

Mold flow analysis service

Mold flow analysis description

Up to customer's requirement, we provide the custom mold flow analysis service.

Before making the mold design, through the mold flow analysis, customer can optimize their parts design by checking the material filling, deformation, shrinkage, welding line, temperature, shear stress, hot runner layout...etc to de-bug the parts design mistake, to simplify the manufacturing process and to raise up the positive productivity rate.

The following are some examples...of our mold flow analysis service contents.

Mold flow analysis – data of parts :

Customer requirements		
	Product 3D	Gate location
New project	122-090P4-3D(150506)	母模1點開放式熱噴GFSR57配合冷流道2處側進膠。(參考圖：090P4-1.jpg)
Design change		

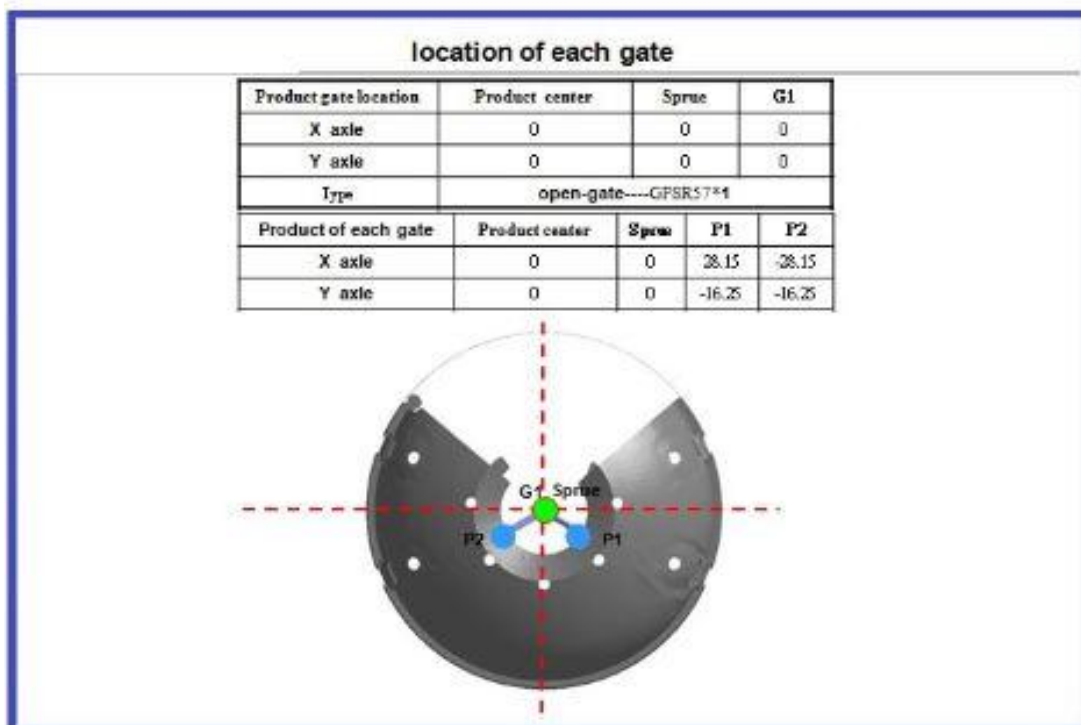
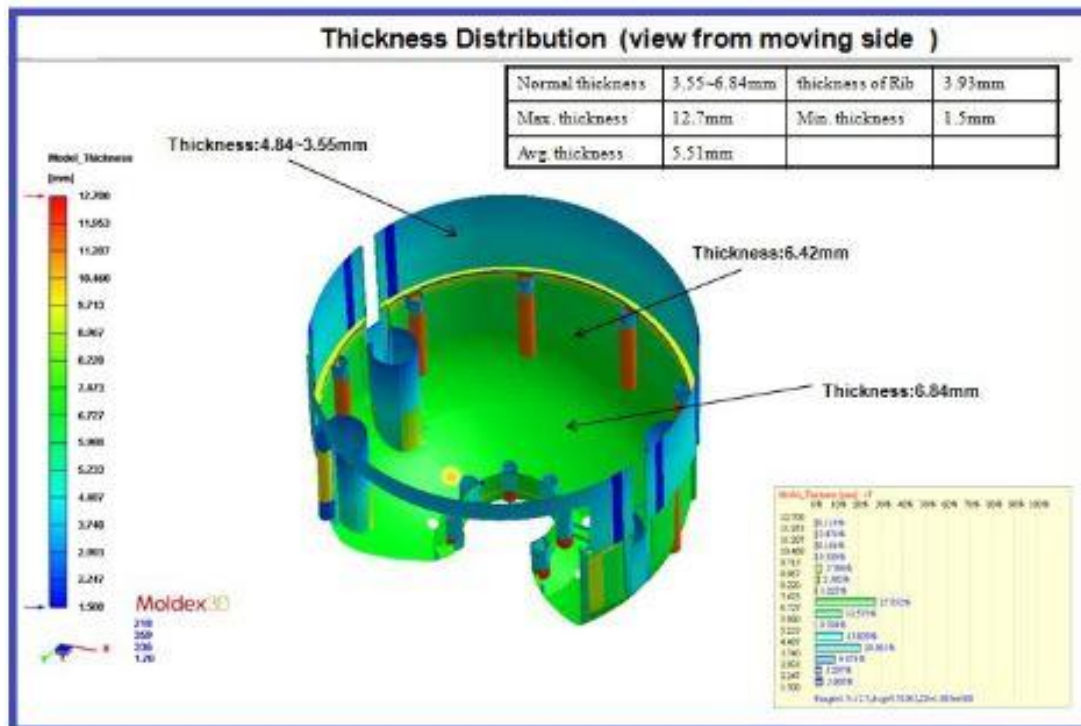
data of parts			
Information			
Size (mm) :	Length :	Width :	Height :
	273.5	273.5	219
Material :	PA66+GF30		
Alternative materials :	PA66_UltramidA3HG6HR		
Qty of cave :	1cavity / Mold		
Product Vol.(cc)	1102.20/Cavity		







Mold flow analysis – thickness distribution & gate location :



Mold flow analysis – gate size & hot runner layout :

Condition of injection machine (open/close)

Machine (Ton)	Injection Pressure(MPa)	Screw Diameter (mm)	Ram Position(mm)	Injection Velocity(%)
650	185	95	211-180-30-0	25-50-50-25
Melt Temperature(℃)	Mold Temperature(℃)	Cooling Channel(℃)	V/P switch-over (By volume(%) filled)	
290	85		98%	
Filling Time(sec)	Filling Pressure(MPa)	Packing Time(sec)	Packing Pressure(MPa)	Cooling Time(sec)
3.02	129.5	3.6	25.42	12

Project Settings | Filling/Packing Settings | Cooling Settings | Summary

Setting method: Machine made 1-by profile

In this mode, users can't set the injection time directly. The injection time is determined by flow rate profile and packing time settings.

Process File: W10070-A11000070_3.pro

Mold File: W10070-A1100000.moh

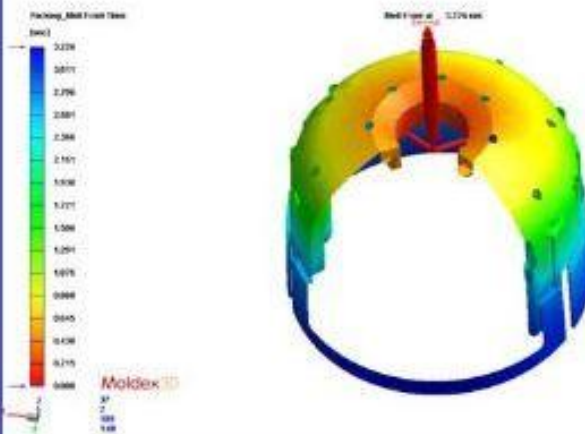
Material File: PAM_MaterialA1100000_1.mh

Machine Settings: TOSHIBA - G5000T 650A

Item	Content	Unit
Machine	TOSHIBA	
Grade	TOSHIBA T-09A	
Unit and/or date (yy/mm/dd)		
Comment		
Screw Diameter	95	mm
Screw Stroke	444	mm
Shot Weight	2900	g
Injection Pressure	185	MPa
Injection Rate	786	cm³/min
Clamping Force	650	kN

Melt front analysis 1 (animation) (open/close)

- Melt front advancement is a position indicator as melt front boundary movement in different time duration in the filling process. From the melt front advancement one can:
 - Examine the filling pattern of the molding
 - Check potential incomplete filling (short shot) problem
 - Identify weld line locations
 - Identify air trap locations
 - Check gate contribution for runner balance
 - Check proper gate location to balance flow and eliminate weldline.



Mold flow analysis – temperature & shear stress :

Bulk Temperature (open/close)

Bulk temperature is a velocity-weighted averaged temperature of plastic melt across the thickness at current instant. The convection from frozen layer that is stationary is ignored in this data. The effect of heat convection and viscous heating can be displayed from this data. Therefore, it can apparently demonstrate how heat convection affects the melt temperature and the temperature distribution of injection area and viscous heating area. Normally, bulk temperature distribution can reflect the trends or peaks of filling flow.

Material		PA66_UltramidA3HG6HR	
Freeze Temp.	277℃	Temp. Max.	300℃
Bulk Temp. min value	253℃		
Bulk Temp. max value	324℃		

Filling Bulk Temperature

Unit: °C

323.980
323.263
320.507
308.838
305.513
302.352
299.088
295.793
292.507
289.238
285.973
282.707
279.442
276.177
272.912
269.647
266.382
263.117
259.852
256.587
253.322

Moldex3D

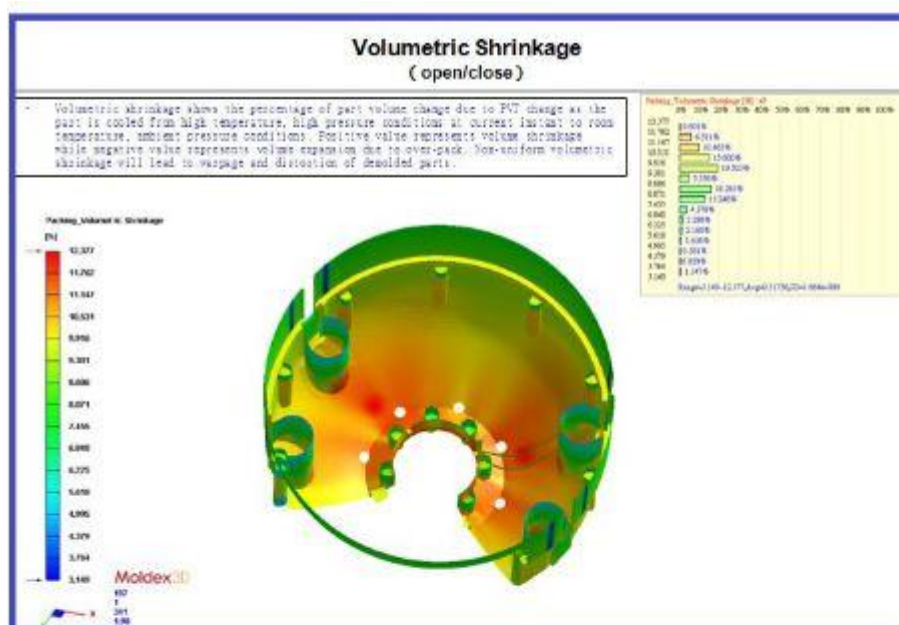
100
50
10

Filling Bulk Temperature List of

100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355	360	365	370	375	380	385	390	395	400	405	410	415	420	425	430	435	440	445	450	455	460	465	470	475	480	485	490	495	500																																																																																																																									
323.980	323.263	320.507	308.838	305.513	302.352	299.088	295.793	292.507	289.238	285.973	282.707	279.442	276.177	272.912	269.647	266.382	263.117	259.852	256.587	253.322	250.057	246.792	243.527	240.262	237.000	233.735	230.470	227.205	223.940	220.675	217.410	214.145	210.880	207.615	204.350	201.085	197.820	194.555	191.290	188.025	184.760	181.495	178.230	174.965	171.700	168.435	165.170	161.905	158.640	155.375	152.110	148.845	145.580	142.315	139.050	135.785	132.520	129.255	125.990	122.725	119.460	116.195	112.930	109.665	106.400	103.135	99.870	96.605	93.340	90.075	86.810	83.545	80.280	77.015	73.750	70.485	67.220	63.955	60.690	57.425	54.160	50.895	47.630	44.365	41.100	37.835	34.570	31.305	28.040	24.775	21.510	18.245	14.980	11.715	8.450	5.185	1.920	-1.345	-4.610	-7.875	-11.140	-14.405	-17.670	-20.935	-24.200	-27.465	-30.730	-33.995	-37.260	-40.525	-43.790	-47.055	-50.320	-53.585	-56.850	-60.115	-63.380	-66.645	-69.910	-73.175	-76.440	-79.705	-82.970	-86.235	-89.500	-92.765	-96.030	-99.295	-102.560	-105.825	-109.090	-112.355	-115.620	-118.885	-122.150	-125.415	-128.680	-131.945	-135.210	-138.475	-141.740	-145.005	-148.270	-151.535	-154.800	-158.065	-161.330	-164.595	-167.860	-171.125	-174.390	-177.655	-180.920	-184.185	-187.450	-190.715	-193.980	-197.245	-200.510	-203.775	-207.040	-210.305	-213.570	-216.835	-220.100	-223.365	-226.630	-229.895	-233.160	-236.425	-239.690	-242.955	-246.220	-249.485	-252.750	-256.015	-259.280	-262.545	-265.810	-269.075	-272.340	-275.605	-278.870	-282.135	-285.400	-288.665	-291.930	-295.195	-298.460	-301.725	-304.990	-308.255	-311.520	-314.785	-318.050	-321.315	-324.580	-327.845	-331.110	-334.375	-337.640</

[illegible]

Mold flow analysis – Shrinkage :



Conclusion (open/close)

Item	material	Situation	Note
Point type and quantity	GFSK5T*1	Pass	
Gate size	Φ 5.63mm	Pass	
Gate flow	360cc/sec	Pass	
Bulk Temperature	324℃	Pass	
Shear Rate	798441 (1/sec)	the value is higher at some area	the value is higher at vestige area
Shear Stress	0.51MPa	the value is higher at some area	the value is higher at vestige area
Volumetric Shrinkage	3.15-12.38%	the value is higher	
Injection pressure	36.32MPa	Pass	
Pressure Loss	63.33%	NG	the pressure loss is higher and it should be controlled under 30%.
Welding Line		NG	
Air Trap		Pass	

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