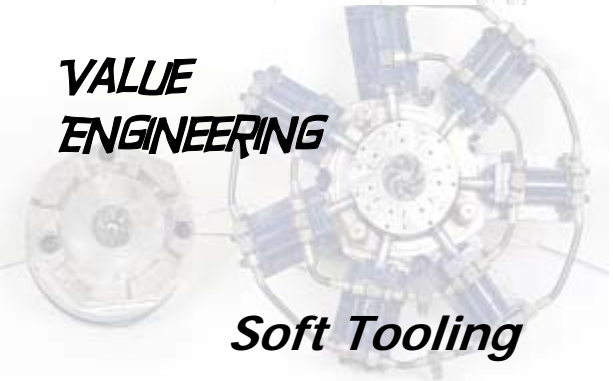
**Mould Design**

**Mould Design  
 validation**



**DFX STUDIES**

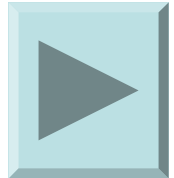
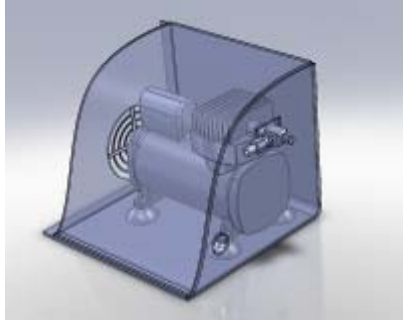
**VALUE  
 ENGINEERING**



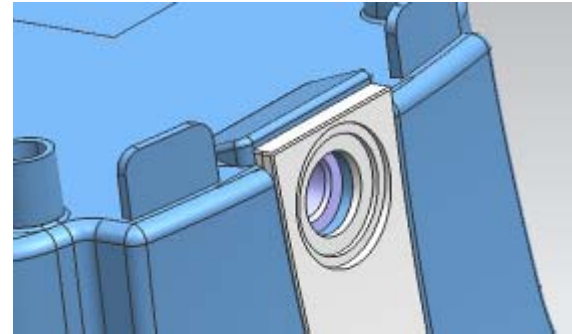
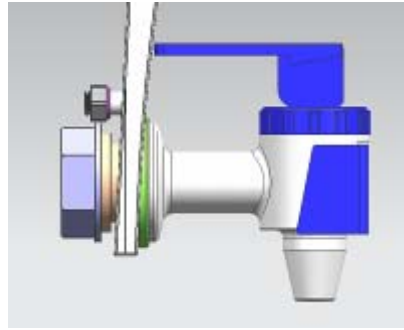
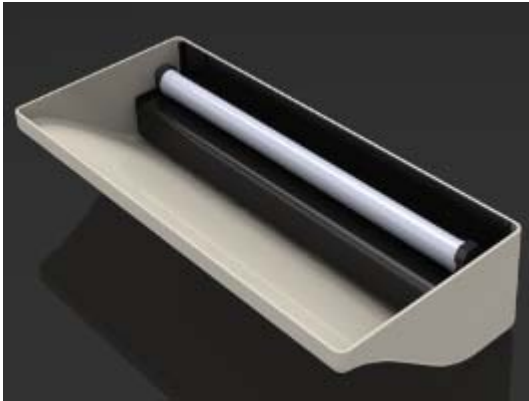
**Soft Tooling**



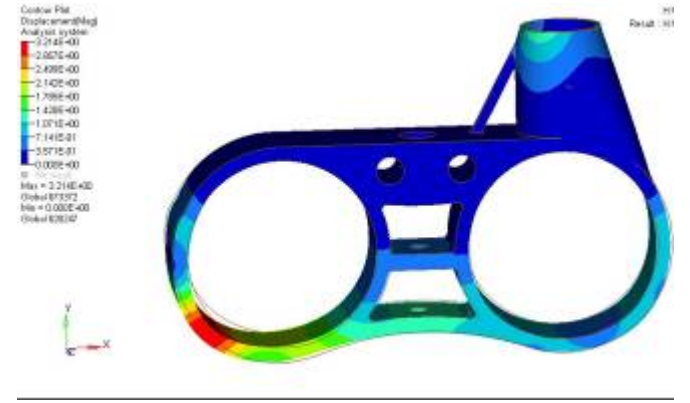
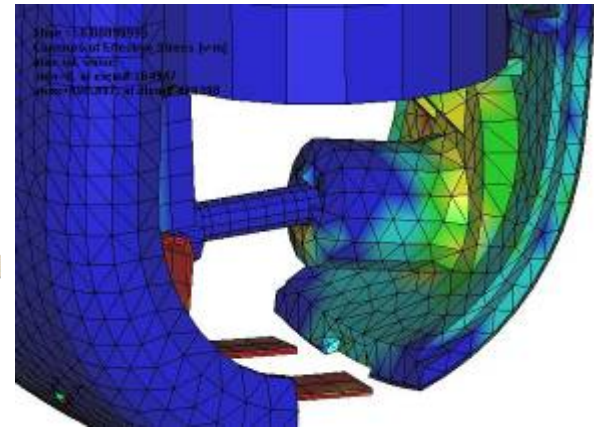
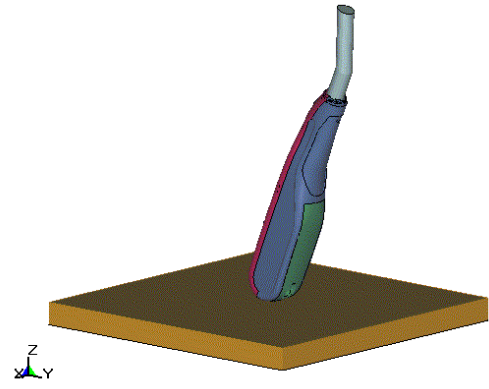
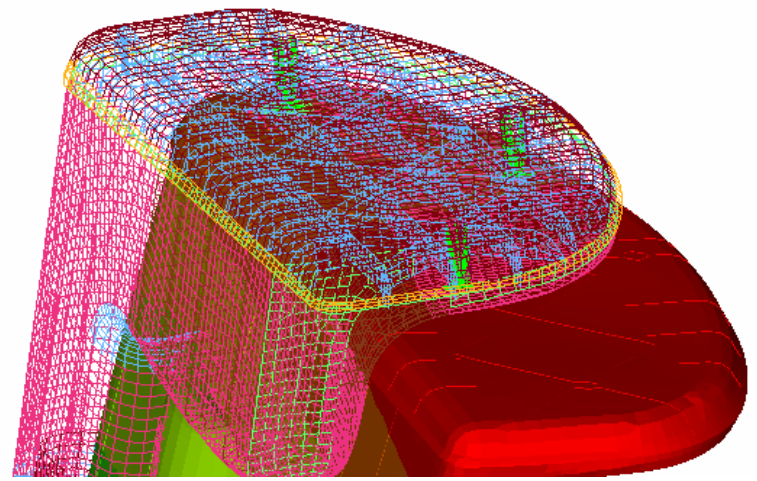
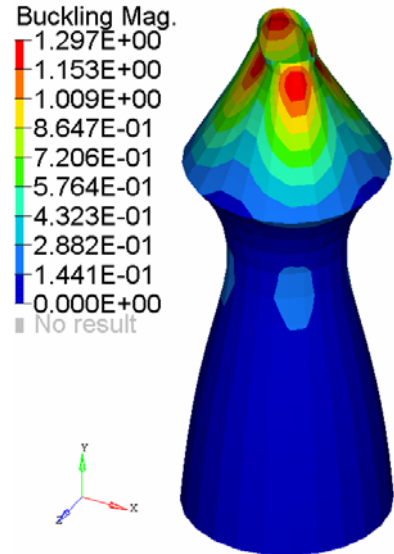
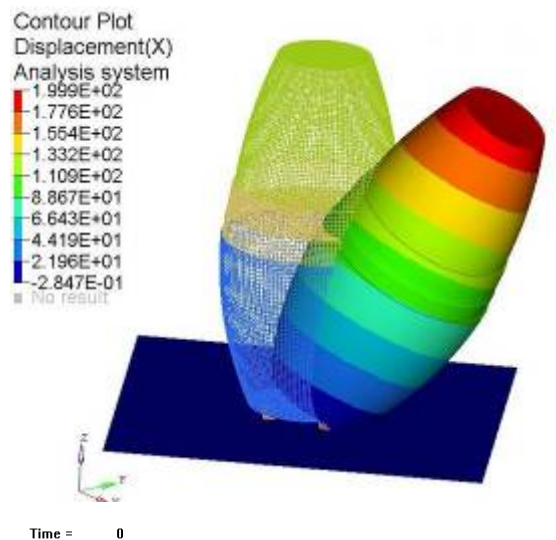
# Concept Design Projects



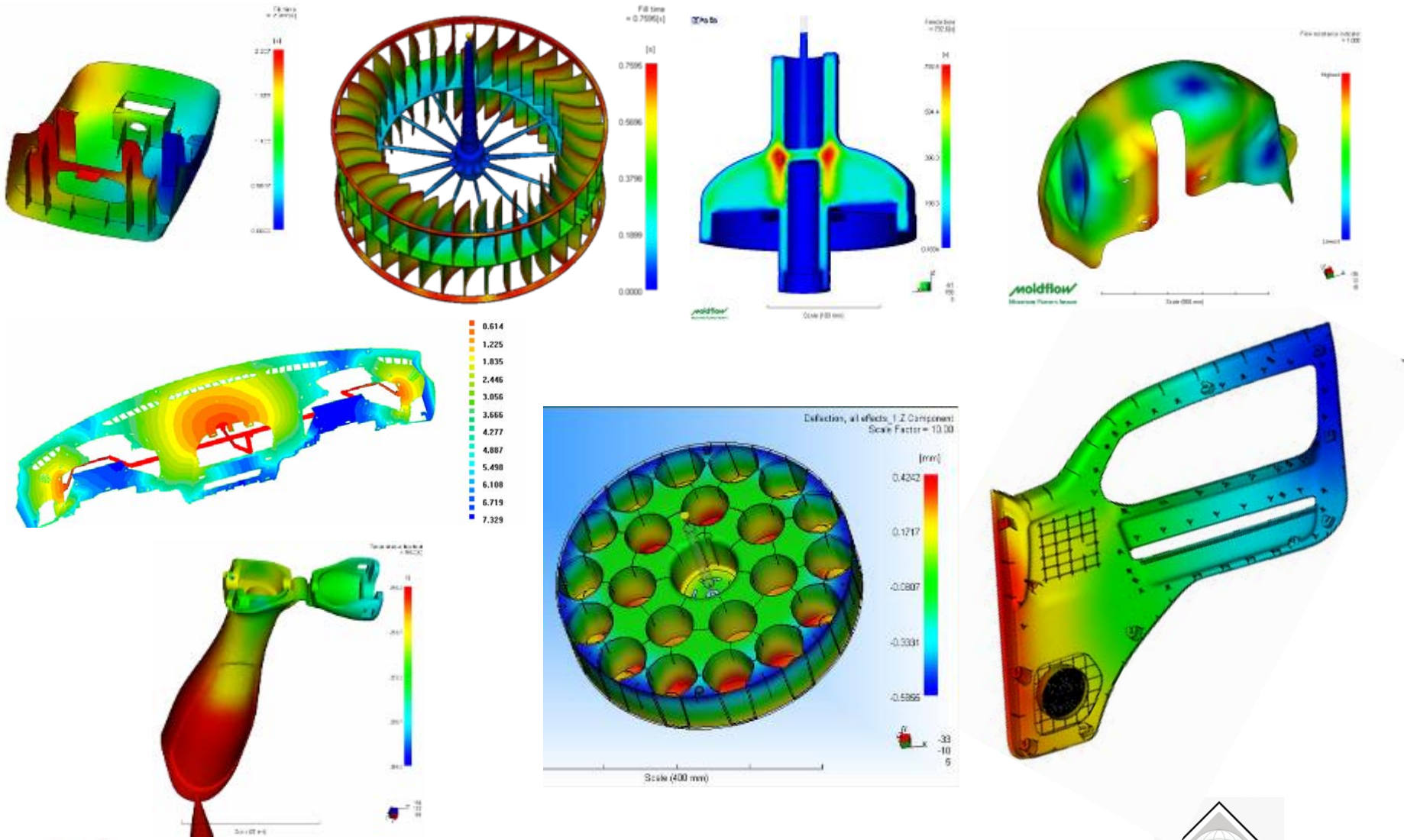
# Product Detailing Projects



# FEA Projects



# Moldflow Projects



# Holistic Design (DFM/DFA)

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Holistic Design for Plastics is optimized by following Design for Moldability (DFM), Design for Assembly (DFA) and Quality Assurance principles

## **Service requirements (15%)**

- Application demands and service requirements thoroughly understood

## **Part and Tool Design (30%)**

- Optimized with the right development methodology and technology

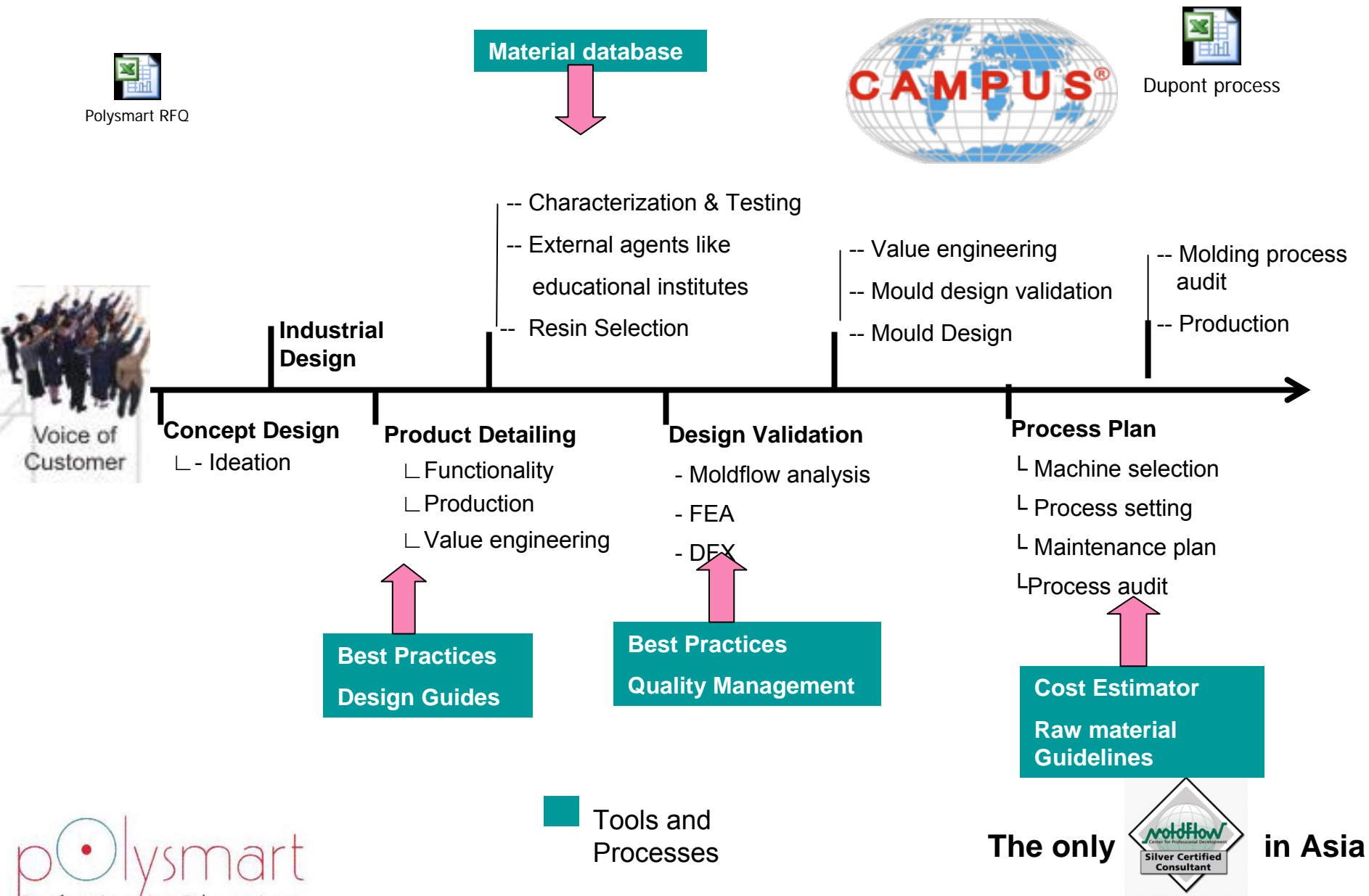
## **Material (40%)**

- Selected to meet Quality, Cost, Delivery and Service requirements

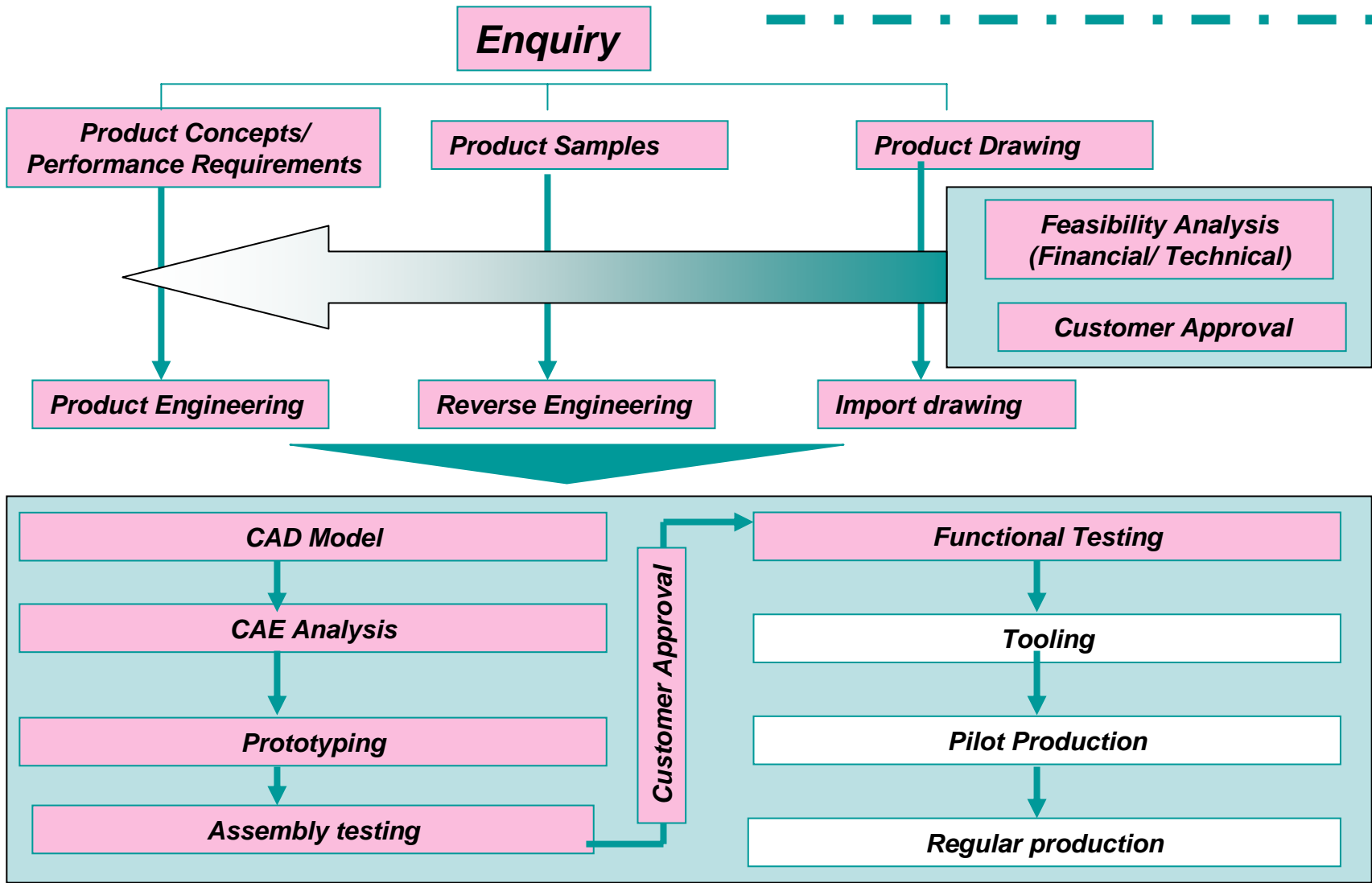
## **Process (For Part, Prototype and Tool Production) (15%)**

- Process variation with respect to optimized input parameters are controlled for desired results.
- TS 16949 principles adhered during product/ tool development.
- DOE conducted on shop floor for final tool validation
- SPC and Six Sigma principles are strictly followed during production for consistent results.

# Process Followed & Best Practices

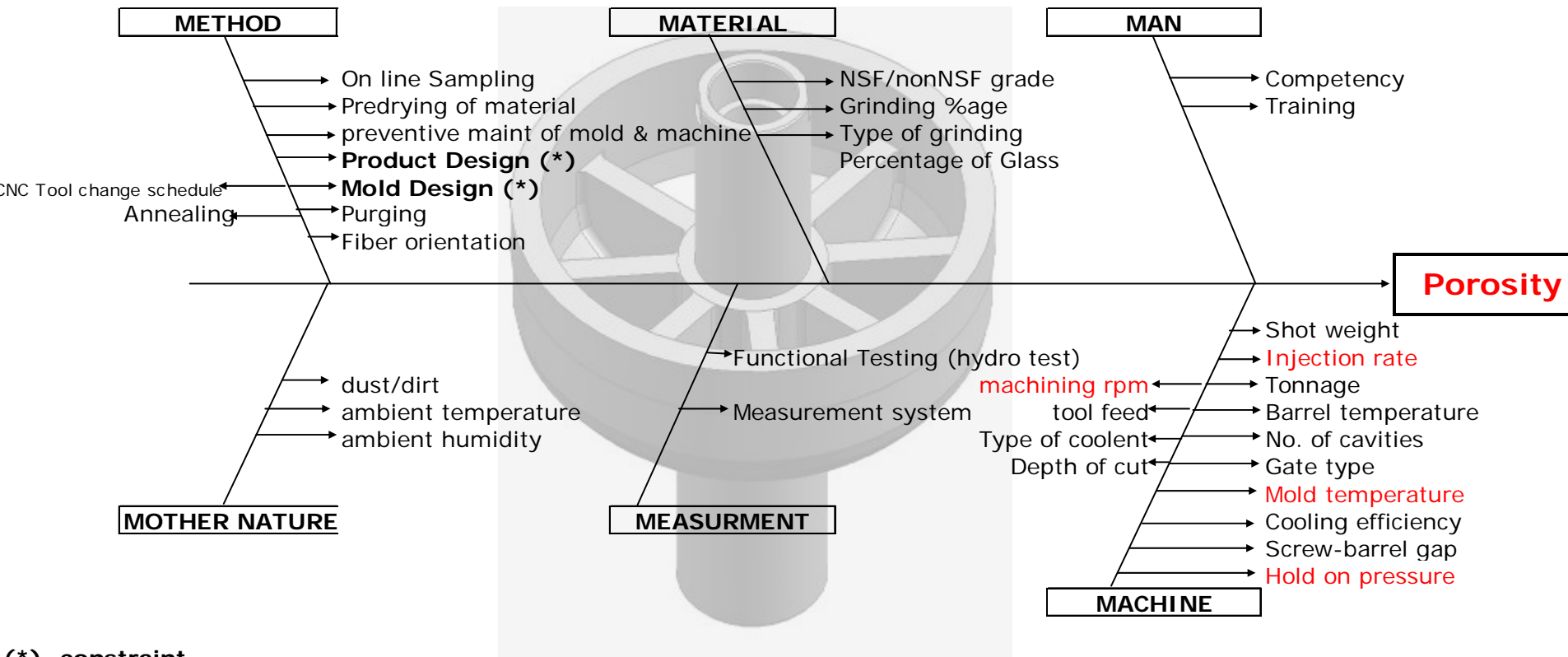


# Our Process



Project Management and Quality Systems

# Process Followed & Best Practices



(\*)- constraint  
 Variables in red above are significantly affecting porosity

## Cause And Effect Diagram For Porosity

# Process Followed & Best Practices

## Six Sigma DMAIC – Improve (Solutions Statement)

M's	Root Cause as per Cause & Effect diagram	Control Measures
Machine	Glass Fibre Breaking	Set as per optimized results from Moldflow simulation and DOE
	Injection Rate	Set as per optimized results from Moldflow simulation and DOE
	High Injection Pressure	Set as per optimized results from Moldflow simulation and DOE
	Barrel Temperature	Barrell temperature set as per SABIC processing guide lines
	Machine Variation	Machines are maintained as per the m/c manufactures specification for preventive maintenance.
	Gate Type	Mold running with optimized feed system as per Moldflow simulation guidelines
	Mold Temperature	Set as per optimized results from Moldflow simulation & FEA
	Cooling Efficiency	Measured and controlled as per Moldflow simulation guidelines
	Thermal Shock	Set as per optimized results from Moldflow simulation & FEA
	Hold on Pressure	Set as per optimized results from Moldflow simulation and DOE
	Machining RPM	Process set at optimized result based on guidelines from SANDVIK and HAAS
	Tool Feed	Process set at optimized tool feed rate based on guidelines from SANDVIK and HAAS
	Type of Coolant	Established coolant of ITW - W40 grade as per guidelines from HAAS
	Depth of cut	Process set at optimized depth of cut based on guidelines from SANDVIK and HAAS
Material	NSF/nonNSF grade	GFN 3 - 701S - as per specifications from Pentair
	Grinding %age	15% - as per specifications from Pentair
	Type of grinding	Grinding specifications set as per recommended guidelines from SABIC
	Supply of off grade material	GFN 3 - 701S - as per specifications from Pentair
	Percentage of Glass	30% - as per specifications from Pentair

# New Product Development (NPD) Process



Voice of Customer



# What we can Offer to our Clients

- **Moldflow Studies**

- Design for manufacturing (DFM)

- Confidence of fill
    - Molding window analysis
    - Multi cavity/ multi component molding
    - Overmolding
    - Cold runner v/s hot runner business case

- Product design optimization

- Optimum thickness of component
    - Balanced filling
    - Clamp tonnage optimization through product design
    - Rib and boss design

# What we can Offer to our Clients

- **Moldflow Studies**
  - Mold design optimization
    - Injection point location, runner sizing
    - Cooling layout, cooling insert
  - Material selection
    - Selection of right grade from flow perspective
- **FEA**
  - Linear and Non Linear analysis
    - Buckling analysis (Top loading)
    - Fluid structure interaction
    - Side impact
    - Drop test
    - Colliding of packages analysis
  - Packaging studies
    - Load bearing capacity

# What we can Offer to our Clients

- **Design**
  - Conceptual Product Design
  - Product detailing from sketches or A surfaces
  - Geometric Dimensioning & Tolerance (GD&T) studies
  - Design validation for plastic molding
- **Mold Management Studies**
  - Mold design verification
  - Standardization of mold components
  - Nomenclature for molds/ components
  - Follow-up on mold construction, metallurgy of parts, BoM verification,
  - Mold maintenance plans, trials and dimension verification
  - Process set-up
- **Additional Services**
  - Reverse Engineering
  - Rapid Prototyping
  - Soft Tooling

# Our Valued Customers



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