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For mega part between 5000T ~ 10000T

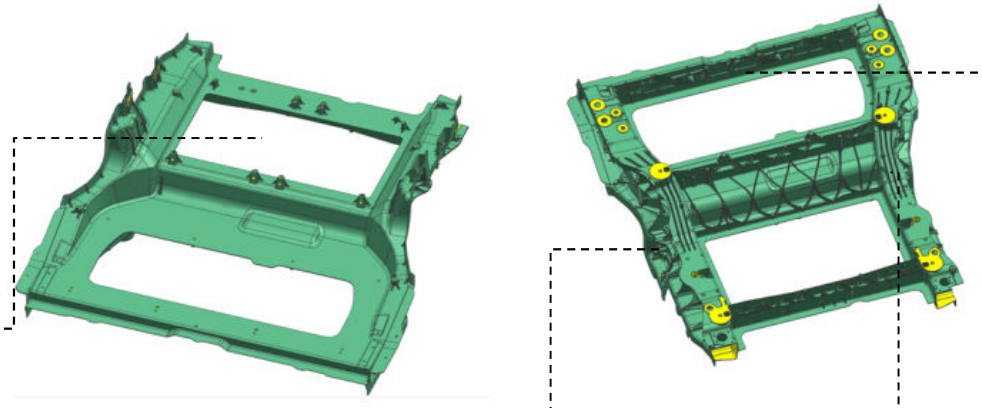
- **Mega part casting design Challenge**

☑ **D** for Know-How in Design
M for Know-How Manufacture

Rear Floor

D&M ☑

Part Dimension：1601*1568*524
DCM Capacity：6600T/7200T
Alloy: C611
•Rm:≥250 MPa
•Rp0,2≥120 MPa
•A ≥10%



Main Challenge

Key point No.1
- Ingating area selection

Key point No.2
- High requirement of mechanical property

Key point No.3
- Air exhausted

Key point No.4
- Deformation risk

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- **Mega part casting design Challenge No.1**

Key point No.1

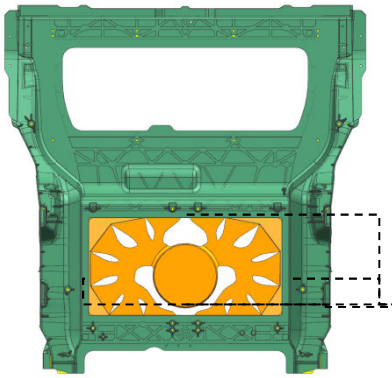
- Mega part is heavier than normal part, but filling time could be not shorten (related to alloy & wall thickness)
- When Ingating wall thickness >5mm, elongation is hard to >10%

Alloy: C611
- Rm: ≥250 MPa
- Rp0,2≥120 MPa
- A ≥10%

$$t = K\left\{\frac{T_i - T_f + SZ}{T_f - T_d}\right\}T$$

参数类型	整体
K =常数	0.0346
Ti=浇口金属温度（℃）	680
Tf=液相线温度（℃）	620
Td =充填前模具表面温度（℃）	180
S=充填结束时的固体百分比（%）	30
Z =固体单位换算系数（℃/%）	4.8
T=平均壁厚（mm）	3.85
t=充填时间 (ms)	61.761

按平均壁厚3.85计算，需要的充填时间是0.62s



- Ingating along wall thickness 3.5mm

Solution

- Find or recommend to modify the wall thickness about 3.5mm area for ingating system

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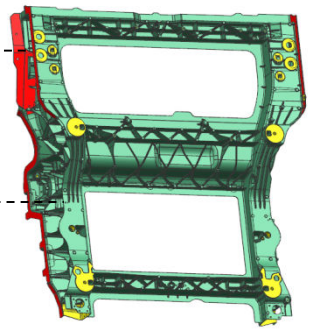
- **Mega part casting design Challenge No.2**

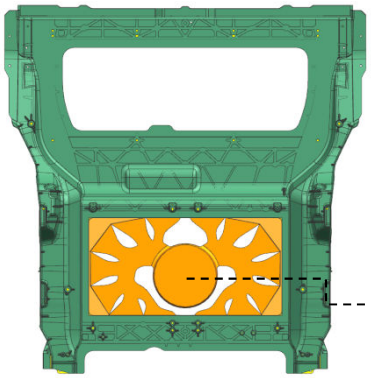
Key point No.2

- High requirement of mechanical property
- Many SPR requirement area in red area

Alloy: C611
•Rm: ≥250Mpa
•Rp0,2≥120MPA
•A ≥10%

- SPR





- Center ingating system

Solution

- Filling from the middle area to assure the SPR area in priority
- Choose center ingating system

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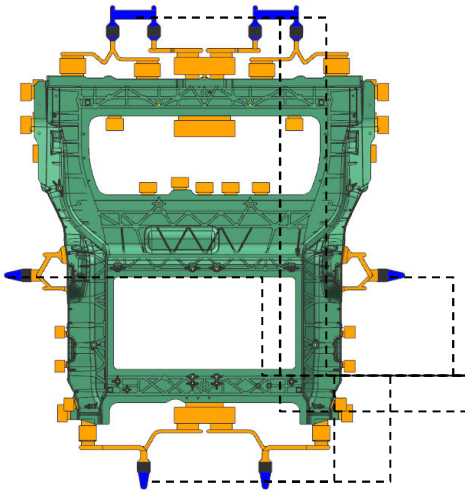
- **Mega part casting design Challenge No.3**

Key point No.3

- Part's overall size is large, filling distance is long , air exhaust is hard



Solution

- Besides the end of 4 vacuums, set up 2 more vacuums in the middle for air exhausting

- Multiple vacuum system

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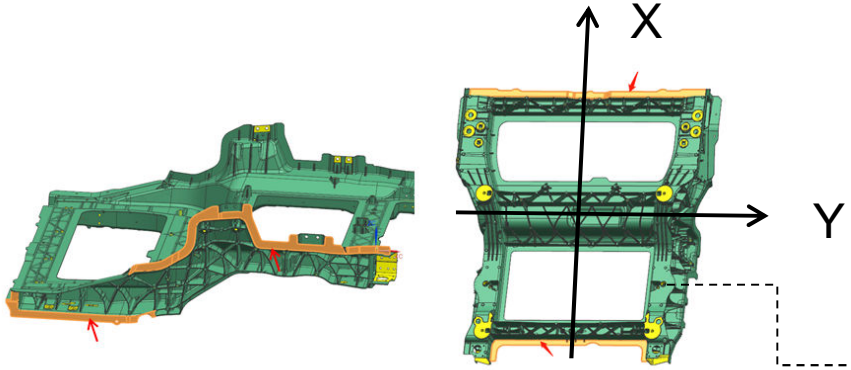
- **Mega part casting design Challenge No.4**

Key point No.4

- Part's overall size is large, it will affect the dimension after the process of solidification



Solution

- Ejection set in slider to avoid demolding deformation
- Set thermal system to control the gap of temperature for each area of mold, to escalate the solidification area faster cooling

- Counter deformation