Injection Moulding Process Dataset

Injection moulding is the most commonly used manufacturing process for the fabrication of plastic parts. A wide variety of products are manufactured using injection moulding, which vary greatly in their size, complexity, and application. The injection moulding process requires the use of an injection moulding machine, raw plastic material, and a mould. The plastic is melted in the injection moulding machine and then injected into the mould, where it cools and solidifies into the final part. Please see below video regarding the injection moulding.

https://youtu.be/b1U9W4iNDiQ

https://www.basilius.com/blog/understanding-the-injection-mold-process

https://revpart.com/injection-molding-process-control/

Process monitoring can streamline and automate many aspects of production and quality control. Instead of inspecting parts to determine acceptance/rejection after they are produced, process monitoring and control can be set to detect unacceptable variables and automatically reject a piece. Earlier detection can also lead to fewer rejections.

In this data sets, key process parameters are measured including:

- Cylinder heating zone 1: temperature at Cylinder heating zone 1
- Cylinder heating zone 2: temperature at Cylinder heating zone 2
- Cylinder heating zone 3: temperature at Cylinder heating zone 3
- Cylinder heating zone 4: temperature at Cylinder heating zone 4
- Cylinder heating zone 4: temperature at Cylinder heating zone 5
- Maximum injection pressure: maximum mould fills pressure
- Mould temperature control unit 1: reheat the mould and then to keep the mould at the temperature set point
- Cycle time: overall moulding cycle time
- Injection time: the time it takes the screw to move from the injection start position to the transfer position
- Dosage time: the time that dosing equipment for injection moulding
- Switch-over volume: the V/P switch-over indicates the point - usually a percentage of the total volume - where the injection molding machine (IMM) will change the filling process from a velocity driven (fill) to a pressure driven control (pack).
- Material cushion: the material remaining in front of the screw, after the mold filling and pack stages of the injection process is called the cushion. Having a cushion ensures that the screw does not bottom out against the front of the barrel.

Example of settings: (not directly link to your group's data)

Settings	Setting Range
Normal 1	Master Setup
Condition 1	Cylinder Heating Zone +10 C, Barrel (325, 320, 320, 305, 290)
Condition 2	Cylinder Heating Zone -10 C, Barrel (305, 300, 300, 285, 270)
Condition3	Switch over position +10% (5mm)
Condition4	Switch over position -10% (4mm)
condition 5	Mold Temperature +10% @ 100 Degree C
condition 6	Mold Temperature -10% @ 80 Degree C
Condition7	Injection Speed +25% @ 100mm per sec
Condition 8	Injection Speed -25% @ 60mm per sec