Moldflow Analysis Report

CASE  MF Report of pipe connector
ANALYSIS AIMS

- To analysis original design, and check flow, cooling, and warpage.
Plastic Material Introduction

**PA66 Ultramid A3K : BASF**

The customer not supply the grade of material, we choose a general material.

1. Melt Density 0.94627 g/cu.cm
2. Solid Density 1.1322 g/cu.cm
3. Ejection Temperature 180 deg.C
4. Recommended Mold Temperature 50 deg.C
5. Recommended Melt Temperature 290 deg.C
6. Absolute Max. Melt Temperature 300 deg.C
7. Melt Temperature Minimum 280.0 deg.C
8. Melt Temperature Maximum 300.0 deg.C
9. Mold Temperature Minimum 40.0 deg.C
10. Mold Temperature Maximum 60.0 deg.C
11. Maximum Shear Rate 60000.00 1/s
12. Maximum Shear Stress 0.500 MPa

Viscosity model

Specific Volume vs Temperature

PVT profile
The mostly wall thickness of part is imbalance shown by picture.
1X4 cavities, two plate mold, Cold runner + Pin gate, the size is shown by picture.
Cooling system design is shown in the picture, the diameter of all channels is 6, 8, 10mm, and the diameter of bubblers is 4-6mm.
Processing conditions

Filling Conditions:
Mold temperature: **50.00** deg.C
Melt temperature: **290.00** deg.C
Injection time: **1.5** sec

Cooling Conditions:
Coolant Temperature (Cavity): **40** deg.C
Coolant Temperature (Core): **40** deg.C

Packing Profile:
- Packing pressure at 80% Max. injection pressure

<table>
<thead>
<tr>
<th>PRESSURE [MPa]</th>
<th>STEP DURATION [sec]</th>
</tr>
</thead>
<tbody>
<tr>
<td>32.5</td>
<td>0.0</td>
</tr>
<tr>
<td>32.5</td>
<td>10.0</td>
</tr>
</tbody>
</table>
Temperature (top), part

Top temperature of part is balance shown by picture.
Temperature (bottom), part

Bottom temperature of part is balance shown by picture.
Fill time

Shown by picture is the filling status, flow is balance.
Fill time series
Temperature at flow front

Temperature at flow front is balance shown by picture.
Air traps

The magenta circles are possible air traps shown by picture, please attention venting.
Weld lines

The black lines are possible weld lines.
Volumetric shrinkage

Volumetric shrinkage is imbalance shown by the picture, please pay attention to the setting of packing.
Frozen layer fraction

- Time = 1.479[s]
- Time = 2.888[s]
- Time = 4.388[s]
- Time = 5.888[s]
- Time = 7.138[s]
- Time = 11.49[s]
Injection Pressure & Clamp Force

Pressure at injection location: Max.: 40.7MPa

Clamp Force: Max.: 6.8ton
Deflection – X direction

Deflection of X direction is balance, cause warp is little.
Deflection – Y direction

Deflection of Y direction is balance, cause warp is little.
Deflection – Z direction

Deflection – Z direction is balance, cause warp is little.
Summary

The results:

- The flow status is balance, the injection and packing pressure are normal.
- The volumetric shrinkage is imbalance, please attention the setting of packing.
- The deflection of X&Y&Z direction is balance, cause warp is little;