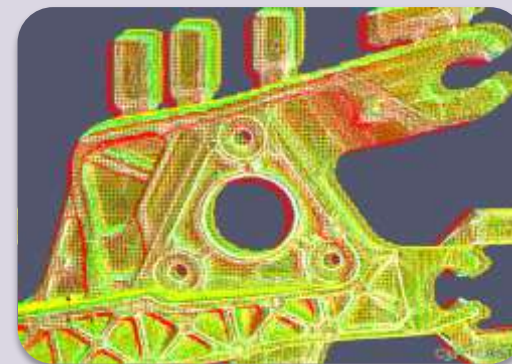
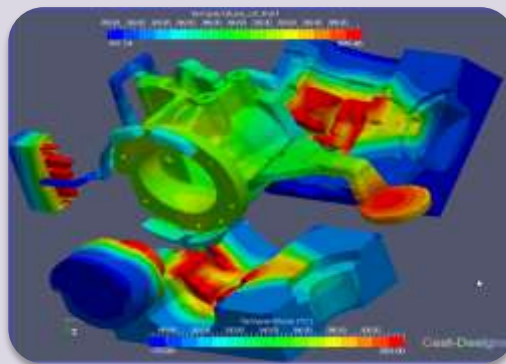
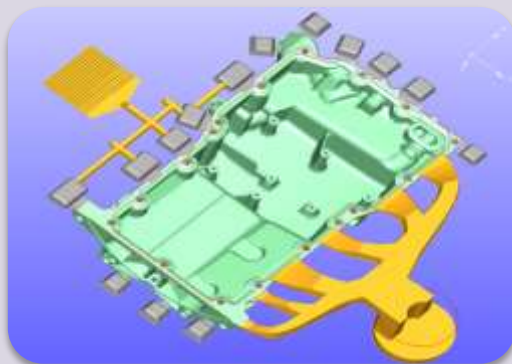


CAST-DESIGNER CASTING SIMULATION OPTIONS



STANDARD SIMULATION

- Flow
- Flow with Temperature
- Air Entrapment
- Pressure
- Velocity
- Shrinkage
- Analysis with out considering cooling channel
- Fast Cooling Analysis

FULL MOLD SIMULATION

- **Standard Simulation +**
- Analysis considering Cooling channel & Mould geometry
- Temperature on Mould
- With Optional Mould Cycling and Thermal Balance

ADVANCED SIMULATION

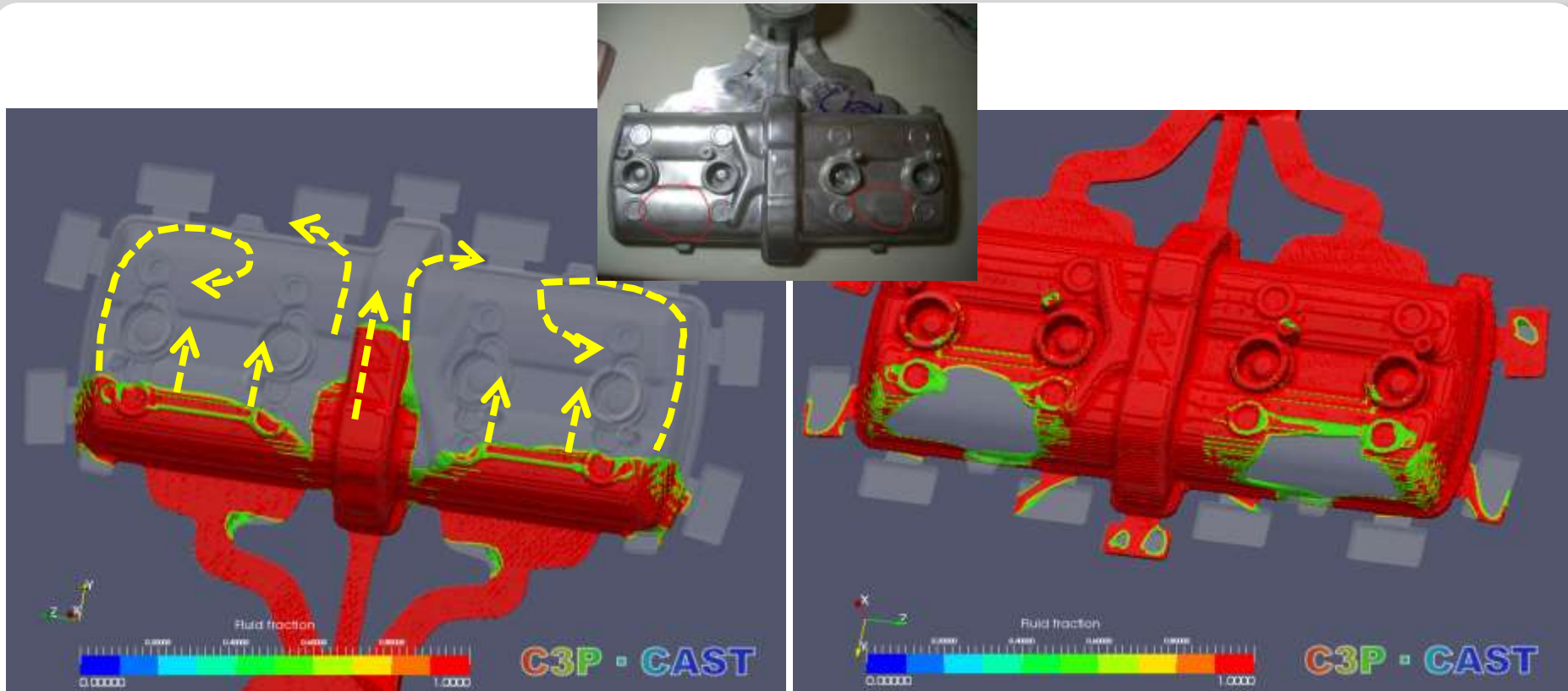
- **Full Mold Simulation +**
- Stress Analysis
- Part Distortion
- Compensation Part (Compensated part geometry mesh)

*Applicable for HPDC, LPDC & GDC

CAST-DESIGNER CPI RESULTS

Following examples describe the different results from Cast-Designer CPI (Casting Process Insight) and how to interpret the results to get the maximum benefits out of these results.

Cast-Designer Simulation to check the Metal Flow

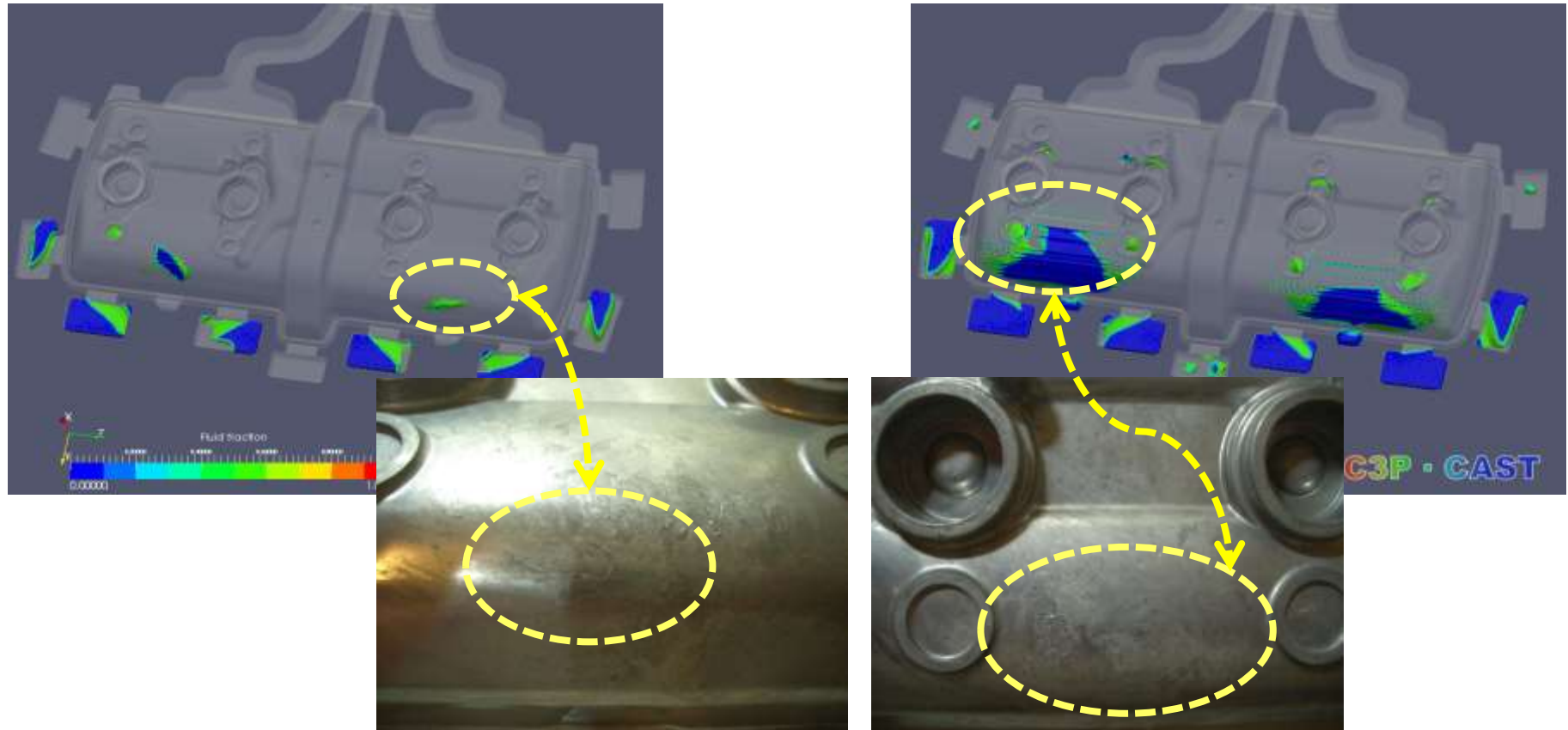


Main defects: gas entrapment, cold shot.

Main reasons : **the sequence of filling process was not good.** metal in the central was too fast and the side metal close the part quickly, the overflow was closed too early. So the part with two big gas entrapment region.

Improvement suggestion: change the gating system style to balance the metal flow of the central and side, the section area of the runner should be optimized.

Cast-Designer Simulation to check the Metal Flow (Gas entrapment)

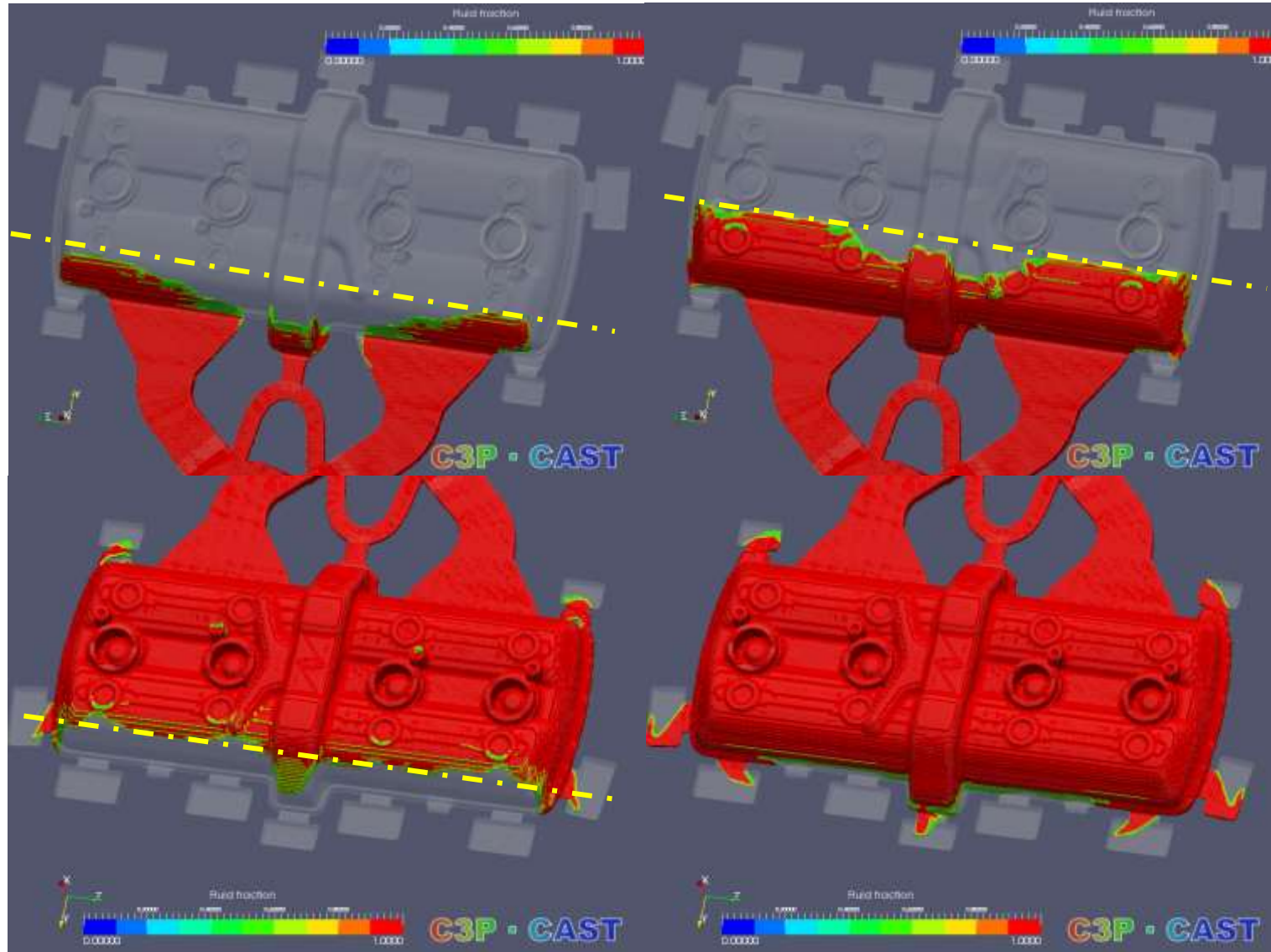


Main defects: gas entrapment, cold shot.

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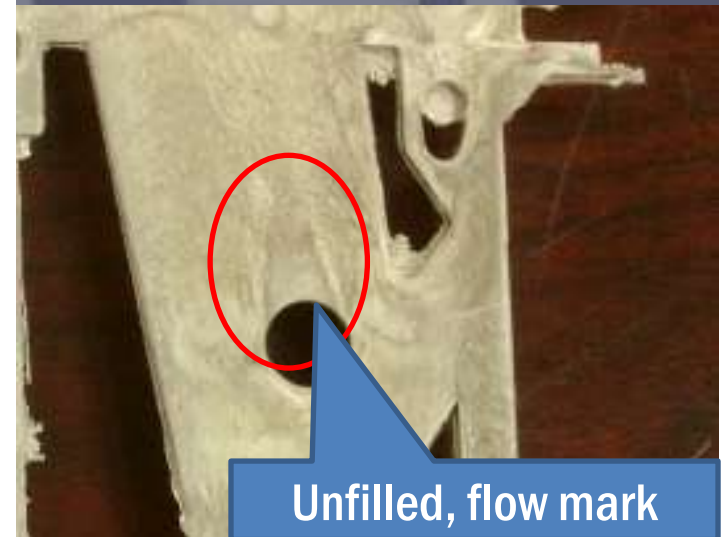
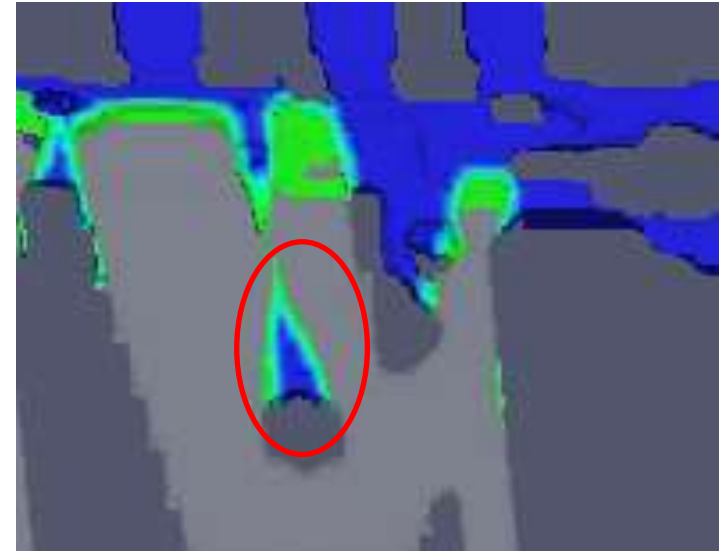
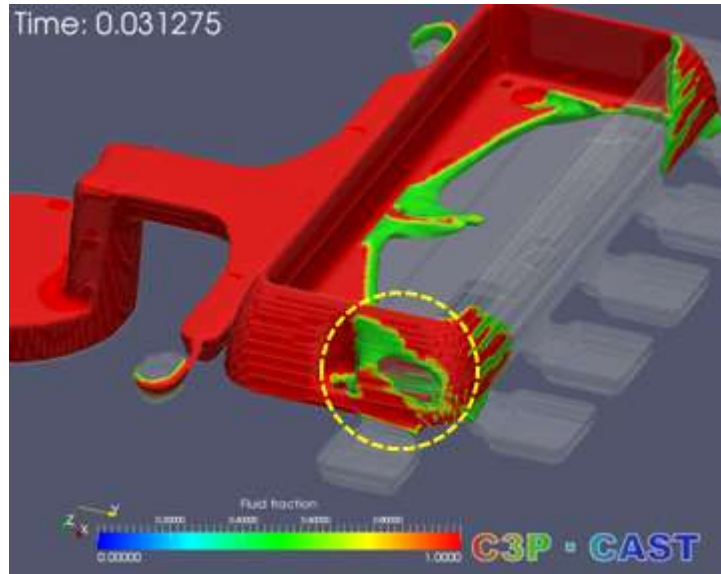
CPI validation for the new designed gating system



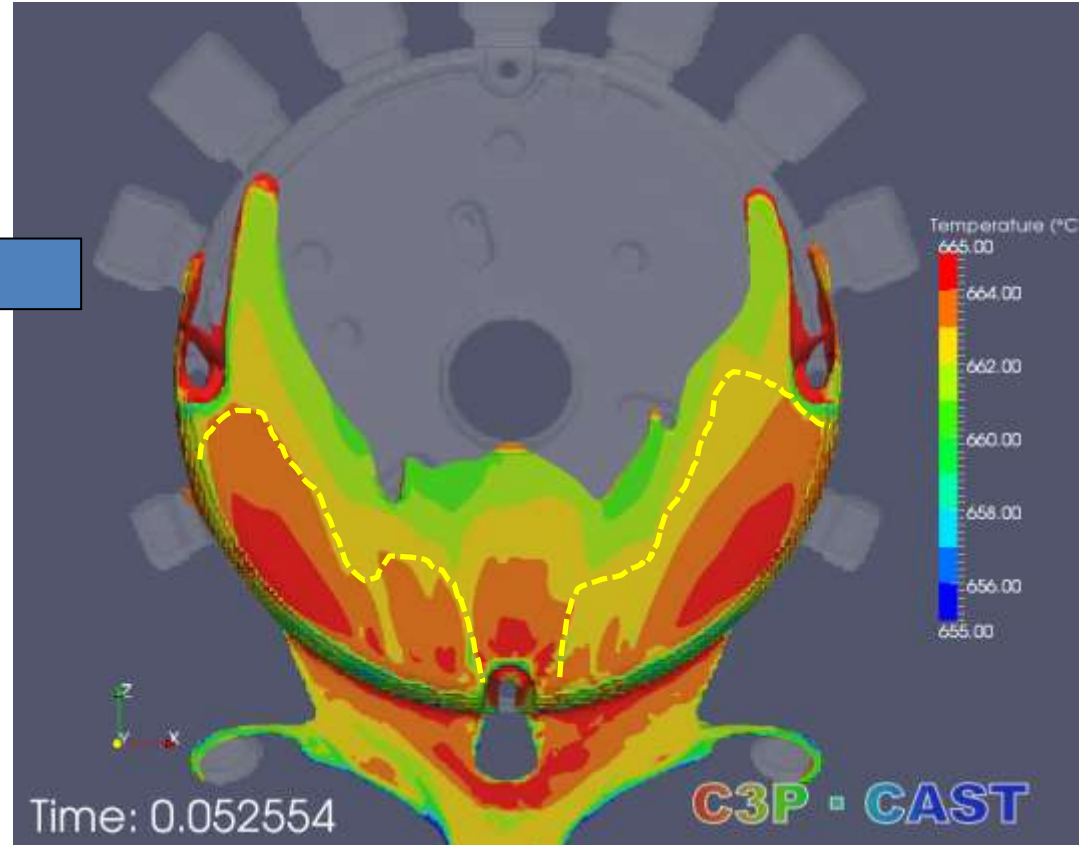
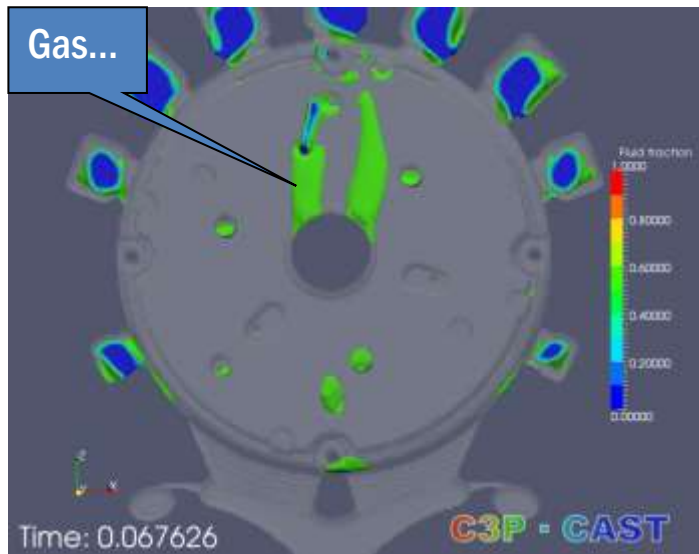
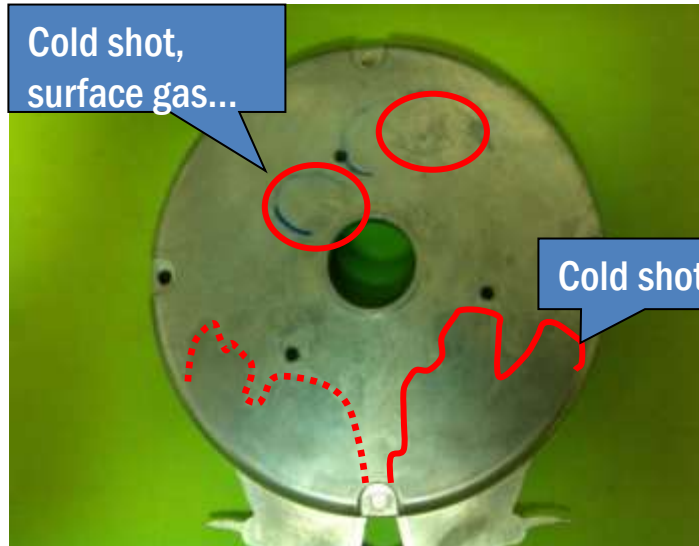
Conclusion of the new design:

The liquid metal filled well and quite balanced, due to the geometry of the casting, the user also need take care of the venting system.

Checking Metal Flow for Unfilled, Flow mark

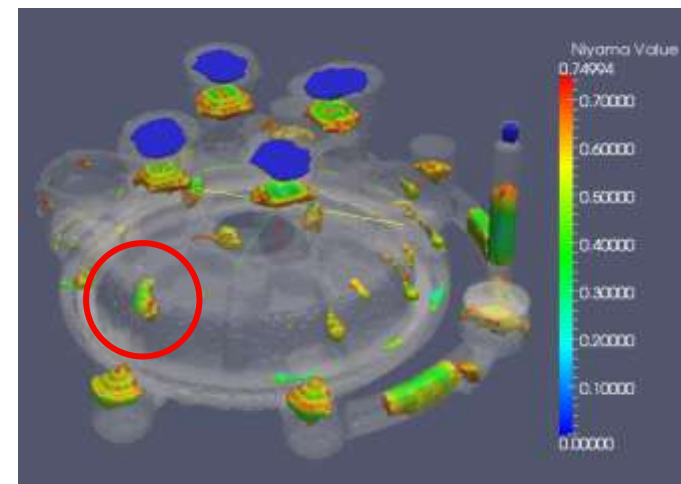
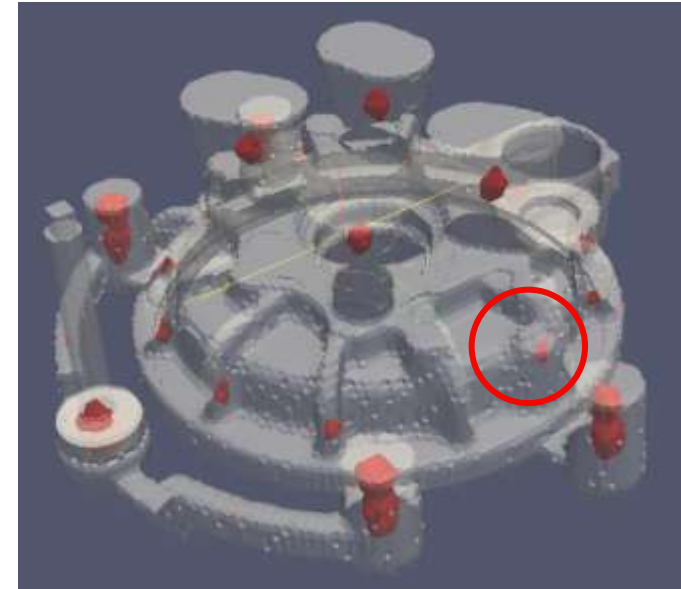
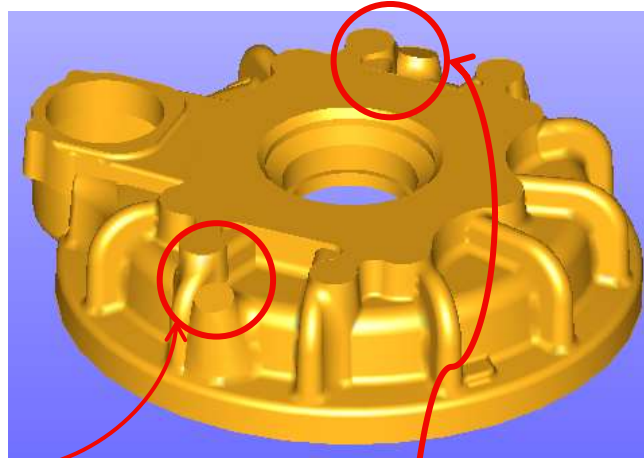


Check Metal Flow for Gas, Flow mark

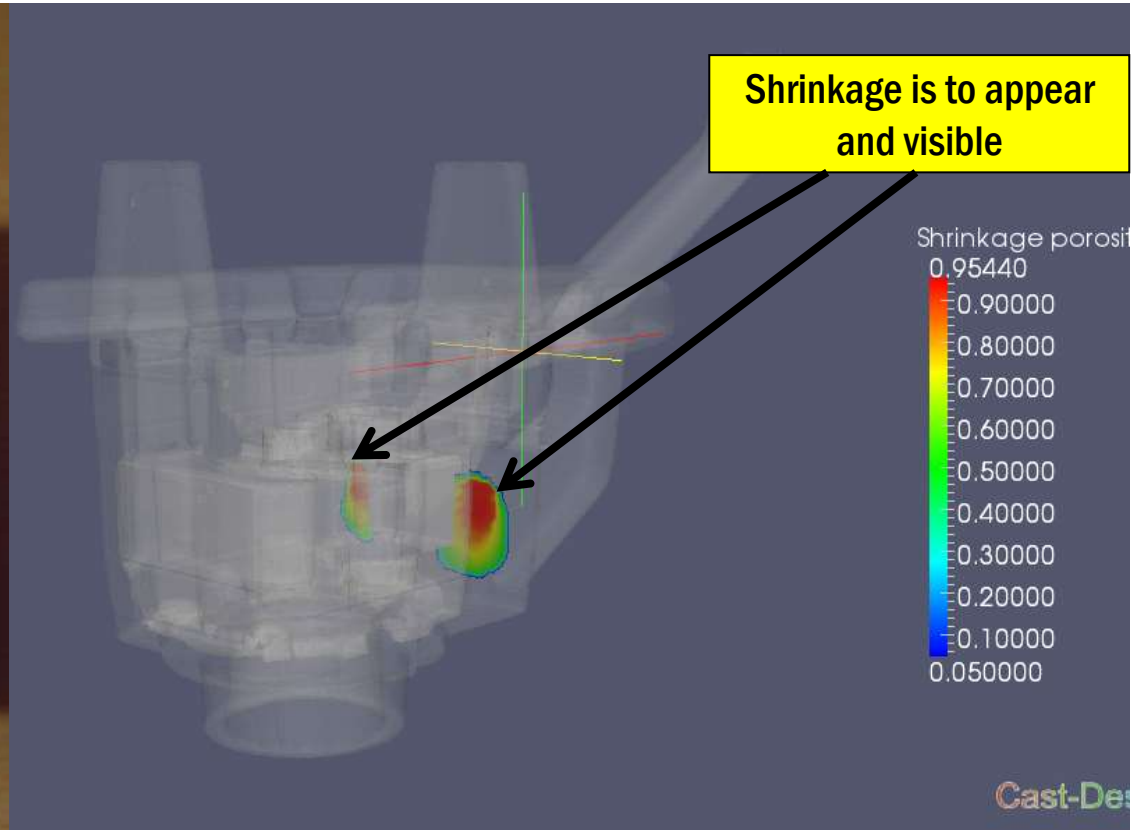


- Check the cold shot in temperature drop
- Gas entrapment could be checked as the metal flow pattern

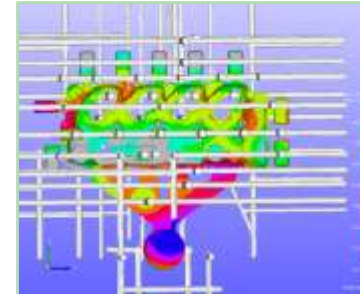
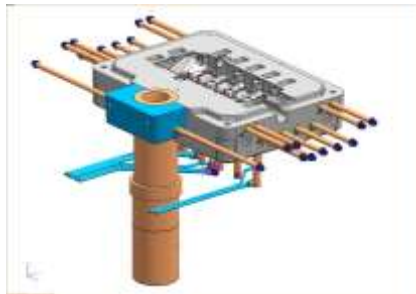
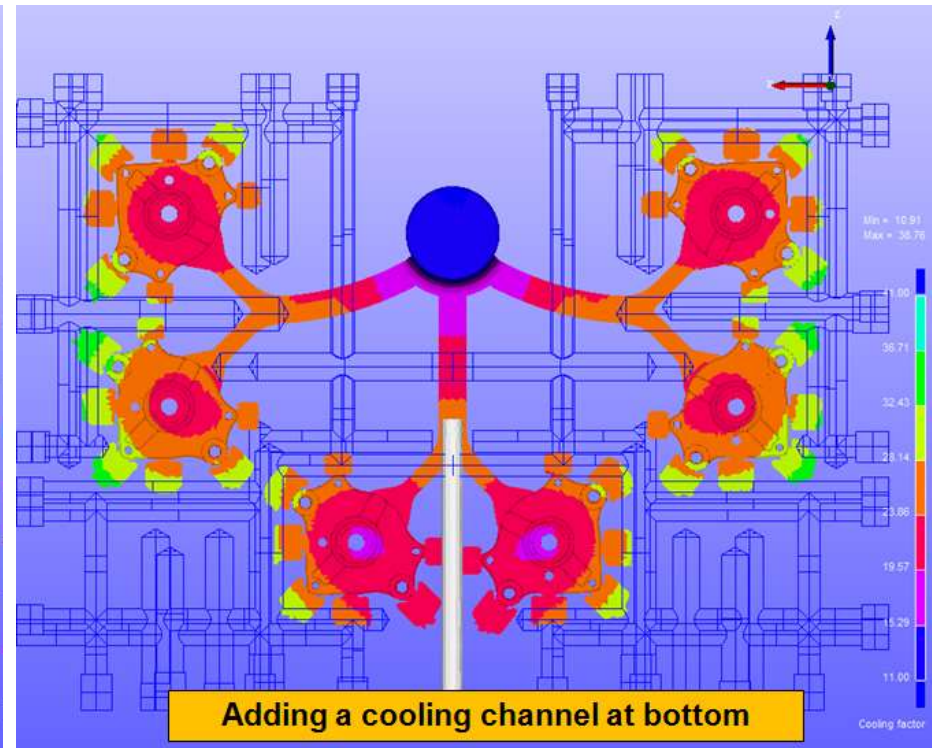
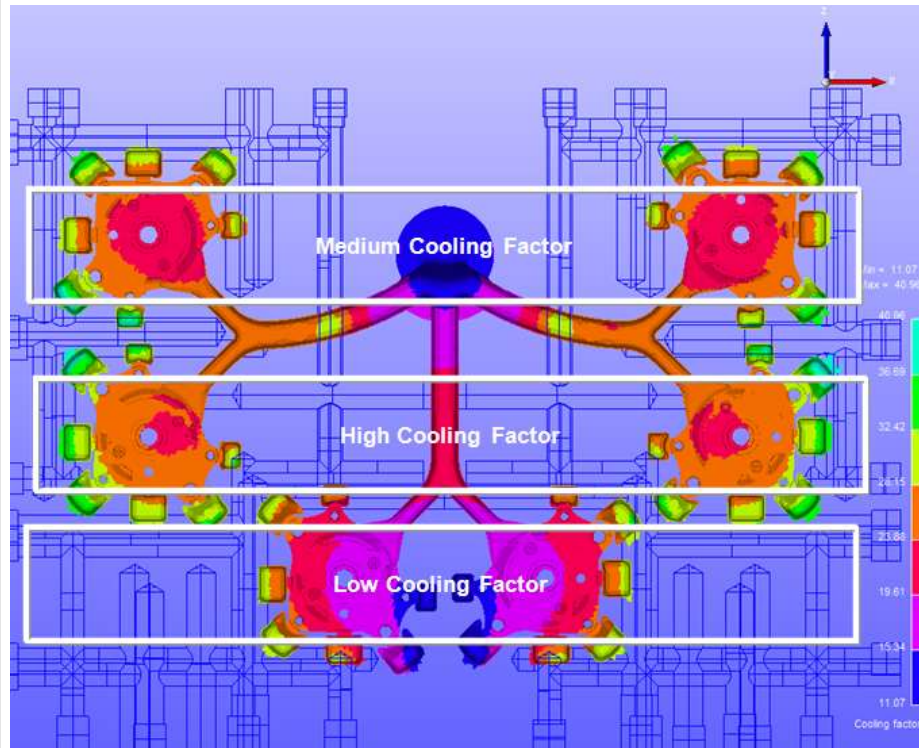
Sand Casting: Defects Analysis (Shrinkage Porosity)



Gravity Die Casting: Shrinkage Porosity



Check the complex cooling system in Fast cooling function



Example Work Process

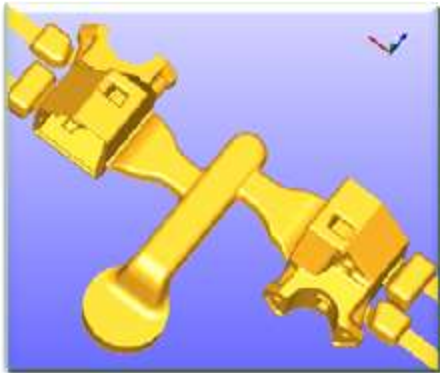
The inner gate put to the side wall, the metal flow was very complex, with lots of gas entrapment, the overflow was closed too early.

Part geometry was complex, the defects include unfilled, gas porosity, cold shot etc.

Change the inner gate to the complex geometry region, also optimize the section area, and put to the maximum wall thickness region. This gating system has solved the unfilled problem success

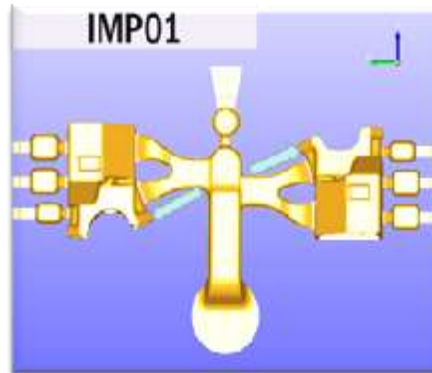
Due to the part geometry, the shrinkage porosity was not easy to eliminate.

Consider to optimize the gating system, to solve it in 3rd phase pressure.



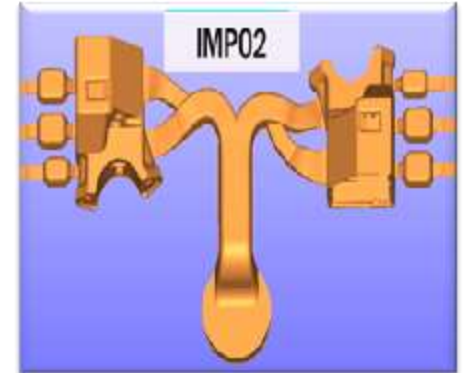
Original design plan

Pass ratio < 35%



Improved Plan IMP01

Pass ratio > 75%

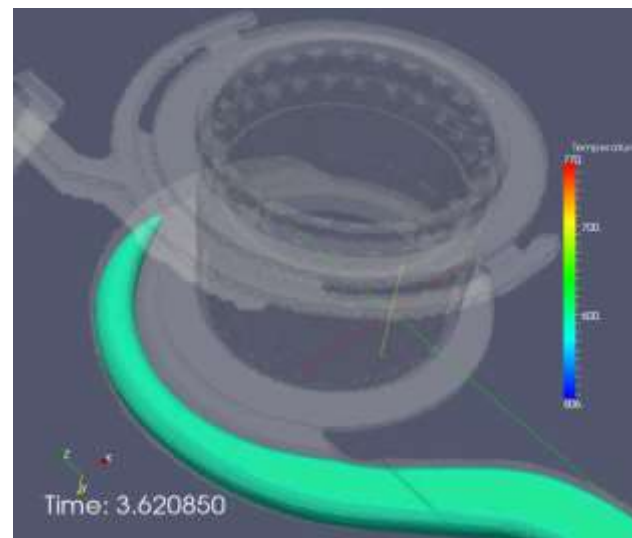
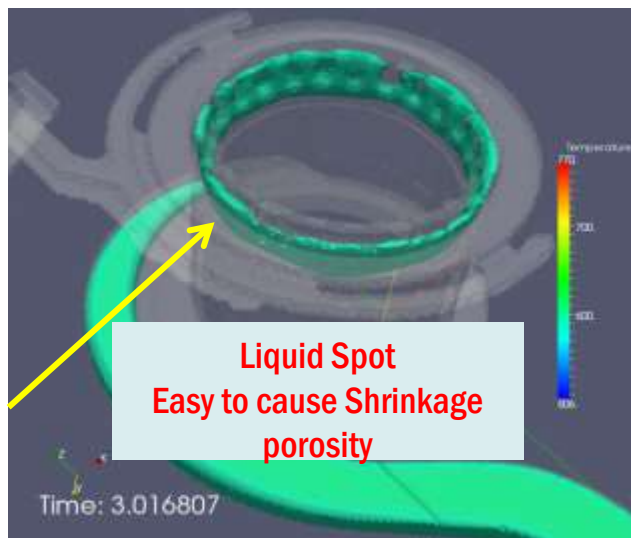
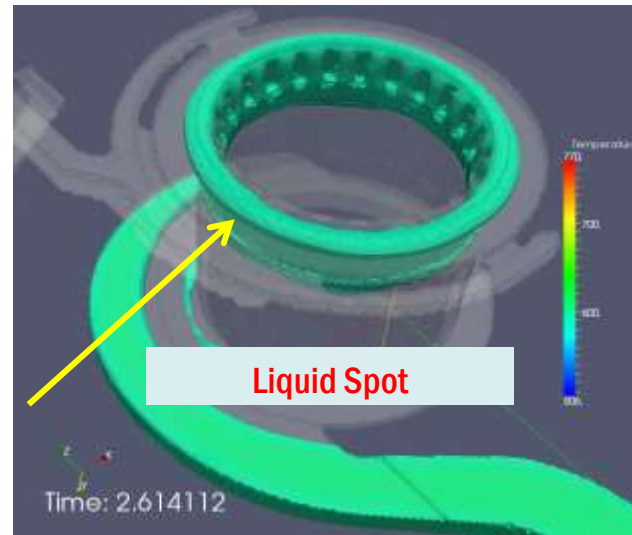
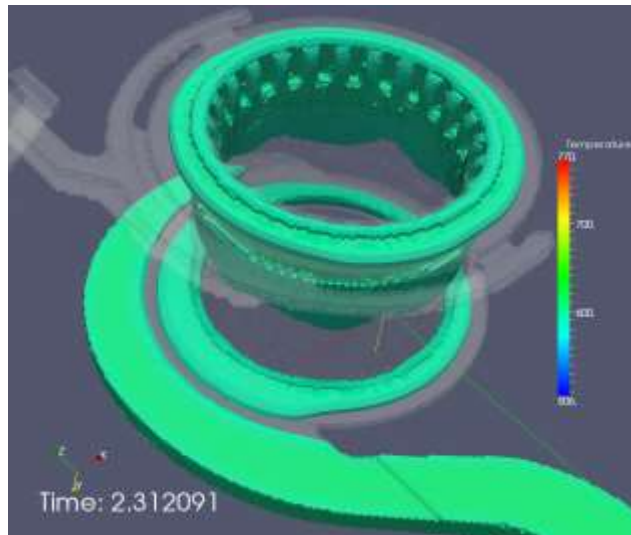


Improved Plan IMP02

Pass ratio > 98%



Solidification Process: Check for Liquid Spots



Color: Temperature
distribution

Time: take account from
end of filling.

Shrinkage Porosity Results Comparison

STANDARD ANALYSIS



**Shrinkage Porosity with out
considering Cooling Channel
& Mold geometry**

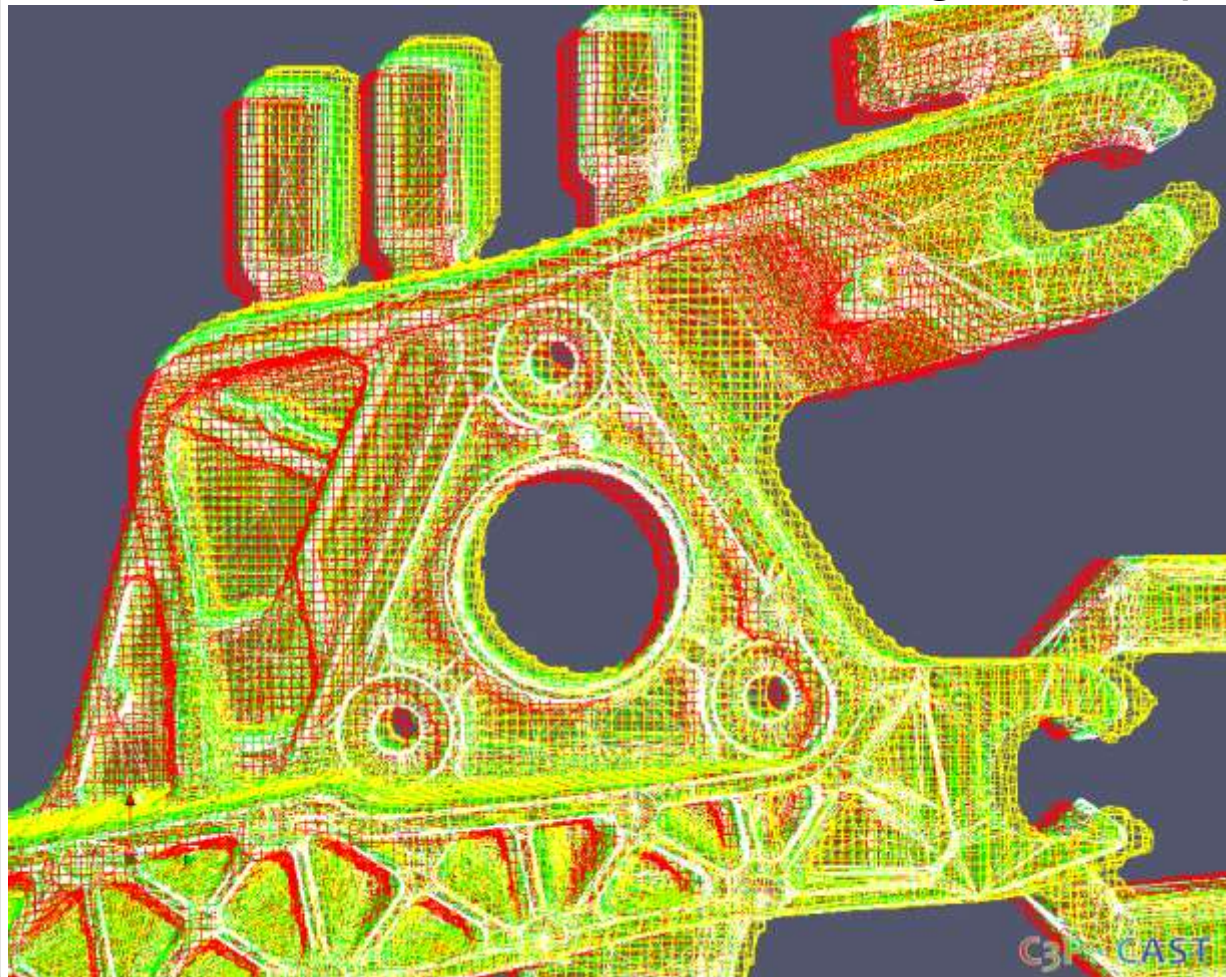
FULL MOLD ANALYSIS



**Shrinkage Porosity
considering Cooling Channel
& Mold geometry**

Casting Deformation & Compensation

For this kind of casting, due to the longer size in one direction, also with thin wall and many ribs, it is easy to cause deformation and distortion after casting process. Cast-Designer can predict the deformation and distortion and guess the compensation shape.



White

• Original Part

Red

• Deformation on Original Part

Yellow

• Compensation Part

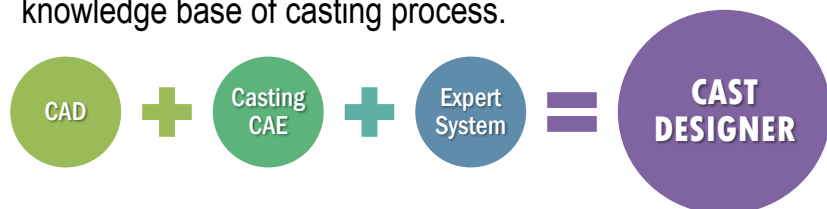
Green

• Deformation on Compensated Part



CAST DESIGNER: CASTING SIMULATION

Cast Designer from C3P Software International, USA, is a combination of CAD, Casting CAE and with expert system knowledge base of casting process.



Cast designer is based on latest FEM technology offers faster results than traditional CAE systems. Cast Designer is the only software which offers built-in tools & wizards to create complete gating system design. Cast Designers offers advanced features like coupled analysis of thermal, flow and mechanical stress and parallel computing. Supports Cast iron, steel, stainless steel, Al alloys, Copper alloys, Nickel alloys etc.

SUPPORTED CASTING PROCESS

- Sand Casting
- Gravity Die Casting
- Tilt Casting
- Centrifugal Casting
- High Pressure Die Casting
- Low Pressure Die Casting
- Lost Wax / Investment Casting
- Lost Foam

NESTech is the Authorized partner for Products from C3P Software International, USA



FORM ADVISOR

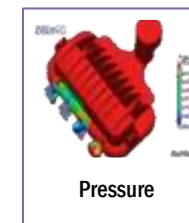
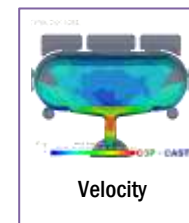
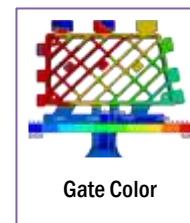
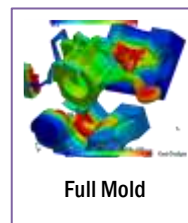
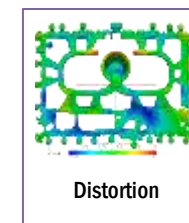
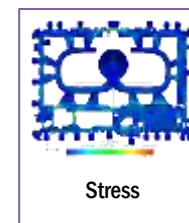
The World's first increment based die design and CAE solution for sheet metal forming process



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Design for Manufacturing and Upfront Analysis Tools

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SIEMENS



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Mr. K.G. Venkatesan

Mobile : 98430-21363

Email: kgvenky@nestechglobal.com

6/9, Damodaran street, (off) Spurtank road Chetpet

Chennai-600031

Ph: +91 44 4291 1901 to 1930

COIMBATORE

Mr. N. Kannan

Mobile : 88700-09210

Email: kannan.nagarajan@nestechglobal.com

1054/18, Avinashi Road, 2n Floor, Gowtham Centre Annex

Coimbatore - 641018

Phone : +91 422 439 1070, Fax : +91 422 2240 993