What is PQ²?

PQ² is a mathematical formulation that describes the relationship between pressure and flow rate of a liquid in a confined space. When used in the die casting process, it defines the relationship between liquid metal pressure and metal flow rate through the in-gate.

Graphically, the PQ² relationship compares the metal pressure (P), represented on the vertical axis, with the metal flow rate (Q), represented on the horizontal axis. The horizontal axis is skewed to illustrate the squared relationship of flow rate with pressure.

What is the Next Step?

Check out the Mentium system for the complete monitoring and control of your die casting machine and is related process.

Take the next step in PQ² concepts by getting all of the information you need to keep your process under control and your production levels at the highest they've ever been! The Mentium system can do this for you!

DCPP Features & Benefits

- Machine, Die, & Setup Documentation
- Automatic Generation of Velocity / Position Profile Graphs
- Automatic Generation of PQ² Graphs
- Automatic Generation of PV² Graphs
- Improve Die Design
- Improve Production & Reduce Scrap
- Perform What If Scenarios, When Changing Process Variables
- Minimize Setup Time and Costs
- Much, Much More!

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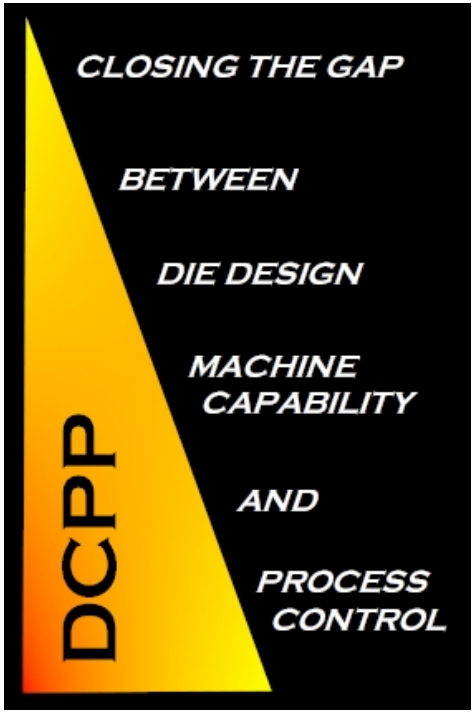
The Die Casting Process Planner



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What is DCPP?

DCPP was developed to improve the die casting process by providing a tool which will help link die design with machine capability. DCPP not only provides you with the ability to define the die casting process, but also provides you with an understanding of the cause and effect of changing process variables such as gate area, plunger speed, fill time, flow rates, system pressure, plunger diameter, etc.

DCPP is easy to use and will help you define the best process for your die casting needs. Through information that you supply, DCPP will determine if the process is feasible and within the limits of your machine and die configuration. DCPP will also determine what the velocity profile should be, based on both supplied and calculated information about the current machine and die configuration. Recommended slow and fast shot velocities are calculated, as well as, the starting positions for each.

The process documentation feature of DCPP alone is a valuable tool. It can be used to document all of your setups. When using this documentation as a guideline for future setups, setups will be identical and require less time. This will minimize your costs by reducing the amount of setup time and related scrap.

The Die Casting Process Planner Functionality

Documentation, Storage & Retrieval

Machine Information
- Machine Name
- Machine Type
- Machine Description
- Lockup Capacity
- Operating Shot Pressure
- Maximum Pressure Used For Dry Shots
- Maximum Measured Dry Shot Velocity
- Planned Shot Speed As A Percent Of Maximum
- Shot Cylinder Bore Diameter
- Tail Rod Diameter
- Stroke Length

Die & Setup Information
- Weight Of Metal Through Gate
- CD Value (Calculated using the actual model)
- Weight Density Of Cast Metal (Suggested values are listed in the DCPP Manual)
- Selected Gate Area
- Minimum Metal Pressure
- Maximum Fill Time
- Minimum Gate Velocity
- Maximum Gate Velocity
- Plunger Or Tip Diameter
- Total Shot Weight
- Approximate Project Area
- Distance To Cover Fill Or Pour Hole
- Sprue Volume
- Nozzle Length (Hot Chamber)
- Nozzle Diameter (Hot Chamber)
- Gooseneck Length (Hot Chamber)
- Gooseneck Diameter (Hot Chamber)
- Intensifier Ratio (Cold Chamber)
- Seconds Of Vacuum (Cold Chamber)
- Shot Sleeve Length (Cold Chamber)
- Biscuit Thickness (Cold Chamber)

Printing & Viewing

Machine Information
Die Information
Setup Information
Miscellaneous Calculations
- Gate Velocity
- Flow Rate Of Metal Through Gate
- Machine Size Requirement
- Slow Shot Velocity
- Fast Shot Velocity
- Slow Shot Start Position
- Fast Shot Start Position
- Runner Full Position
- Start Cavity Fill Position
- Die Full Position
- Total Shot Volume
- Part Volume
- Volume Of Gooseneck & Nozzle (Hot Chamber)
- Runner Volume
- Percent Of Metal In Sleeve
- Metal Pressure
- Required Pressure
- Cavity Fill Distance
- Cavity Fill Time
- Time For Slow Shot
- Area Of Plunger
- Area Of Shot Cylinder

Graphs & Forms
- PQ^2
- PV^2
- Velocity Profile
- Miscellaneous Graphs

Charts
- Effect Of Changing The Gate Area
- Effect Of Changing The Plunger Diameter
- Effect Of Changing The Plunger Speed