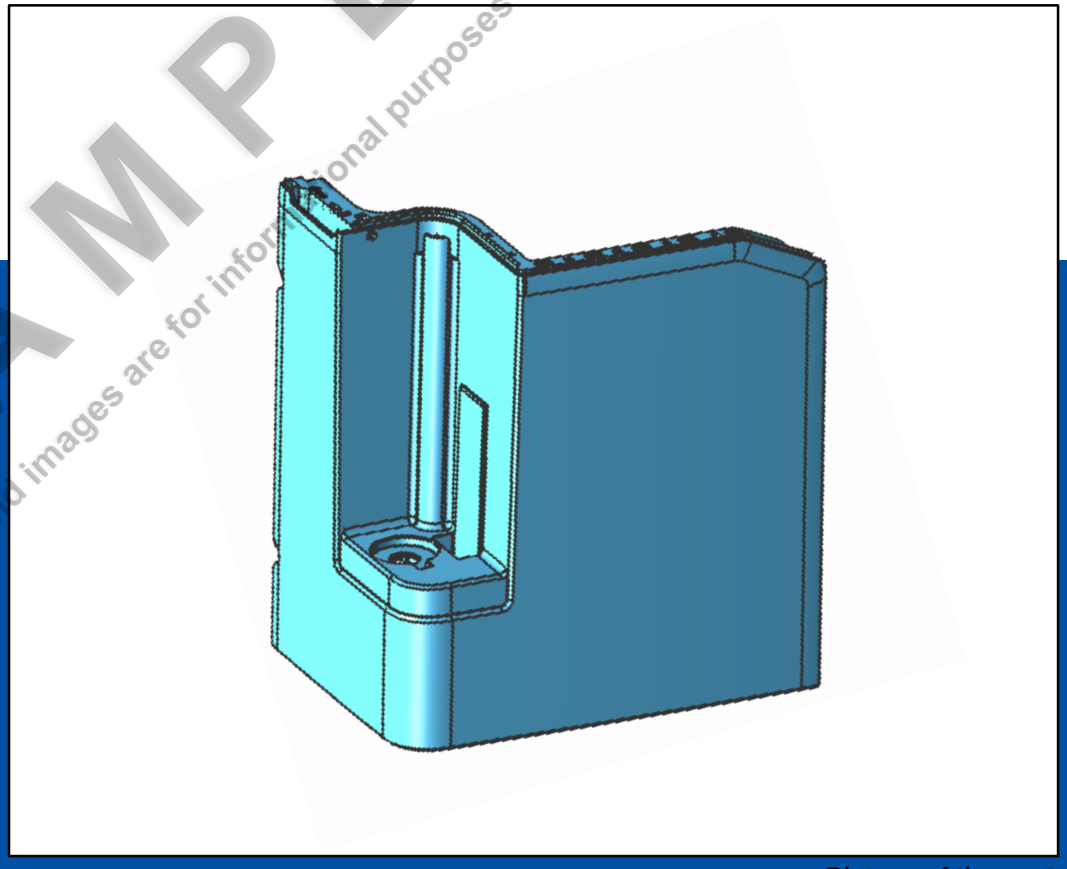
B/S/H/

DFM Report



Picture of the part:

1.1 Project & DFM Information

B/S/H/

Basic Part Data					
Language: Preferred language to fill in the DFM Report is English. Usage of other language is applicable if upfront agreed with BSH					**EN**
End Customer		**BSH**		**Mould BSH Serial No**	**4059953**
Project Name		**TE300**		**Planned Machine (T)**	**500**
Part Name		**L-Housing 30**		**Cavities**	**2**
Part material		**PA Durethan BKV30F 000000**		**Part CQP Clasification** [A, B, C]	**B**
CAD No. / Rev.-Status		**60100000004224**	**B1-T**	**Submission Date**	**27.03.2016**
Contact (s)	**Part**	**Novak**	**Janez Novak, janez.novak@bshg.com , +386 (3) 8311-111**		
	Tool	**Zorec**	**Ivan Zorec, ivan.zorec@bshg.com, +386 (3) 8322-222**		
	Project	**Name3**	**Name, Mail, Telephone**		

Mould Maker Data				
Customer (if not BSH)	**Eurel**	**Basic Tool Dimensions (BHT)**	**296x346x343**	
Mould Maker	**Shanghai Weihong**	**Injection system**	**Cold runner system**	
Mould Designer (contact1)	**John Doe, Mail, Telephone**		**Injection Moulding Machine Clamping Force** [kN]	**5000kN**
Other Contact (s)	**Name1, Mail1, Telephone1**		**Shot volume with sprue** [cm³] (Foreseen value)	**56,5ccm**
	Name2, Mail2, Telephone2			
DFM Report Responsible (contact2)	**John Doe, Mail, Telephone**		**Submission Date** (Date of last revision sent to BSH)	**28.04.2016**

1.2 Table of contents

B/S/H/

	Chapter	Topic	Requested		Done and Confirmed	
			For Quotation	After Tool Order	Supplier Finished [B]	Datum OK Customer Confirmed [A]
1. Project	1.1	Project & DFM Information	✓	✓	YES	Novak, 2016-04-25
	1.2	Table of contents	✓	✓	YES	Novak, 2016-04-25
2. Product Info	2.1	Part and tool basic data	✓	✓	YES	Novak, 2016-04-25
	2.2	Mould cavity Layout	✓	✓	YES	Novak, 2016-04-25
	2.3	Gate Location and Type PROPOSAL	✓	✓	YES	Novak, 2016-04-25
3. Parting Lines	3.1	Cavity & Core main parting lines definition	✓	✓	YES	Novak, 2016-04-25
	3.2	Slider & Lifter core Location and parting line definition	✓	✓	YES	Novak, 2016-04-25
	3.3	Ejector pin Location Proposal	✓	✓	YES	Novak, 2016-04-25
	3.4	Venting of critical areas	✓	✓	YES	Novak, 2016-04-25
4. Draft	4.1	Draft Analysis	✓	✓	YES	Novak, 2016-04-25
5. Drawing Analysis (2D)	5.1	Analysis of Control Dimension, Tolerances, Surface finish,…	✓	✓	YES	Novak, 2016-04-25
6. Cooling	6.1	Cooling Channel Proposal & cooling of cavity inserts and critical areas	For Quotation not Requested	✓	YES	Zorec, 2016-04-28
7. Improvement proposals	7.1	Product / Mould Improvement Proposals		✓	YES	Novak, 2016-04-25
8. Product Engrave	8.1	Cavity No. typ, size and Location		✓	YES	Novak, 2016-04-25
	8.2	/		✓	YES	Novak, 2016-04-25
	8.3	Adjustable model version sign typ, size and Location		✓	YES	Novak, 2016-04-25
9. Mold flow analysis	9.1	Input data for mold flow analysis , mesh and material parameters		✓	YES	Zorec, 2016-04-28
	9.2	Fill time		✓	YES	Zorec, 2016-04-28
	9.3	Pressure drop Mold flow analysis		✓	YES	Zorec, 2016-04-28
	9.4	Weld Lines		✓	YES	Zorec, 2016-04-28
	9.5	Air Traps		✓	YES	Zorec, 2016-04-28
	9.6	Sink Marks		✓	YES	Zorec, 2016-04-28
	9.7	Warping		✓	YES	Zorec, 2016-04-28
	9.8	With Cooling		See *CRITERIA	no	/
10. Remarks	10	Other remarks		✓	no	/

***CRITERIA:** (Classification A,B,C - see BSH data on pg.1)*

1. ***For A parts:*** → ***Necessary***
2. ***For B and C parts:*** → ***If without cooling process part warps more than are allowable tolerances on drawing then COOL-analysis HAS TO BE PERFORMED***

A … *filled in by BSH*
B … *filled in by supplier*

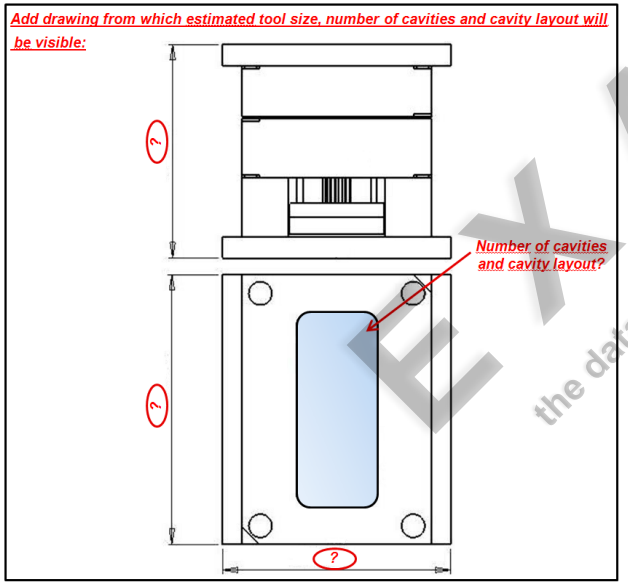
2.1 Part and Tool basic data

Short description of Mold.	**Hot-runner mould**			
Confirmation:	Tool can be used on 1st page planned moulding machine	**DEMAG 500t**	**Cavity Steel**	**1.2343 HRC52-54**
Type of Gate		**Tunnel gate**	**Core Steel**	**1.2343 HRC52-54**
No. of Cavity		**1*1**	**Slider Steel**	**1.2343 HRC52-54**
No. of Injection Points		**1*1**	**Lifter Steel**	**1.2343 HRC52-54**
Estimate Part Weight (g)		**520g**	**Coating of cores and cavities**	**none**
Mold Shrinkage		**1.0052**	**Resin (Color Additiv)**	**ABS+MB**
			Estimated Runner Weight (g)	**---**

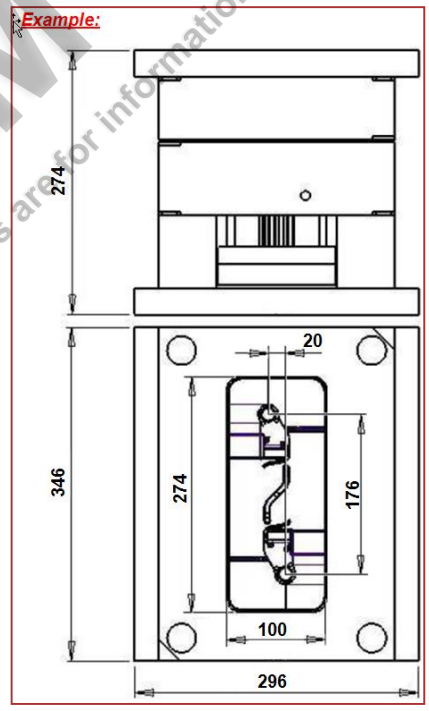
2.2 MOULD CAVITY LAYOUT

(sketch can be used here)

Add drawing from which estimated tool size, number of cavities and cavity layout will be visible:



Example:



On injection moulding tool concept show:

- number of cavities;
- layout of cavity inserts;
- tool orientation on the moulding machine.

Mark upper (Top) side of tool.

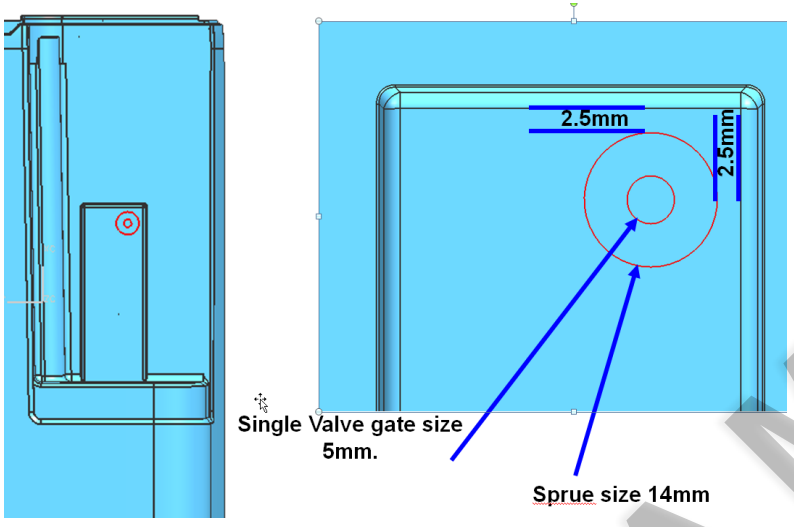
BSH Decision/Comments

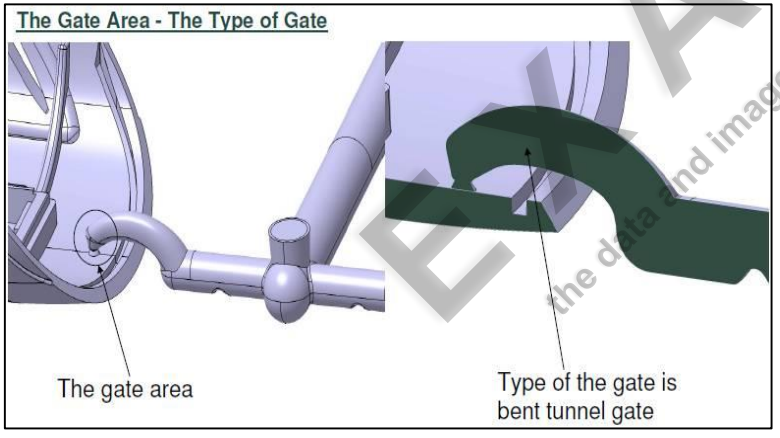
OK / **NOK**
Name,
dd.mm.yy

2.3 Gate location and Type Proposal

B/S/H/

Example:





Describe and show:

- sprue type;
- position of sprue-point;
- size of sprue-point;
- impact of sprue-point on part geometry (calotte, etc.);
- in case of more complex injection system, calculation of pressure-drop through cavity and hot-runner system must be performed. (For TOOL ORDER ONLY!);
- dimension`s of cold runner system (see picture below) (For TOOL ORDER ONLY!).

BSH Decision/Comments
OK / NOK Name, dd.mm.yy

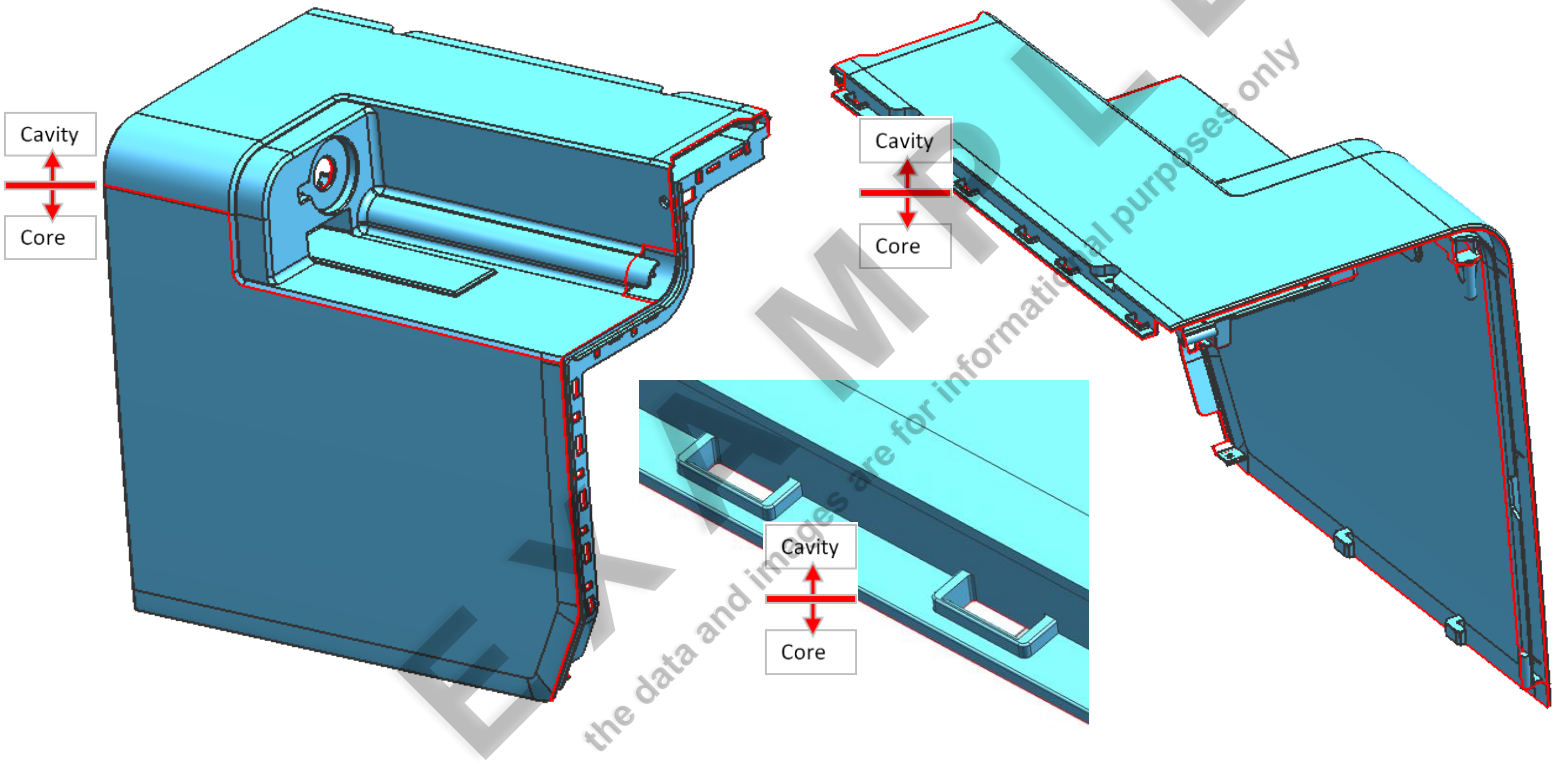
3.1 Cavity & Core main parting lines definition

B/S/H/

Example:

Describe and show:

- main parting lines



BSH Decision/Comments
OK / NOK Name, dd.mm.yy

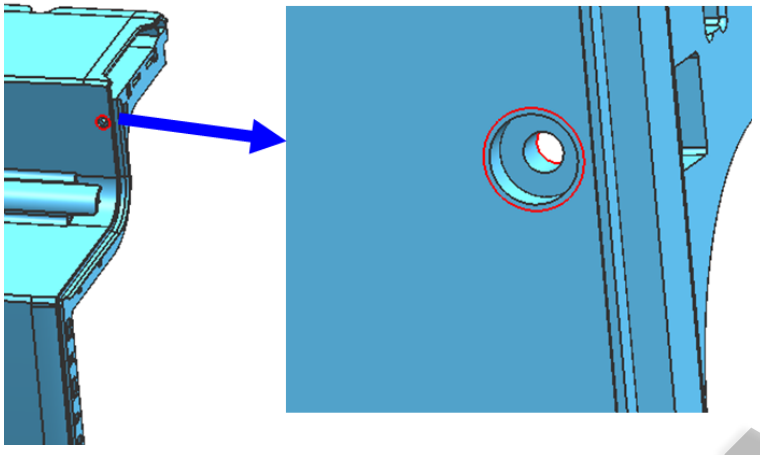
3.2 Slider & Lifter cores Location and parting line definition

B/S/H/

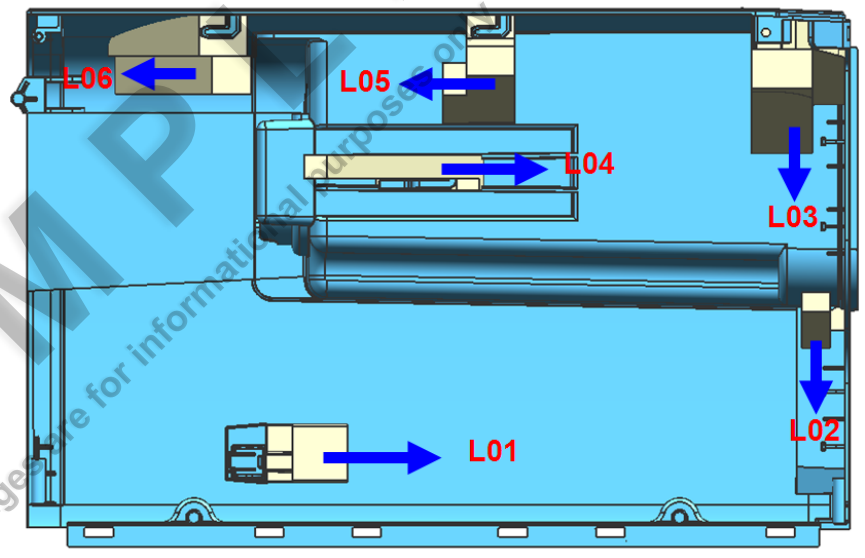
Example:

Describe and show:

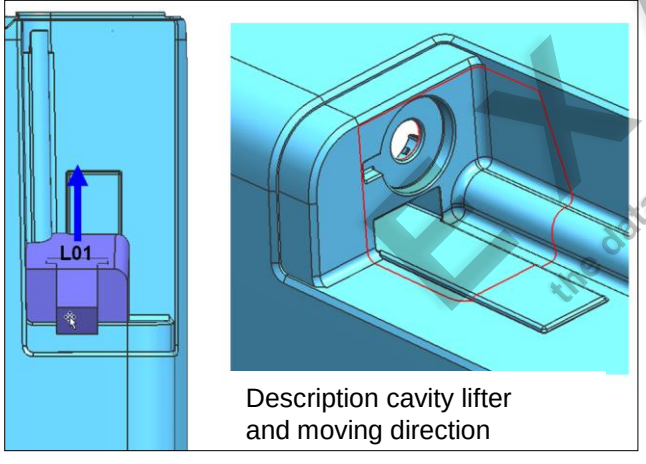
- all slider parting lines;
- show lifters and moving directions.



Description of slider parting line



Description of 6 core lifters and moving direction



Description cavity lifter
and moving direction

BSH Decision/Comments
OK / NOK Name, dd.mm.yy

3.3 Ejector pin Location Proposal

B/S/H/

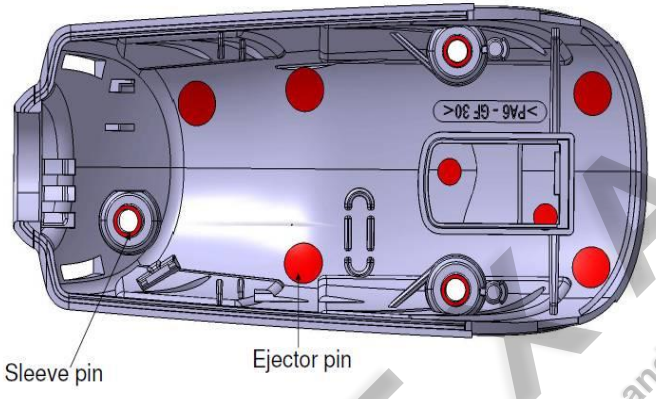
Important: If ejectors are below side cores, they must be mechanical protected and this principle must be shown here.

Describe and show:

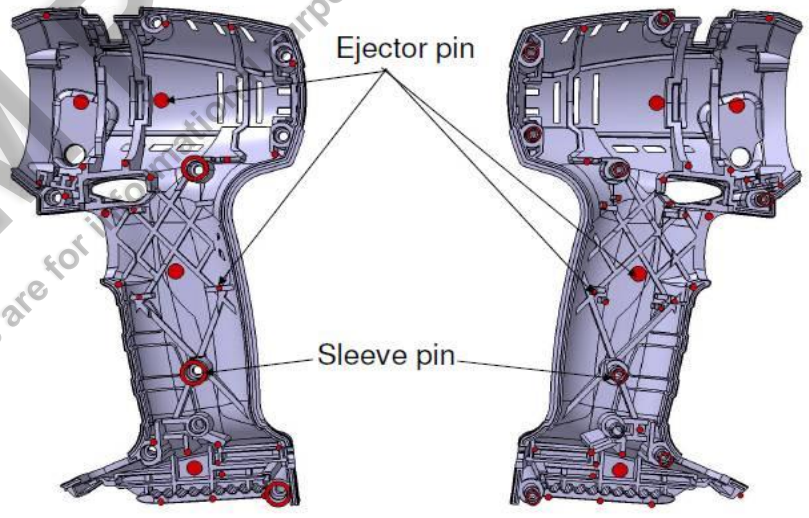
- show position and marks of ejectors and protection of ejectors under side cores

Examples:

The Ejector Area – Type of Ejector



The Ejector Area – Type of Ejector



BSH Decision/Comments
OK / NOK Name, dd.mm.yy

3.4 Venting of critical areas:

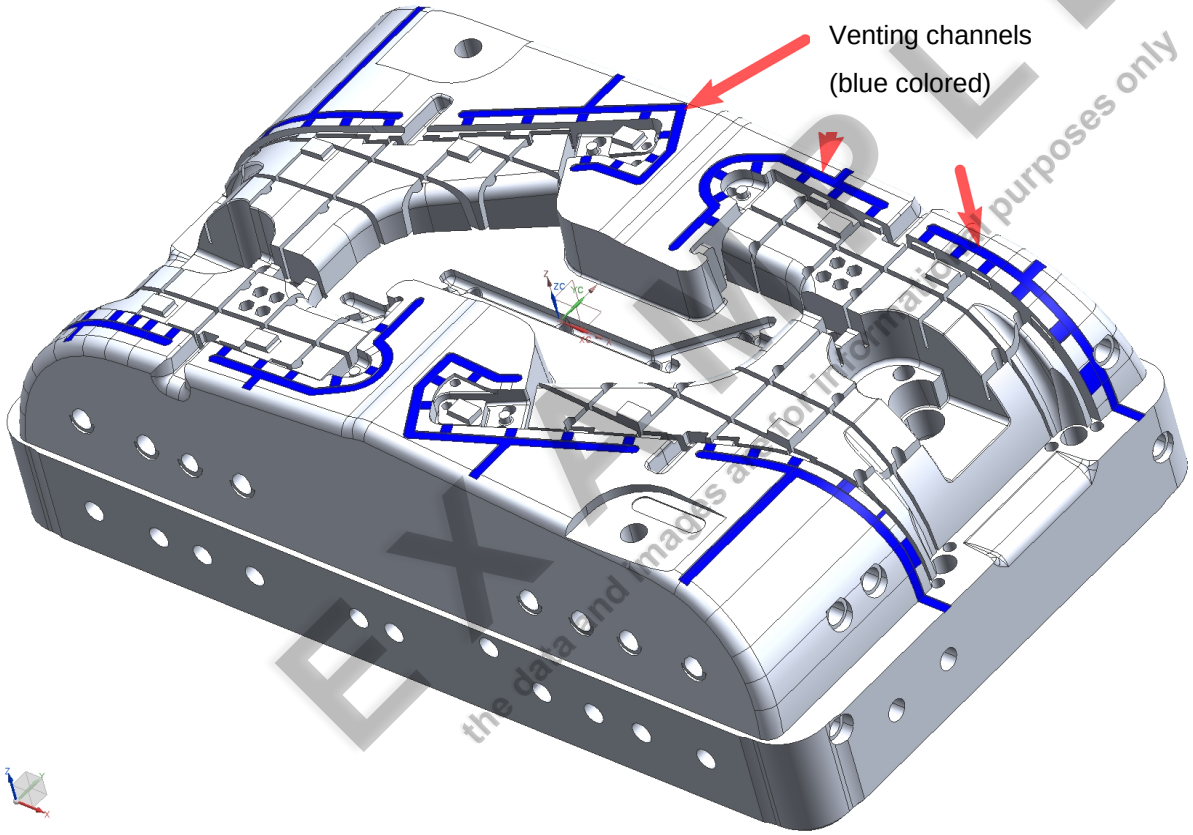
B/S/H/

(for Quotation sketch can be used here)

Show the way of venting critical areas regarding to:

- part geometry;
- analysis of air traps presence;
- filling analysis.

Example:



BSH Decision/Comments
OK / NOK Name, dd.mm.yy

4.1 Draft analysis

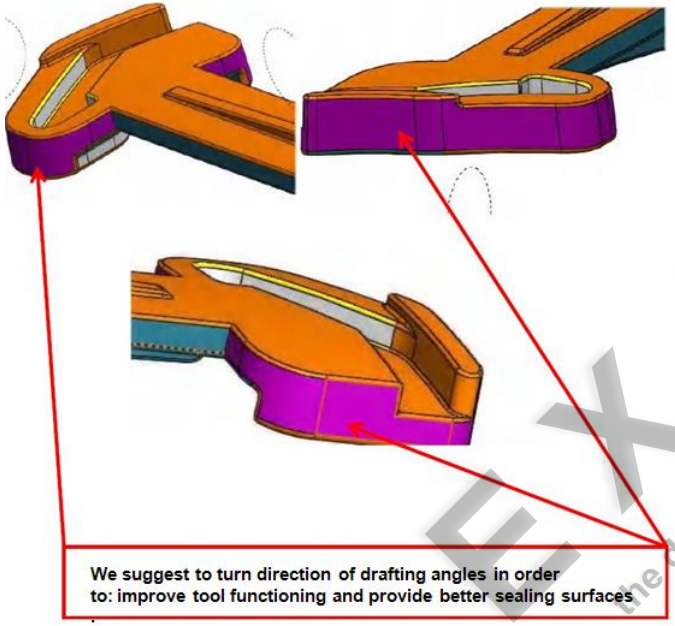
B/S/H/

Show influence of drafting angles on:

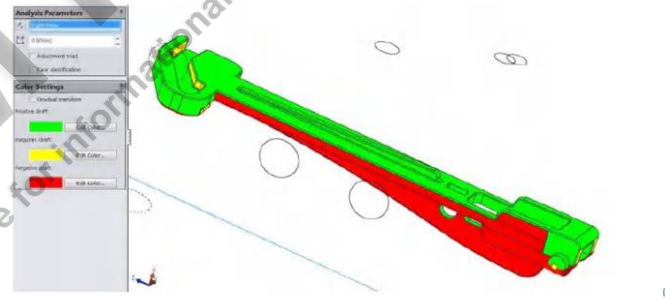
- shape, surface structure and for demolding;
- give potential recommendations for modification of drafting angles on part.

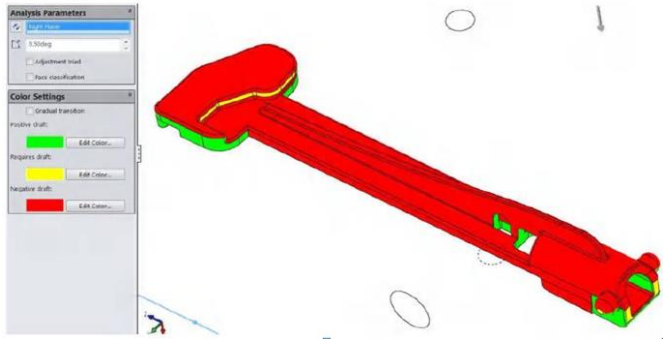
Example:

Recommendation for modification of drafting angles on the part:



Analysis of drafting angles on the part:





BSH Decision/Comments
OK / NOK Name, dd.mm.yy

5.1 Analysis of Control Dimension, Tolerances, Surface finish,…

B/S/H/

If proposal for drawing change exist it must be clarified and confirmed here.

Check 2D drawing characteristics and specially:

- control dimension analysis;
- tolerance analysis;
- how to reach the requirements?
- changeable inserts / separate inserts?!?
- surface finish analysis.

BSH Decision/Comments
OK / NOK Name, dd.mm.yy

6.1 Cooling Channel Proposal & cooling of cavity inserts and critical areas

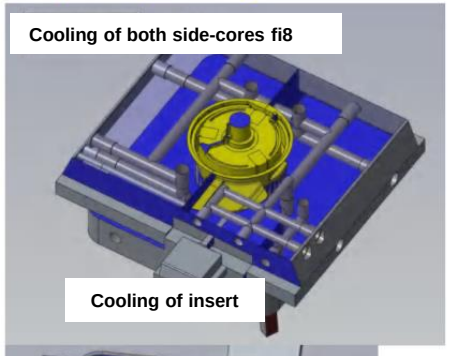
B/S/H/

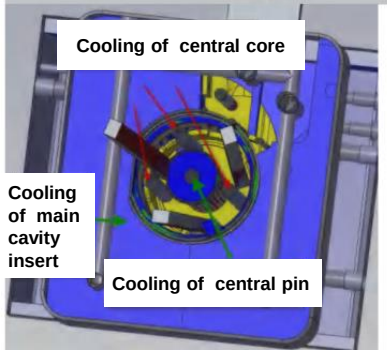
Show implementation of:

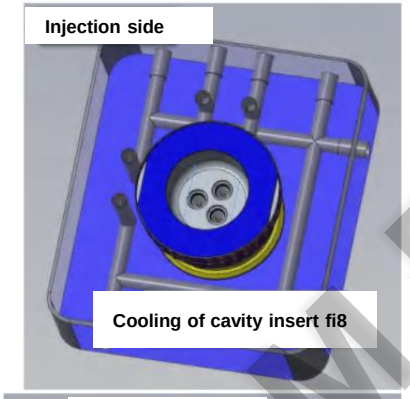
- cooling;
- cavity inserts (injection side & ejection side);
- critical areas (baffle plates, spiral core, etc.);
- cooling of hot-runner system;
- tool housing;
- dimension of the cooling system (e.g. diameter, distance, etc.).

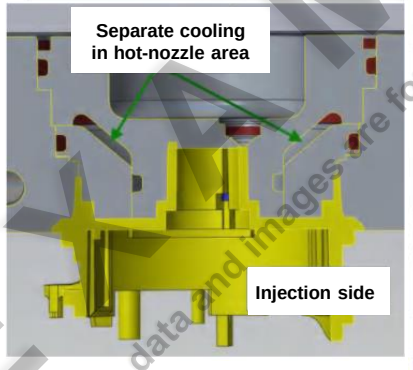
Examples:

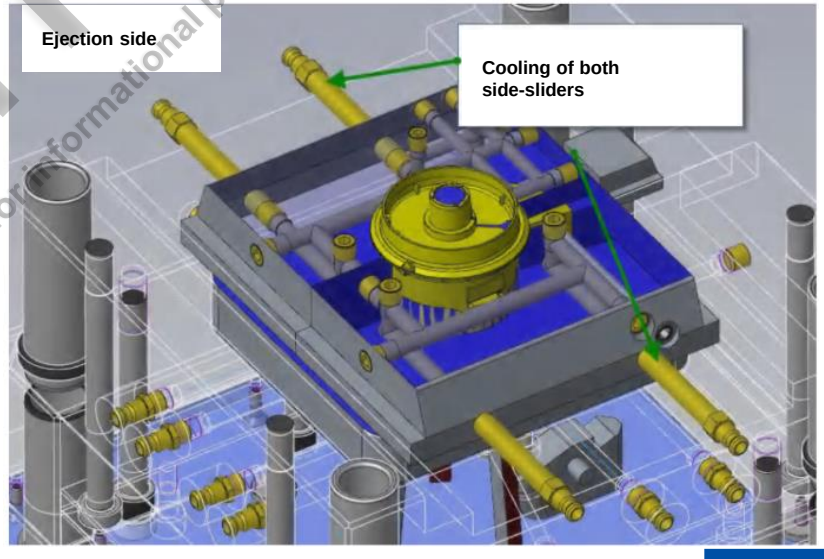
Temperiranje / Cooling:











BSH Decision/Comments
OK / NOK Name, dd.mm.yy

7.1 Improvement Proposals

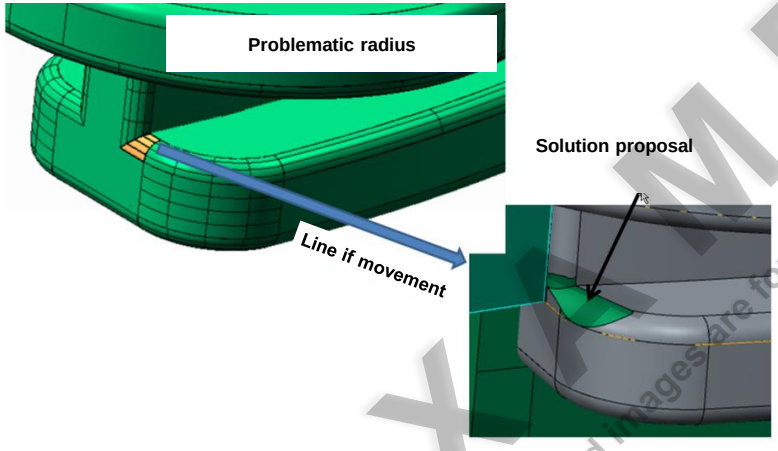
B/S/H/

Describe and show proposals e.g.:

- undercut Improvement Proposal;
- mould Improvement Proposal;
- cavity & Core Draft Angle Improvement Proposal;
- slider & Lifter Draft Angle Improvement Proposal.

Undercut Improvement Proposal 1

Examples:



BSH Decision/Comments
OK / NOK Name, dd.mm.yy

8 Product Engrave, Sign type size and location

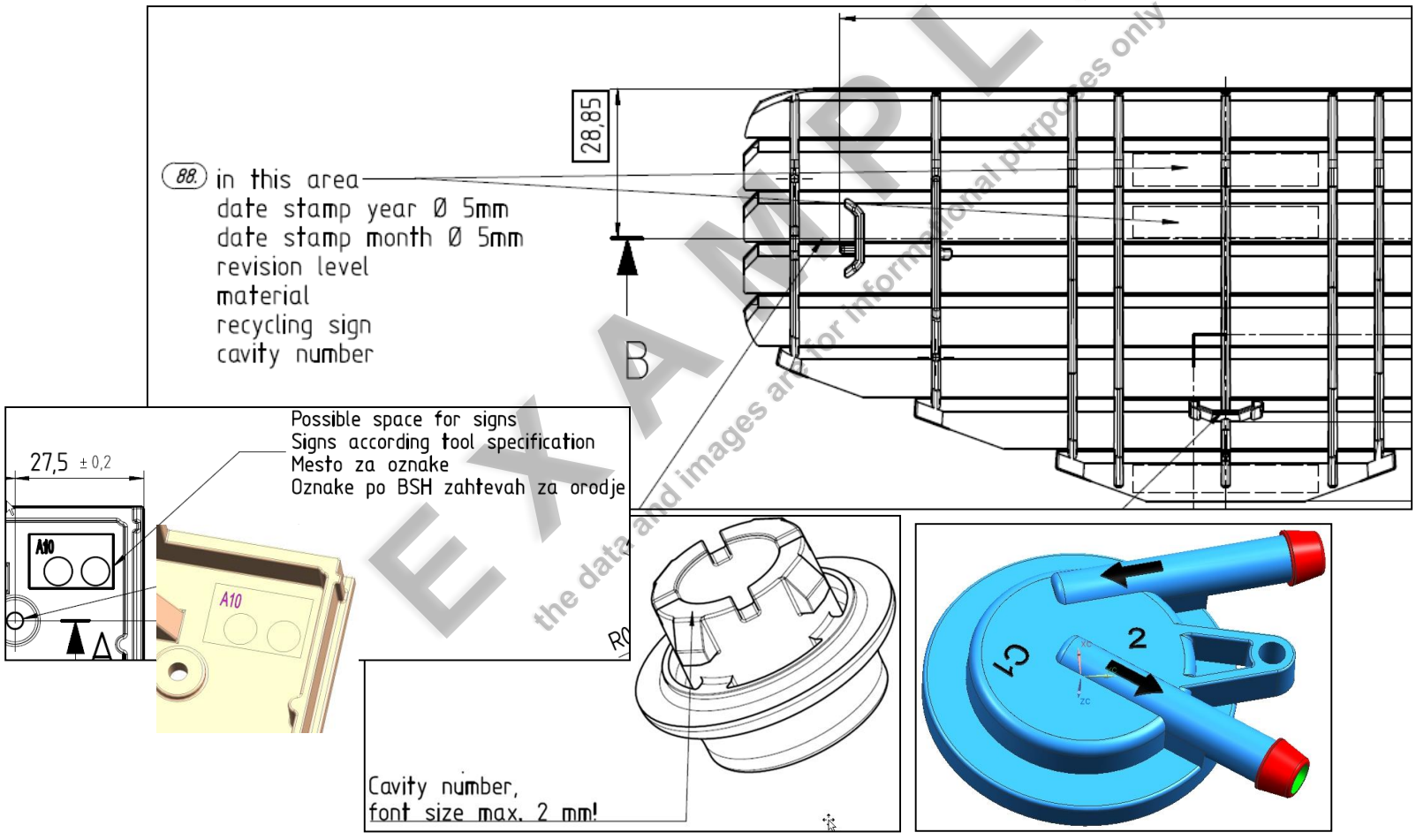
B/S/H/

Confirmation whether proposed place for signs is suitable regarding injection moulding-tool concept. If not, here show proposal for other location.

Check 2D drawing demands:

8.1 cavity no. type, size and location
8.2 adjustable date sign type, size and location
8.3 adjustable model version sign type, size and location

Examples:



BSH Decision/Comments
OK / NOK Name, dd.mm.yy

9 Mold flow analysis

B/S/H/

Mold Flow Analysis Report should be a separate report, prepared in detailed and professional manner. See points 9.1÷ 9.8

This file or files must be attached to this DFM Report.

Restriction:

A mesh match percentage of **85%** or higher is acceptable for a Dual Domain Fill+Pack analysis. A percentage of 50% or lower will cause the Fill+Pack analysis to abort. For a Dual Domain Warp analysis, the mesh match percentage should exceed **85%**.

9 Mold flow analysis:

9.1 Input data
9.1.1 mesh (parameter)
9.1.2 material, process parameter (mold, barrel, hot runner temperature, e.g.)
9.2 fill time
9.3 pressure drop
9.4 weld lines
9.5 air traps
9.6 sink marks
9.7 warping
9.8 cool FEM analysis

	File name	Sent: Datum
DFM Report Attachment 1	**DFM_MF_4059953_001. pdf**	**2017-04-26**
DFM Report Attachment 2		
DFM Report Attachment 3		
DFM Report Attachment 4		

BSH Decision/Comments

OK / NOK
Name,
dd.mm.yy

10 OTHER REMARKS [B]

B/S/H/

Fill in other remarks or proposals that are important for achieving manufacturing process as foreseen with the requirements.

BSH Decision/Comments
OK / NOK Name, dd.mm.yy

IMPORTANT NOTE: If there are no remarks to the technical requirements or other related documentation submitted by BSH, it is assumed, that supplier confirms to achieve required product, tool and process specifications.