Grille Case Study  
Injection Molding

Flowchart for Plastic Molding

1. Fill hopper with plastic powder.
   - Is level of plastic in hopper?
     - No → Continue
     - Yes → Turn on heater.

2. Check temperature.
   - Is temperature correct?
     - No → Continue
     - Yes → Turn on motor.

   - Is amount of plastic in mold?
     - No → Continue
     - Yes → Turn on pressurized air.

   - Mold cool enough?
     - No → Continue
     - Yes → Open mold, remove plastic shape.

5. Quality of part good?
   - No → Part goes to recycle bin.
   - Yes → Part used in production.

6. Fill hopper with plastic powder.
   - Part goes to recycle bin.
U of defects

Pareto Plot
Black spots
Cause-and-Effect Diagram

- People
  - training
  - supervision

- Method
  - clean vent
  - purging procedure

- Machine
  - maintenance
  - screw
  - speed
  - vent tube
  - design

- Material
  - process
  - variation
  - supplier

- Black Spots
U of Spots

Replace screw

UCL=4.62
Avg=2.50
LCL=0.38

U of Spots (Cont)

Vent tube redesign

UCL=4.63
Avg=2.50
LCL=0.38
U of Scratches

Coat belt laces
Coating wears off

Count Per Unit for Scratches

Sample

UCL=2.212
Avg=1.100
LCL=0.000

U of Scratches (Cont)

Belt replaced

Count Per Unit for Scratches (Cont)

Sample

UCL=1.109
Avg=0.421
LCL=0.000

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