Plastic Product Design with NX

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1. Introduction to plastic

2. Plastics Materials – An Overview

   - Classification
   - Thermoplastics
   - Thermosets Crystalline
   - Amorphous, and Liquid
   - Crystalline Polymers
   - Copolymers
   - Alloys
   - Elastomers
   - Additives
   - Reinforcements and Fillers

3. Physical, Mechanical, Thermal, Electrical properties

4. Environmental Considerations

5. Structural Analysis

6. Design Considerations for Injection-Molded Parts
   - Injection Molding Process
   - Design Strategy
   - Efficient and Functional Design
   - Material Selection
   - Nominal Wall Thickness
   - Normal Ranges of Wall Thickness
   - Structural Requirements of the Nominal Wall
   - Insulation Characteristics of the Nominal Wall
   - Impact Response of the Nominal Wall
   - Draft
   - Structural Reinforcement
   - Ribs
   - Other Geometric Reinforcement
   - Bosses
   - Coring
   - Fillets and Radii
   - Undercuts

7. Checking different problems in tooling and solutions

8. Basic Tooling considerations: Lifters-Undercut & Draft analysis

9. Sharp edges on tools & parts

PRODUCT DESIGN WITH NX:

1. Feasibility study of surface with environment

2. 'A' surface analysis

   - Visual Analysis
   - Visually Analysis
   - Joint & tangency Analysis
   - Draft Analysis/Slope Analysis
   - Curvature Analysis (Radius Analysis)
   - Develop length & feasibility checking
   - Section study
   - Thickness mapping

3. Visible Surface Design procedure

4. Non visible surface design procedure (B-Surface)

5. Tooling Surface Design

6. Sample product study

Injection Mould Design with NX

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   - Amorphous and Liquid
   - Crystalline Polymers
   - Copolymers, Alloys, Elastomers, Additives, Reinforcements, and Fillers.

3. Physical, Mechanical, Thermal, Electrical properties

4. Injection Molding process

5. Basic understanding of Core, Cavity, Runner, gate, sprue, Shot capacity, Plasticizing capacity, Injection velocity, Injection pressure, purging, Daylight.

6. Calculation of No. of cavities

7. Shrinkage

8. Feed System:

   - Sprue Design
   - Runner design & different runner layouts
   - Type of Gates

9. Mold Layout explanation

10. Ejection systems & different types of ejectors

11. Undercut molding

12. Design concept of Two Plate Mold

13. Design concept of Split Mold & actuation techniques

14. Design concept of Side core Side cavity mold & actuation techniques

15. Design concept of under feed & Runner less Mold

16. Design concept of three plate Mold & actuation techniques

17. Design concept of Unscrewing Mold & actuation techniques

Implementation in NX

1. Component Analysis

2. Molded part Validation

3. Project Initialization

4. Mold part shrinkage

5. Cavity lay-out

6. Work piece & Core cavity extraction

7. Mold Parting

- Region Analysis
- Patching
- How to define core & cavity region
- Design parting surface
- Edit parting surface

- Core & Cavity Definition

8. Mold Tools For patching

9. Mold Base selection.

10. Standard part including Register ring, sprue bush, ejector pins, retaining pins, Guide pillar & guide bush. Etc

11. Slider & lifter design

12. Gate & runner Tools

13. Cooling systems

14. Electrode creation

15. Bill of Material

16. Project work