FORMTEKNIK
Your Solution Partner

ESI Report Small

Content

Scope

- 1: This report scope is to provide alternative ideas to optimise the part quality and archive lowest possible cycle time, by optimizing the part thickness.

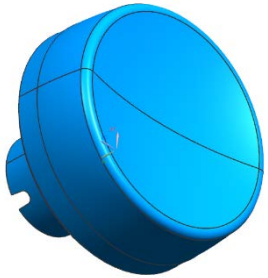
- 2: Scope is also to evaluate cooling optimization in steel core.

General Parameters

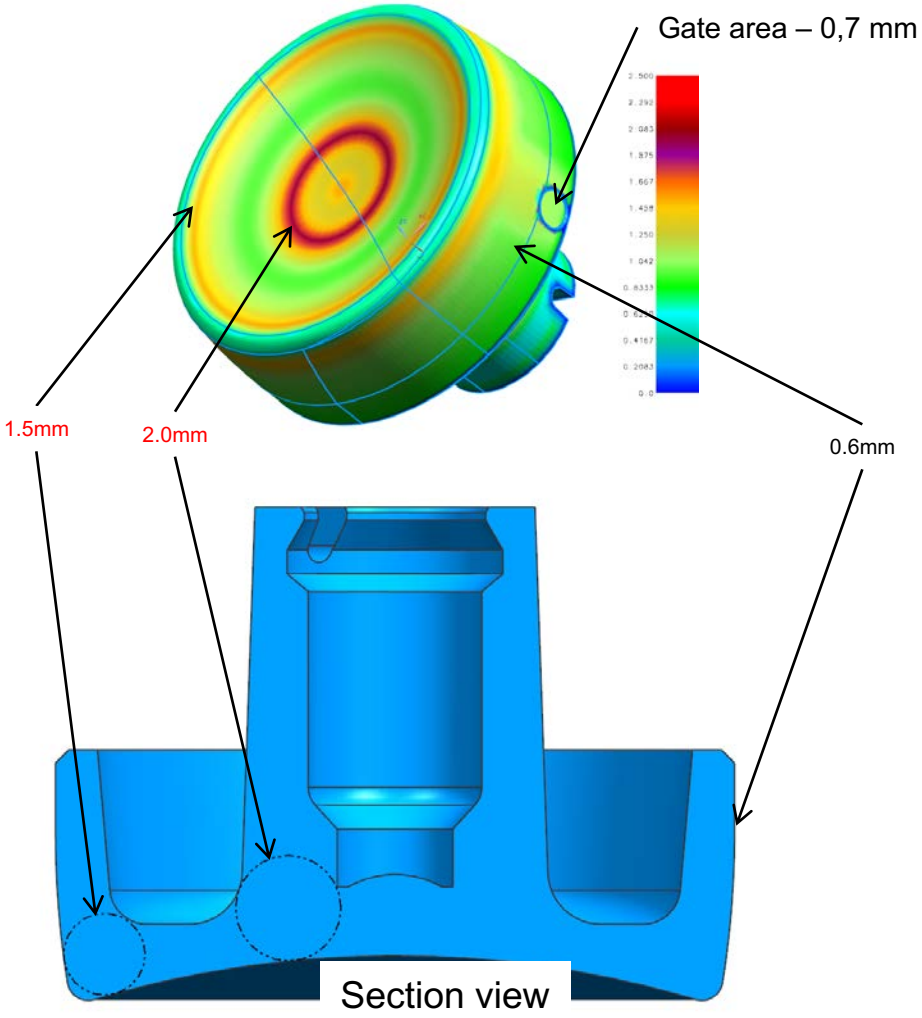
Project name:		Tool concept:	2 plate with sliders
Part name:		Number of cavities:	32
Version / Revision:	V14-10	Injection concept:	Valve gate direct.
Design – Status:	Production	Number of drops:	32 drop
Material:	PC/ABS		
Shrinkage:	N/A ~%	Texture (VDI) cavity:	VDI 24
Part volume:	0,35 cm^3	Texture (VDI) core:	VDI 24
Part weight:	0,39 gram	Special area texture:	VDI 30-33
Runner weight:	0 gram	Shot weight:	12,48 gram
Moulding machine:	Elion 175 T	Nozzle type:	U 350 - Husky
Tot. projected surface:	36 cm^2	Requirements:	< 50 Ton

Wall Thickness Analysis

ORIGINAL part

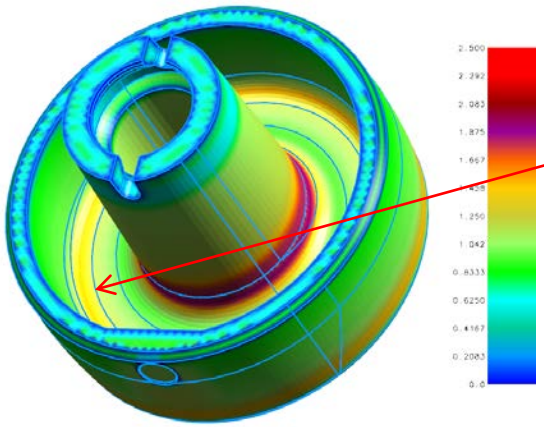


Not uniform section thickness can influence part quality and part distortion, because of local rest shrinkage and not proper working holding pressure.



Wall Thickness Analysis

ORIGINAL part



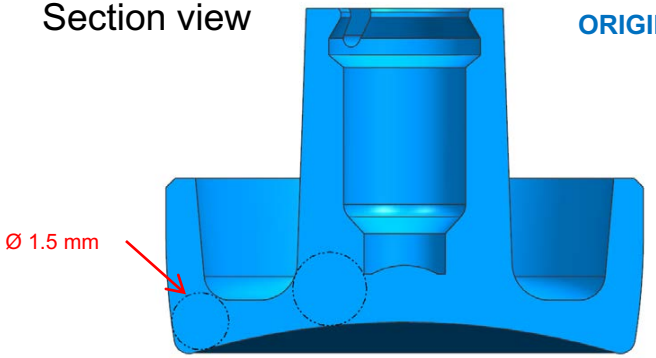
Suggestion to change part to have more uniformed part section thickness.

See also 3D file.

Red surfaces **MODIFIED**.

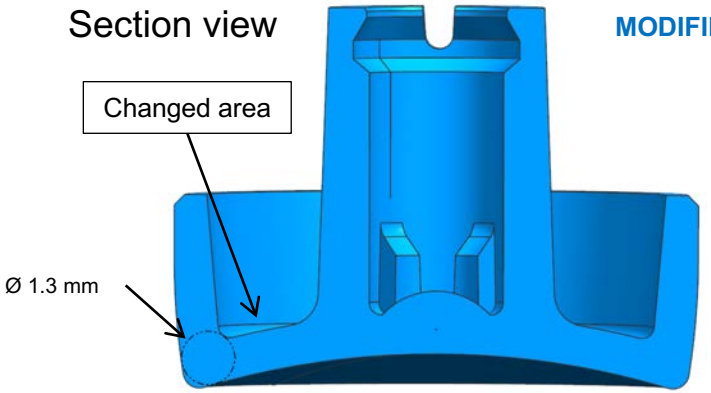
Section view

ORIGINAL part



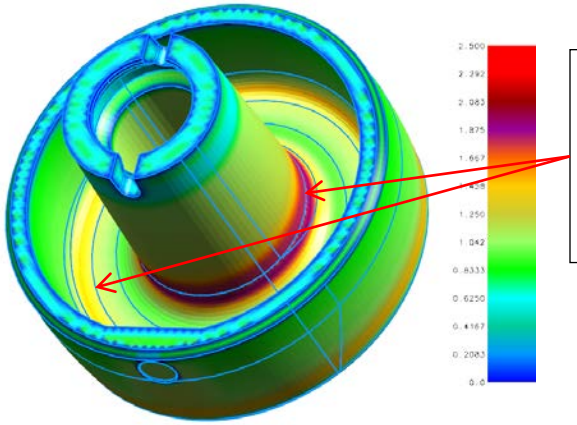
Section view

MODIFIED part



Wall Thickness Analysis

ORIGINAL part



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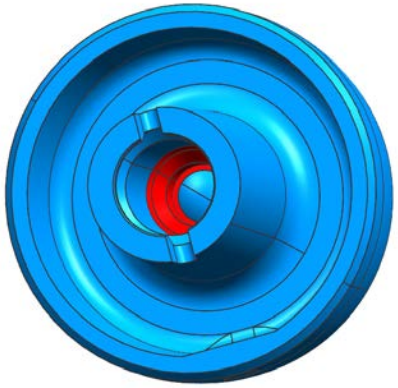
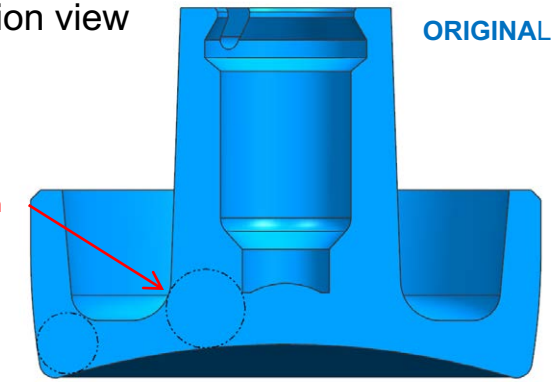


Section view

ORIGINAL part

Ø 2.0 mm

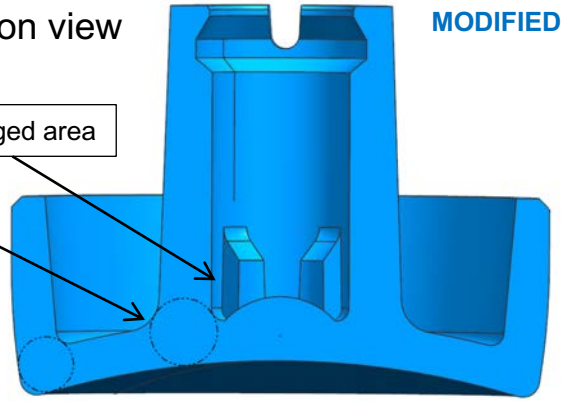


Section view

MODIFIED part

Changed area

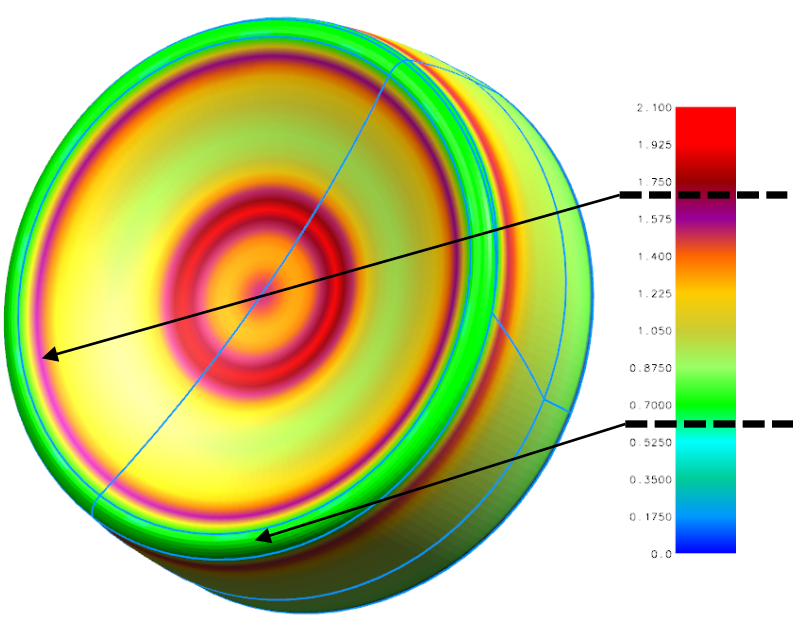
Ø 1.5 mm



Analysis Result

Advantage thickness is reduces with 0,24 mm

ORIGINAL part

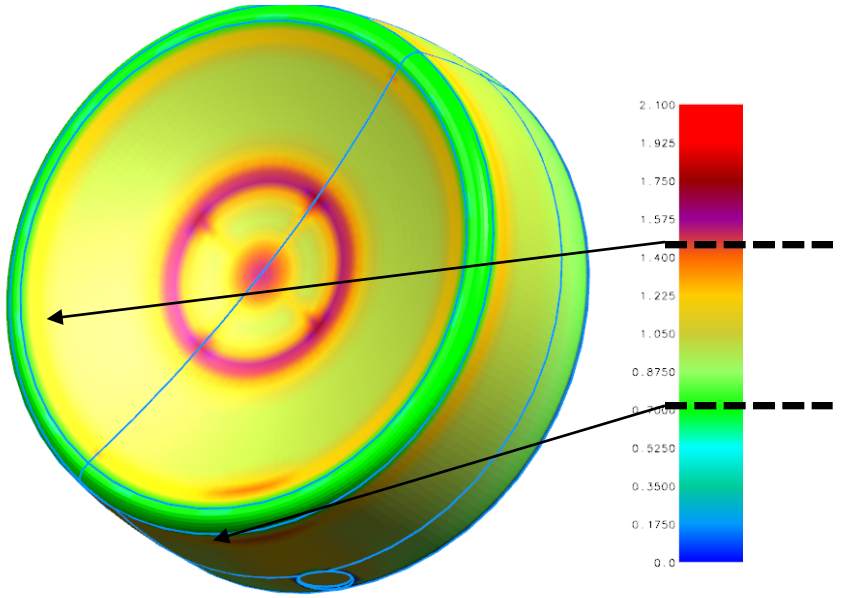


Overall Results

Average Thickness: 1.01321

Maximum Thickness: 2.0051

MODIFIED part



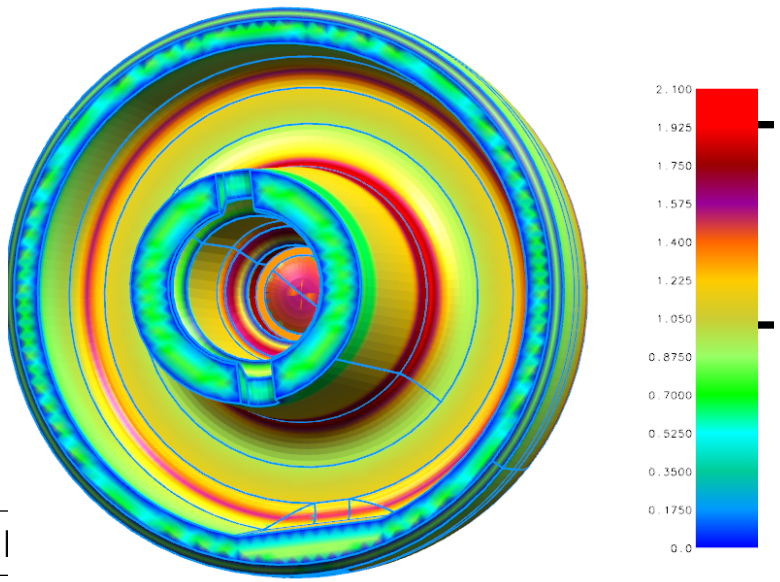
Overall Results

Average Thickness: 0.942148

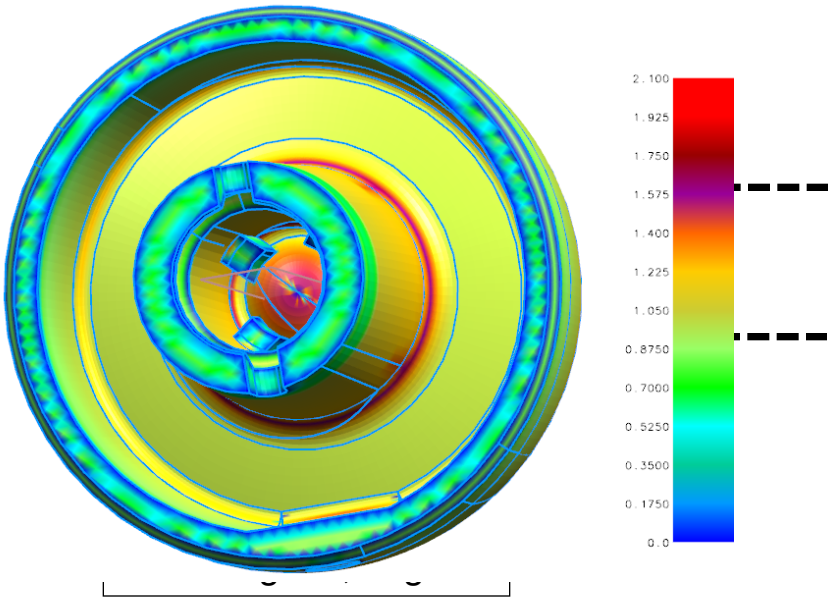
Maximum Thickness: 1.71812

Analysis Result

ORIGINAL part



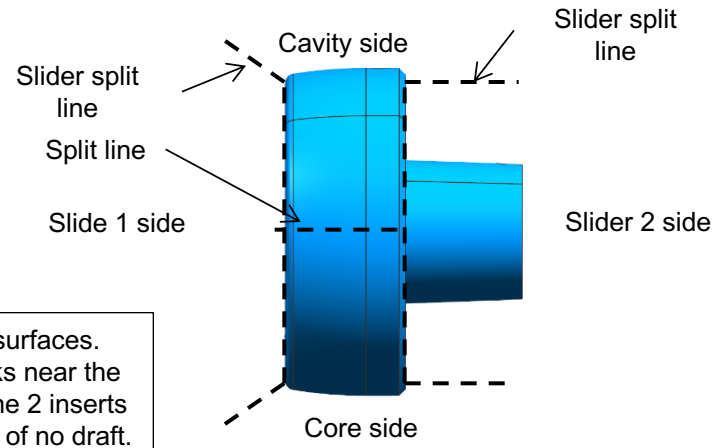
MODIFIED part



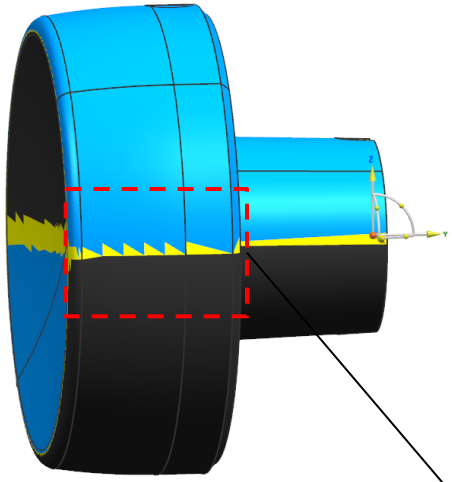
- Theoretical cycle time reduction based on part thickness optimization is app. 1 sec. see Mold flow results. (next 3 slides).
- 0,08 gram less material used for the modified part. 80 Ton material saved on 1.000.000.000 parts !

Draft Analysis From Cavity Side

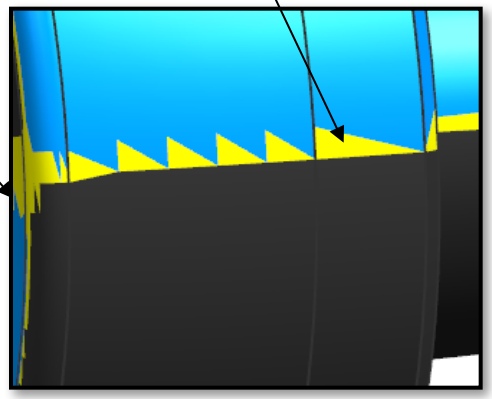
Blue surfaces = cavity side
Yellow surfaces = No draft or below 0,5 degrees



ORIGINAL part

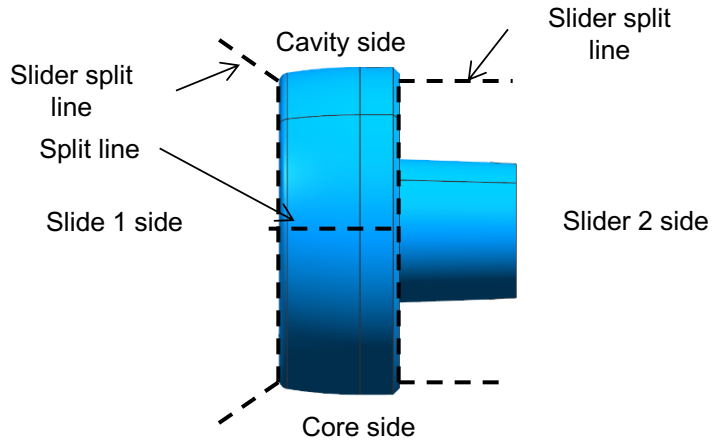


No draft on yellow surfaces. Can give scratch marks near the parting line between the 2 inserts (yellow area) because of no draft.

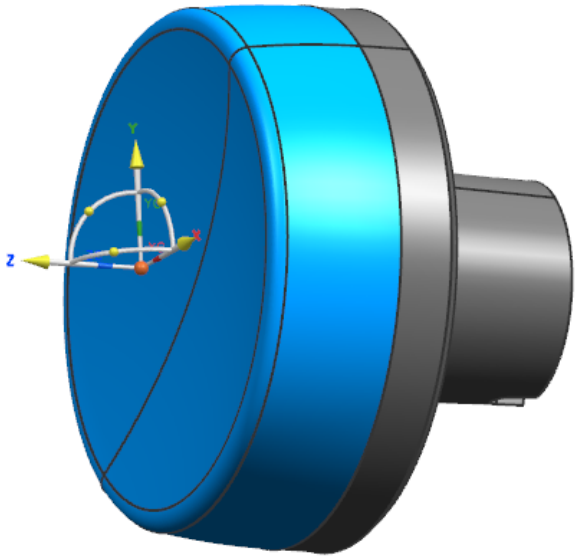


Draft Analysis From Slider 1

Blue surfaces = slider 1 side
Yellow surfaces = No draft or below 0,5 degrees



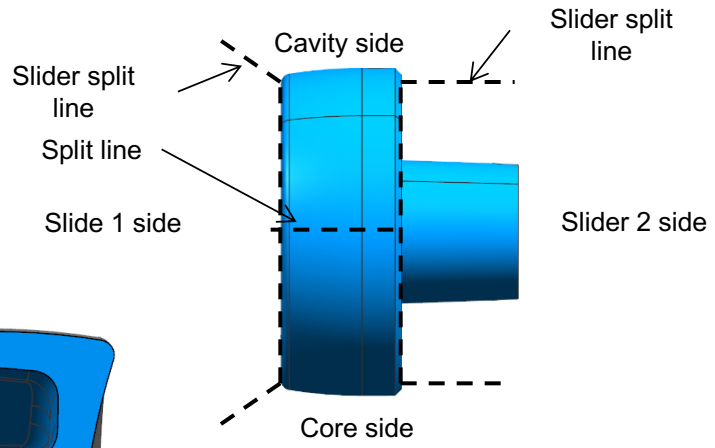
ORIGINAL part



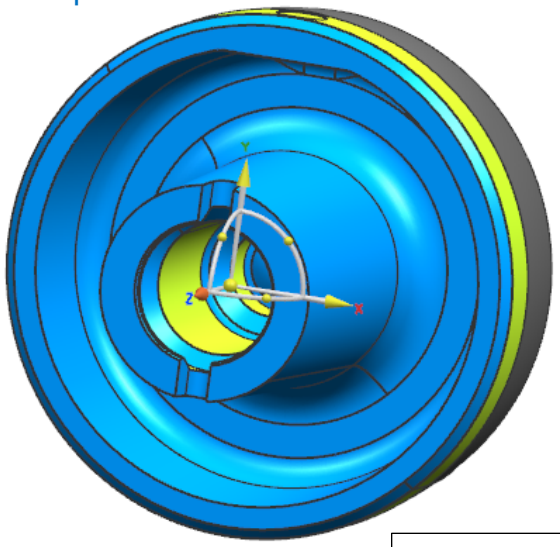
Draft in slider 1 direction is ”OK”

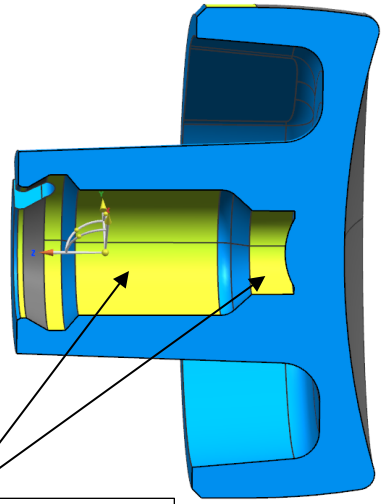
Draft Analysis From Slider 2

Blue surfaces = cavity side
Yellow surfaces = No draft or below 0,5 degrees



ORIGINAL part



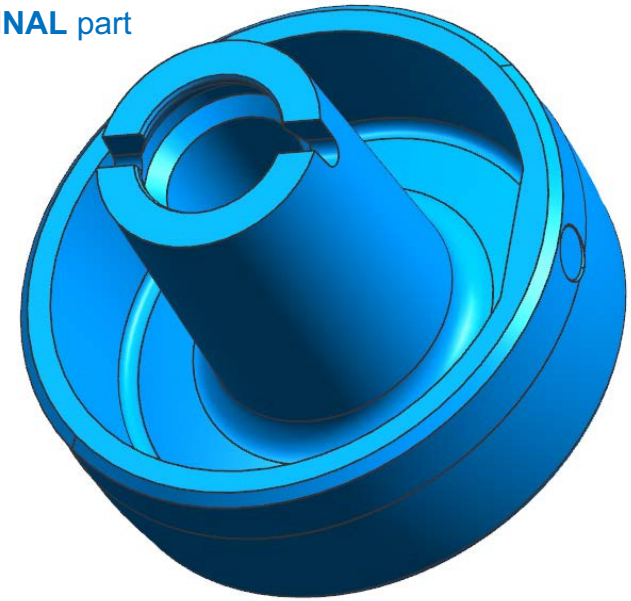


No draft on yellow surfaces will give scratch marks.

Suggest to add 0,5 / 1,0 draft to this surface

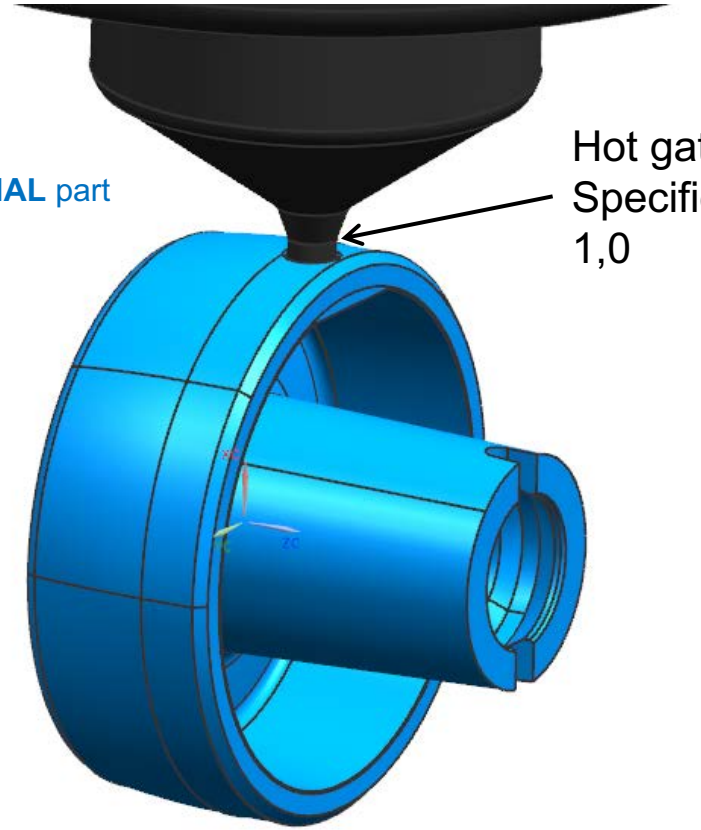
General Remarks

ORIGINAL part



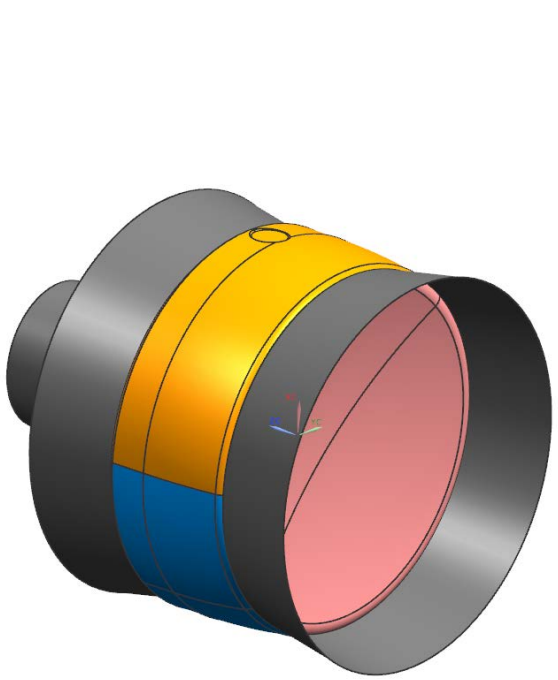
Generally the part has a relatively large wall thickness. This will have big impact on cycle time because of higher cooling time.
If part is demolded while the part is to hot, part will be pulled out of shape.
(pulled LONGER)

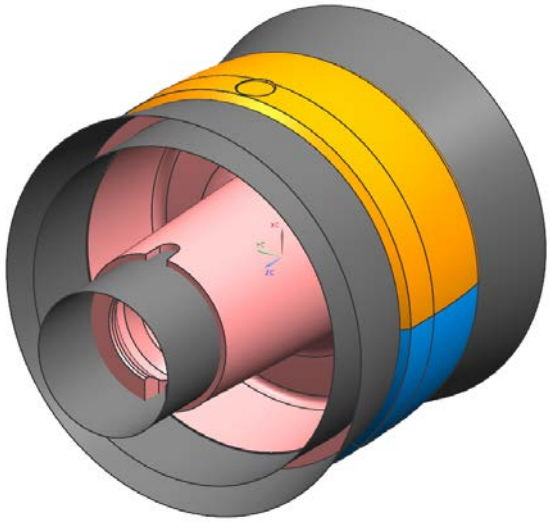
Gate Location

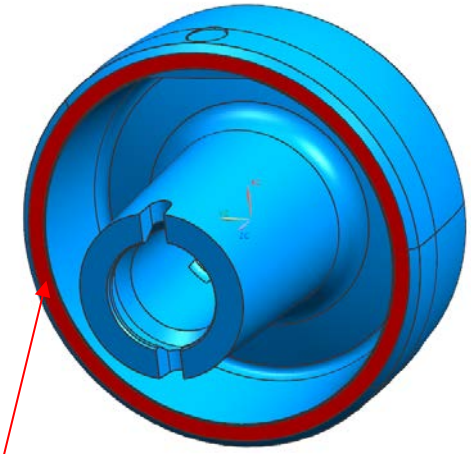


Detail Parting Line

Black Surfaces indicate the flash direction.
Blue is MH, yellow is FH, Pale Dull Red is Slider







Ejector surface (red)

Conclusion

Part optimizing: Theoretical cycle time reduction with reference in 13 degrees surface temp. based ***only*** on part optimization shows “only” app. 1 sec. However the shrinkage marks will be improved as well as controlling the length doing demolding is an issue today, the cycle time optimization can be expected to be more than 2 sec. in reality, plus a material saving of 0,08 gram (40 Ton material per year)