FAST FLOW CHANNEL SIMULATION

[castle RUN

RUN

## FAST FLOW CHANNEL SIMULATION

Velocity tracers visualization

→ **DATA IMPORT FROM MANY CAD SYSTEMS** (including Step, Parasolid™,STL, Iges, Solid Works™, Solid Edge™ and Catia™ and many others)

→ **VALIDATION AND OPTIMIZATION OF FLOW DESIGN GEOMETRY**

→ **MODEL PREPARATION AND SIMULATION CALCULATIONS IN A FEW MINUTES**

→ **INTUITIVE VISUALIZATION OF LIQUID METAL FLOW IN THE RUNNERS TO REDUCE TURBULENCE AND OPTIMIZE RUNNER SECTIONS AND SHAPE**

→ **FAST OPTIMIZATION OF SLOW SHOT INJECTION STROKES AND VELOCITY TO REDUCE AIR ENTRAPMENT**

Plunger motion simulation

Air entrapment in shotsleeve

PiQ² | Developing Expertise
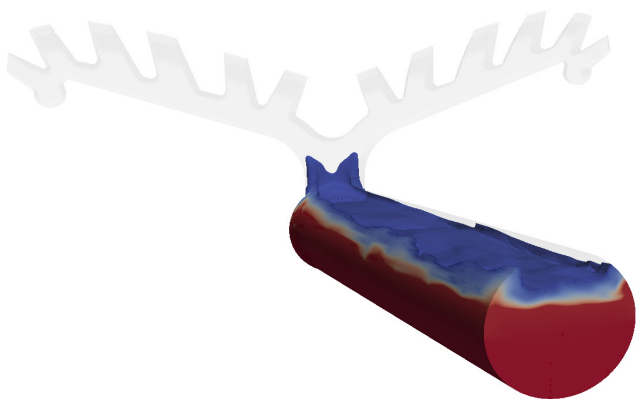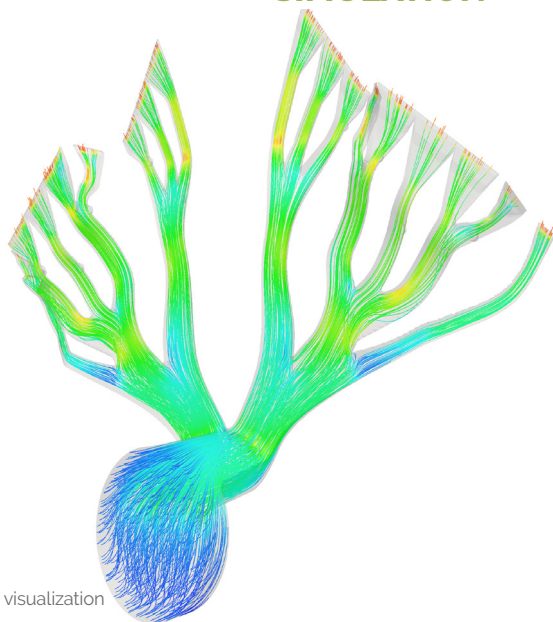
The design of the runners within casting die technology has assumed greater and greater importance in recent years and often represents the only tool for the die designers to improve the quality of the casting and the reliability of the process. In fact mould makers are often asked to find solutions to optimize the filling pattern of the cavity while the geometry or orientation of the part can not be modified at all due to design restrictions.

Castle RUN is an innovative simulation tool for the die design process that is both fast (model preparation and calculation takes just a few minutes) and reliable.

It enables the tool designer to ensure the optimal runner geometry without running an entire simulation of the part as well as providing
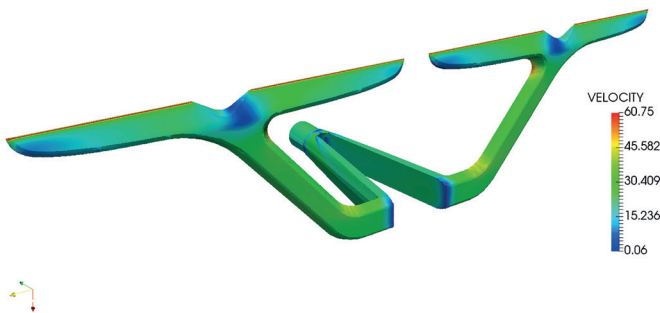a platform for trying different solutions to achieve such expected results as:

→ Filling the cavity at the speed and in the time required
→ Reduction of air entrapments
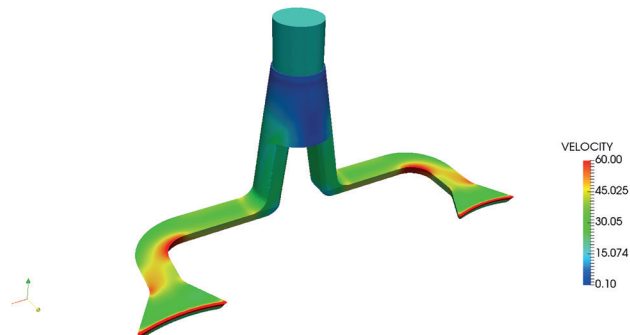→ Minimize turbulence and friction near the gate to reduce die wear and maximize tool life
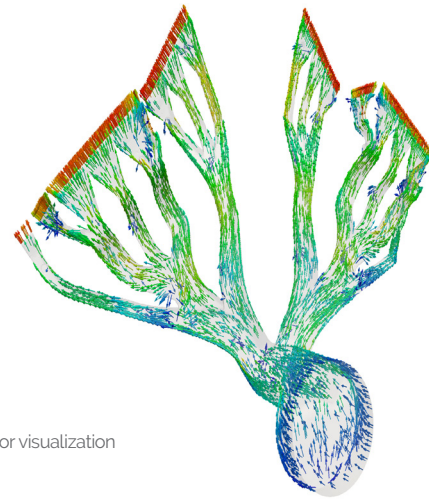
Velocity vector visualization
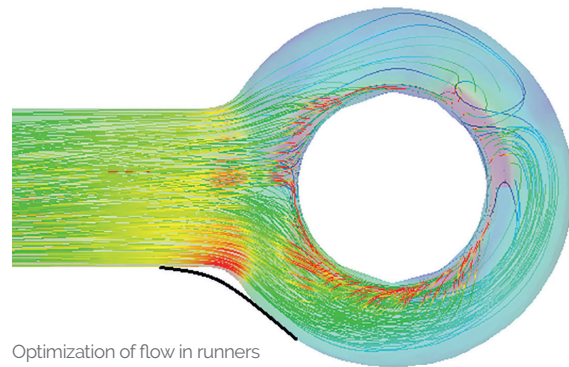
Optimization of flow in runners

VELOCITY
60.75
45.582
30.409
15.236
0.06

Fast evaluation of velocity distribution

VELOCITY
60.00
45.025
30.05
15.074
0.10

Easy identification of critical flow regions

Castle RUN

CASTLE RUN provides a complete map of speed and pressures of the flow that helps to identify:

1 **Turbulent flow**, **air traps** and **loss of energy** through friction

2 **Excessive speed** at the ingate that may erode the die and produce significant soldering

3 **Ingate areas that are "not fully working"** such as may occur where the molten metal doesn't enter through the entire section of the ingate and/or where the flow at different gating areas are not properly balanced

4 The **main direction** of the flow speed vectors as the metal enters the cavity

5 Slow shot **speed injection** profile optimization

The designer can easily modify the runner geometry with the provided modelling tools in order to achieve a better flow in the runners.
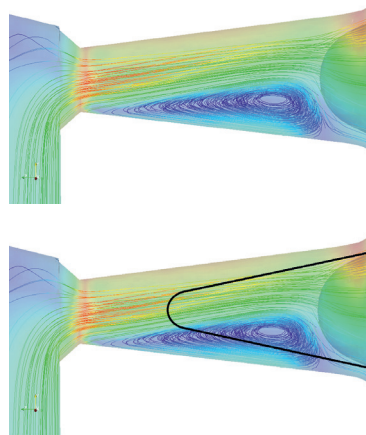

Optimization of runner's shape

CASTLE RUN IS A SIMPLE BUT EFFECTIVE STEP FORWARD
As it is an additional design tool for the casting tool and die maker that:

→ Allows an easy and fast runner shape check for unwanted bottlenecks
→ Provides fast and reliable informations on the main flow in the runners
→ Helps to optimize metal flow before its entrance into the cavity to achieve a smoother filling
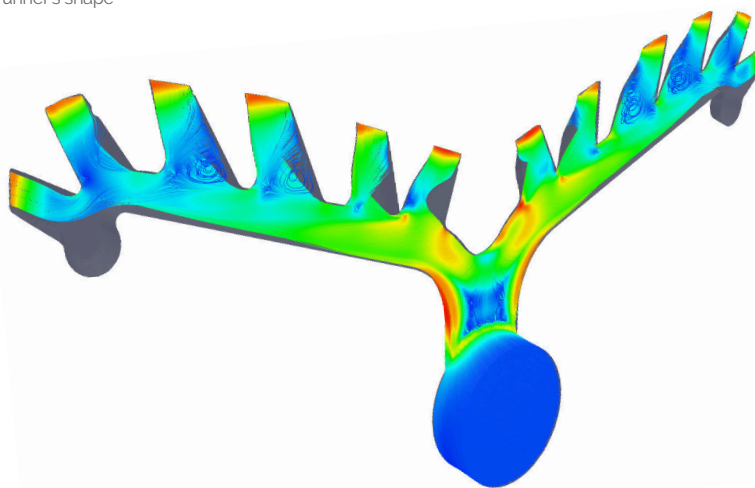
Flow stream lines visualization