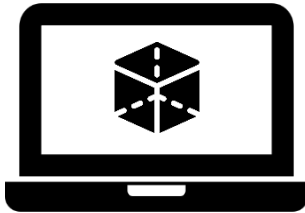
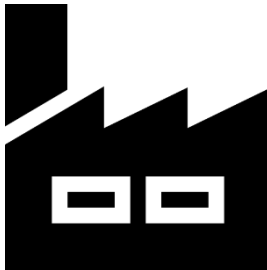


**FOR DIE
MAKERS AND PART
DESIGNERS**



**FOR THE
FOUNDRYMEN**



CastleMIND and
CastleKEY provide the
ability to:

**Optimize area and
thickness of the ingates**
according to the expected
quality specifications for the
casting, its geometry, type
of alloy and the
performances of the die
casting equipment.

**Predict and evaluate the air
venting performance** both
for passive (chill vent) or

CastleMIND and
CastleKEY provide the
ability to:

Optimize production by
providing optimal injection
parameters, slow and fast
shot speeds and strokes,
shot sleeve diameter,
furnace and die
temperature in order to
maximize part quality and
reduce setup time

**Easily identify the defect
root cause** due to the
mould, the machinery or the
process,

active (vacuum)
configurations and suggest
the optimal size for a given
setup.

Supply information on how
to make the mould perform
to its maximum potential
(through PQ² diagram
analysis) according to the
casting equipment and the
operating conditions faced.
It helps to decide whether it
is necessary to modify the
temperature of the die.

and advise on solutions and
improvements.

**Increase overall casting
quality** (in terms of porosity,
surface finishing and other
defects)

**Reduce scrap rate by
increasing process
reliability over time** while
reducing the harmful effects
of alloy and mould
temperature fluctuations, as
well as injection
performance instability.

Reduce die wear and

**Optimize the plunger
diameter and suggest the
best process parameters**
for the given
mould/machine
combination.

**Compile the machine
parameters datasheet**
(injection strokes, plunger
speed and pressure) as a
guideline to be sent to the
foundry or used for realistic
filling simulations.

soldering phenomena,
frequently caused by
poorly calculated and
inadequate gating areas.

Reduce setup costs related
to casting shape reviews
needed to improve mould
performances after the first
sampling process.

Extend mould cycle life by
optimizing both die
geometry and process
injection parameters in
order to avoid washout,
erosion and die wear
phenomena.

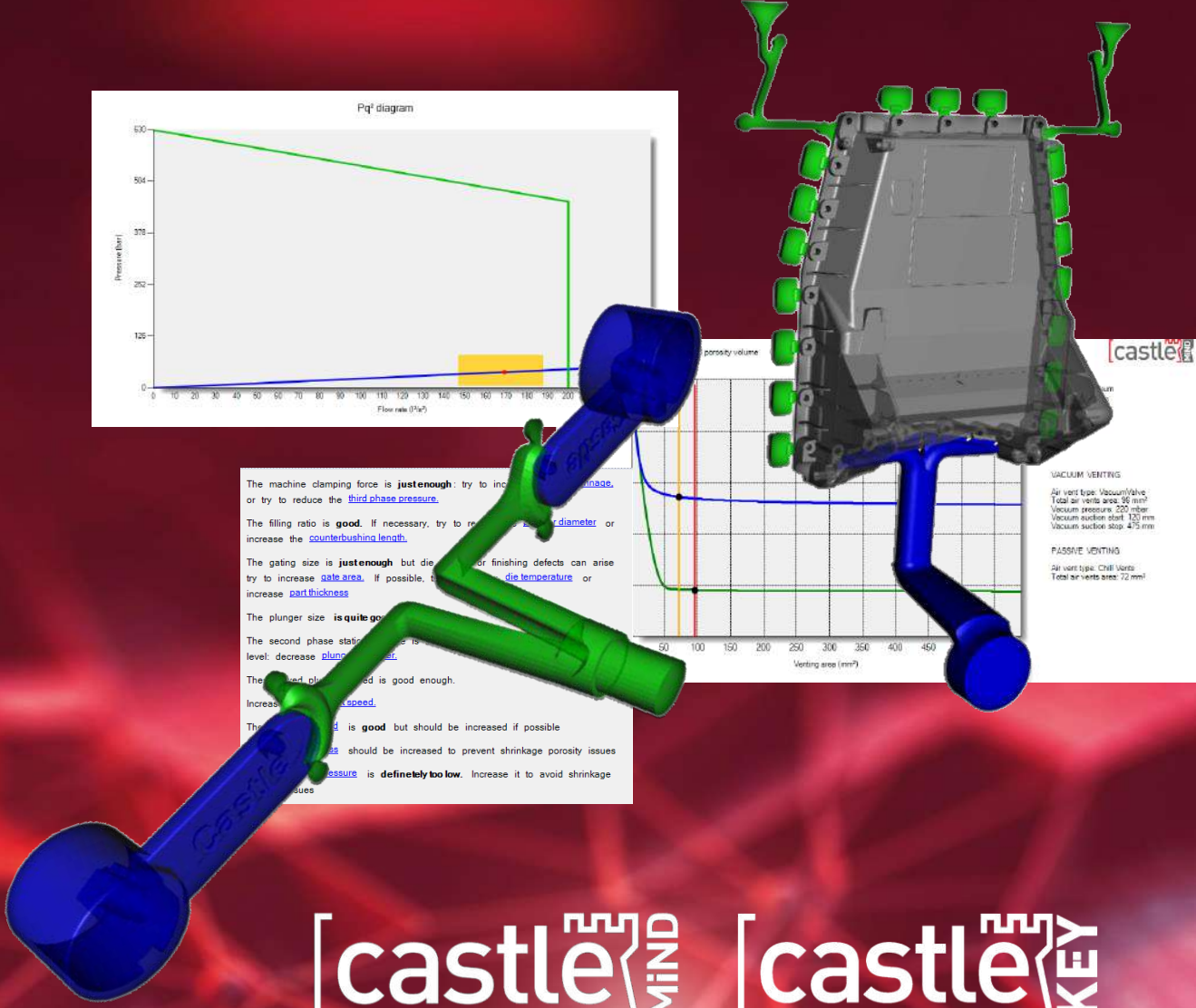
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[castleKEY]

KEY

MiND

SMART OPTIMIZATION, NOW EVEN SMARTER

The machine clamping force is **justenough**: try to increase [machine tonnage](#), or try to reduce the [third phase pressure](#).

The filling ratio is **good**. If necessary, try to reduce the [plunger diameter](#) or increase the [counterbushing length](#).

The gating size is **justenough** but die erosion or finishing defects can arise try to increase [gate area](#). If possible, try to increase [die temperature](#) or increase [part thickness](#).

The plunger size is **quite good**.

The second phase static pressure is **too low** to ensure the required porosity level: decrease [plunger diameter](#).

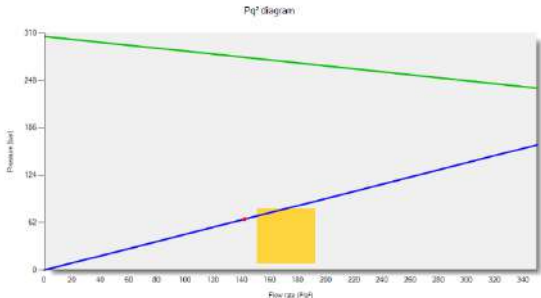
The allowed plunger speed is good enough.

Increase the [fast shot speed](#).

The [slow shot speed](#) is **good** but should be increased if possible.

The [gating thickness](#) should be increased to prevent shrinkage porosity issues.

The [third phase pressure](#) is **definitely too low**. Increase it to avoid shrinkage.



The machine clamping force is **optimal**.

The filling ratio is **optimal**.

The gating size is **optimal**.

The plunger size is **quite good**.

The second phase static pressure is **optimal**.

The allowed plunger speed is good enough.

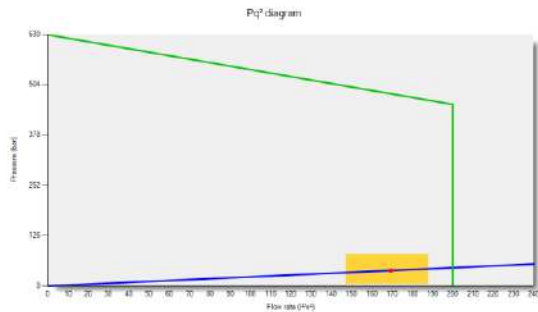
Fast shot speed is **optimal**.

Venting area is optimal.

The slow shot speed is **optimal**.

The gating thickness is **optimal**.

The third phase pressure is **optimal**. Increase it only if necessary.



CastleWIZARD

ALLOY: Alloy grade: EN_AC43400_AISI10MnFe

NUMBER OF CAVITIES: Number of cavities: 1

IDENTIFY PART: Cavity volume: 1243,0 cm³; Cavity weight: 3331,2 g; Part projected area: 1945,0 cm²; Part surface: 5401,0 cm²

QUALITY TARGET: Surface quality level: High; Allowed porosity level: Low

SELECTED MACHINE: Minimum suggested locking force: 3145 ton; Selected machine: GENERIC 3500ton

PRACTICAL INTELLIGENCE FOR DIE CASTING

CastleMIND and CastleKEY are innovative software solutions that present advanced mathematical concepts within an interface designed to make the **software very user friendly**.

The software technical advantage arises from the use of mathematical rules, derived from **fluid dynamic principles**, interpreted and evaluated on the basis of **foundry or mould making experience**.

The calculation output is expressed to make the **results comprehensible and useful** even for operators with no specific technical background.

The software is able to **identify both critical die design features and wrong process parameters**. It suggests how to optimize them to avoid or reduce quality issues during production.

All the hint and tips are provided in **common foundry language** rather than by numbers and diagrams.

The new **CastleWIZARD** allows for a preliminary definition of geometry and process key parameters **in just 6 clicks**.

3D CAD modelling capabilities

Geometry import format

3D Model healing and editing functions

Boolean operations on solids

Run simulation without CAD model

Direct data input from 3D model

HPDC Cold/Hot Chamber optimization

Presses, alloys and die materials database

Vacuum and ventings size optimization

Interactive practical optimization suggestions

CastleWIZARD functionalities

Typical model preparation time

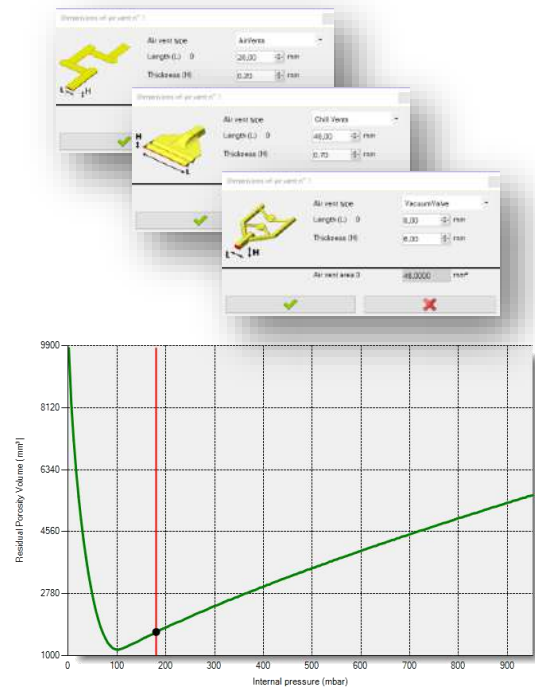
Typical simulation time

Typical training time

On-request customized databases/profiles

Automatic generation of simulation report

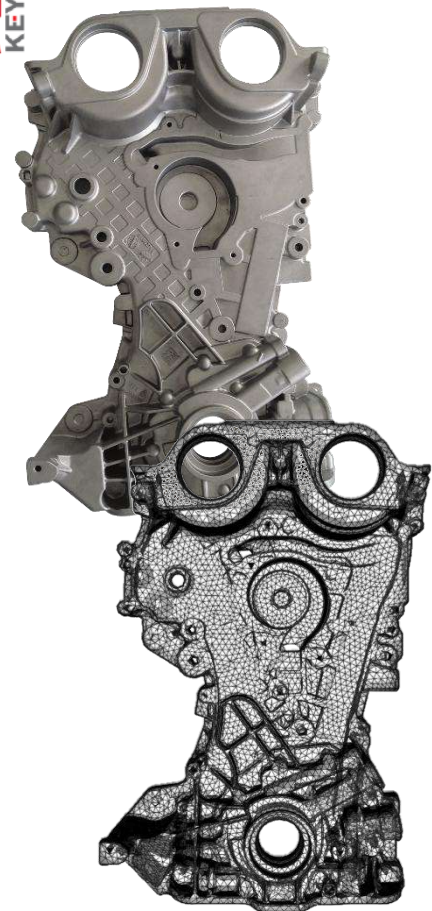
Data export for CastleBODY filling simulation



Step, Parasolid, STL, ...



STL



Model

ITALPRESSE I ITALPRESSE IP1350BC

Suggested line press: 150; Dry shot speed: 9.8; Max injection force: 973.6; Max injection pressure: 518; Locking Force: 1100; Typical second phase speed: 3; Typical first phase speed: 0.2

Plunger: STP DOK400; STP DOK500; STP DOK600; STP DOK700; STP DOK800; STP DOK900; STP DOK1000

Shot sleeve: STP DOK400; STP DOK500; STP DOK600; STP DOK700; STP DOK800; STP DOK900; STP DOK1000

Loader: STP DOK400; STP DOK500; STP DOK600; STP DOK700; STP DOK800; STP DOK900; STP DOK1000

Part material

Alloy grade: EN AC46000 A EN AC46000 AISI9Cu3Fe

Solid state density: 2.74; Solid state temperature: 525; Liquid state density: 2.48; Liquid state temperature: 590; Suggested furnace temperature: 670; Suggested die temperature: 280

Tool material

EN AC46000 A EN AC46000 AISI9Cu3Fe

Required performances

Metal specific pressure: 865; Static safety factor: 1.5; Dynamic safety factor: 1.6; Discharge coefficient: 0.6; Surface finishing: Medium; Allowed porosity: Medium

Process parameters

Medium-high