JG23053_Jade_MDXProject20231004 - Run01

Moldex3D Studio 2022R3OR

Tue, 10-10-2023

Summary

Item Name	Item Data
Mesh File Name	model_Run1.mfe
Material(Part)	HDPE_HD6908_1.mtr
Process	JG23053_Jade_MDXProject20231004_Run1_1.pro
Computation Parameter	JG23053_Jade_MDXProject2023100401.cmx
Remark	

Moldex3D

Summary - Mesh

Item Name	Item Data	Unit
Mesh Type	Solid	
Solid Mesh Element Count	5,920,955	
Part Elements	4,396,684	
Cold Runner Elements	1,524,271	
Nozzle Zone Elements	0	
Surface Mesh Element Count	1,122,724	
Part Dimension	6.58x14.60x0.47	in x in x in
Mold Dimension	16.00x24.00x17.00	in x in x in
Part Volume	3.59574	in^3
Cold Runner Volume	0.816056	in^3

Moldex3D

Summary - Process Condition

Filling	Item Data	Unit
Filling Time	2.26	sec
Melt Temperature	428	°F
Mold Temperature	95	°F
Max Injection Pressure	36259.4	psi
Injection Volume	4.4118	in^3
Packing		
Packing Time	3.6	sec
Max Packing Pressure	36259.4	psi

Moldex3D

Summary - Process Condition

Cooling	Item Data	Unit
Cooling Time	10.6	sec
Mold Open Time	5	sec
Ejection Temperature	234.23	°F
Air Temperature	77	°F
Cycle Time	21.46	sec

Moldex3D

Summary - Filling

Item Name	Item Data	Unit
Actual Filling Time	2.30940	sec
Average Melt Front Temperature	402.87069	°F
Max. Melt Front Temperature	428.44242	°F
Max. Sprue Pressure	6523.261	psi
Max. Clamp Force	57.086	Ton(US)

Summary - Packing

Item Name	Item Data	Unit
Max. Sprue Pressure	6523.261	psi
Max. Clamp Force	57.086	Ton(US)
Gate Freeze Time	4.702, 4.702	sec

Summary - Warpage

Item Name	Item Data	Unit
X-Displacement	-0.01615 ~ 0.01616	in
Y-Displacement	-0.00776 ~ 0.00788	in
Z-Displacement	-0.00678 ~ 0.00638	in
Total Displacement	0.00300 ~ 0.01698	in

Moldex3D

Material

Item Name	Item Data	Unit
Polymer	HDPE	
Grade Name	HD 6908	
Producer	ExxonMobil	
Ejection Temperature	234.23	°F
Freeze Temperature	270.23	°F
Glass Transition Temperature	288.23	°F

Moldex3D

Material

Item Name	Item Data	Unit
Melt Temperature (minimum)	374	°F
Melt Temperature (normal)	428	°F
Melt Temperature (maximum)	482	°F
Melt Temperature Range	374~482	°F
Mold Temperature (minimum)	77	°F
Mold Temperature (normal)	99.5	°F
Mold Temperature (maximum)	122	°F
Mold Temperature Range	77~122	°F

Material - MFI/MVR

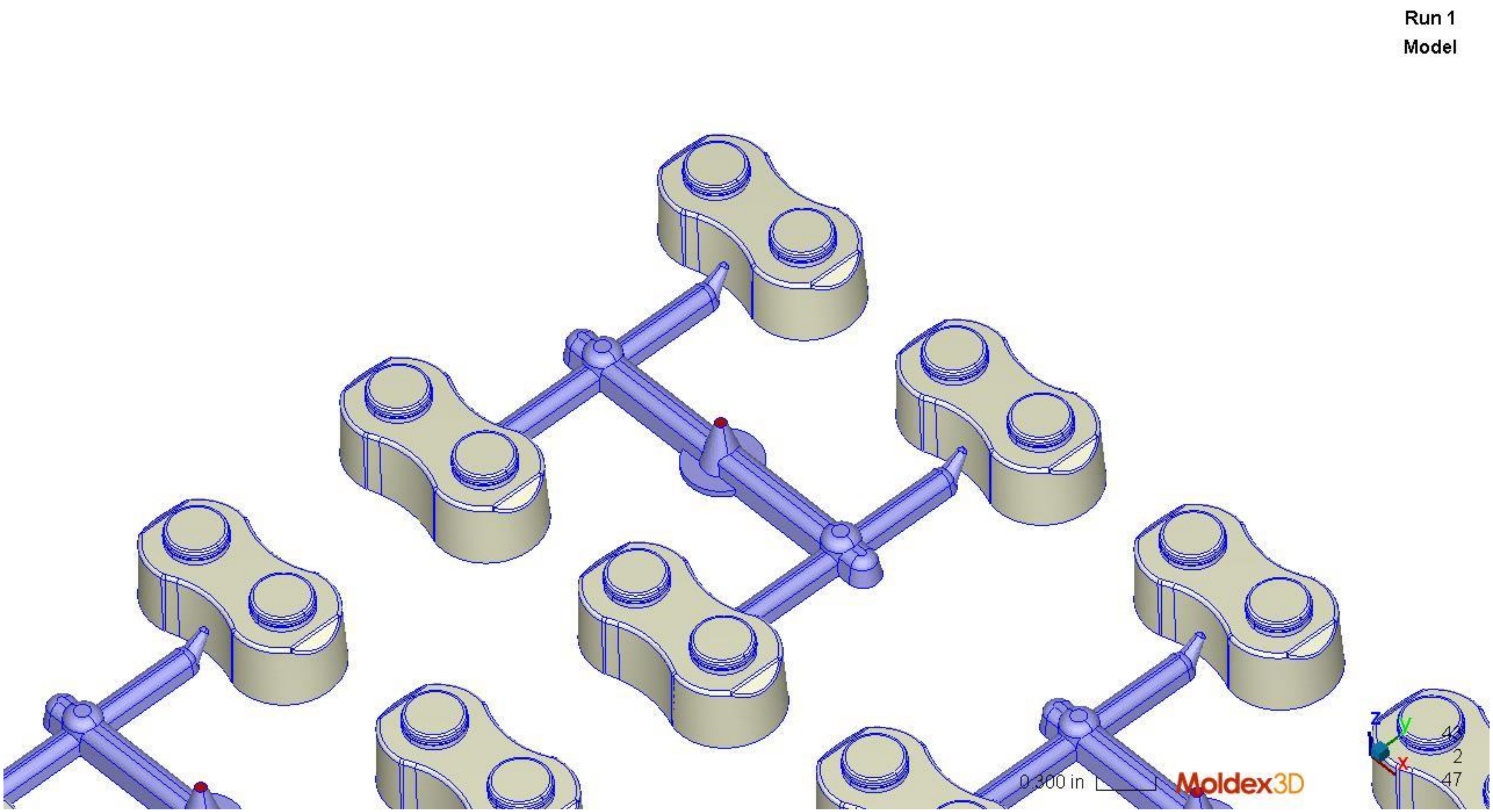
Item Name	Item Data	Unit
Melt Flow Index	8.2	g/10min
Temperature	190	°C
Load	2.16	kg
Melt Volume-Flow Rate	8.49741	cm^3/10min
Temperature	190	°C
Load	2.16	kg

Moldex3D

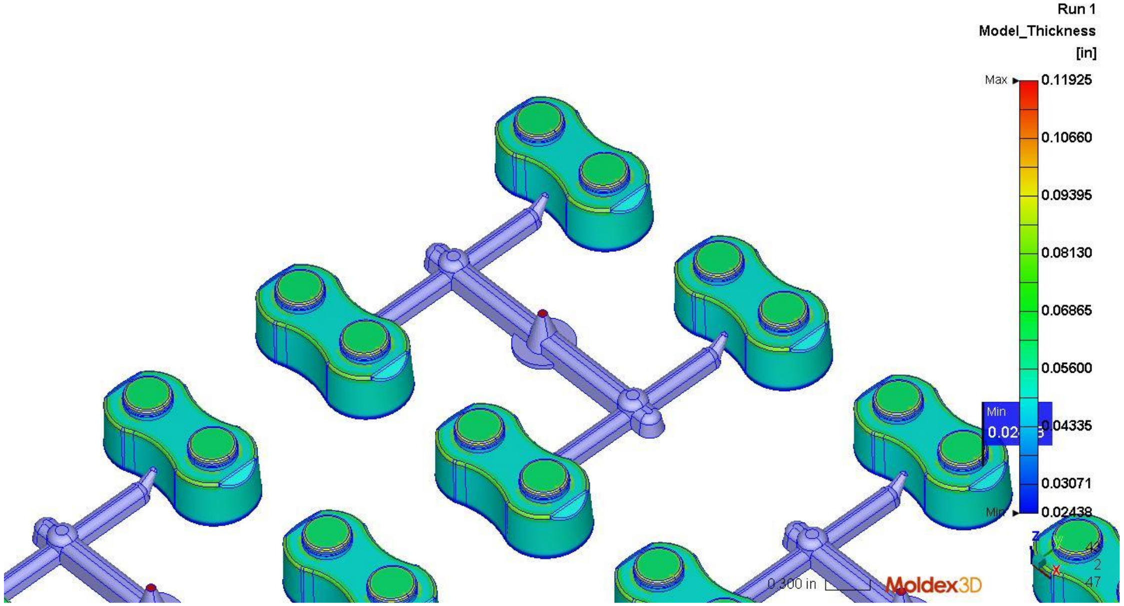
Process

Item Name	Item Data		Unit
VP Switch	By Volume Filled	98	%
Packing Pressure Profile			
Section		3	
Time		2.16, 2.88, 3.6	sec
Pressure		72, 57.6, 46.08	%

Model

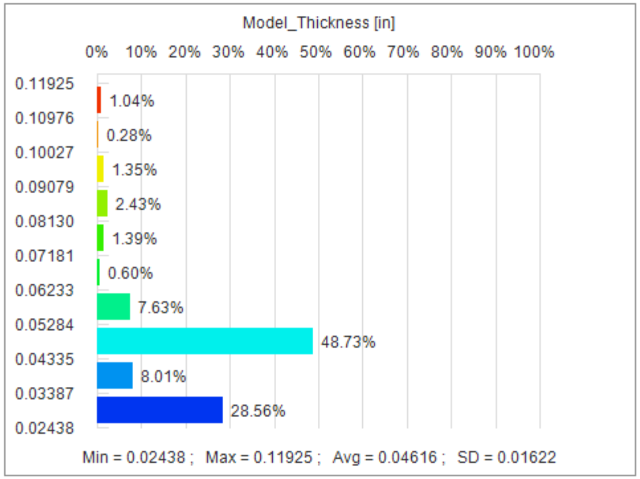


Thickness



Thickness

Histogram

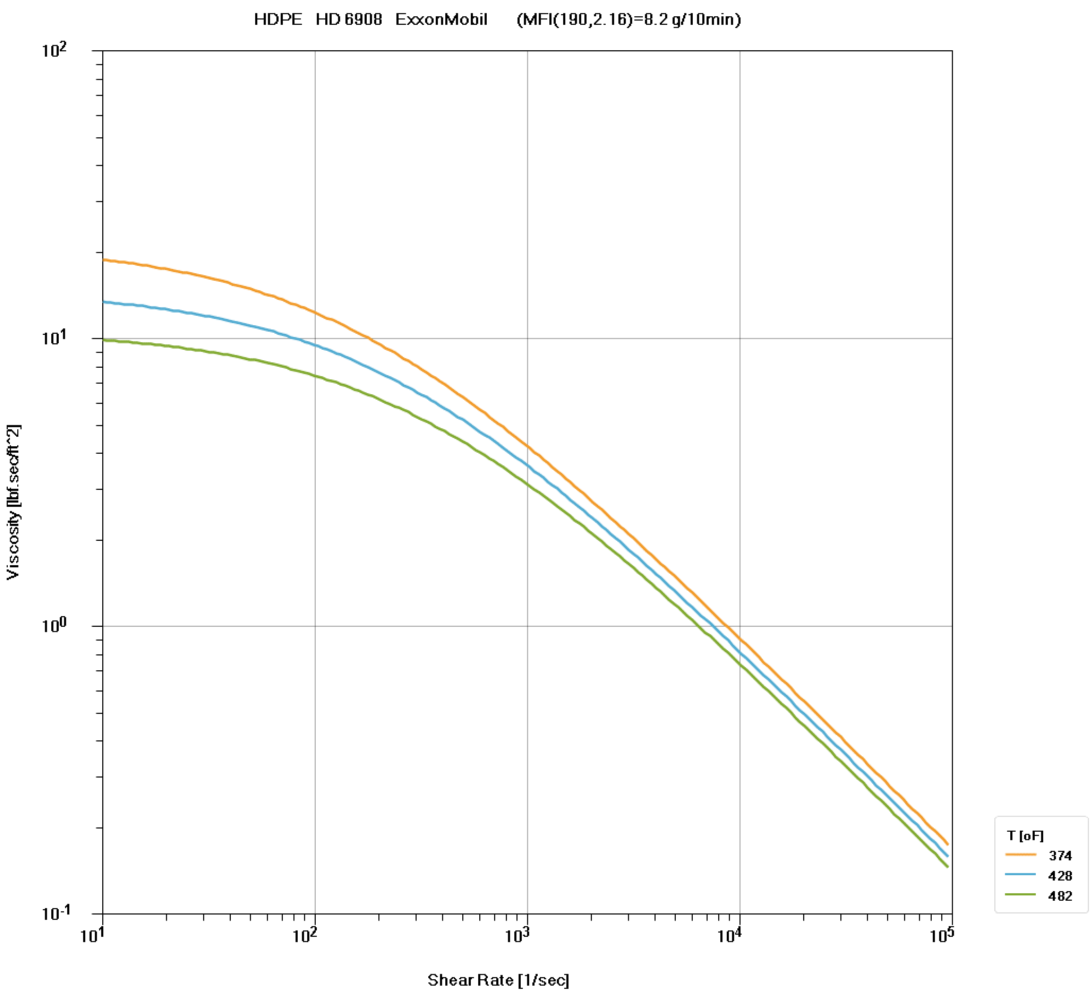


Max	Min
0.11925	0.02438

Avg	SD
0.04616	0.01622

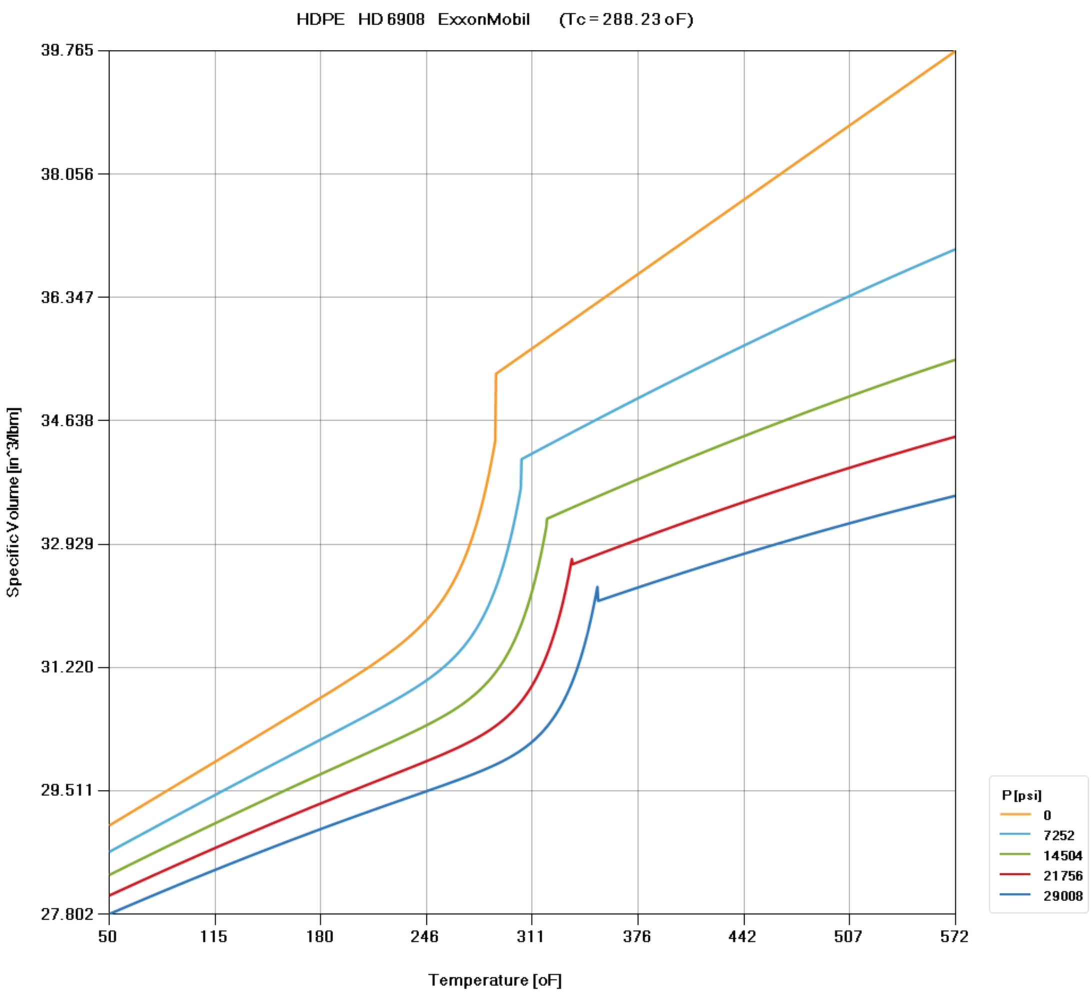
Moldex3D

Material - Viscosity



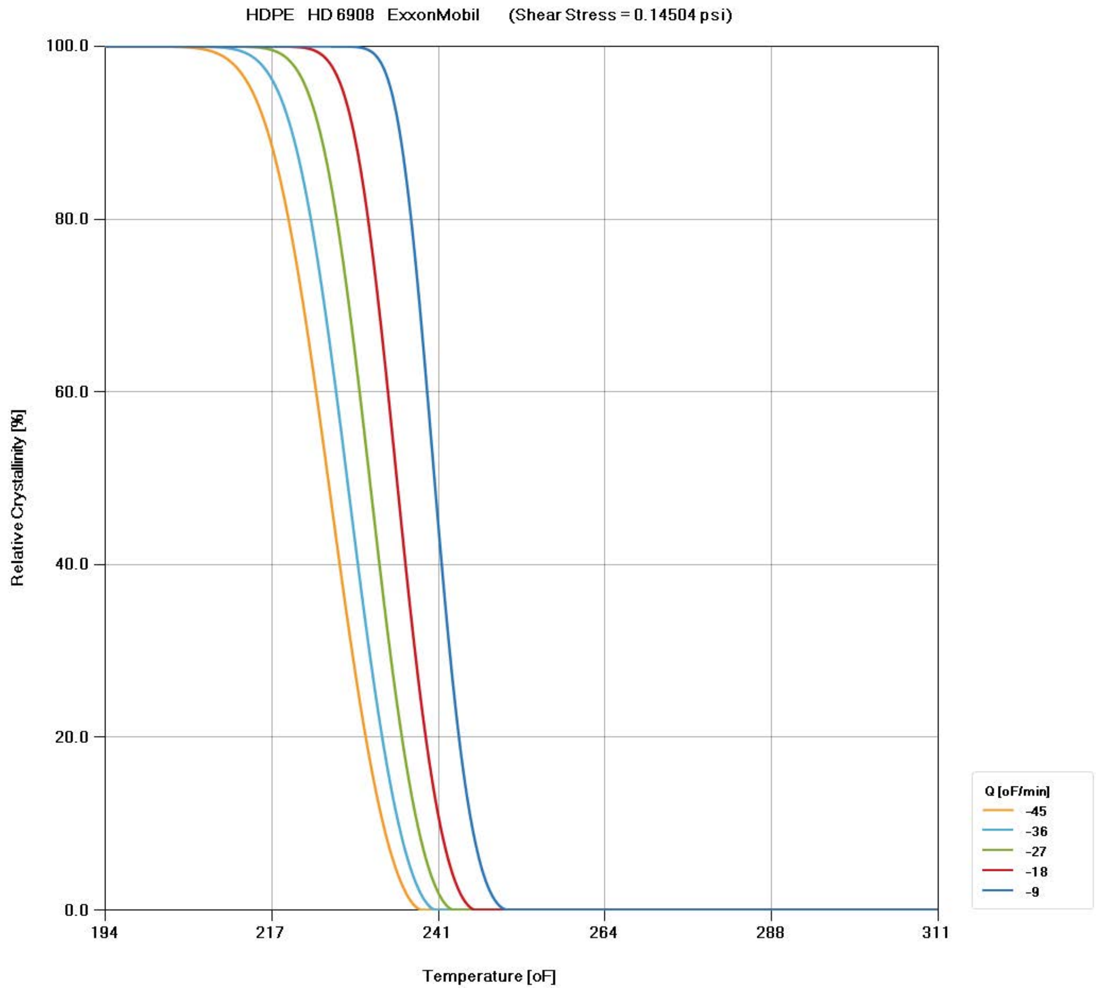
Moldex3D

Material - PVT



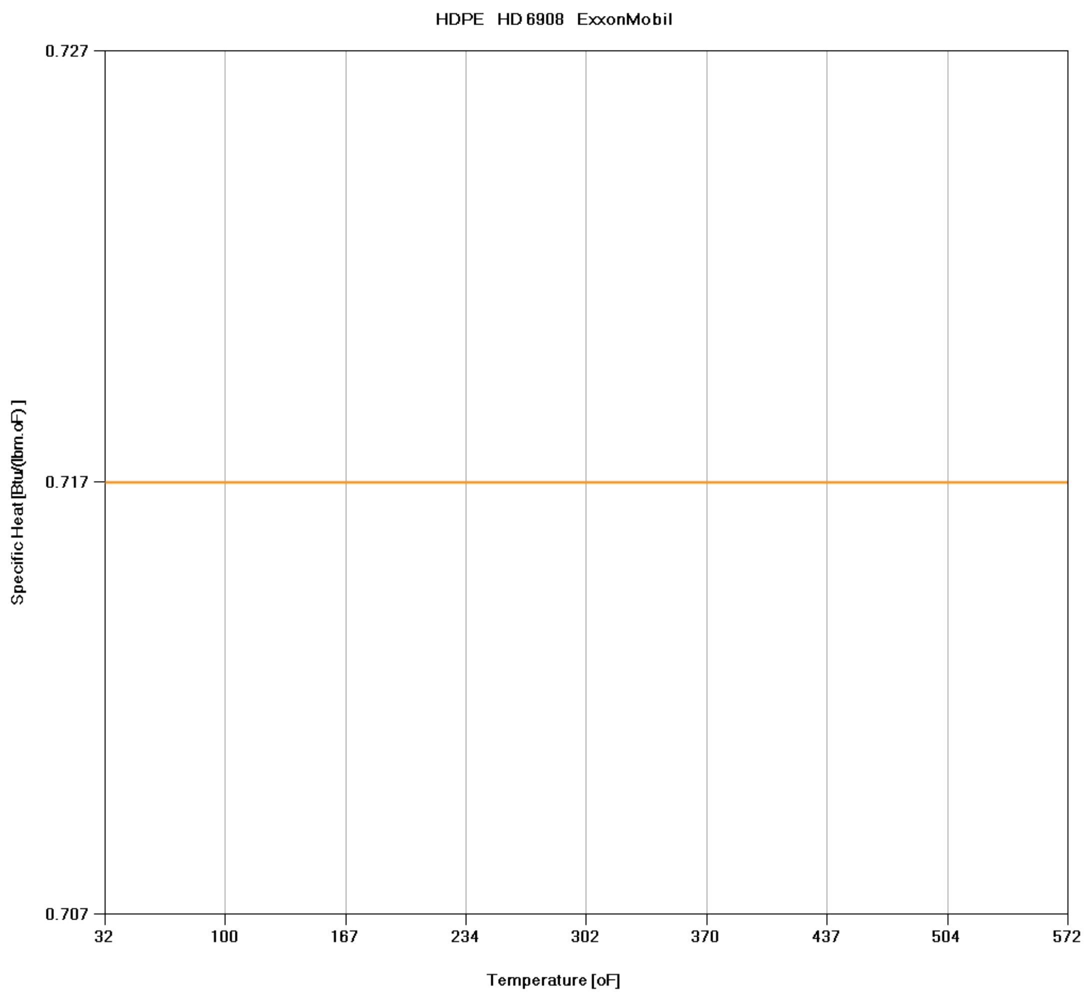
Moldex3D

Material - Crystallinity



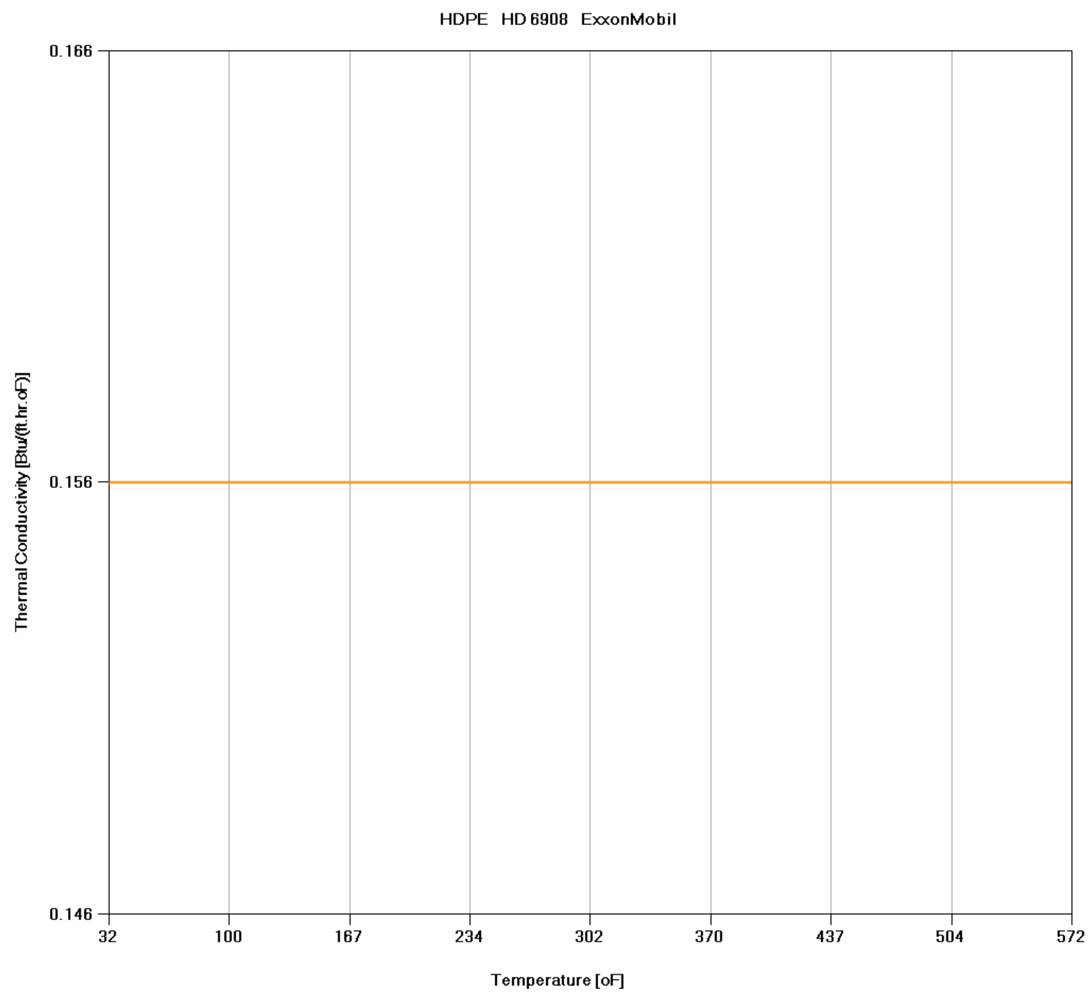
Moldex3D

Material - Specific Heat



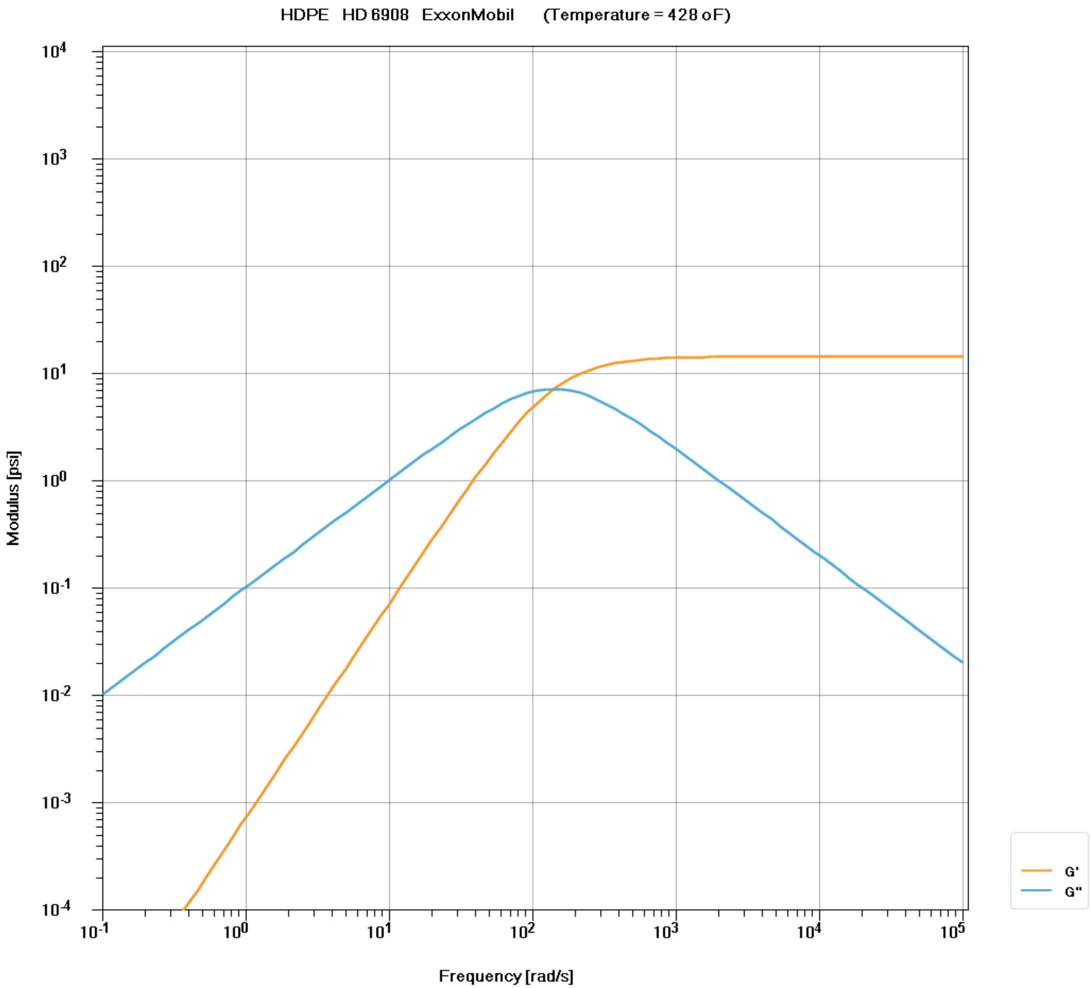
Moldex3D

Material - Thermal Conductivity



Moldex3D

Material - Viscoelasticity



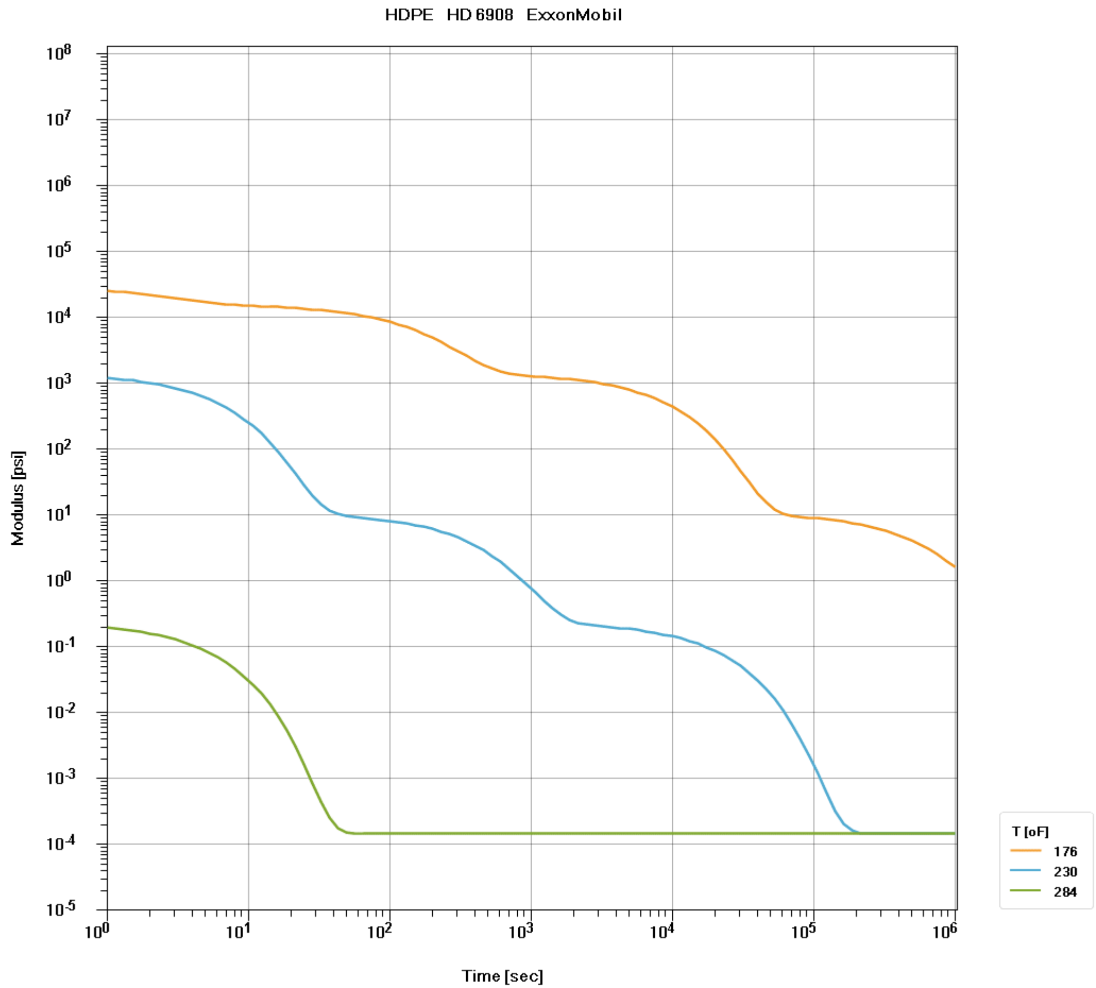
Moldex3D

Material - Mechanical Properties

Polymer | Grade Name | Producer	HDPE | HD 6908 | ExxonMobil
Mechanical Properties	Pure polymer - Isotropic properties
Elastic Modulus	152292 (psi)
Poisson's Ratio	0.4 (-)
CLTE	0.000111112 (1/oF)

Moldex3D

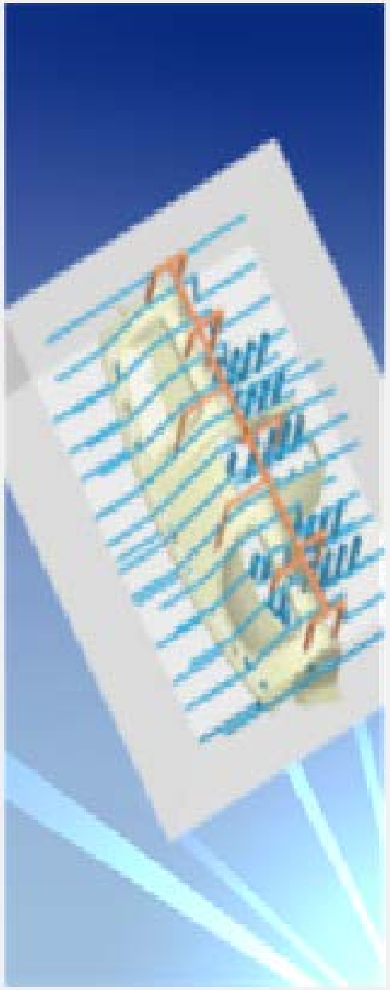
Material - Structure VE



Material - Content

Material	HDPE
Grade Name	HD 6908
Producer	ExxonMobil
Comment	MFI(190,2.16)=8.2 g/10min ,D=0.965 g/cm3
Moldex3D Bank Version	2022.3.4
Process condition	
Melt temperature (minimum)	374 oF
Melt temperature (normal)	428 oF
Melt temperature (maximum)	482 oF
Mold temperature (minimum)	77 oF
Mold temperature (normal)	95 oF
Mold temperature (maximum)	122 oF
Ejection temperature	234.23 oF
Freeze temperature	270.23 oF

Process - Project Settings



Setting method : CAE mode

In this mode, process parameters are not derived from the molding machine informations. You may freely specify process conditions for simulation.

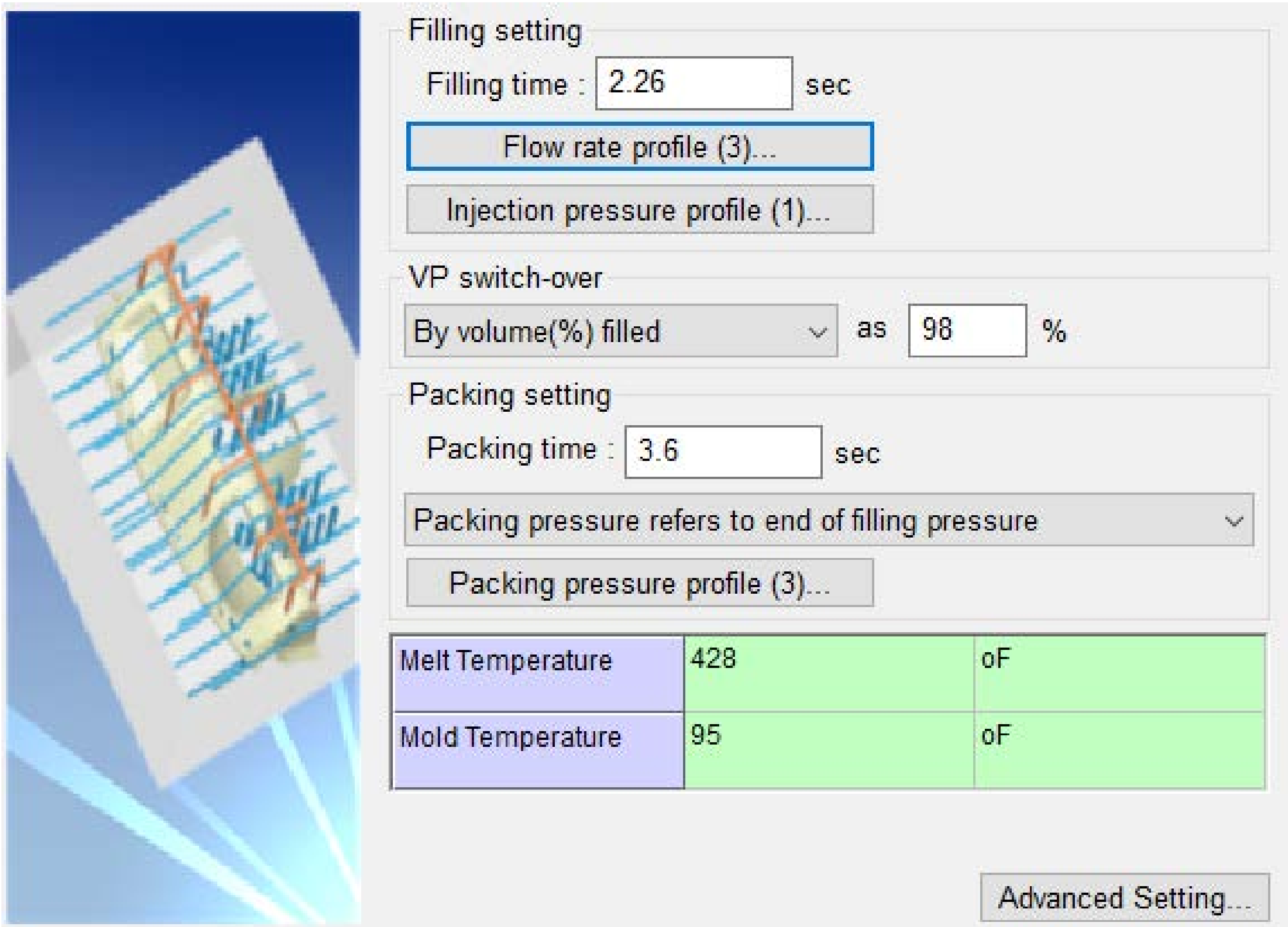
Process File : JG23053_Jade_MDXProject20231004_Run1_

Mesh File : model_Run1.mfe

Material File : HDPE_HD6908_1.mtr

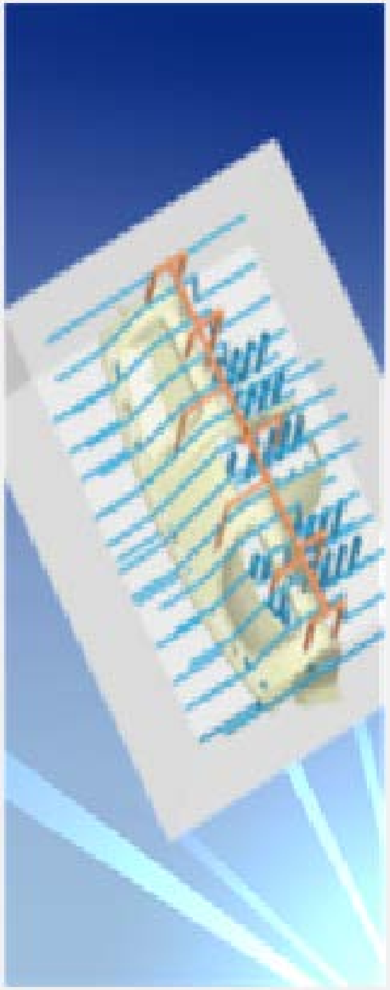
Maximum injection pressure	36259.4	Psi
Maximum packing pressure	36259.4	Psi

Process - Filling/Packing Settings



Moldex3D

Process - Cooling Settings

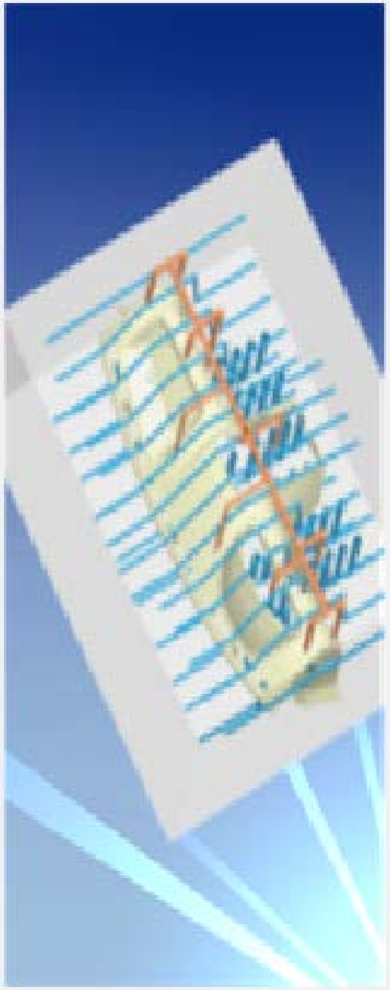


Item	Value	Unit
Cooling method	General	-
Initial Mold Temperature	95	oF
Air Temperature	77	oF
Eject Temperature	234.23	oF
Cooling Time	10.6	sec
Mold-Open Time	5	sec
Ejection Timing After Mold Open	0	sec
Mold preheat	Setting	

Cooling / Heating...
Mold Metal Material...
Mold Insert Initial Temperature...
Part Insert Initial Temperature...
Eject Criteria...
Estimate Cooling Time...

Moldex3D

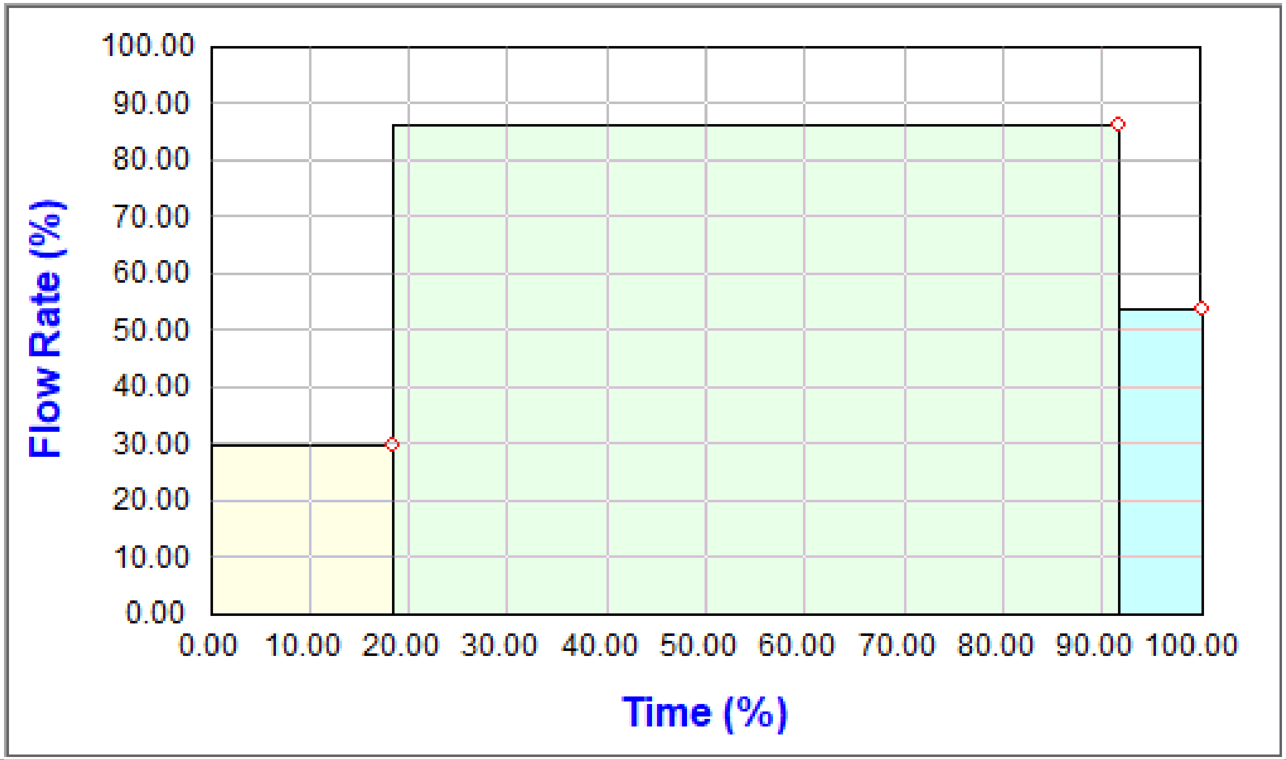
Process - Summary



[Filling]	
Filling time (sec)	2.26
Melt Temperature (oF)	428
Mold Temperature (oF)	95
Maximum injection pressure (Psi)	36259.4
Injection volume (in^3)	4.41174
[Packing]	
Packing time (sec)	3.6
Maximum packing pressure (Psi)	36259.4
[Cooling]	
Cooling Time (sec)	10.6
Mold-Open Time (sec)	5
Eject Temperature (oF)	234.23
Air Temperature (oF)	77
[Miscellaneous]	
Cycle time (sec)	21.46
Mesh file	model_Run1.mfe
Material file	HDPE_HD6000_1.mtr

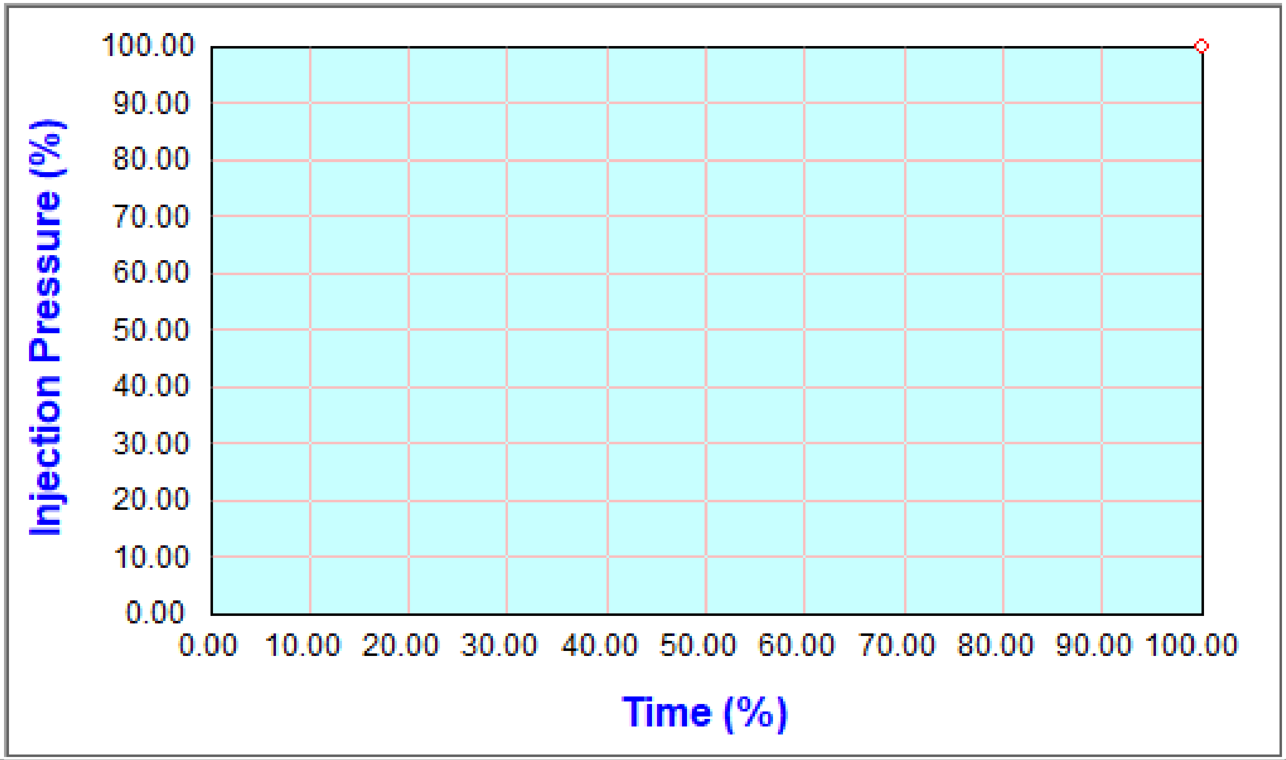
Moldex3D

Process - Flow Rate Profile



Section		Section-1	Section-2	Section-3
Time (%)	0	18.5	91.85	100
Flow Rate (%)	30	30	86.4	54

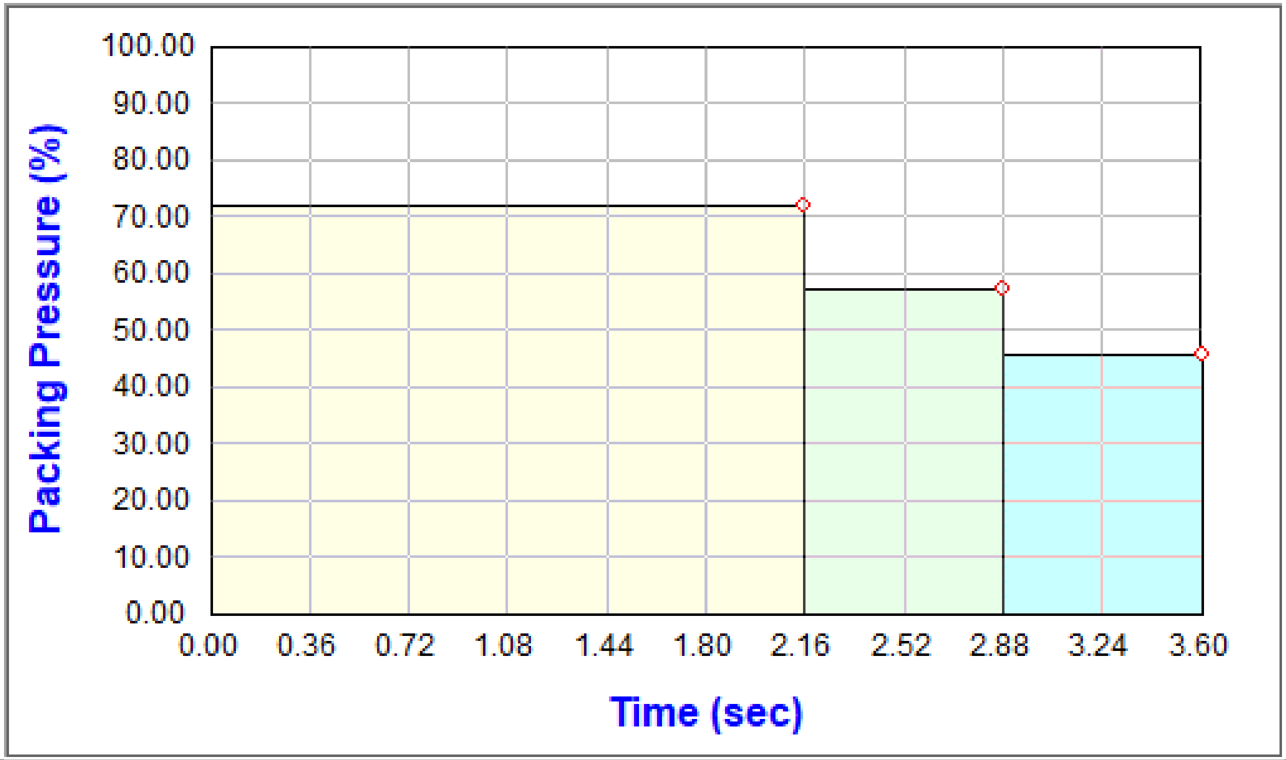
Process - Injection Pressure Profile



Section		Section-1
Time (%)	0	100
Injection Pressure (%)	100	100

Moldex3D

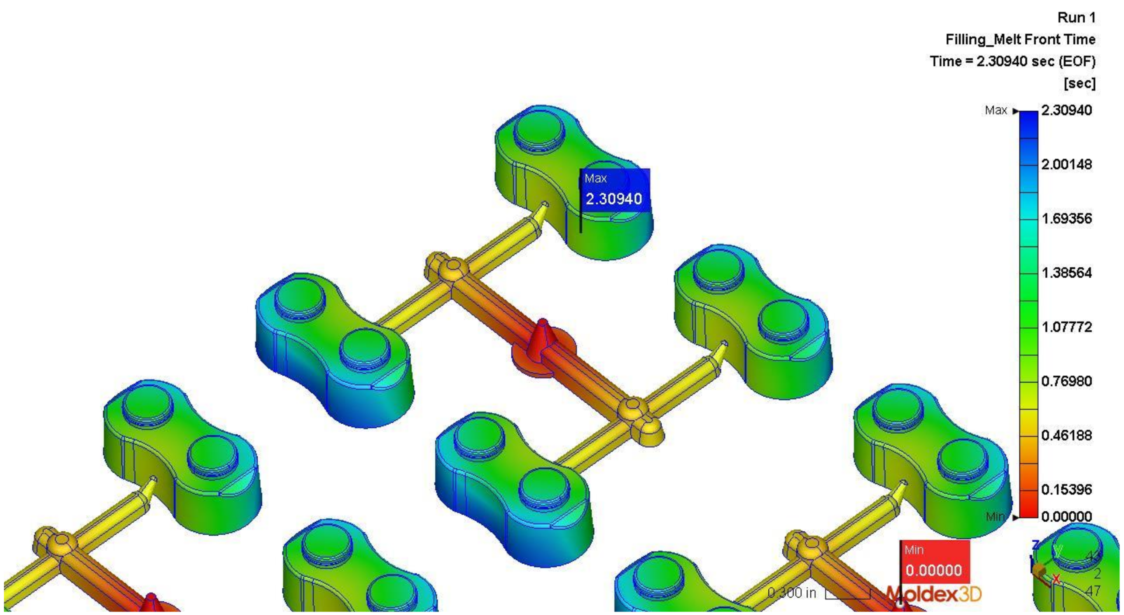
Process - Packing Pressure Profile



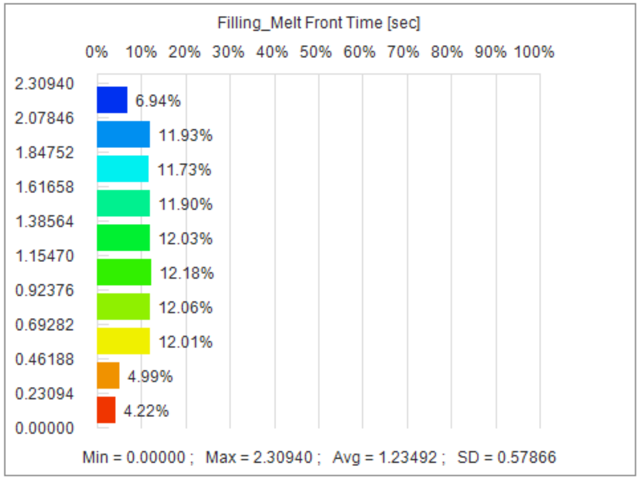
Section		Section-1	Section-2	Section-3
Time (sec)	0	2.16	2.88	3.6
Packing Pressure (%)	72	72	57.6	46.08

Moldex3D

Filling_Melt Front Time



Histogram



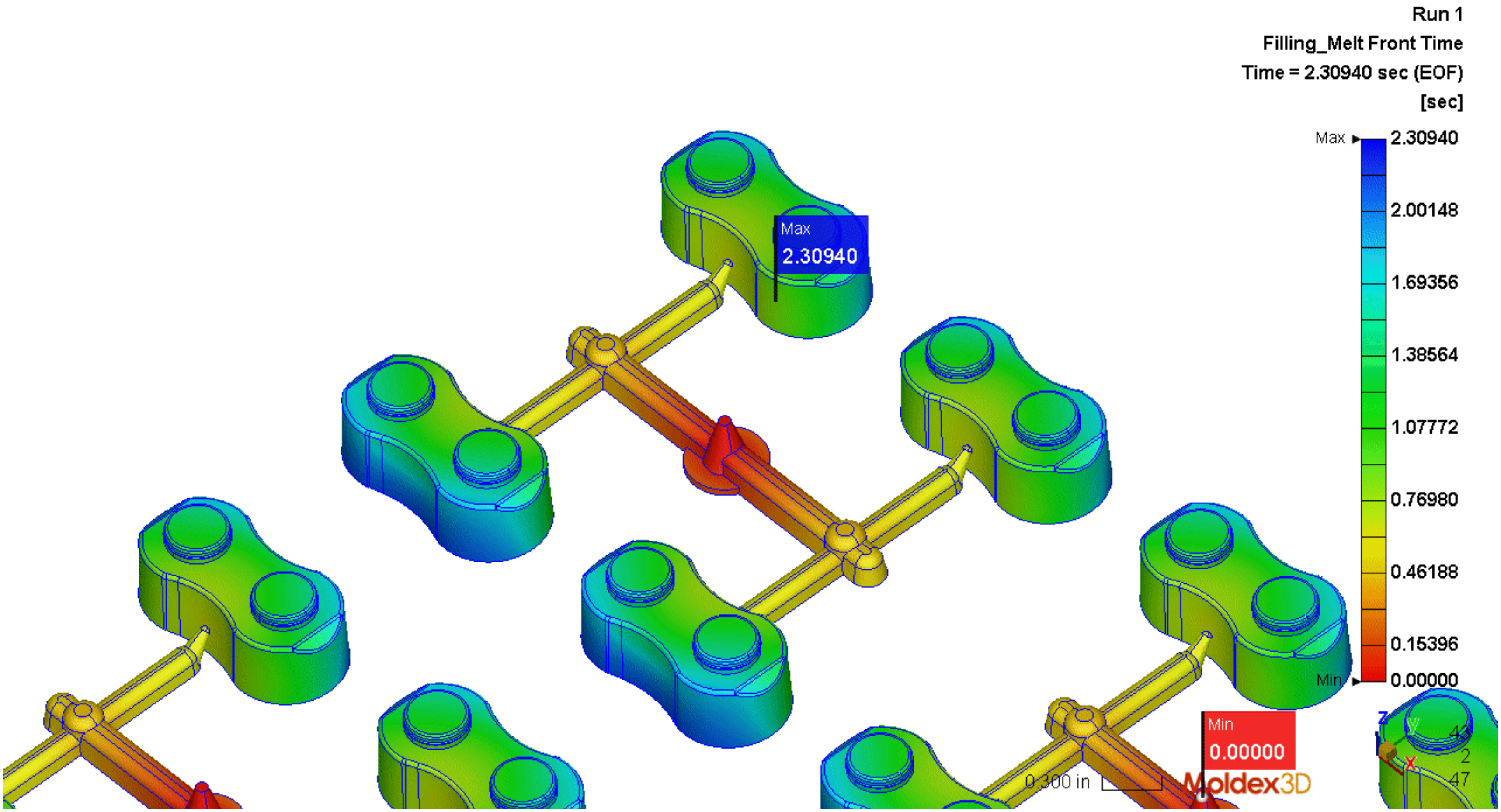
Max	Min
2.30940	0.00000

Avg	SD
1.23492	0.57866

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:

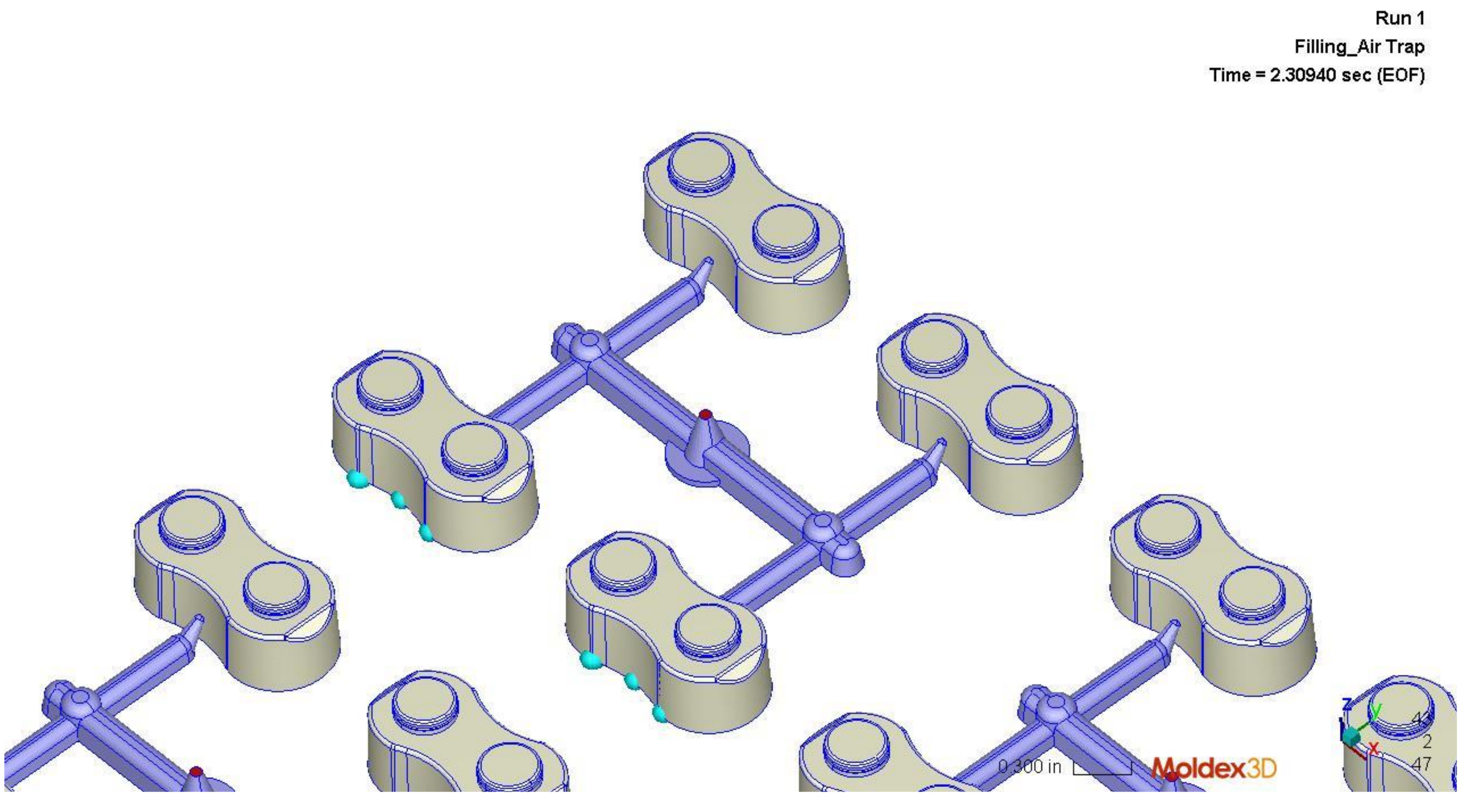
-Examine the filling pattern of the molding
-Check potential incomplete filling (short shot) problem
-Identify weld line locations
-Identify air trap locations
-Check gate contribution for runner balance
-Check proper gate location to balance flow and eliminate weldline.

Filling_Melt Front Time



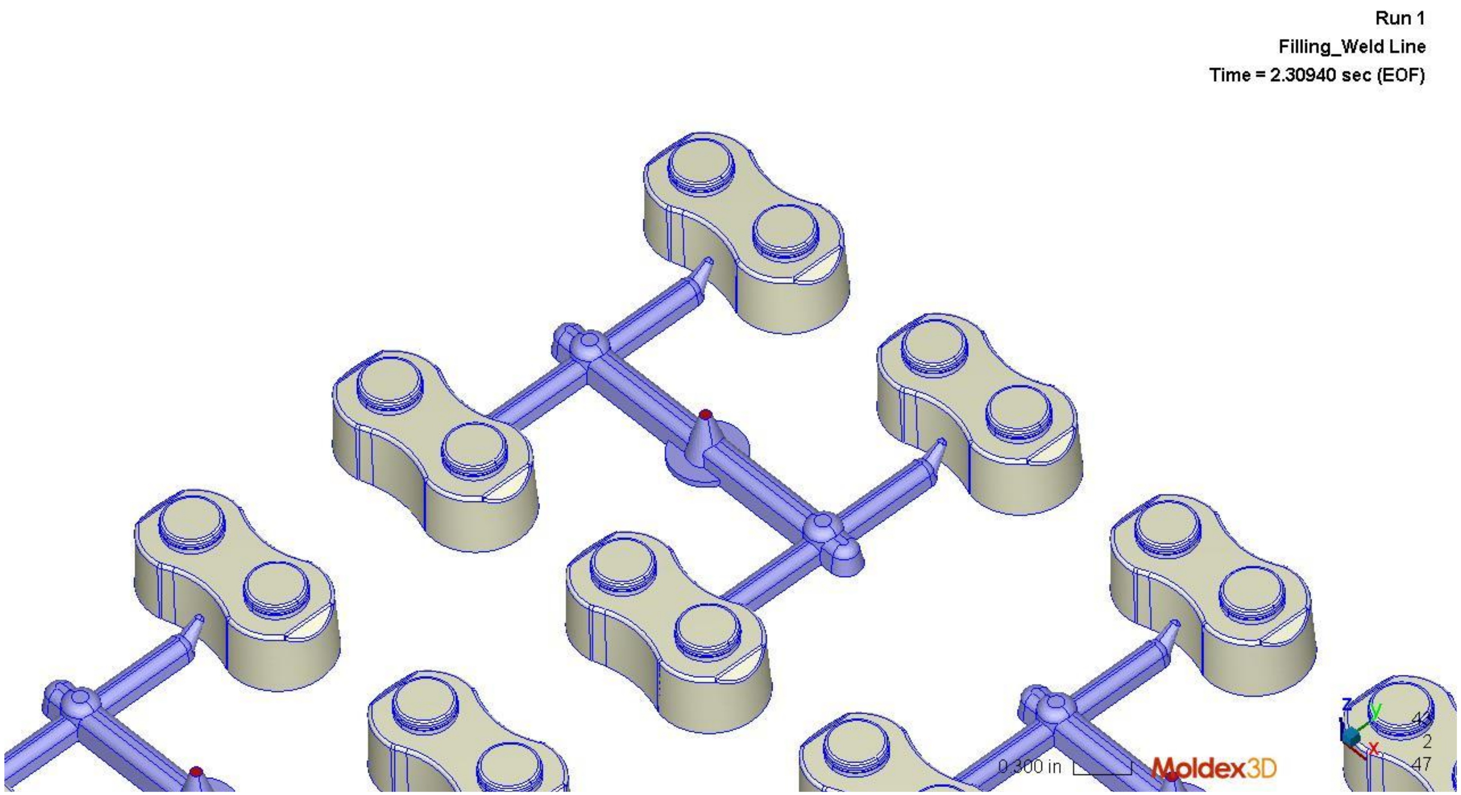
Moldex3D

Filling_Air Trap



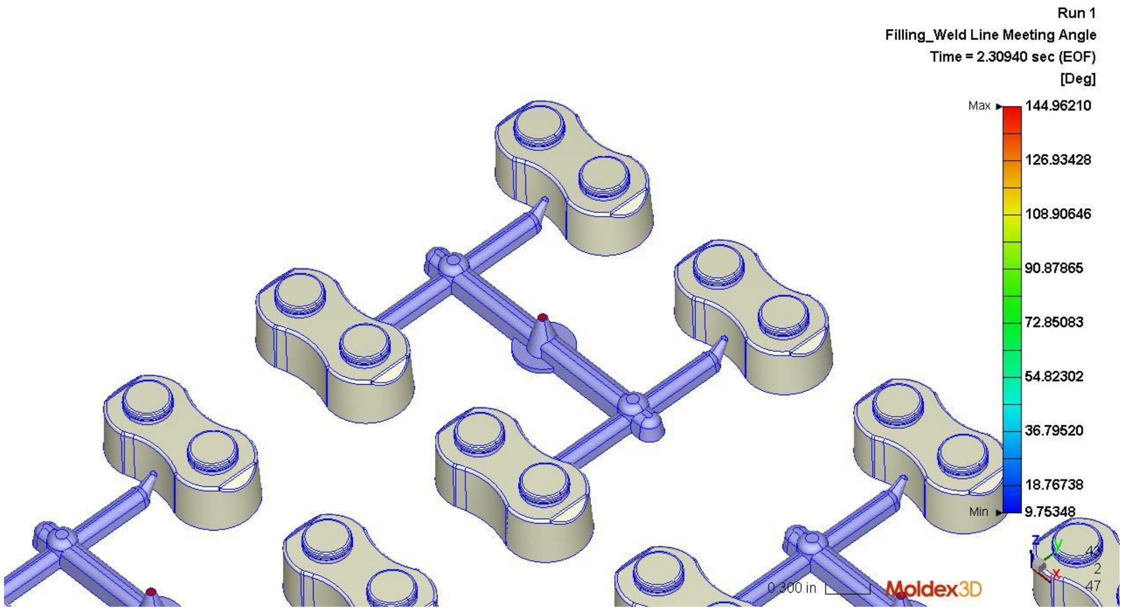
Air Trap

Filling_Weld Line



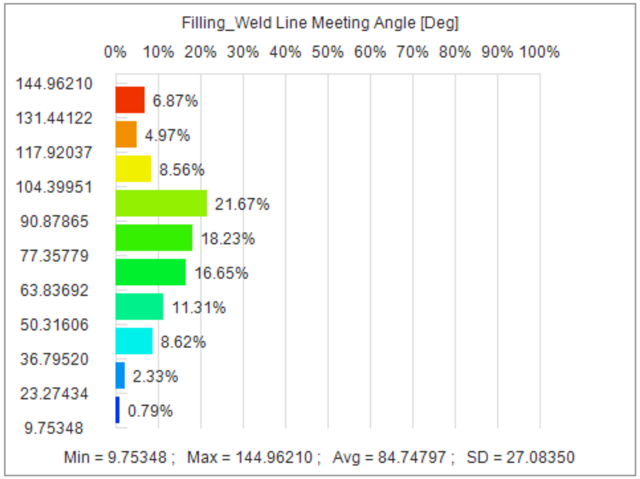
Weld Line

Filling_Weld Line Meeting Angle



Display meeting angle distribution on weld line.

Histogram

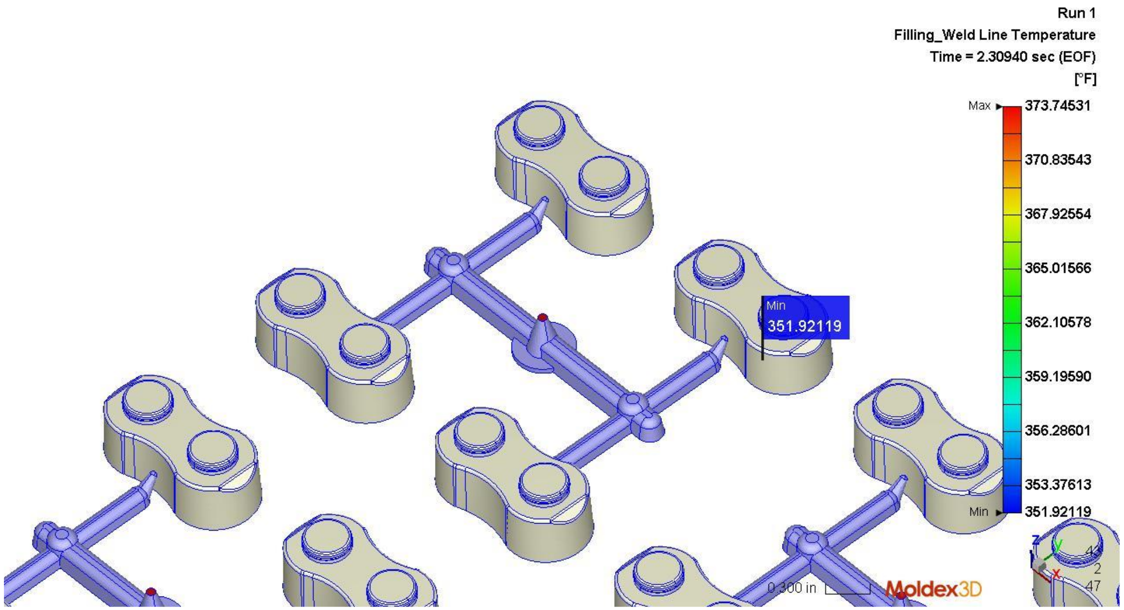


Max	Min
144.96210	9.75348

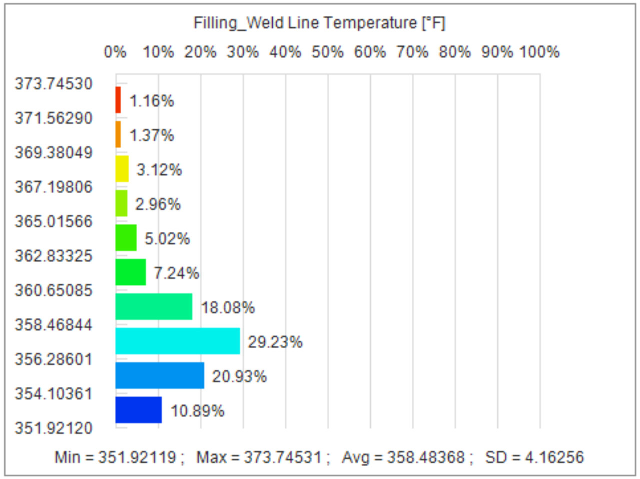
Avg	SD
84.74797	27.08350

Moldex3D

Filling_Weld Line Temperature



Histogram



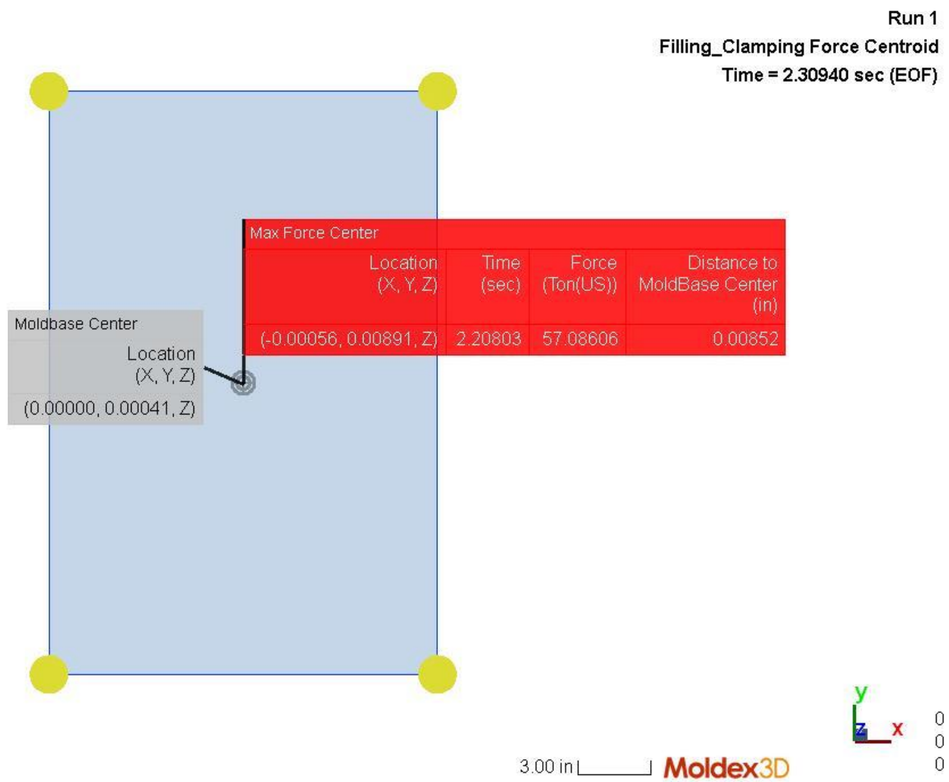
Max	Min
373.74531	351.92119

Avg	SD
358.48368	4.16256

This result displays the recorded temperature on the potential weld line as two melt fronts meet.

Moldex3D

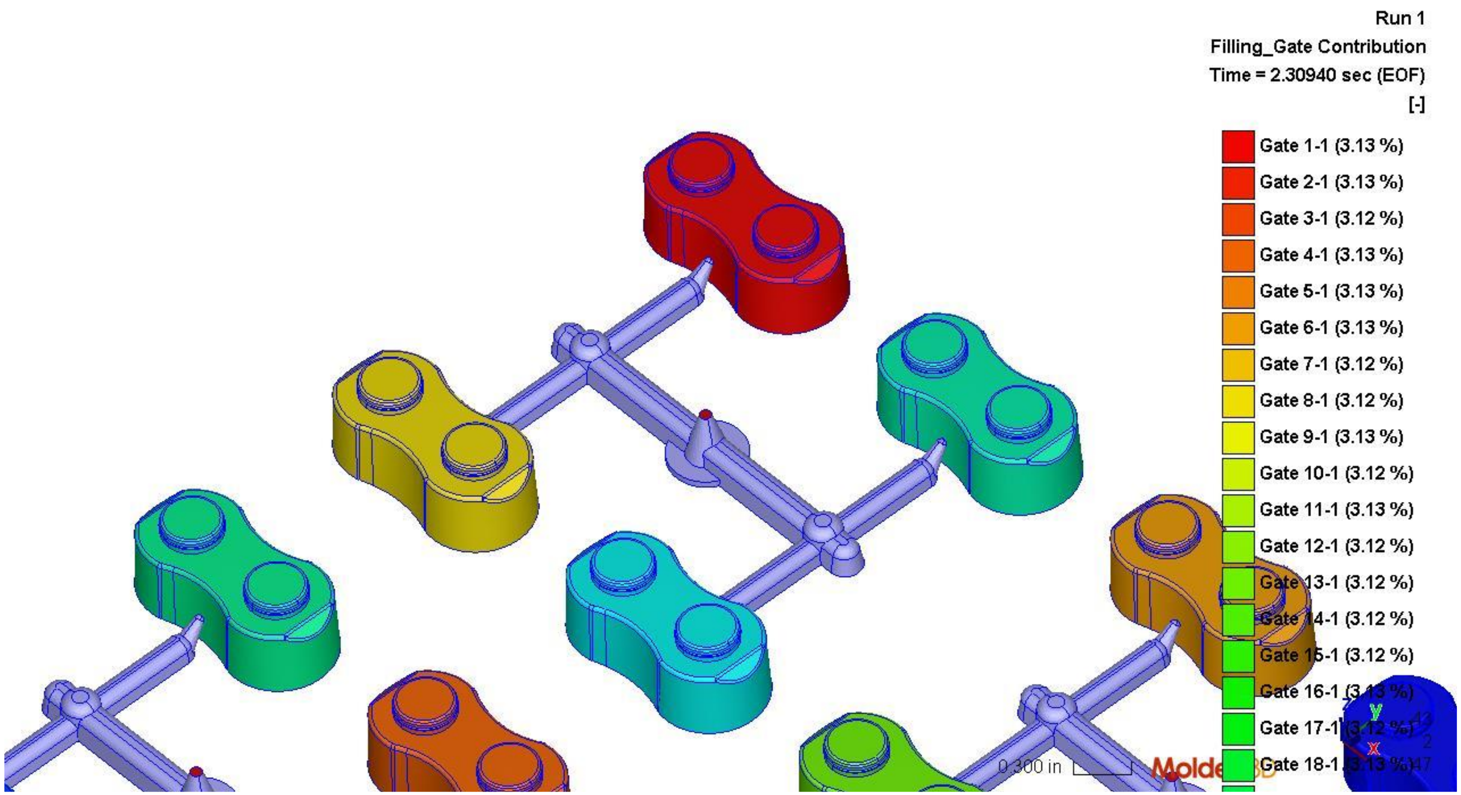
Filling_Clamping Force Centroid



Clamping Force Centroid result draws the centroid points of clamping force (Max) and moldbase. The more distance between two centroid points means more unbalanced force applied inside cavity, and may cause clamping issue or even damage to molding machine. To balance clamping force, it requires proper mold cavity arrangement.

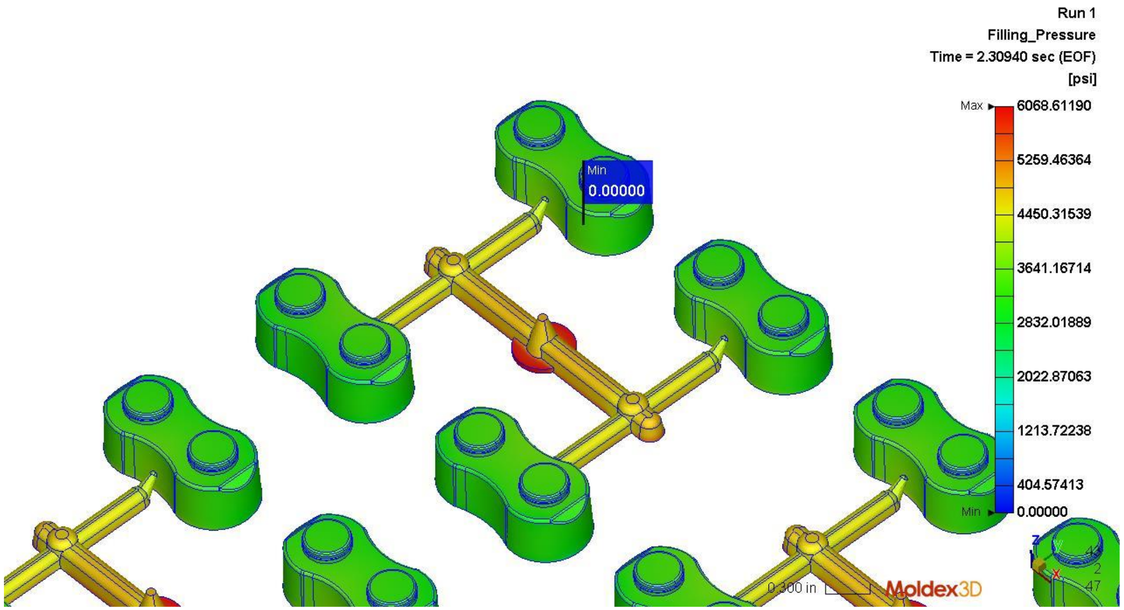
Moldex3D

Filling_Gate Contribution

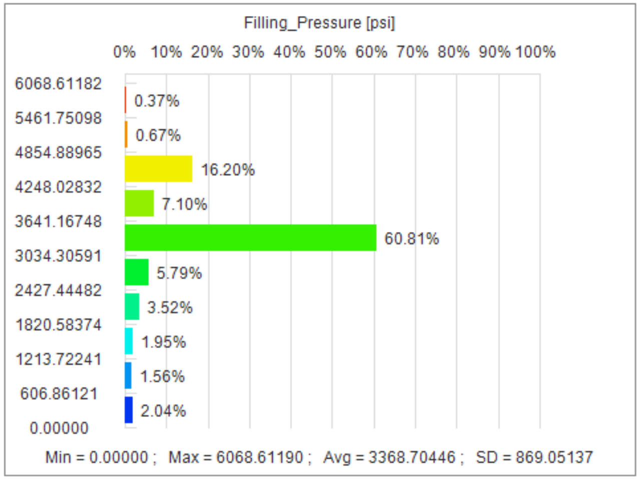


Gate Contribution

Filling_Pressure



Histogram



Max	Min
6068.61190	0.00000

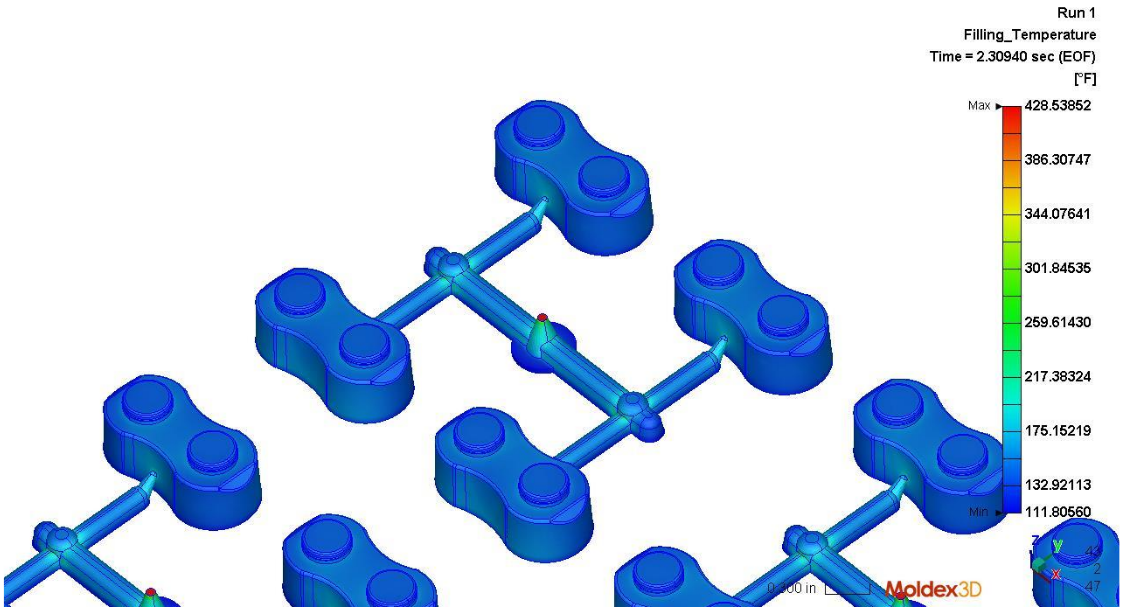
Avg	SD
3368.70446	869.05137

Pressure distribution of the cavity is shown in different colors at current instant. Based on the pressure drop and distribution, users can revise the part and mold design. From the pressure distribution one can:

-Check the pressure transmission situation
-Check runner system pressure drop
-Check flow balance of the design
-Avoid overpacking and flashing of melt
-Examine the extent of packing/holding.

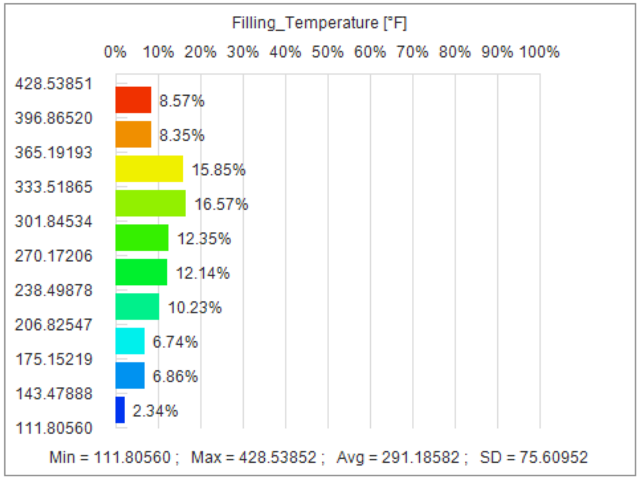
Moldex3D

Filling_Temperature



Plastic melt temperature distribution at current instant. For 3D calculation, the temperature distribution expresses temperatures in all three dimensional for the fully cavity.

Histogram

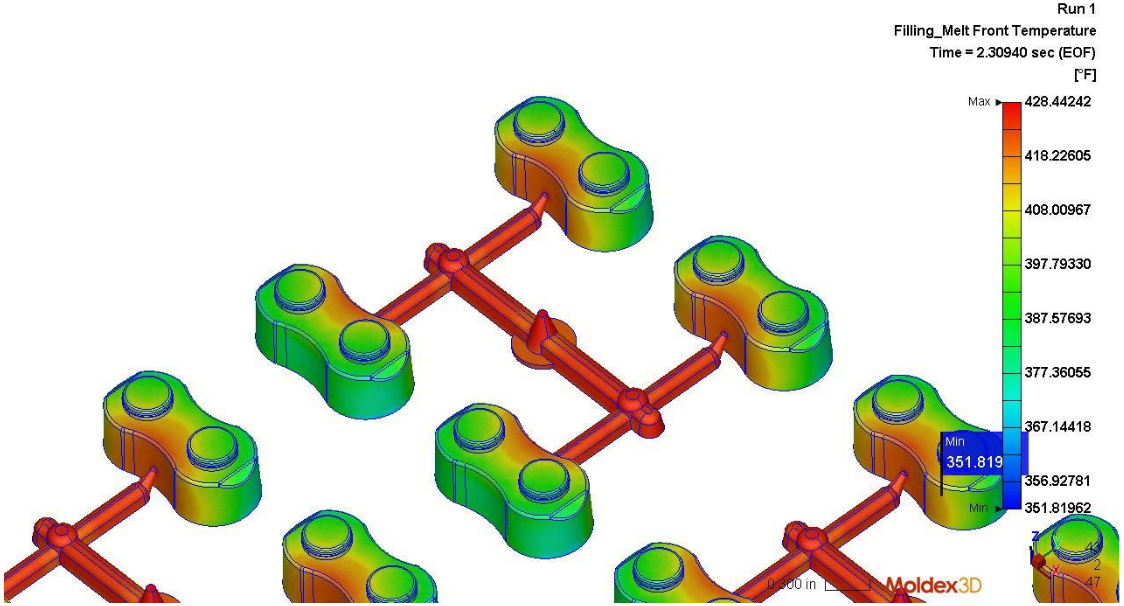


Max	Min
428.53852	111.80560

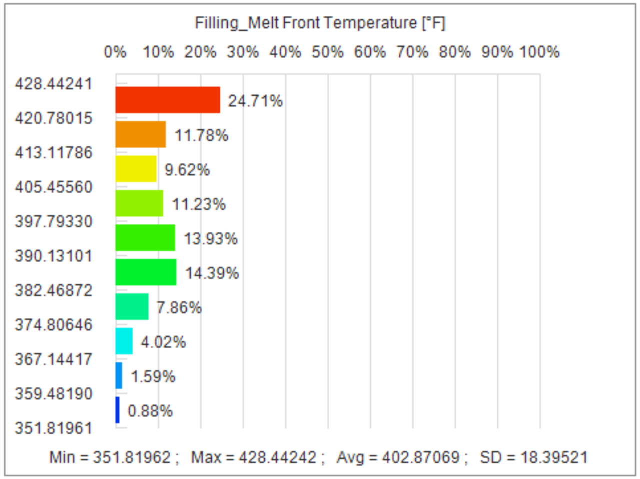
Avg	SD
291.18582	75.60952

Moldex3D

Filling_Melt Front Temperature



Histogram

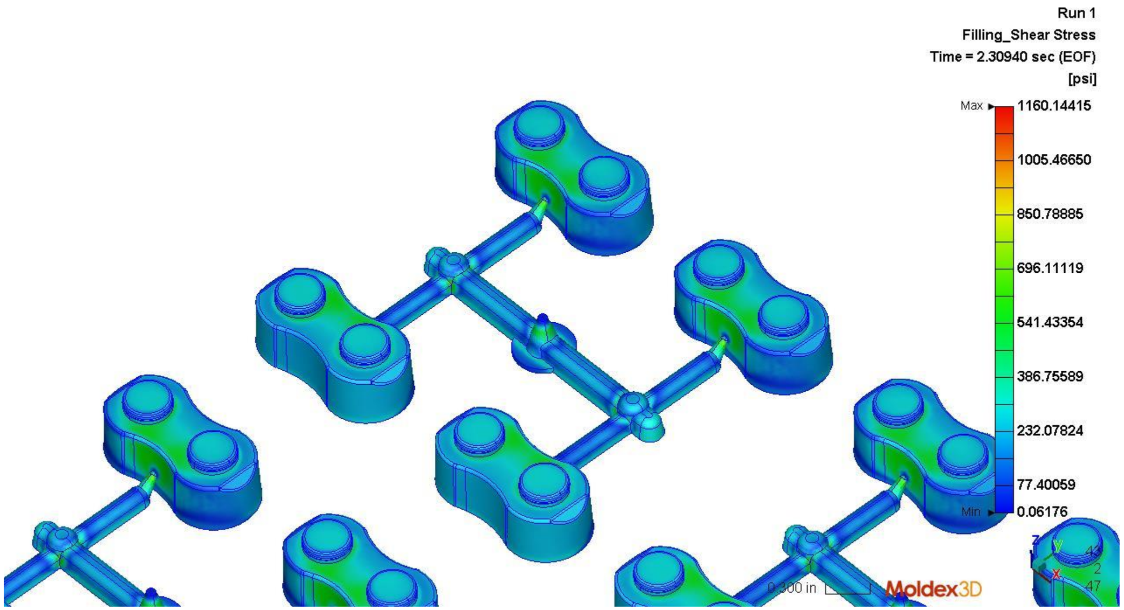


Max	Min
428.44242	351.81962

Avg	SD
402.87069	18.39521

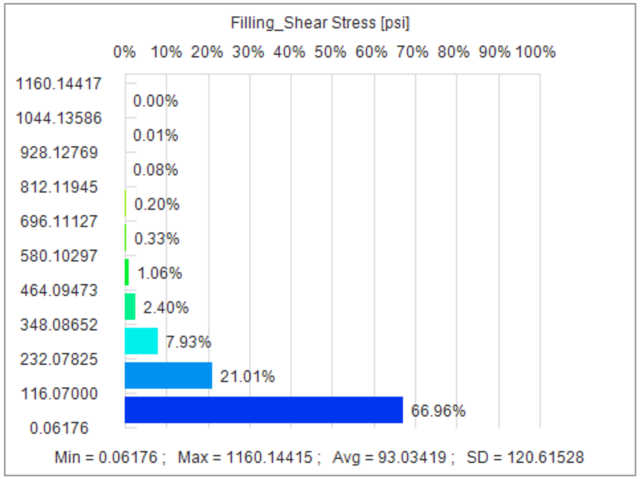
Melt front temperature is the temperature value of the plastic melt as it reaches the given point.
This value indicates how heat is conveyed and dissipated during the molding phases.

Filling_Shear Stress



Shear stress at current instant is shown in different color according to different stress level. Shear stress is one of source of the molded-in residual stress in molded parts. If the shear stress is not distributed evenly, it will cause some dimensional problems. Too high the shear stress level will result in stress-induced problems in the molded part.

Histogram

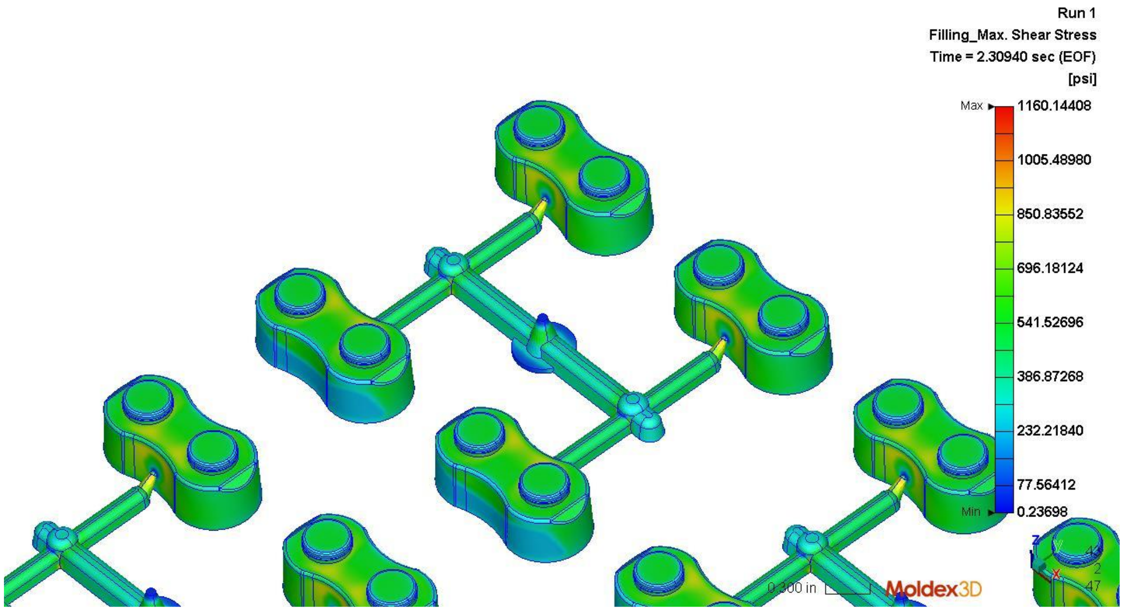


Max	Min
1160.14415	0.06176

Avg	SD
93.03419	120.61528

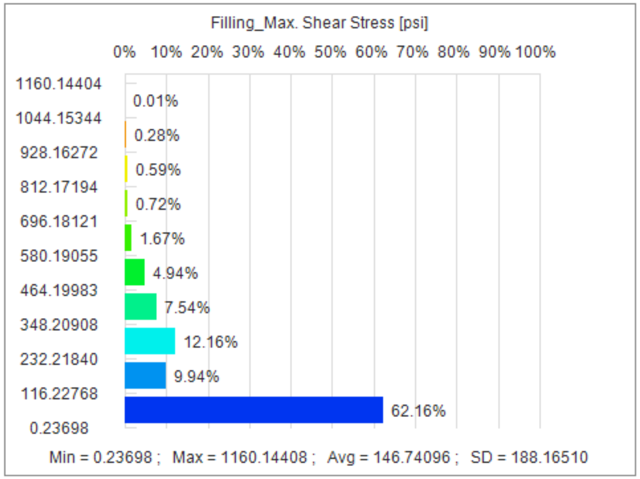
Moldex3D

Filling_Max. Shear Stress



Max. shear stress at each element records the peak value of shear stress during the passing filling time.

Histogram

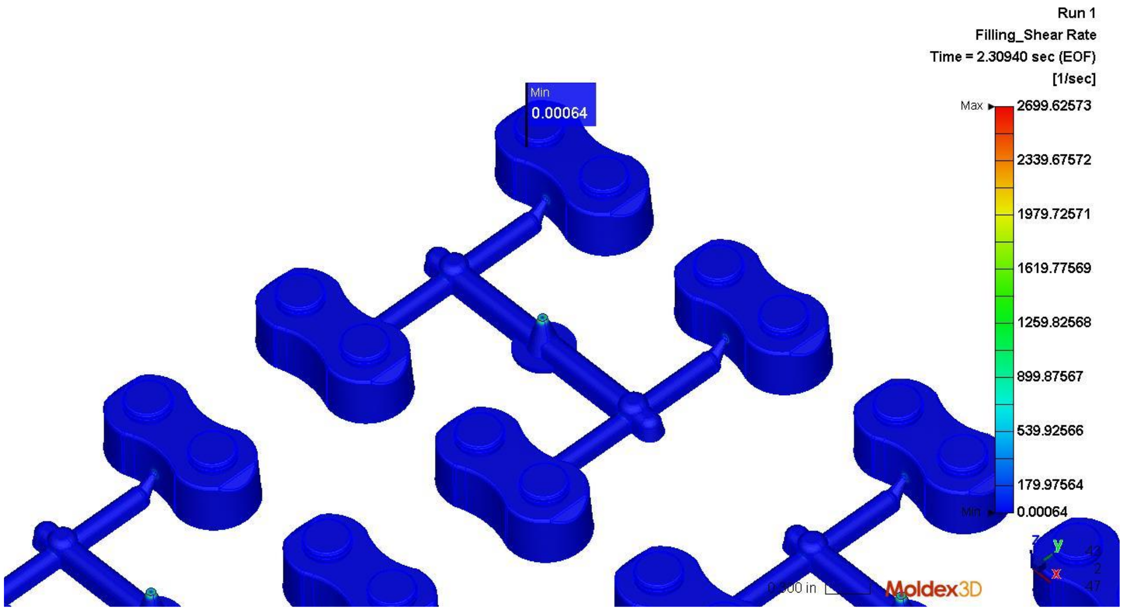


Max	Min
1160.14408	0.23698

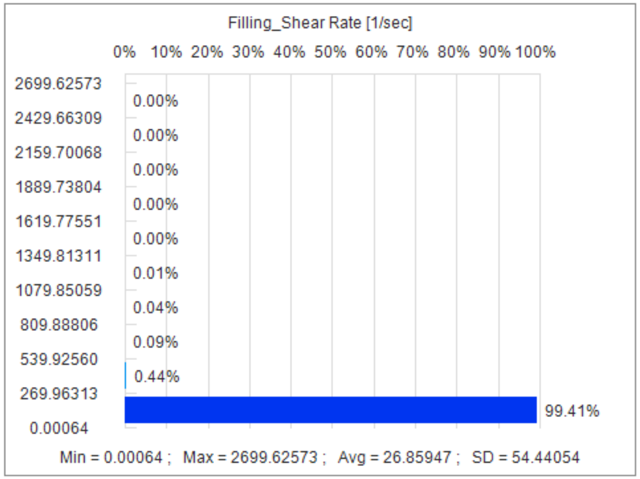
Avg	SD
146.74096	188.16510

Moldex3D

Filling_Shear Rate



Histogram



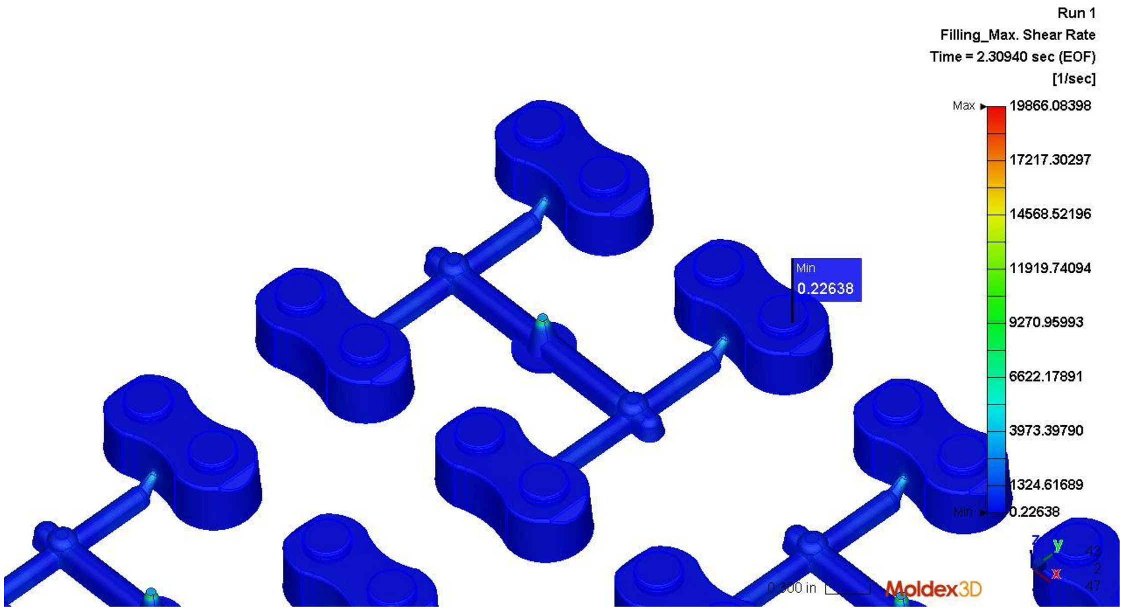
Max	Min
2699.62573	0.00064

Avg	SD
26.85947	54.44054

The distribution of shear rate of part cavity is shown in different colors at current instant. Shear rate is the rate of shear deformation of the material during the polymer processing. Shear rate distribution is related to the variation of velocity gradient and molecular orientation. High shear rate tends to drastically deform molecular chains even to break and then weaken the strength of product. Viscous heating due to high shear rate also should be noticed.

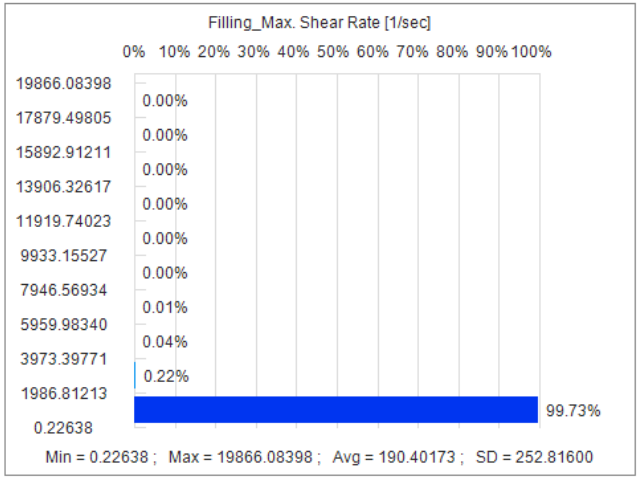
Moldex3D

Filling_Max. Shear Rate



Max. shear rate at each element records the peak value of shear rate during the passing filling time.

Histogram

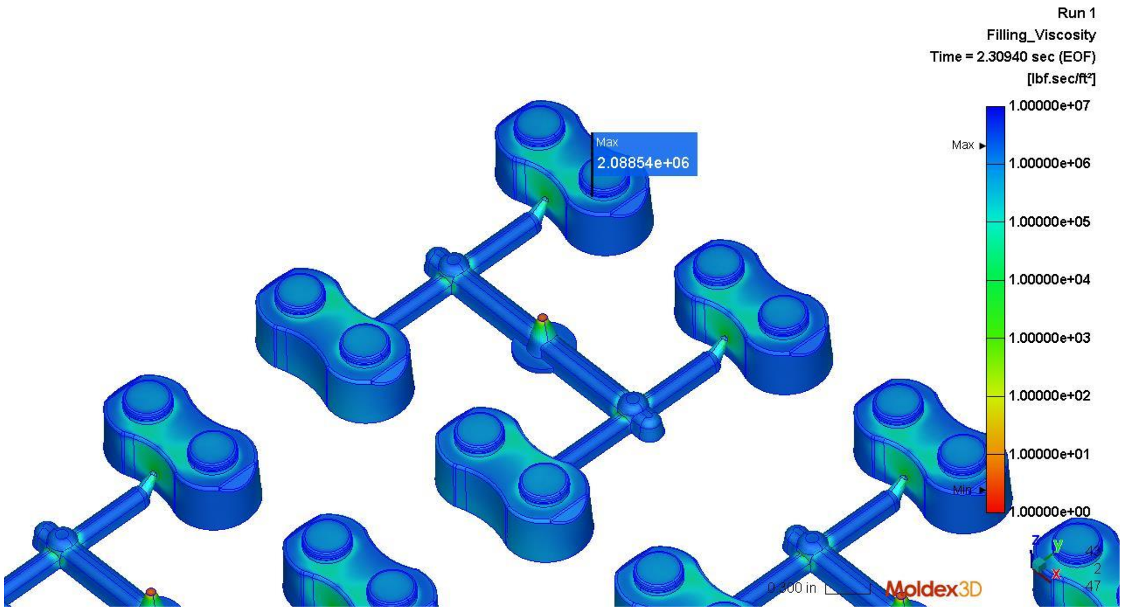


Max	Min
19866.08398	0.22638

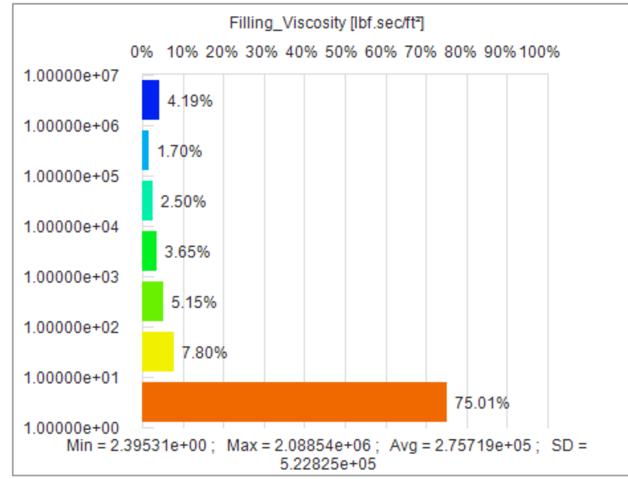
Avg	SD
190.40173	252.81600

Moldex3D

Filling_Viscosity



Histogram



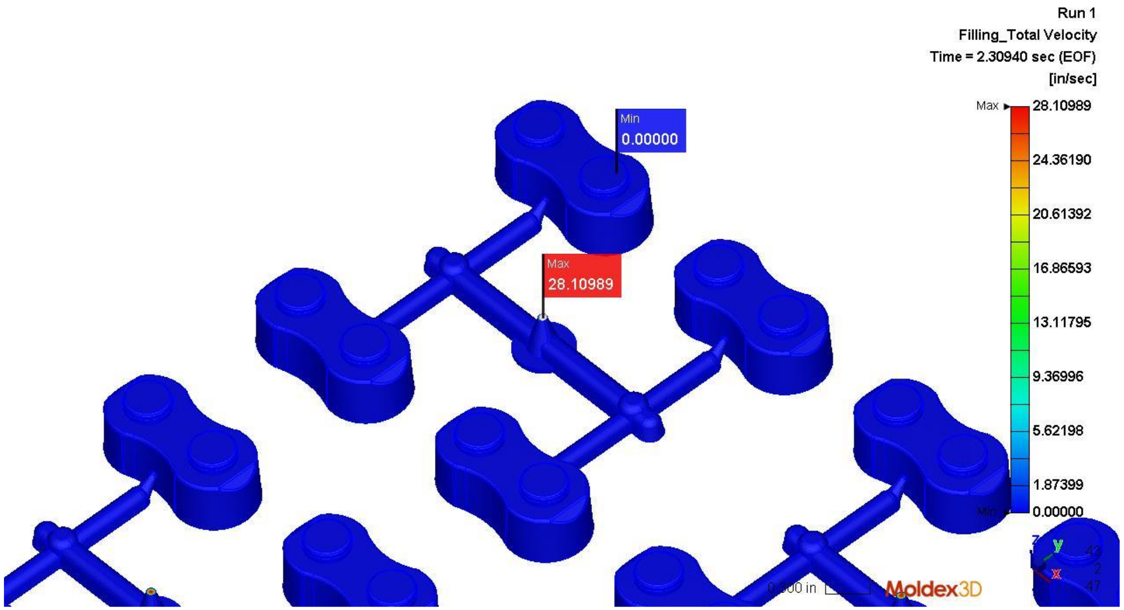
Max	Min
2.08854e+06	2.39531e+00

Avg	SD
2.75719e+05	5.22825e+05

Viscosity is an important property in fluids which can be considered as the resistance of flow.
In polymers, both temperature and shear rate will influence the value of viscosity. The viscosity is constant at low shear rate, and then the viscosity will decrease with increasing shear rate.
Also, the viscosity will decrease as temperature increases.

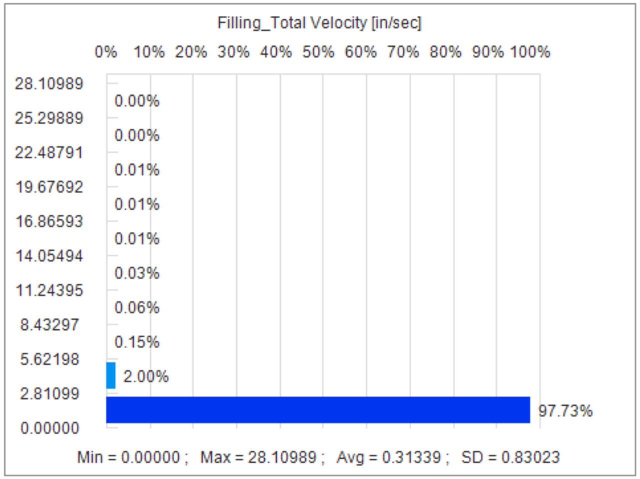
Moldex3D

Filling_Total Velocity



Total velocity is the length (norm) of the velocity vector of plastic melt at current instant. This data can give you the idea about how plastic melt flow at current instant.

Histogram

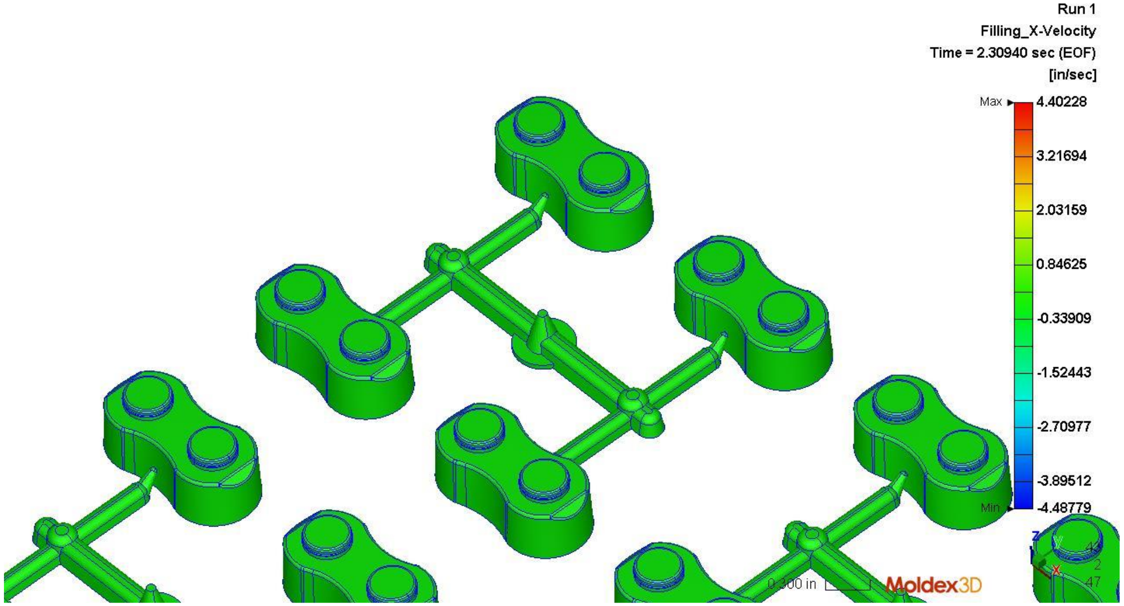


Max	Min
28.10989	0.00000

Avg	SD
0.31339	0.83023

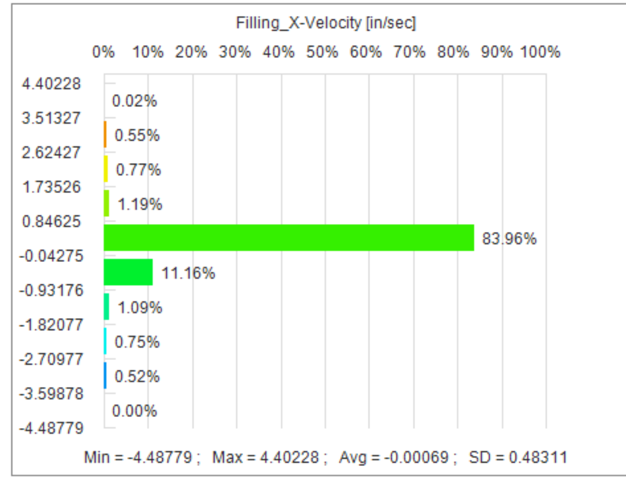
Moldex3D

Filling_X-Velocity



X-Component of the flow velocity of plastic melt at current instant.

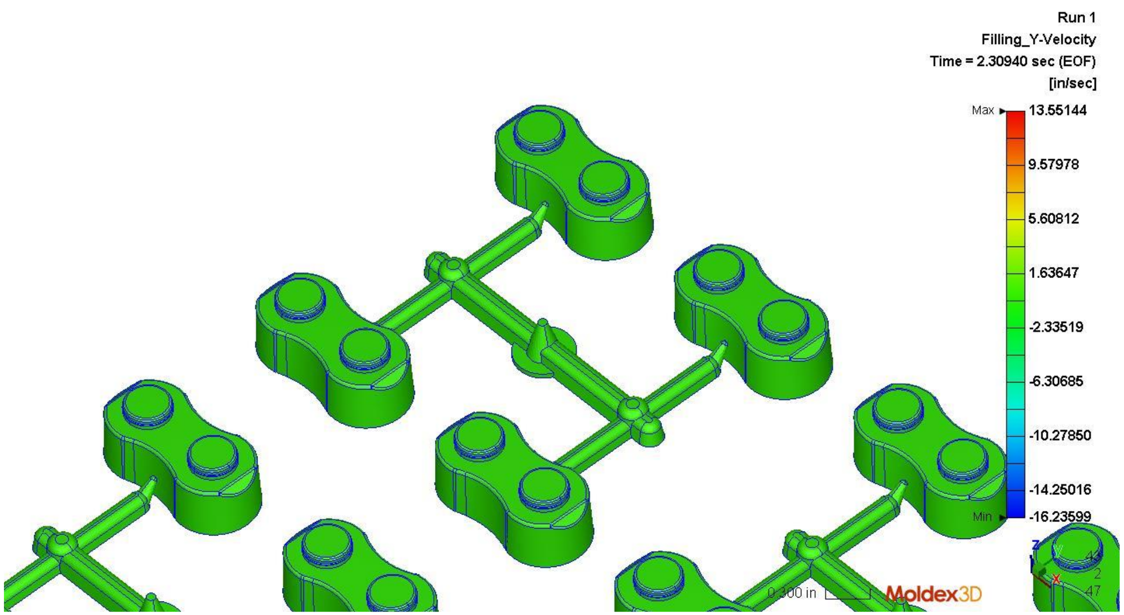
Histogram



Max	Min
4.40228	-4.48779

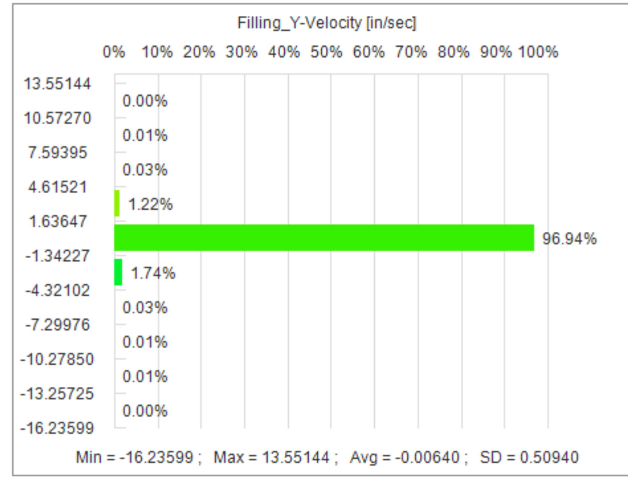
Avg	SD
-0.00069	0.48311

Filling_Y-Velocity



Y-Component of the flow velocity of plastic melt at current instant.

Histogram

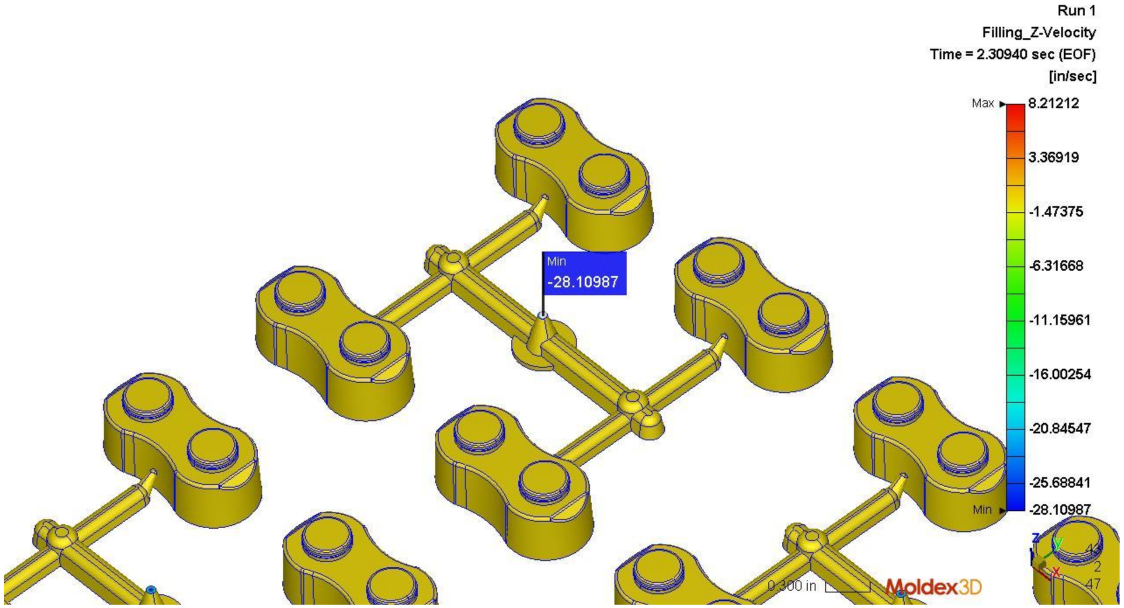


Max	Min
13.55144	-16.23599

Avg	SD
-0.00640	0.50940

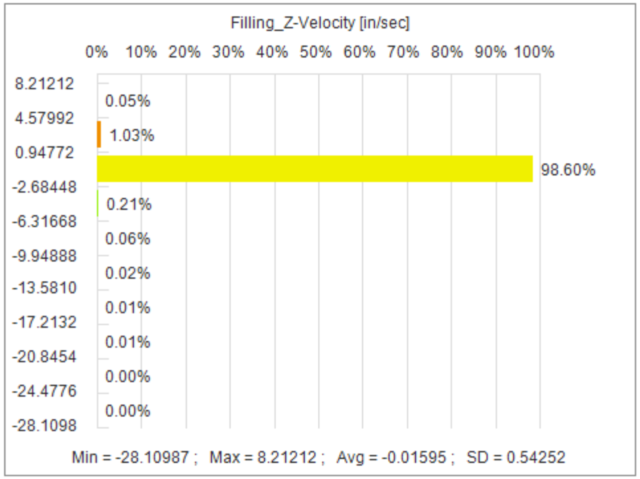
Moldex3D

Filling_Z-Velocity



Z-Component of the flow velocity of plastic melt at current instant.

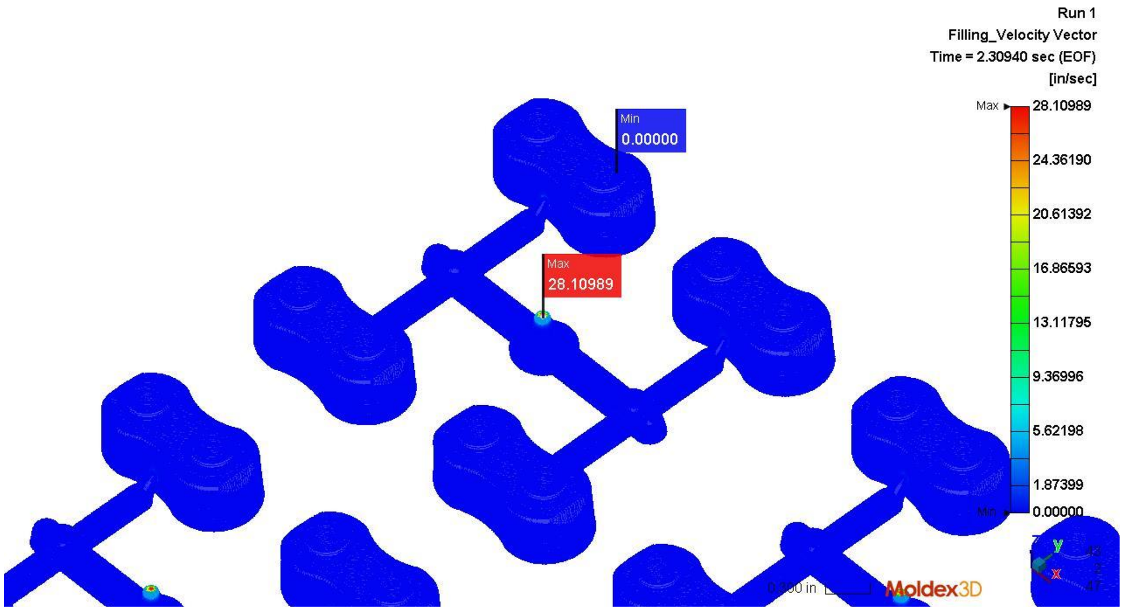
Histogram



Max	Min
8.21212	-28.10987

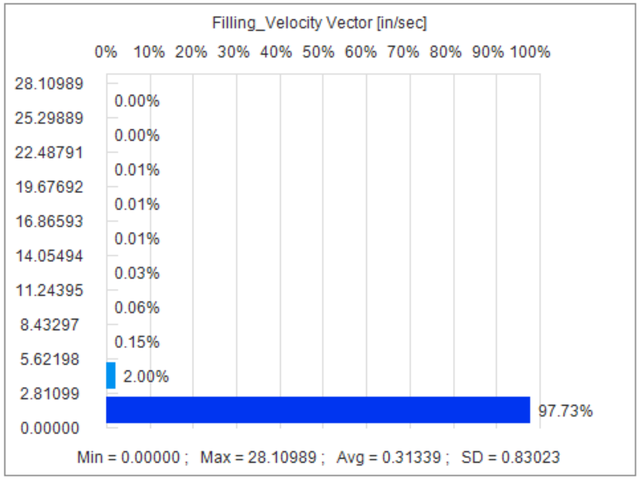
Avg	SD
-0.01595	0.54252

Filling_Velocity Vector



Velocity vector is the vector plot of the velocity vector at current instant.

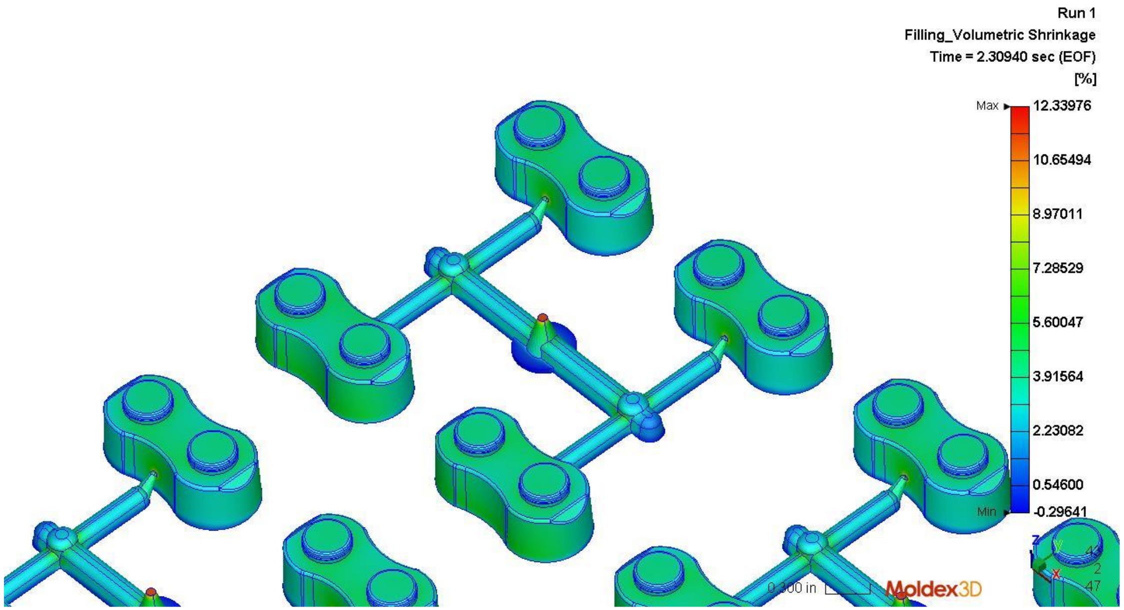
Histogram



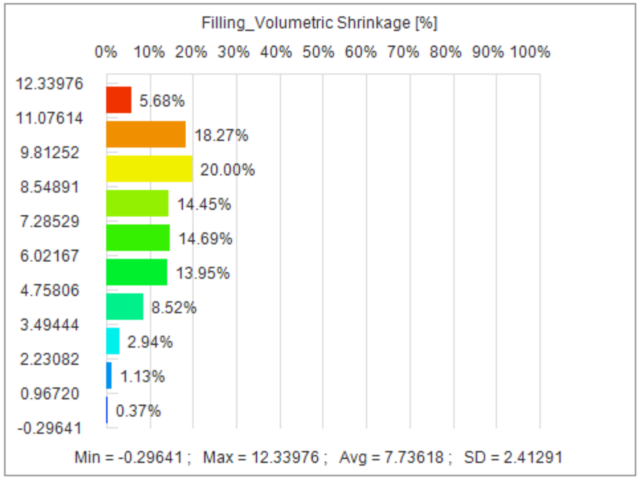
Max	Min
28.10989	0.00000

Avg	SD
0.31339	0.83023

Filling_Volumetric Shrinkage



Histogram



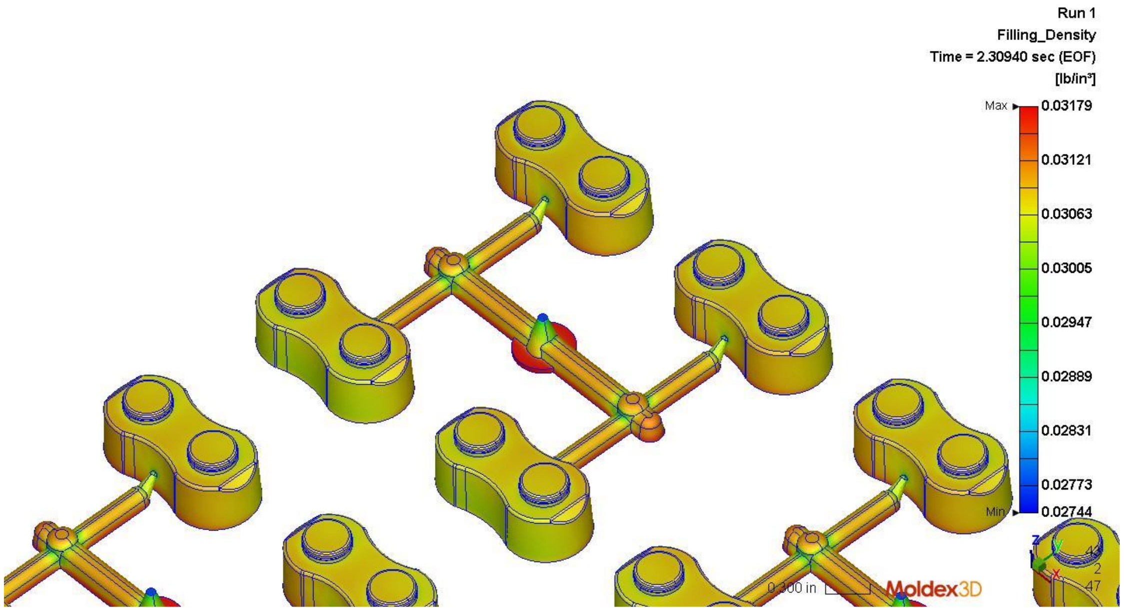
Max	Min
12.33976	-0.29641

Avg	SD
7.73618	2.41291

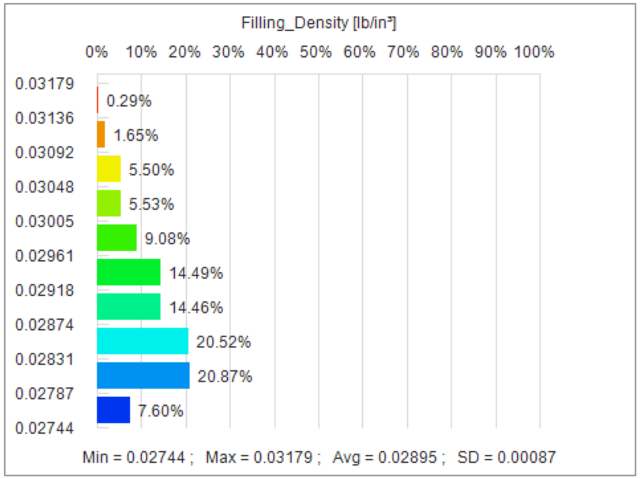
Volumetric shrinkage shows the percentage of part volume change due to PVT change as the part is cooled from high temperature, high pressure conditions at current instant to room temperature, ambient pressure conditions. Positive value represents volume shrinkage while negative value represents volume expansion due to over-pack. Non-uniform volumetric shrinkage will lead to warpage and distortion of demolded parts.

Moldex3D

Filling_Density



Histogram



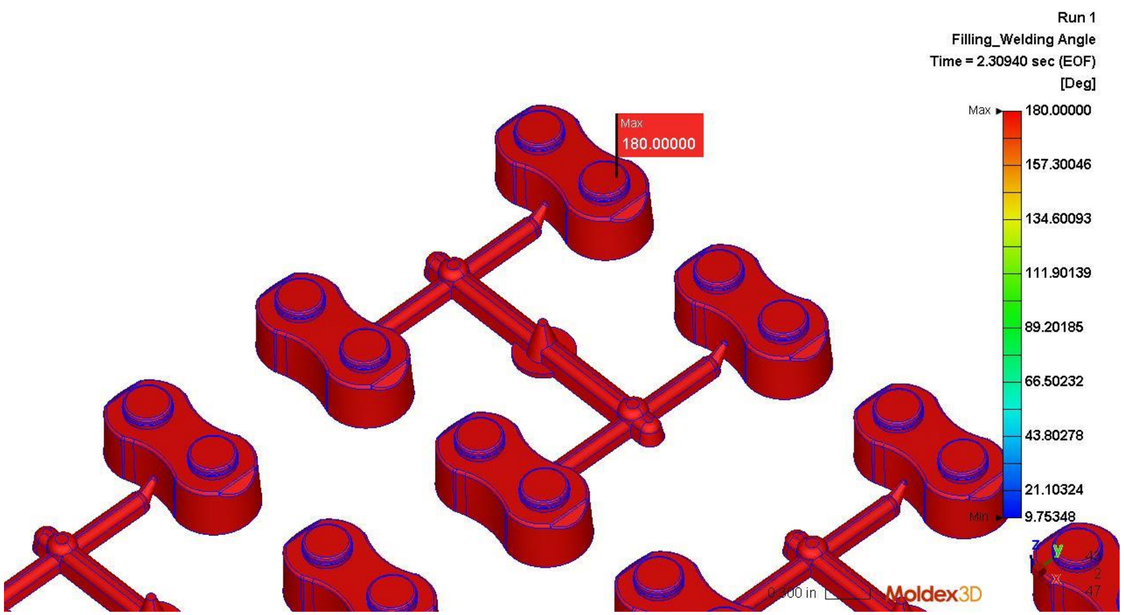
Max	Min
0.03179	0.02744

Avg	SD
0.02895	0.00087

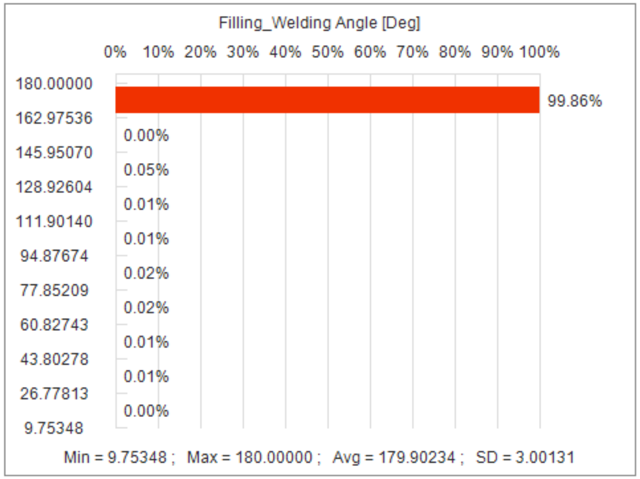
This shows the density distribution at current instant. In general, frozen region will show a greater value of density and molten region will have a lower density value. Non-uniformity in density is a source of part warpage.

Moldex3D

Filling_Welding Angle



Histogram



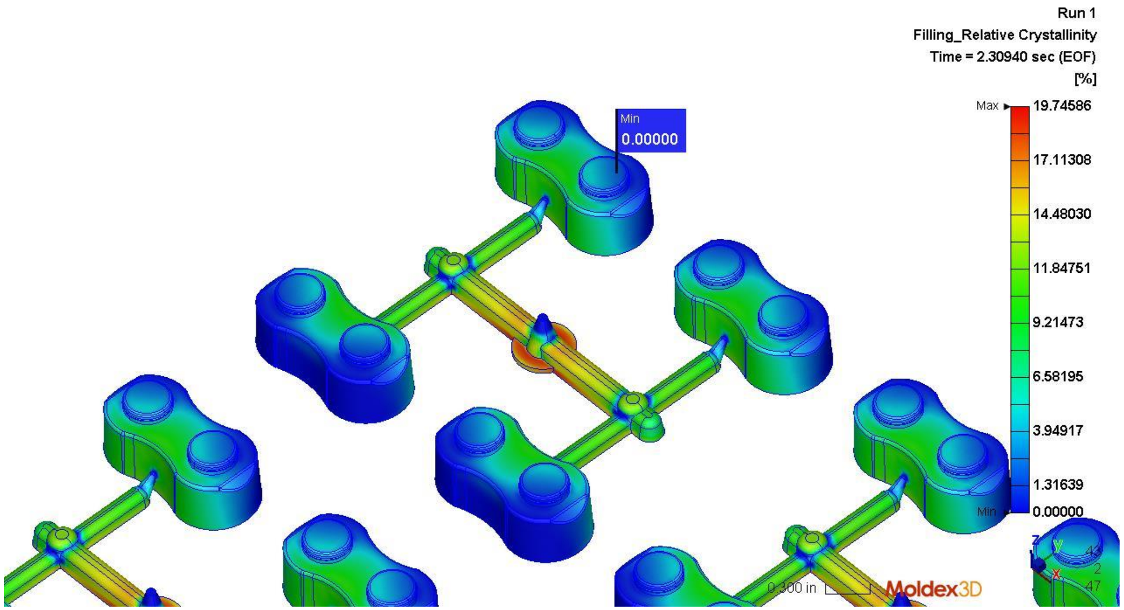
Max	Min
180.00000	9.75348

Avg	SD
179.90234	3.00131

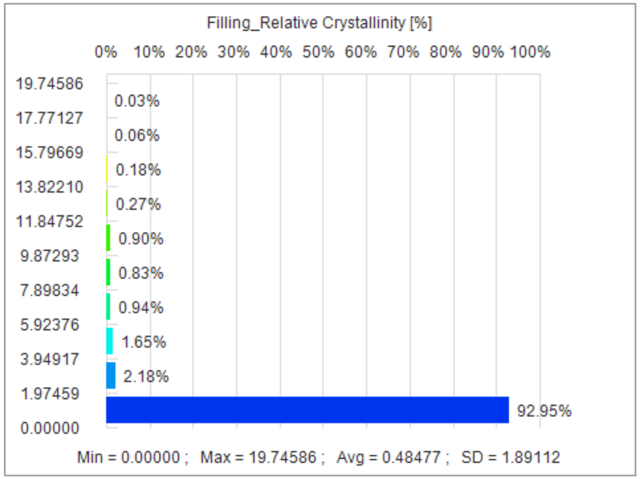
Represent the angle between two converging melt fronts. Small weld meeting angle denotes that two meeting melt fronts will be considered to form a weld line.

Moldex3D

Filling_Relative Crystallinity



Histogram

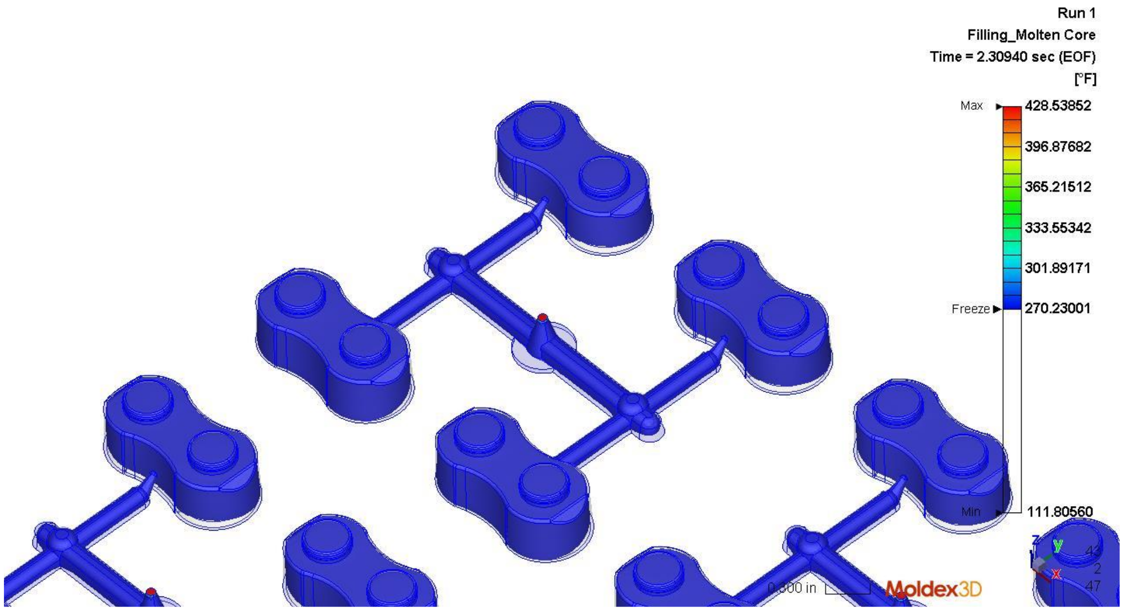


Max	Min
19.74586	0.00000

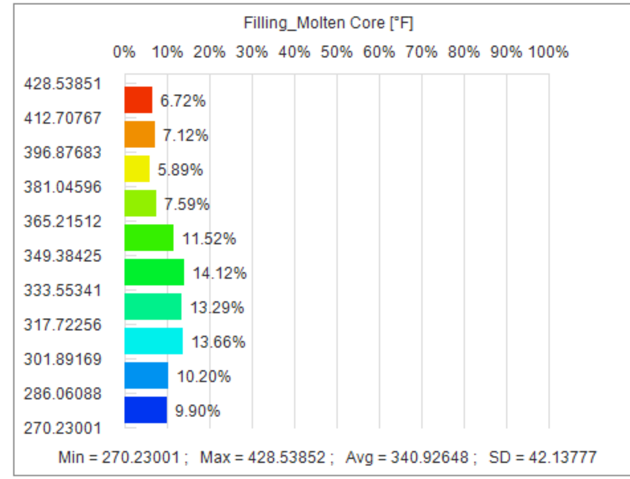
Avg	SD
0.48477	1.89112

Show three dimensional relative crystallinity distribution with the cavity at current instant.

Filling_Molten Core



Histogram



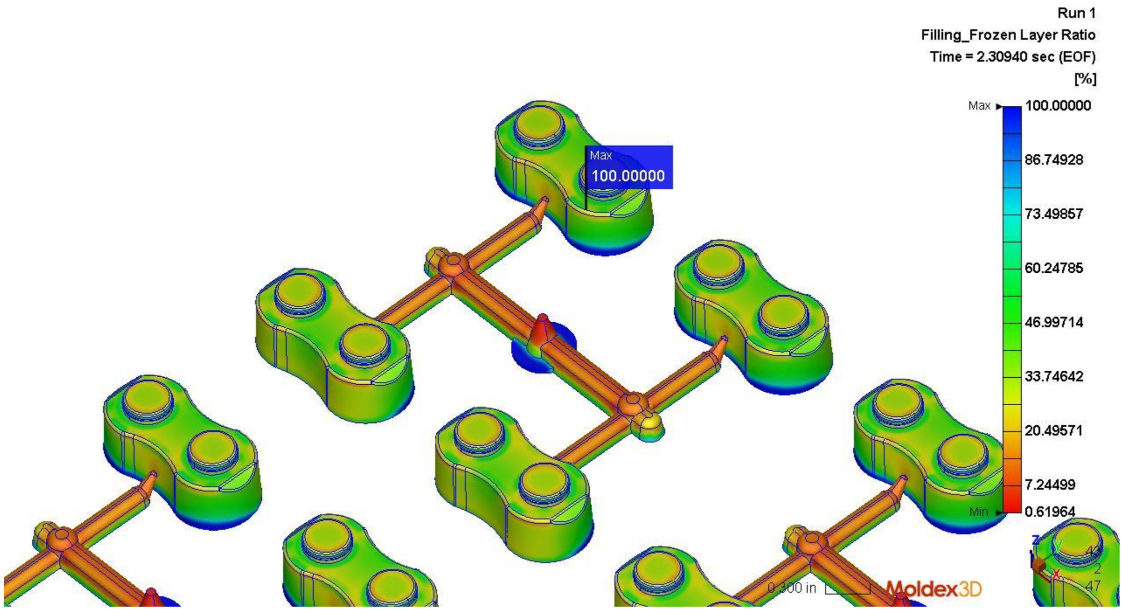
Max	Min
428.53852	270.23001

Avg	SD
340.92648	42.13777

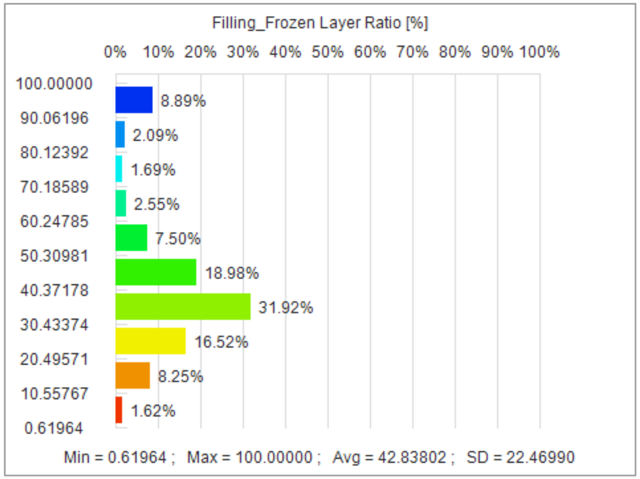
Molten Core result shows the temperature distribution specifically inside the molten plastic, so in other words, the enclosed region is the molding plastic that have not solidified. This 3D isosurface display can be used to check melt freeze condition such around the gate area, and thus to better evaluate packing pressure setting, gating design, etc..Note: the freeze temperature applied here is defined in the selected material.

Moldex3D

Filling_Frozen Layer Ratio



Histogram



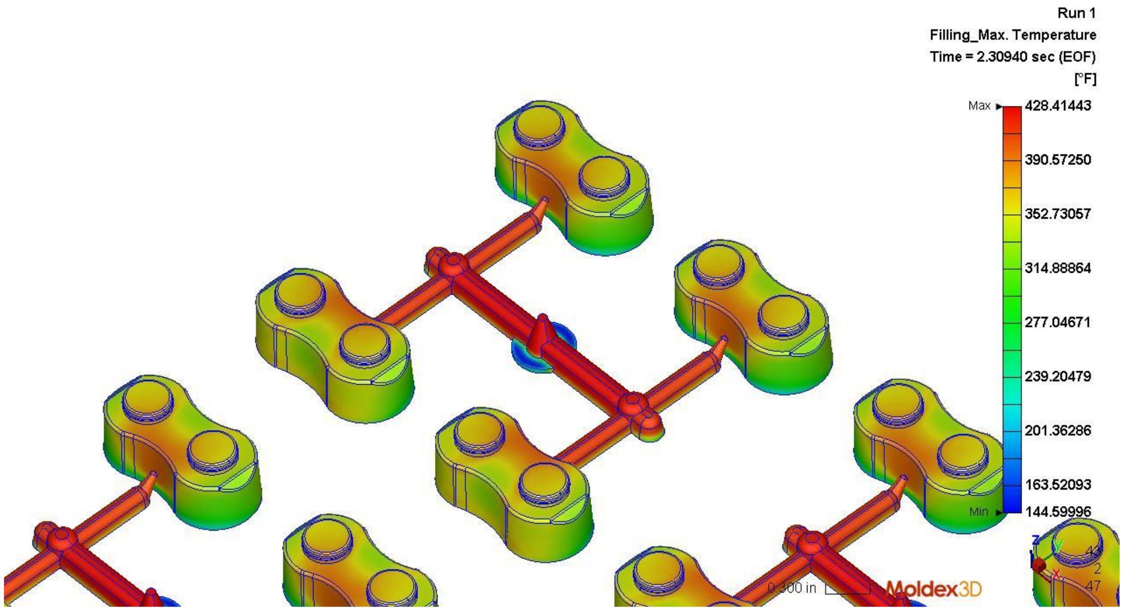
Max	Min
100.00000	0.61964

Avg	SD
42.83802	22.46990

Solidification caused by cooling results in the forming of frozen layer near the cavity surface. With the increasing of time, the frozen ratio increases. The increase of frozen ratio not only reduces the cross-section along the flow path, but also increases the flow resistance and sprue pressure. Furthermore, the residual stress and flow-induced orientation will be affected.

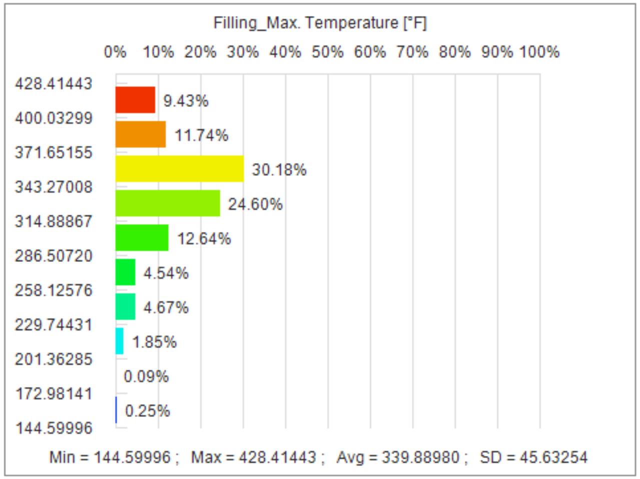
Moldex3D

Filling_Max. Temperature



Shows the maximum temperature in the thickness direction of the part.

Histogram

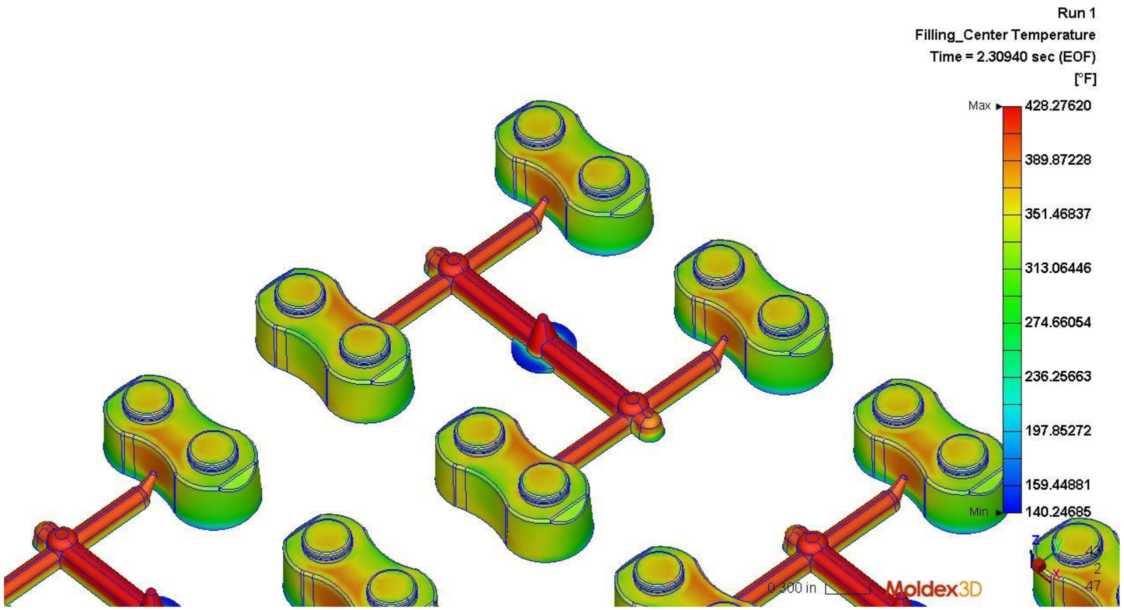


Max	Min
428.41443	144.59996

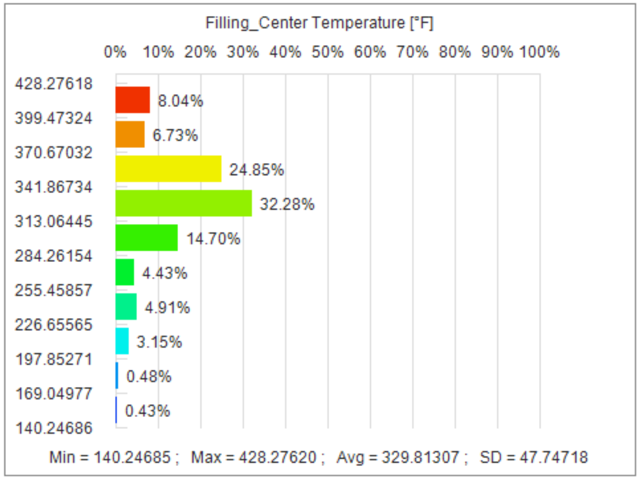
Avg	SD
339.88980	45.63254

Moldex3D

Filling_Center Temperature



Histogram

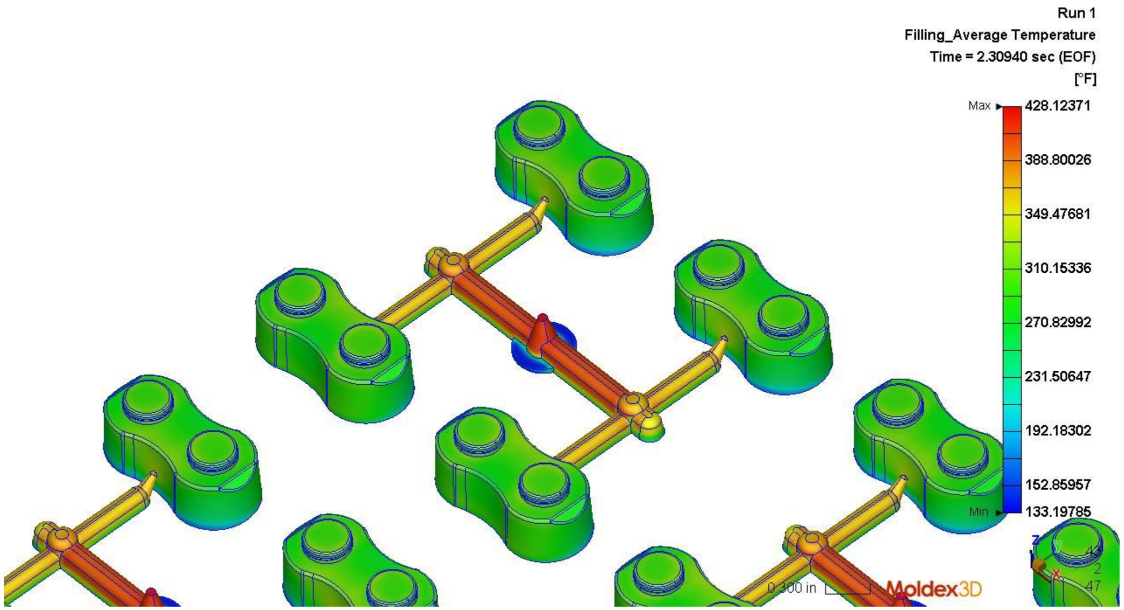


Max	Min
428.27620	140.24685

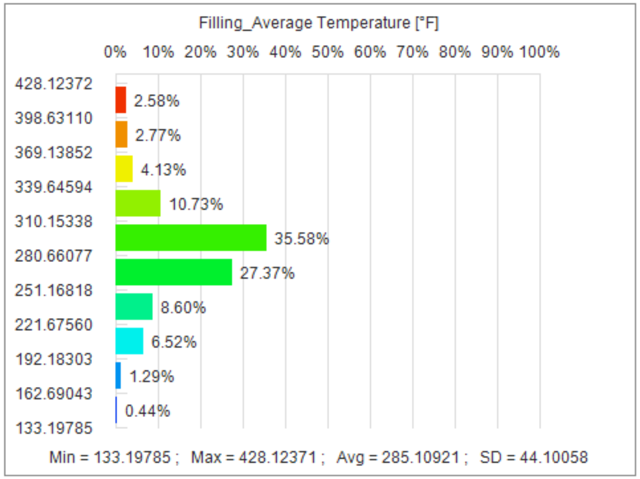
Avg	SD
329.81307	47.74718

Center temperature is the melt temperature of the middle layer (part line) in the thickness direction at current instant. Center temperature is an indicator of thermal energy supply of the fresh hot melt. In general, the center temperature is an indicator of incomplete filling (short shot). If the center temperature is too low, flow hesitation happens and there will be a short shot problem.

Filling_Average Temperature



Histogram



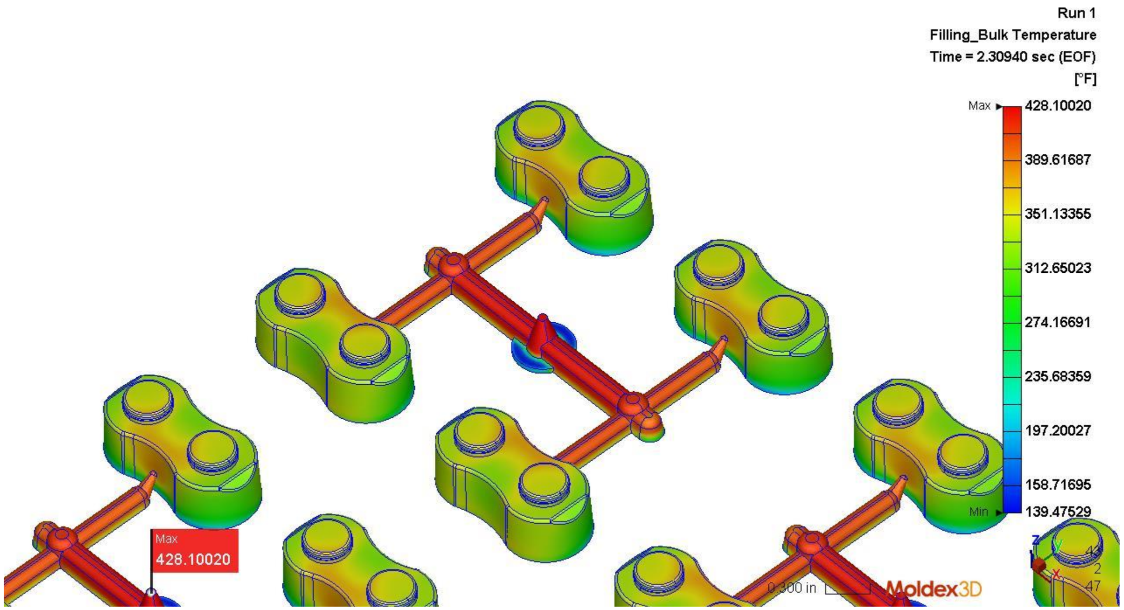
Max	Min
428.12371	133.19785

Avg	SD
285.10921	44.10058

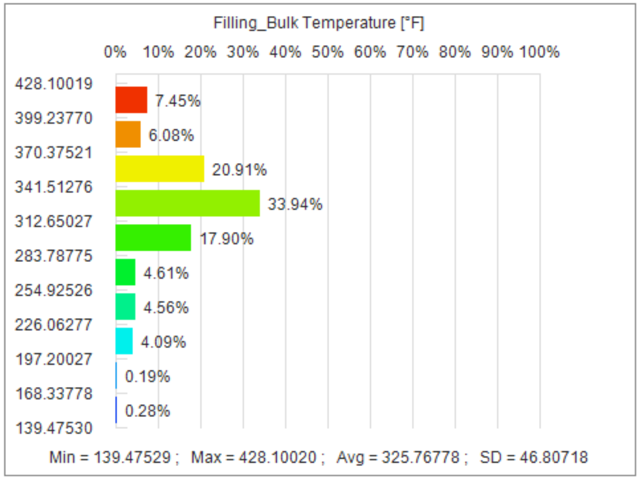
Average temperature is the averaged temperature across the part thickness at current instant.
It considers the effect of mold cooling and viscous heating of melt.
Therefore, average temperature is representative for the part temperature.
This data can be used to check the combined effect of viscous heating of polymer melt and mold cooling.
One should examine if there is any hot spot that will cause burning problem and the possibility of short shot due to flow hesitation and excess mold cooling.

Moldex3D

Filling_Bulk Temperature



Histogram

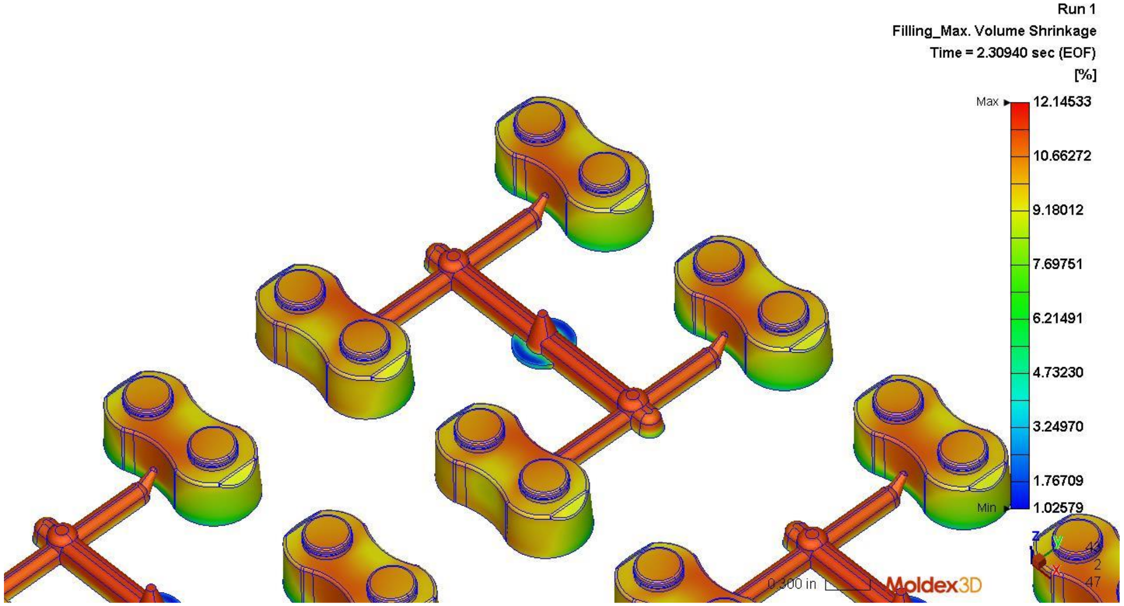


Max	Min
428.10020	139.47529

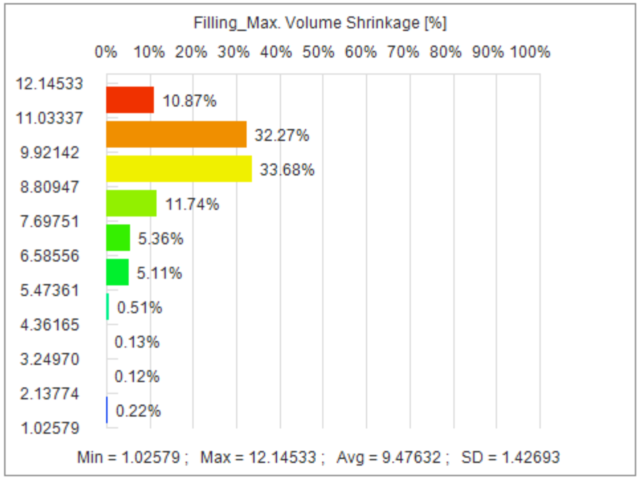
Avg	SD
325.76778	46.80718

Bulk temperature is a velocity-weighted averaged temperature of plastic melt across the thickness at current instant. The contribution 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 hesitation area and viscous heating area. Normally, bulk temperature distribution can reflect the trends or paths of filling flow.

Filling_Max. Volume Shrinkage



Histogram



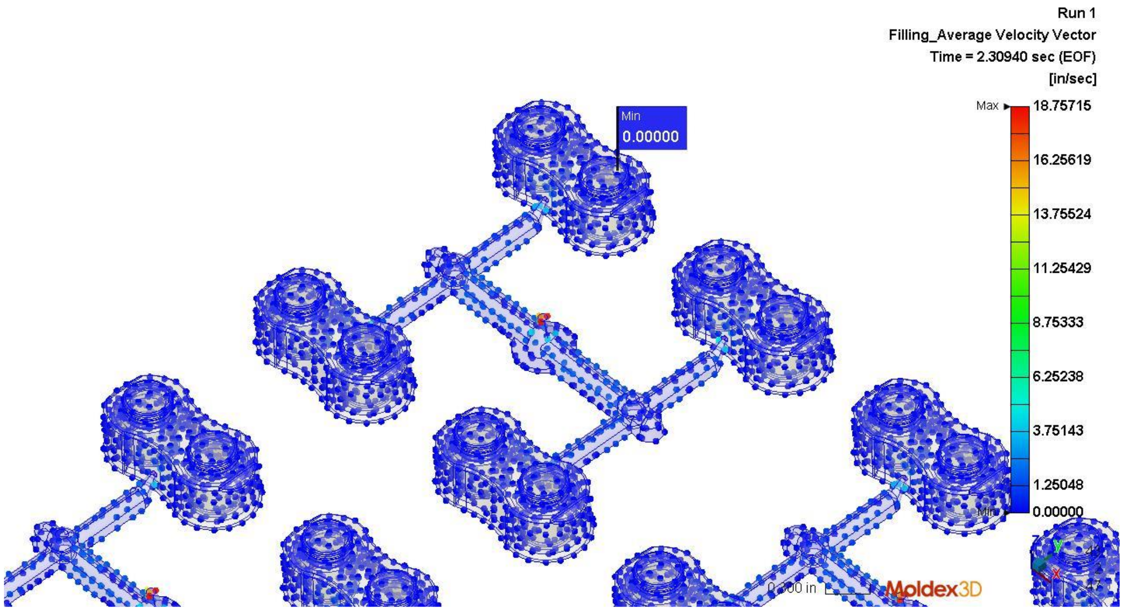
Max	Min
12.14533	1.02579

Avg	SD
9.47632	1.42693

Shows the maximum volume shrinkage across the part thickness at current instant. High positive value represents big volume shrinkage, which may lead to sink mark or void.

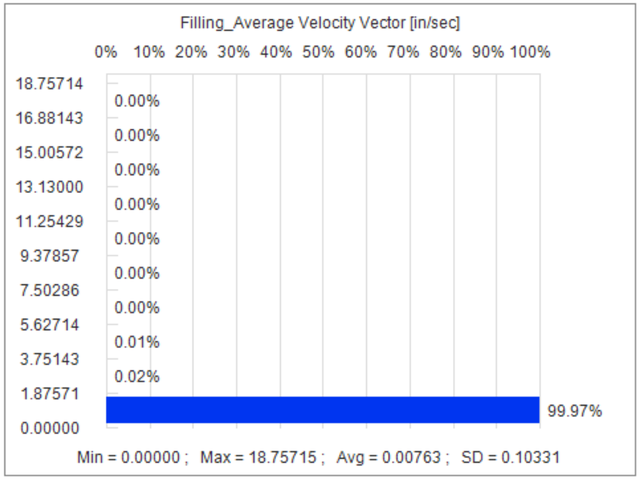
Moldex3D

Filling_Average Velocity Vector



Show the averaged velocity vector across the part thickness at current instant.

Histogram

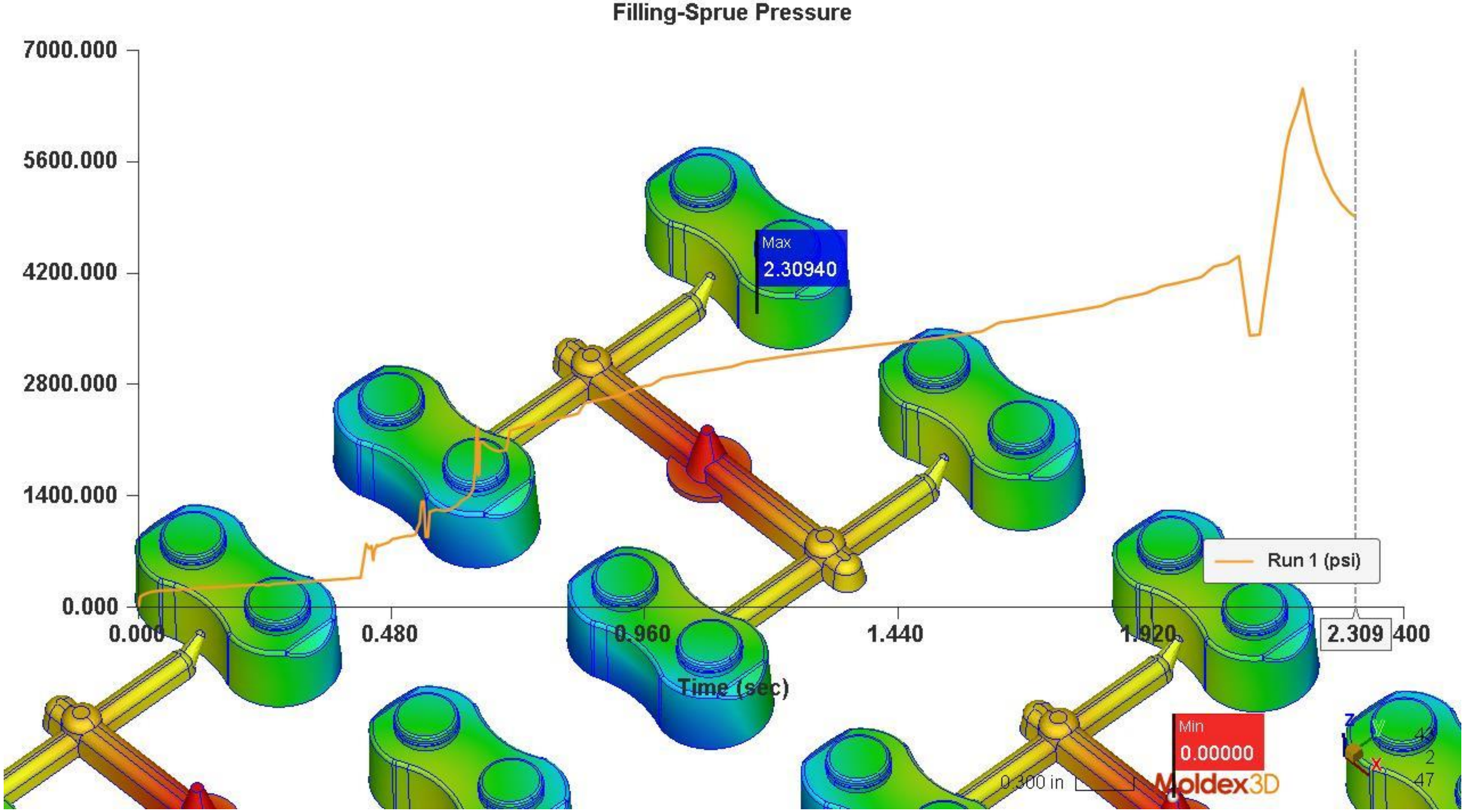


Max	Min
18.75715	0.00000

Avg	SD
0.00763	0.10331

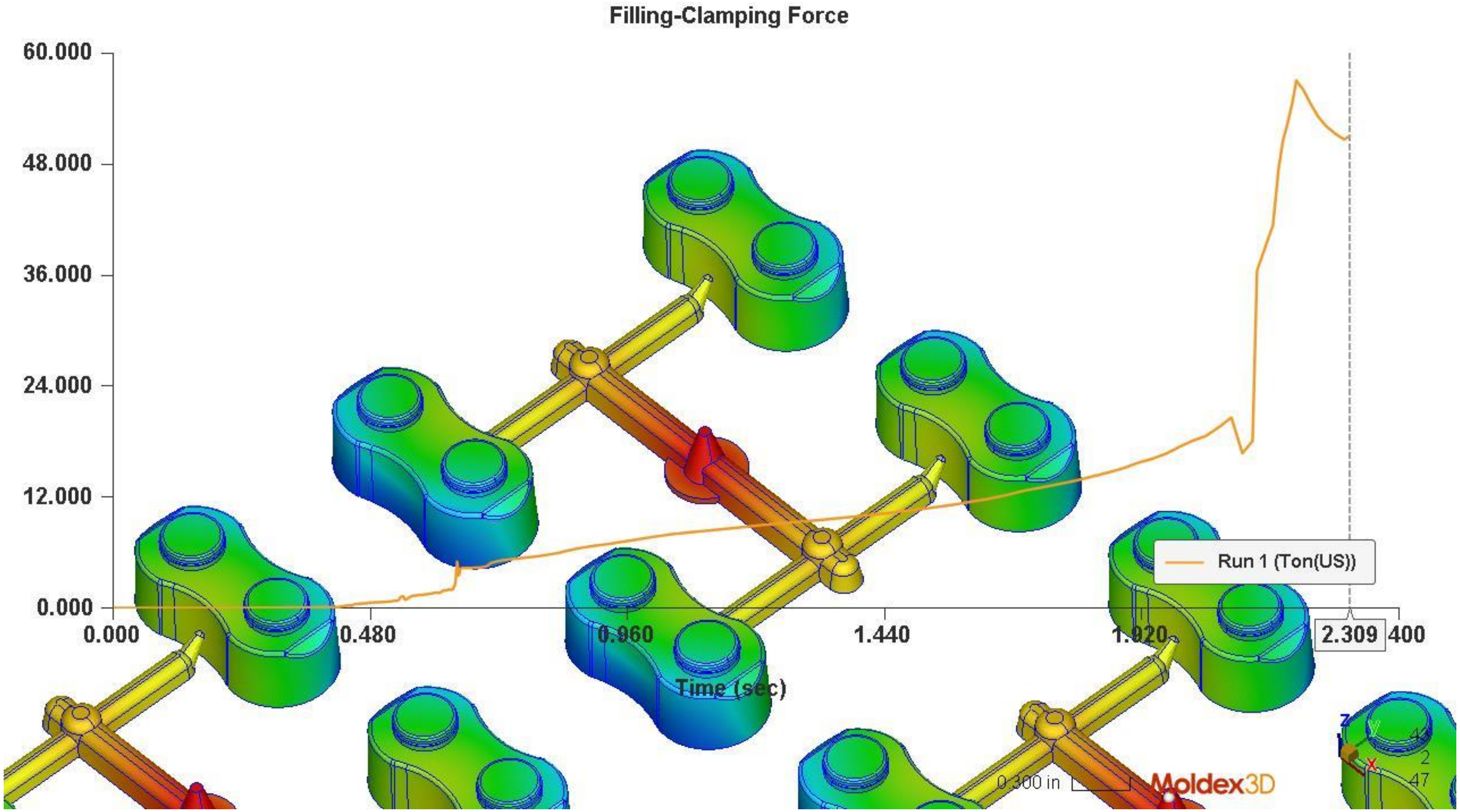
Moldex3D

Filling_XY_Sprue Pressure



Max	Unit
6523.261	psi

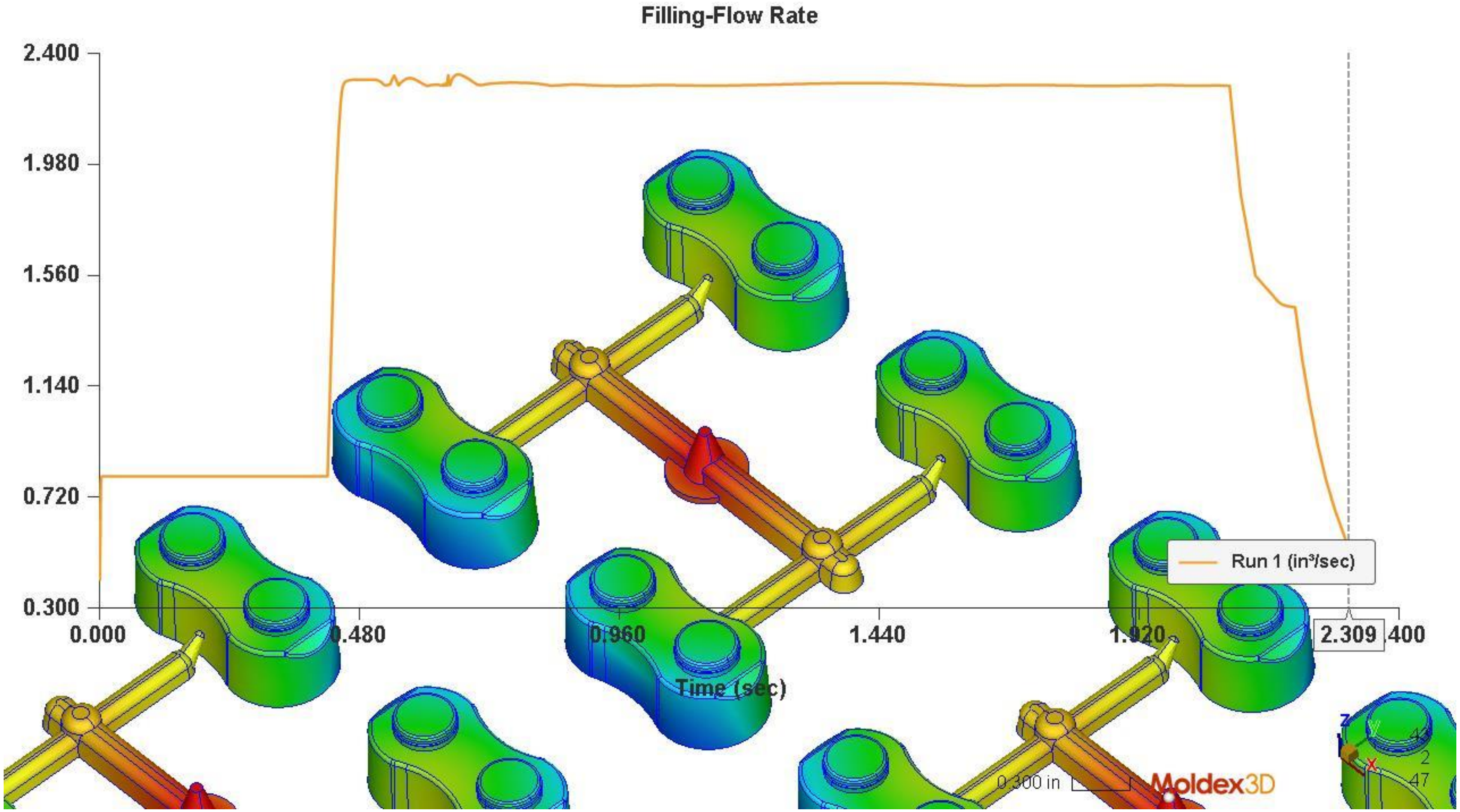
Filling_XY_Clamping Force



Max	Unit
57.086	Ton(US)

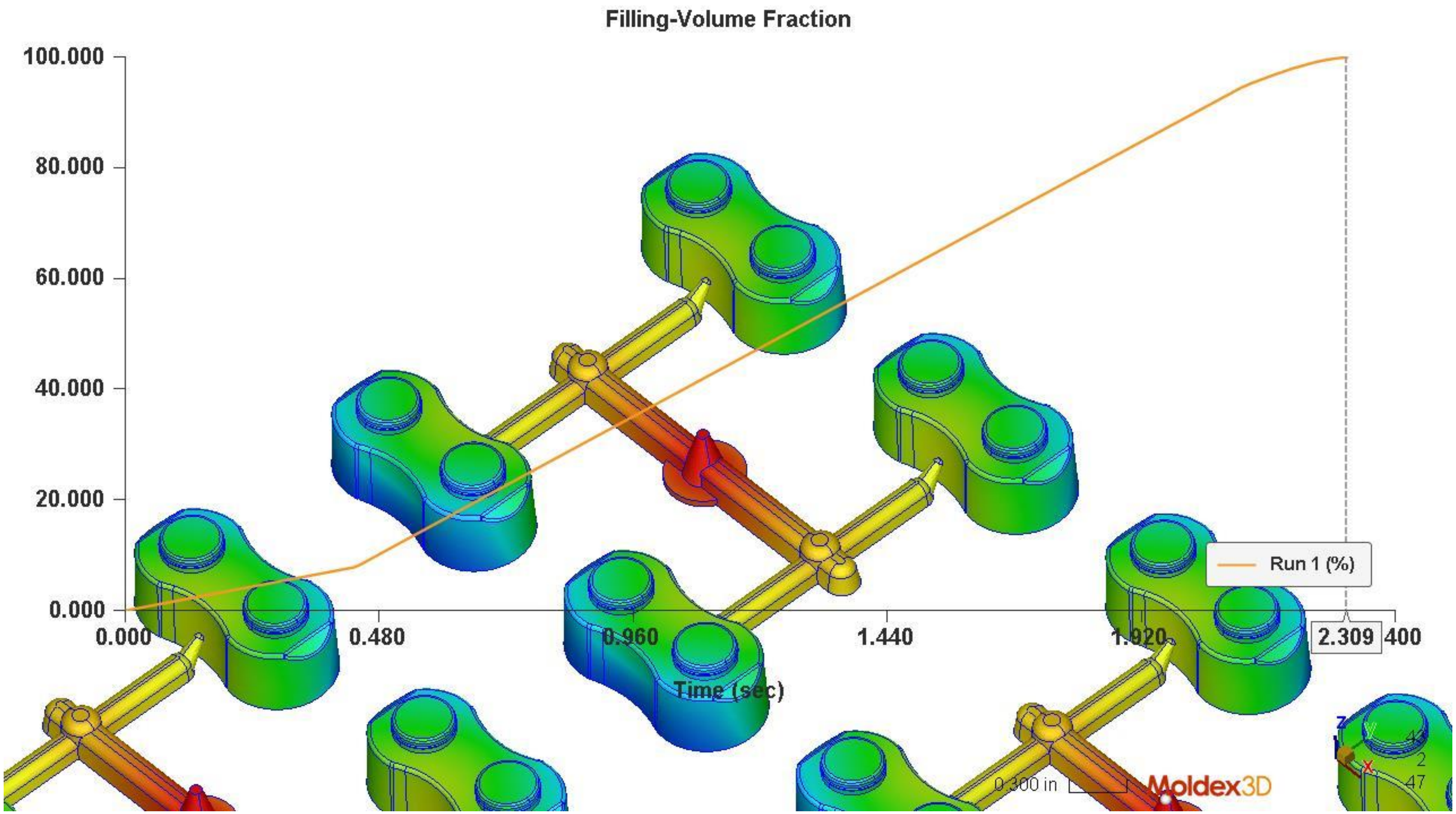
Moldex3D

Filling_XY_Flow Rate



Max	Unit
2.321	in³/sec

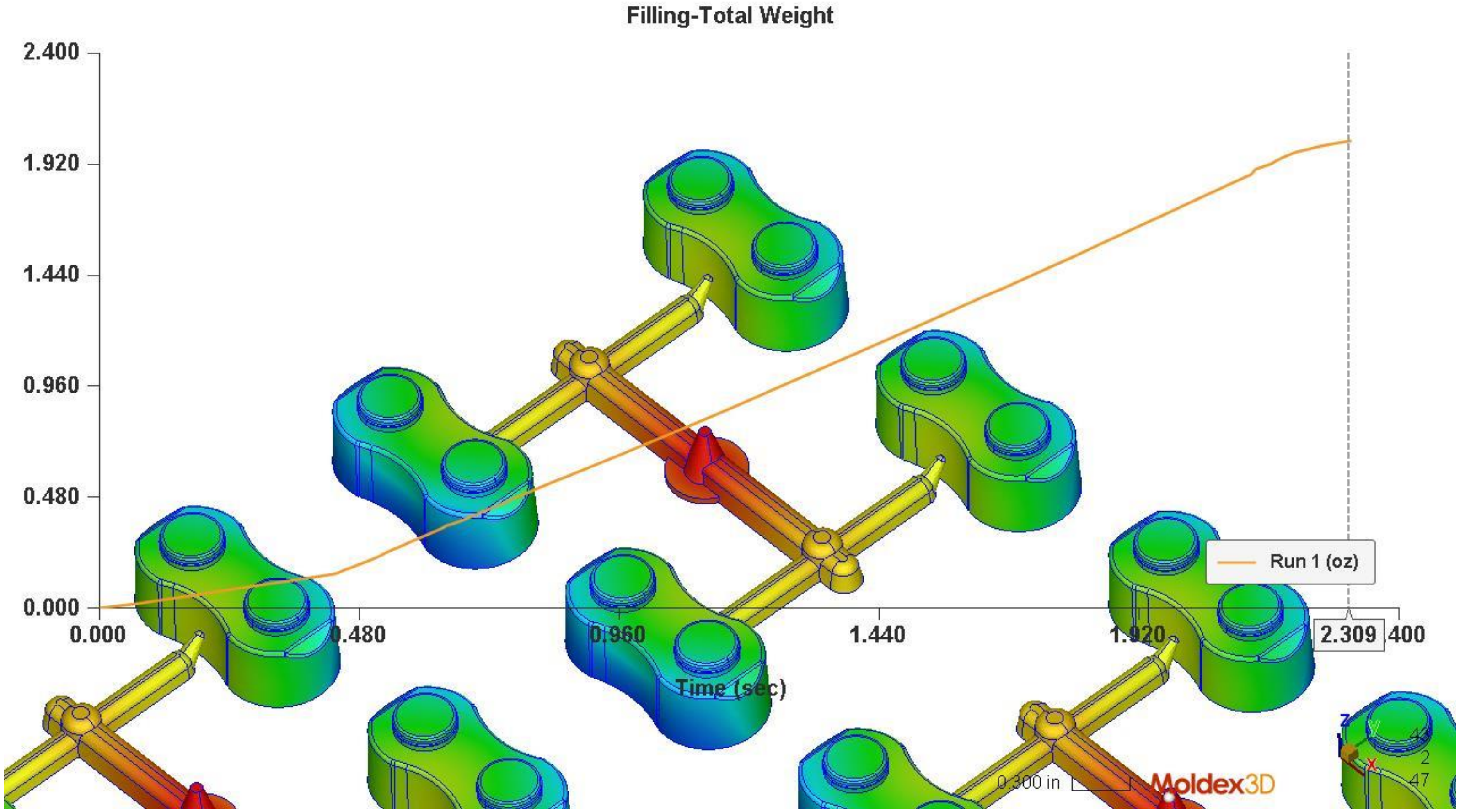
Filling_XY_Volume Fraction



Max	Unit
100.000	%

Moldex3D

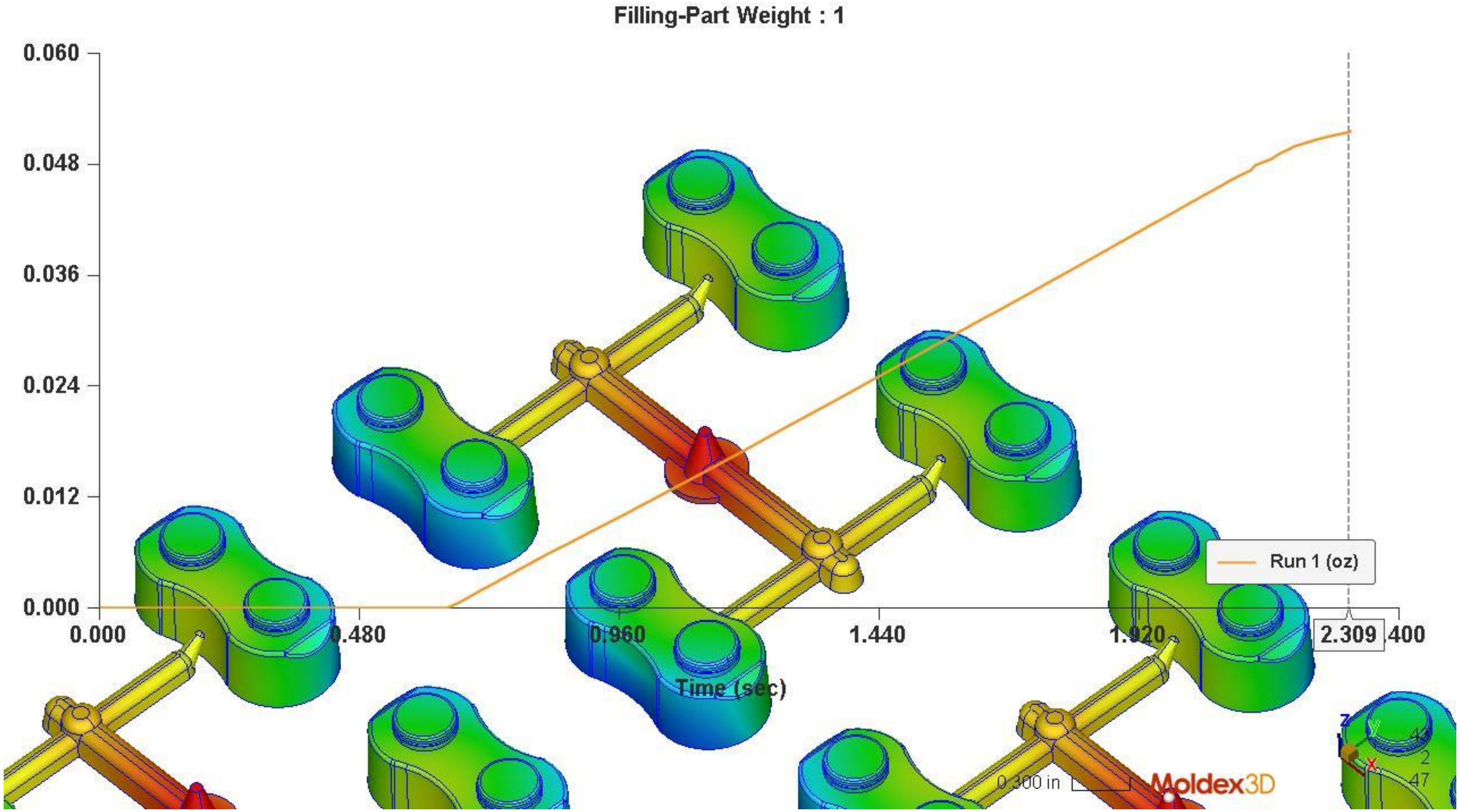
Filling_XY_Total Weight



Max	Unit
2.027	oz

Moldex3D

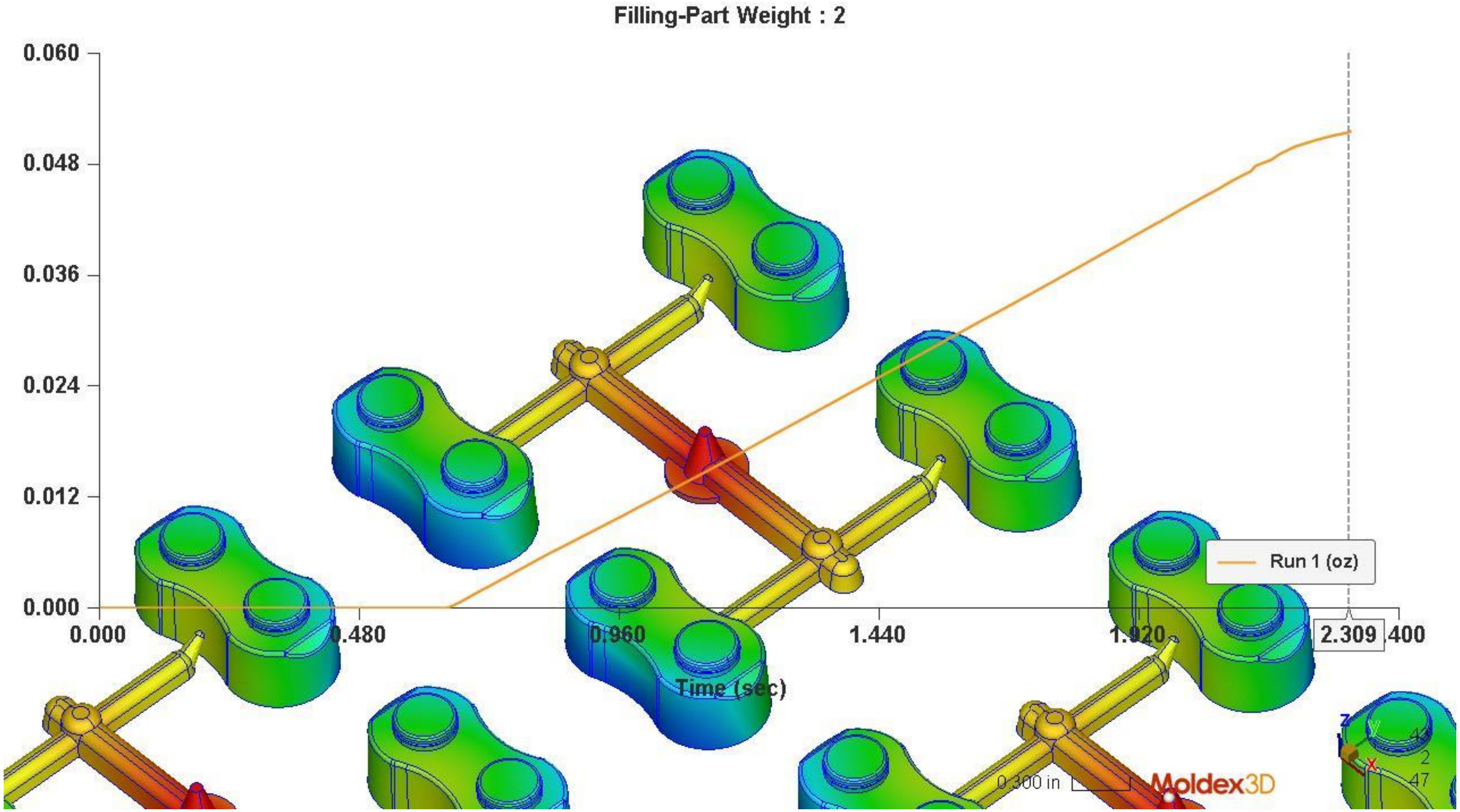
Filling_XY_Part Weight#1



Max	Unit
0.052	oz

Moldex3D

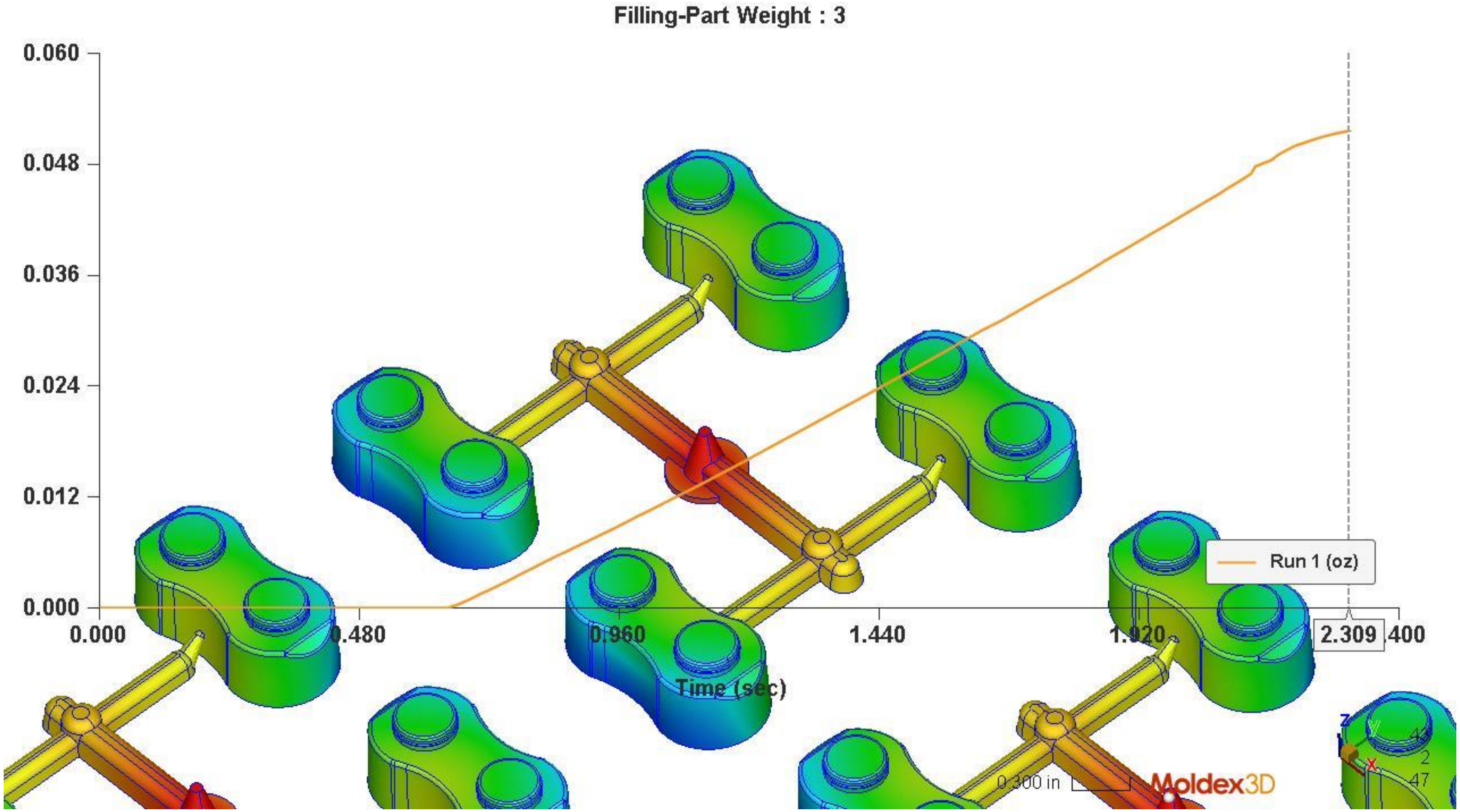
Filling_XY_Part Weight#2



Max	Unit
0.052	oz

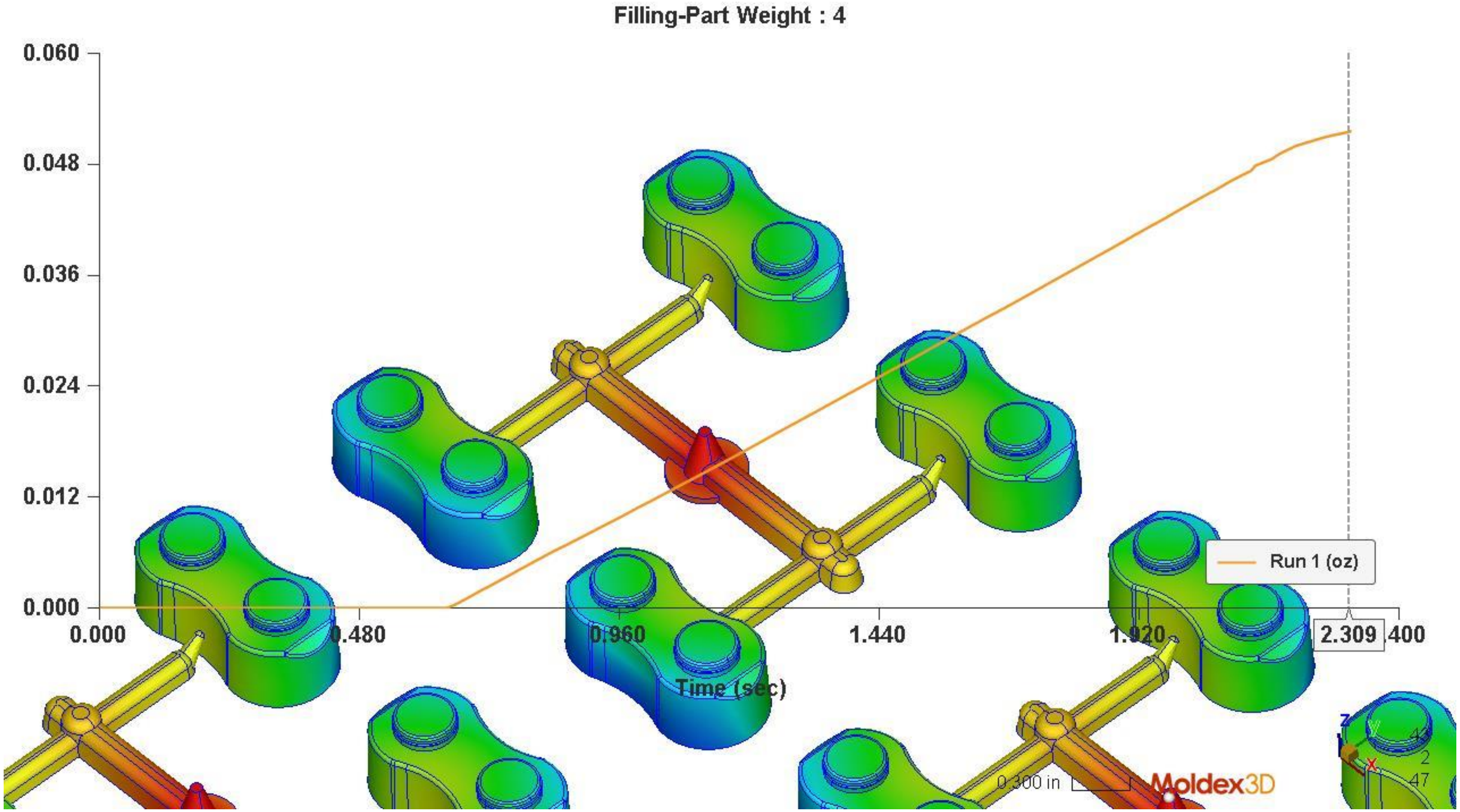
Moldex3D

Filling_XY_Part Weight#3



Max	Unit
0.052	oz

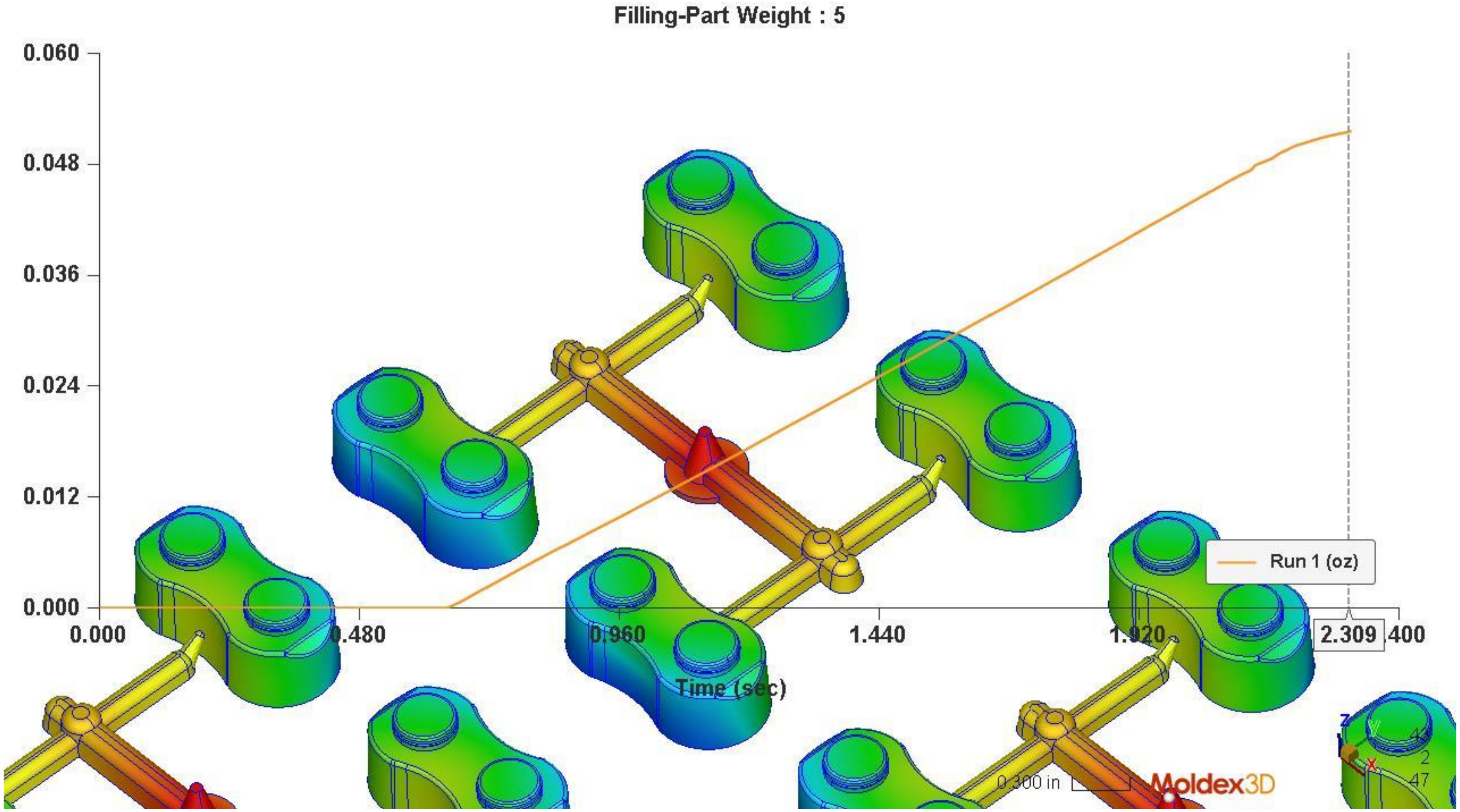
Filling_XY_Part Weight#4



Max	Unit
0.052	oz

Moldex3D

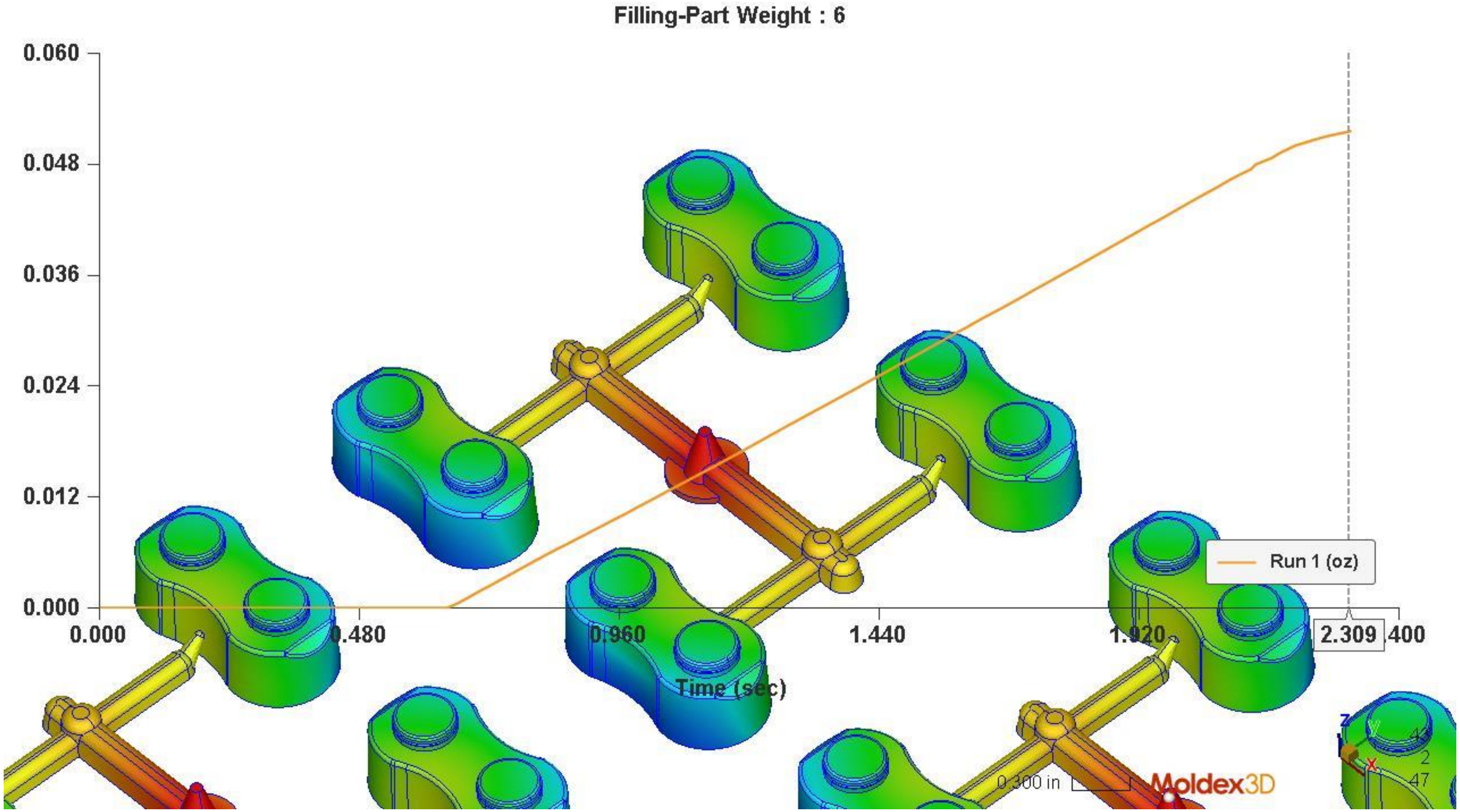
Filling_XY_Part Weight#5



Max	Unit
0.052	oz

Moldex3D

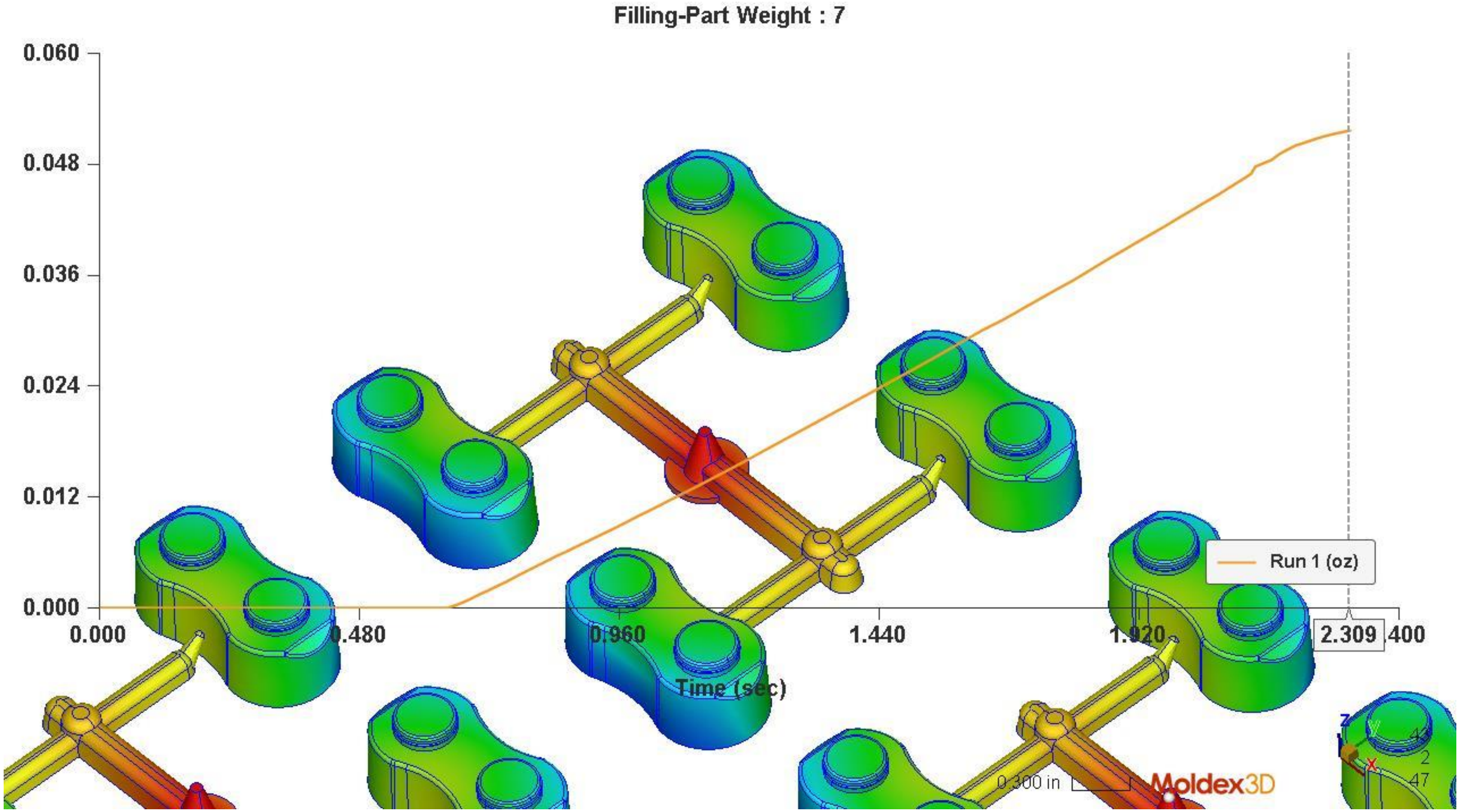
Filling_XY_Part Weight#6



Max	Unit
0.052	oz

Moldex3D

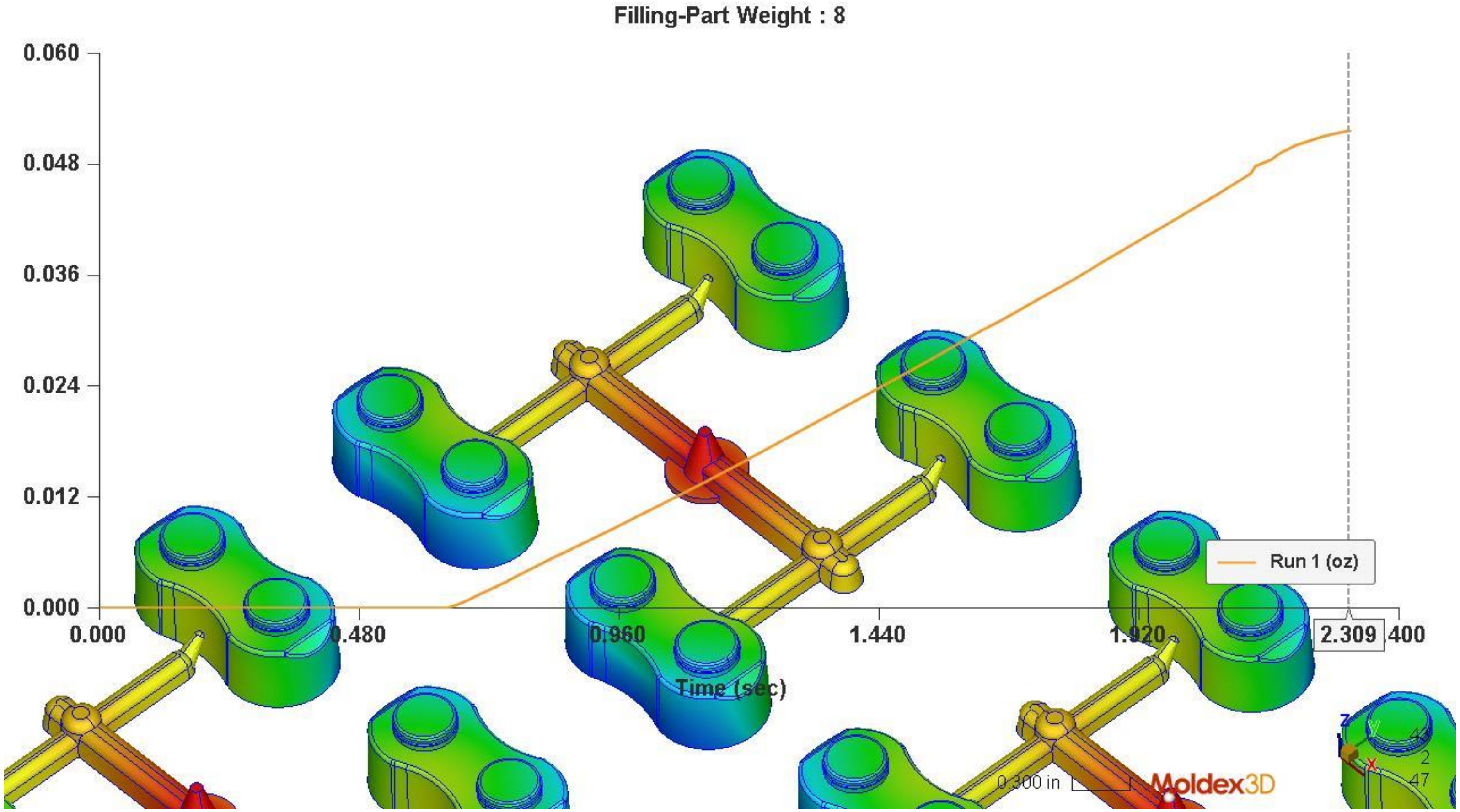
Filling_XY_Part Weight#7



Max	Unit
0.052	oz

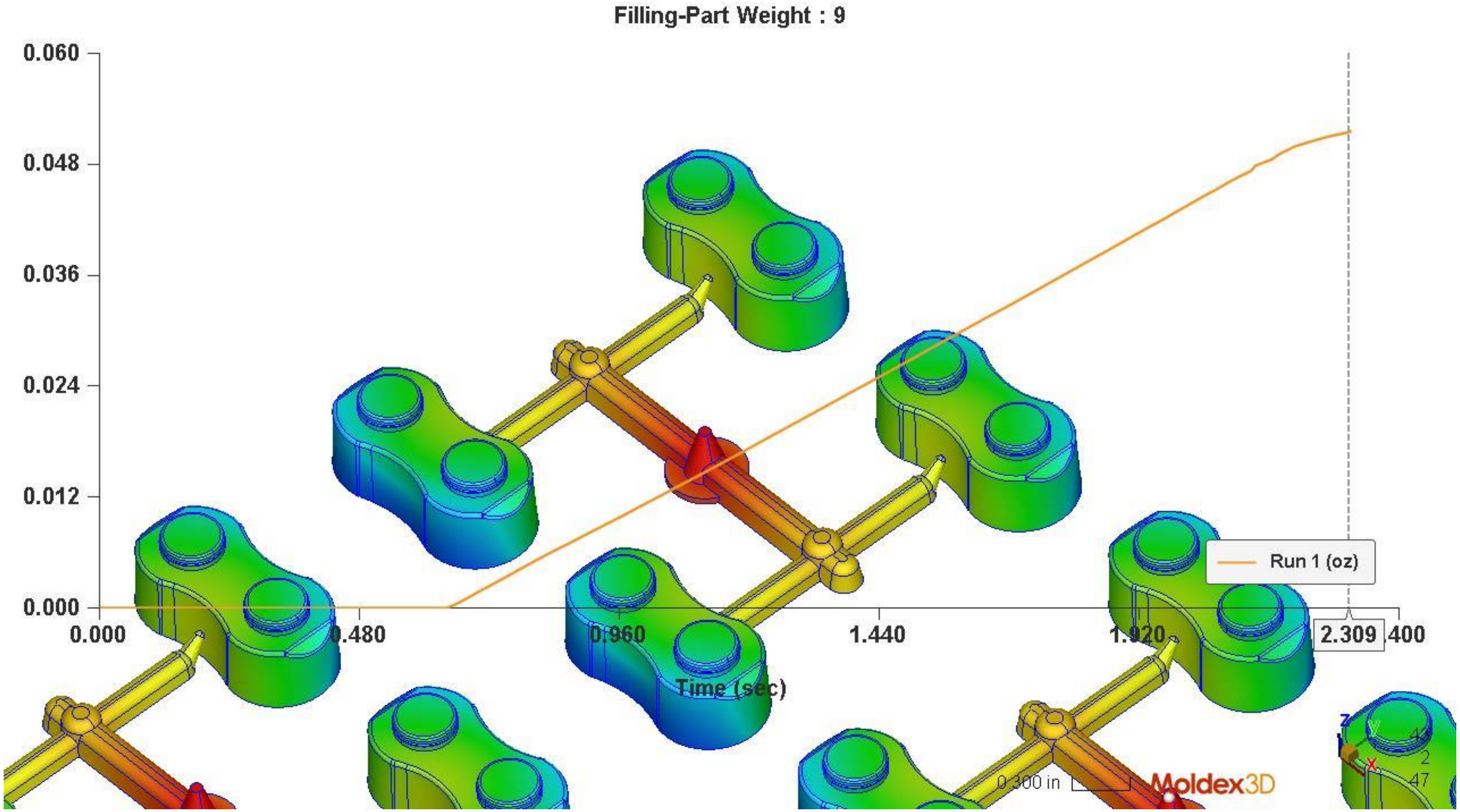
Moldex3D

Filling_XY_Part Weight#8



Max	Unit
0.052	oz

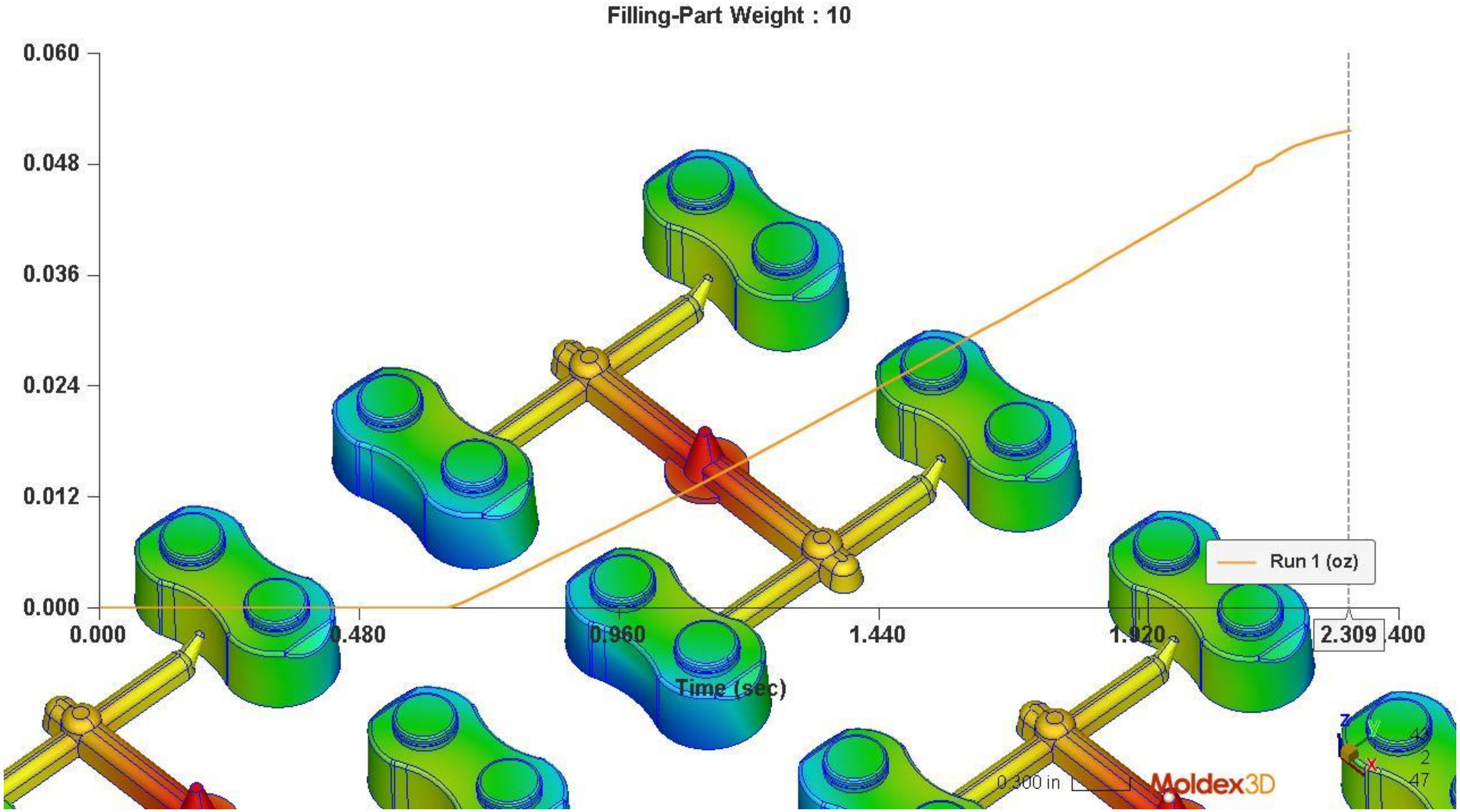
Filling_XY_Part Weight#9



Max	Unit
0.052	oz

Moldex3D

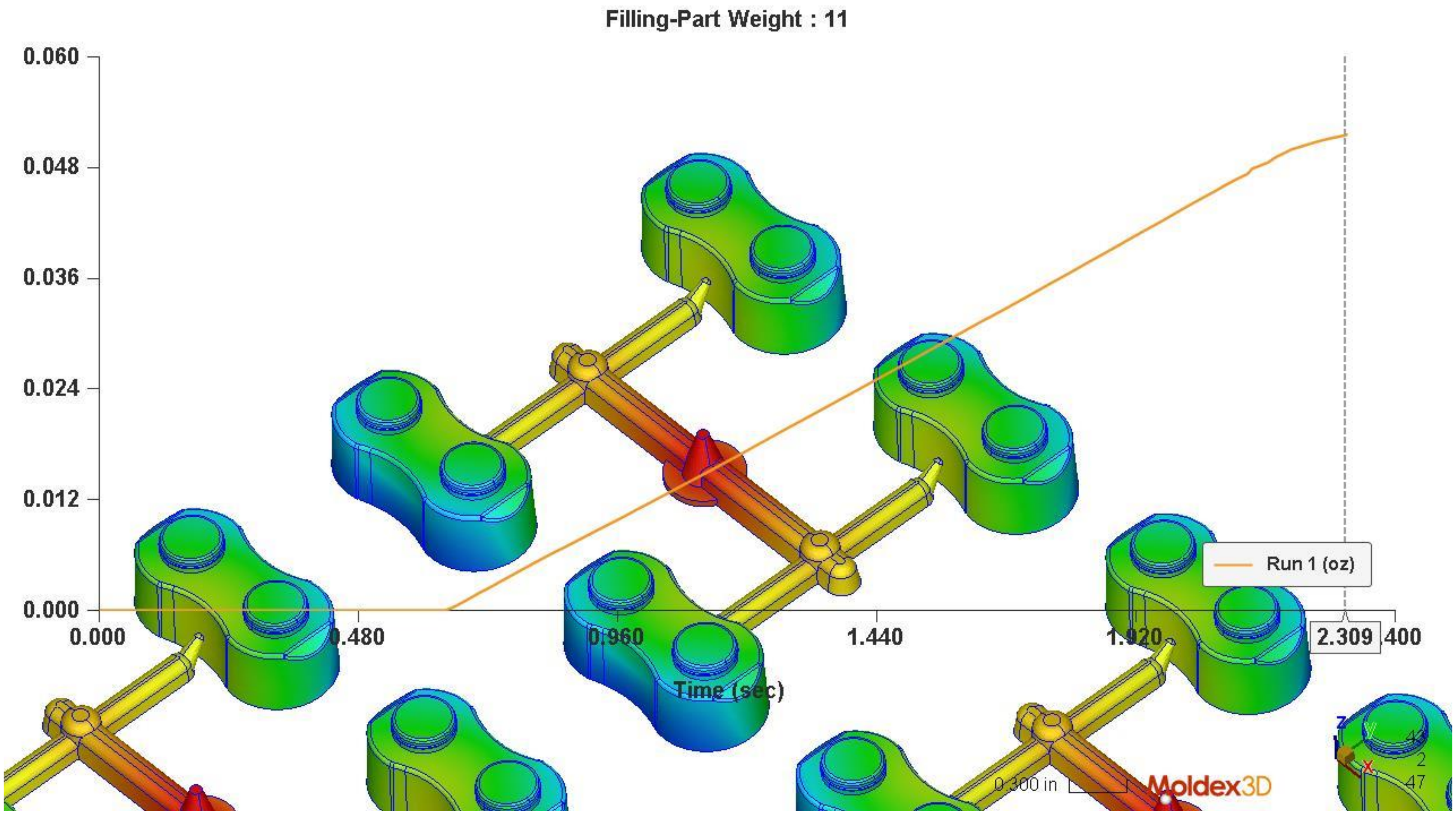
Filling_XY_Part Weight#10



Max	Unit
0.052	oz

Moldex3D

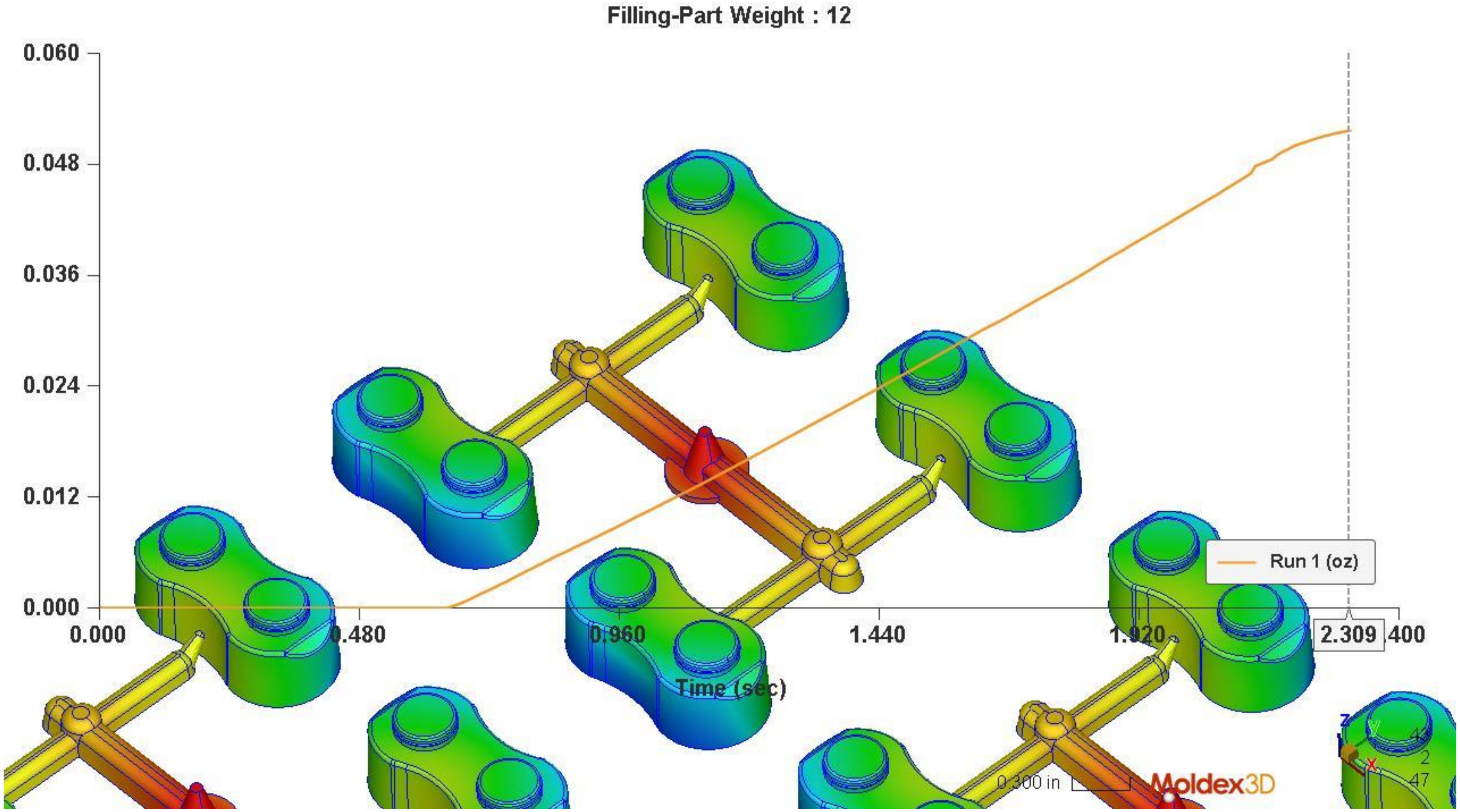
Filling_XY_Part Weight#11



Max	Unit
0.052	oz

Moldex3D

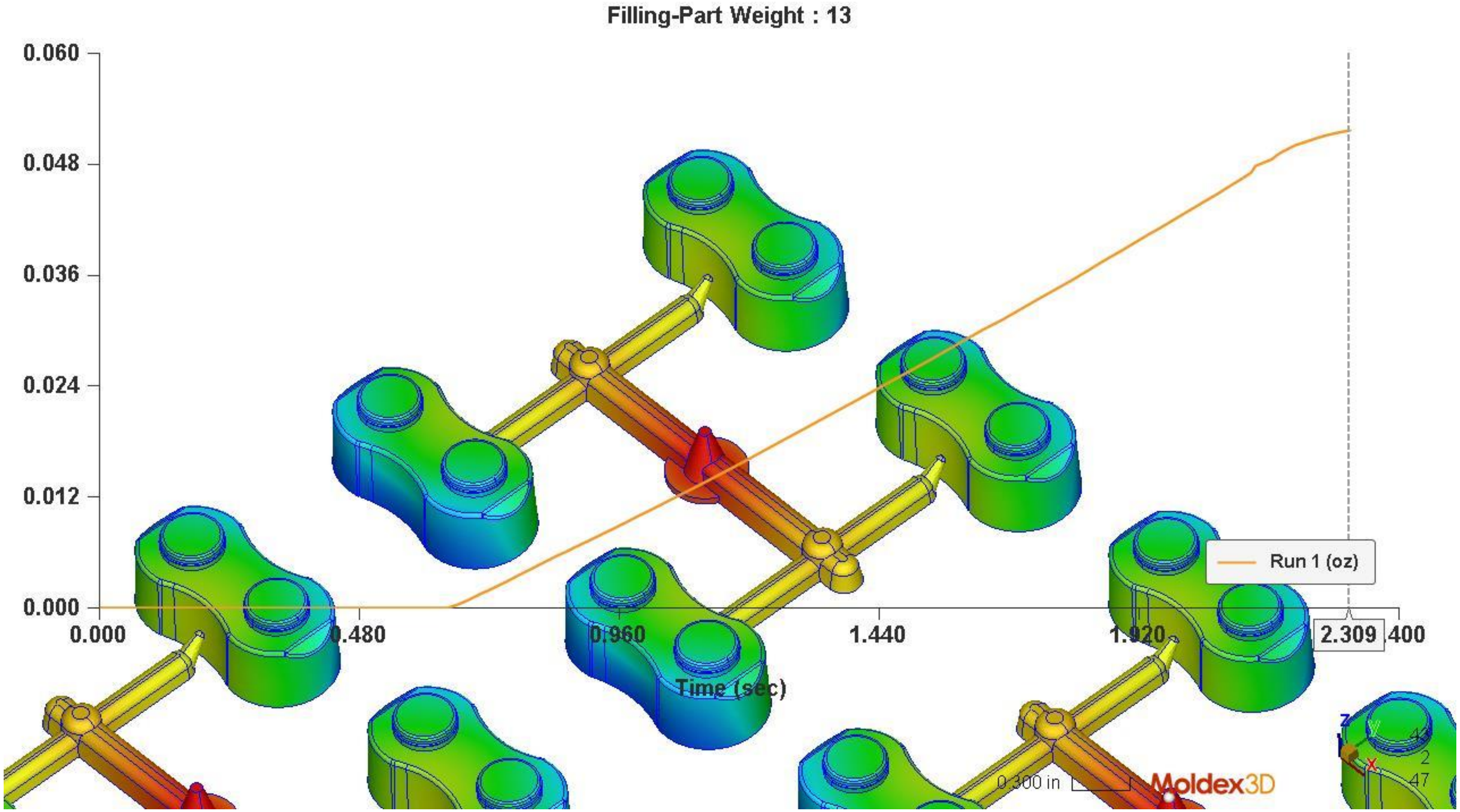
Filling_XY_Part Weight#12



Max	Unit
0.052	oz

Moldex3D

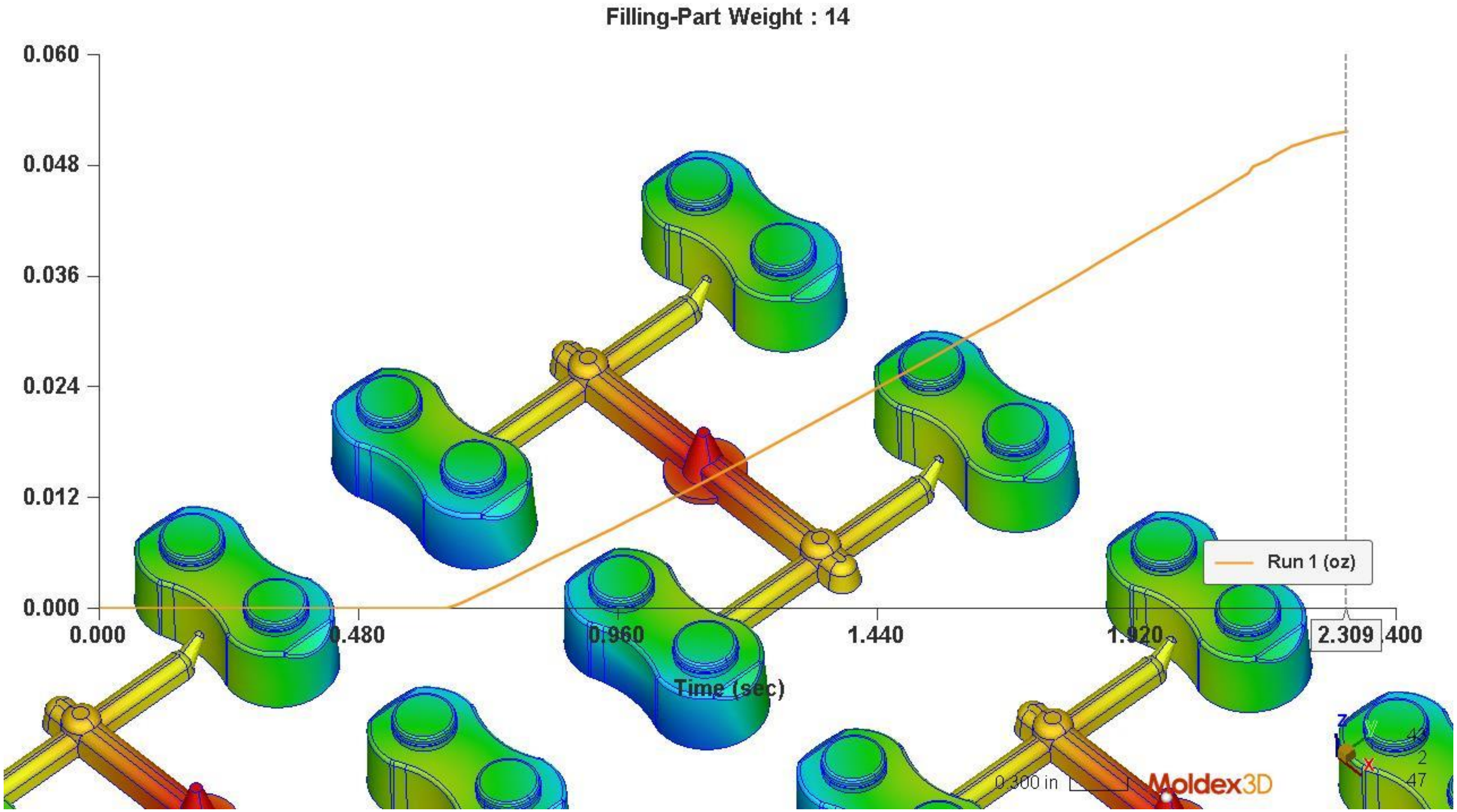
Filling_XY_Part Weight#13



Max	Unit
0.052	oz

Moldex3D

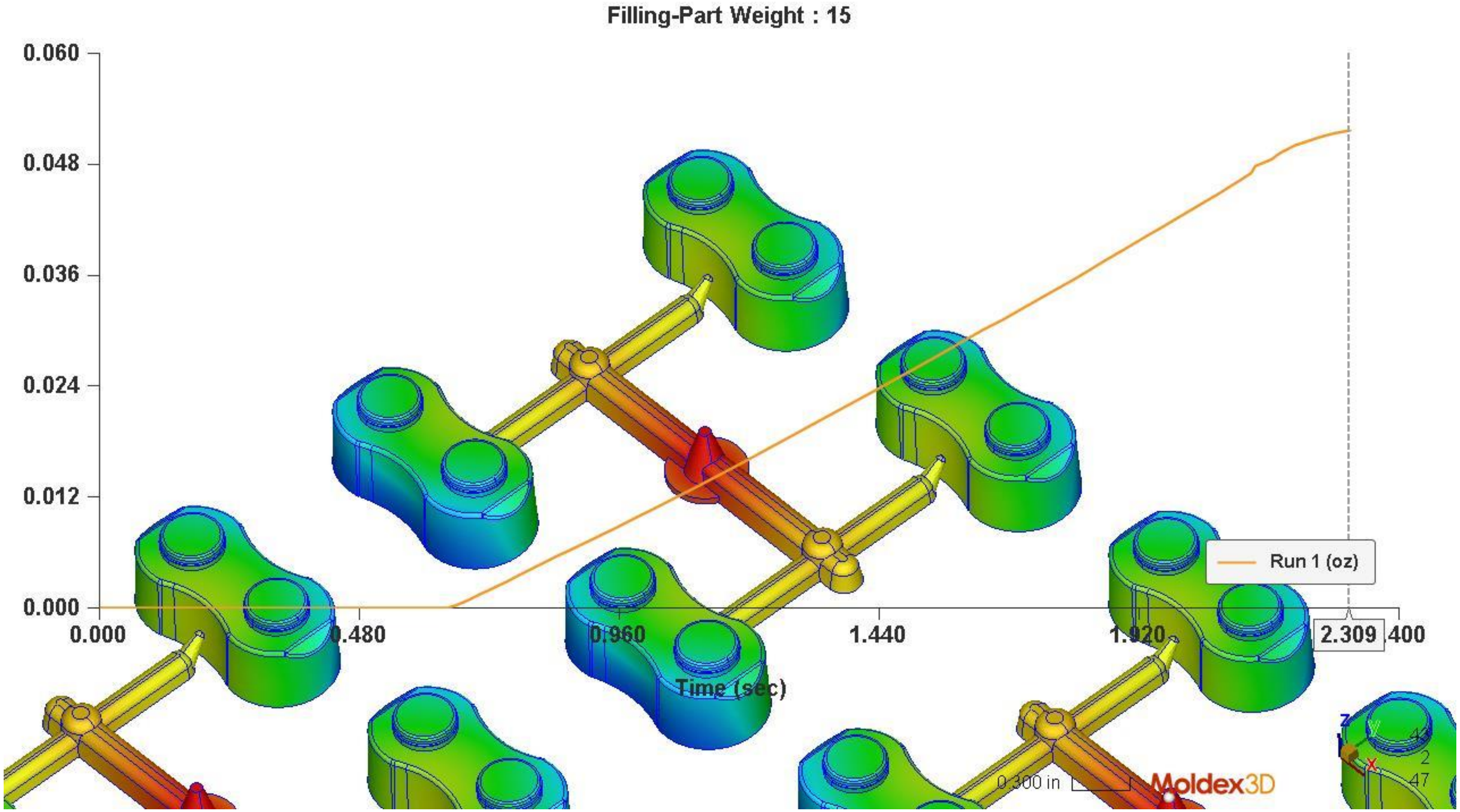
Filling_XY_Part Weight#14



Max	Unit
0.052	oz

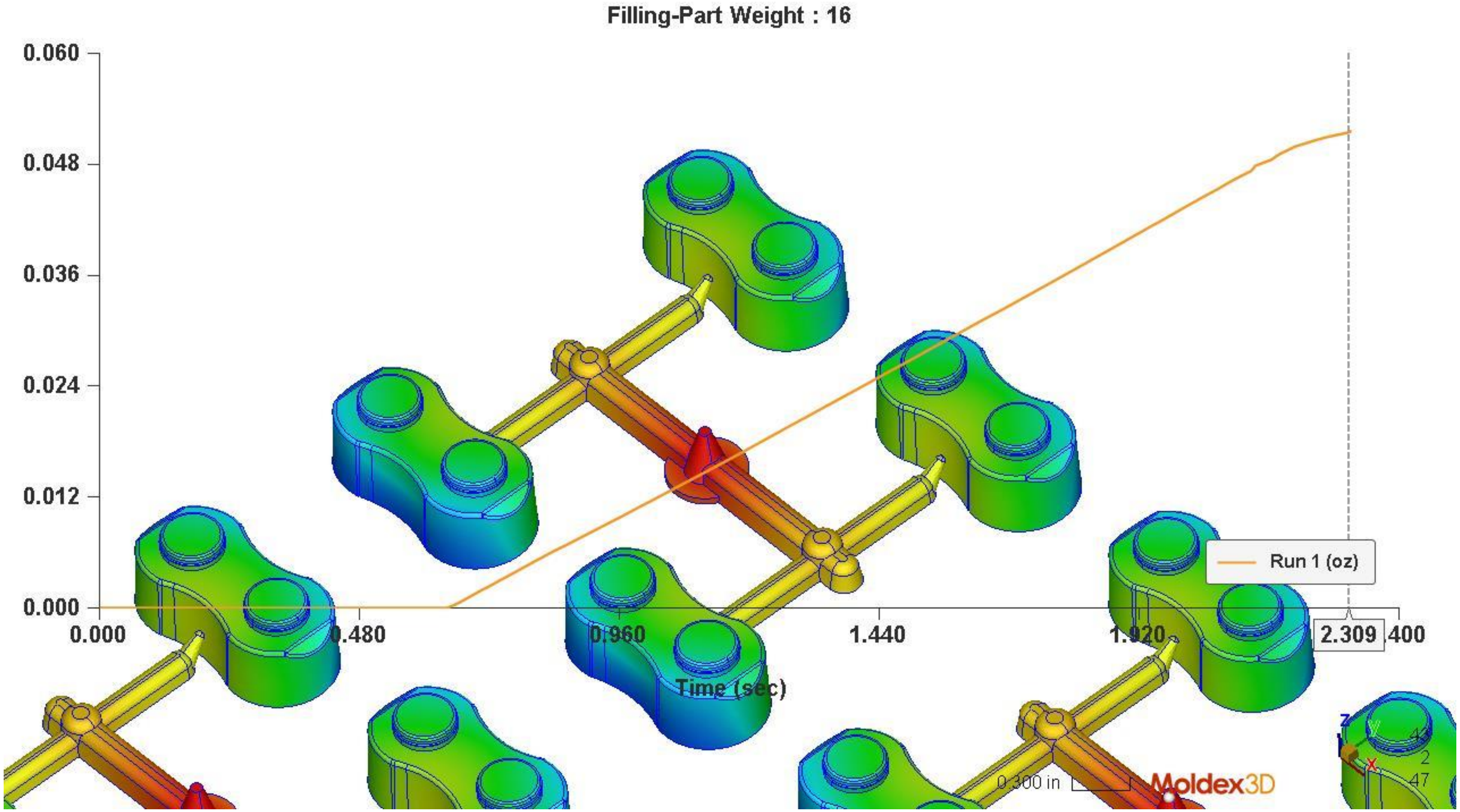
Moldex3D

Filling_XY_Part Weight#15



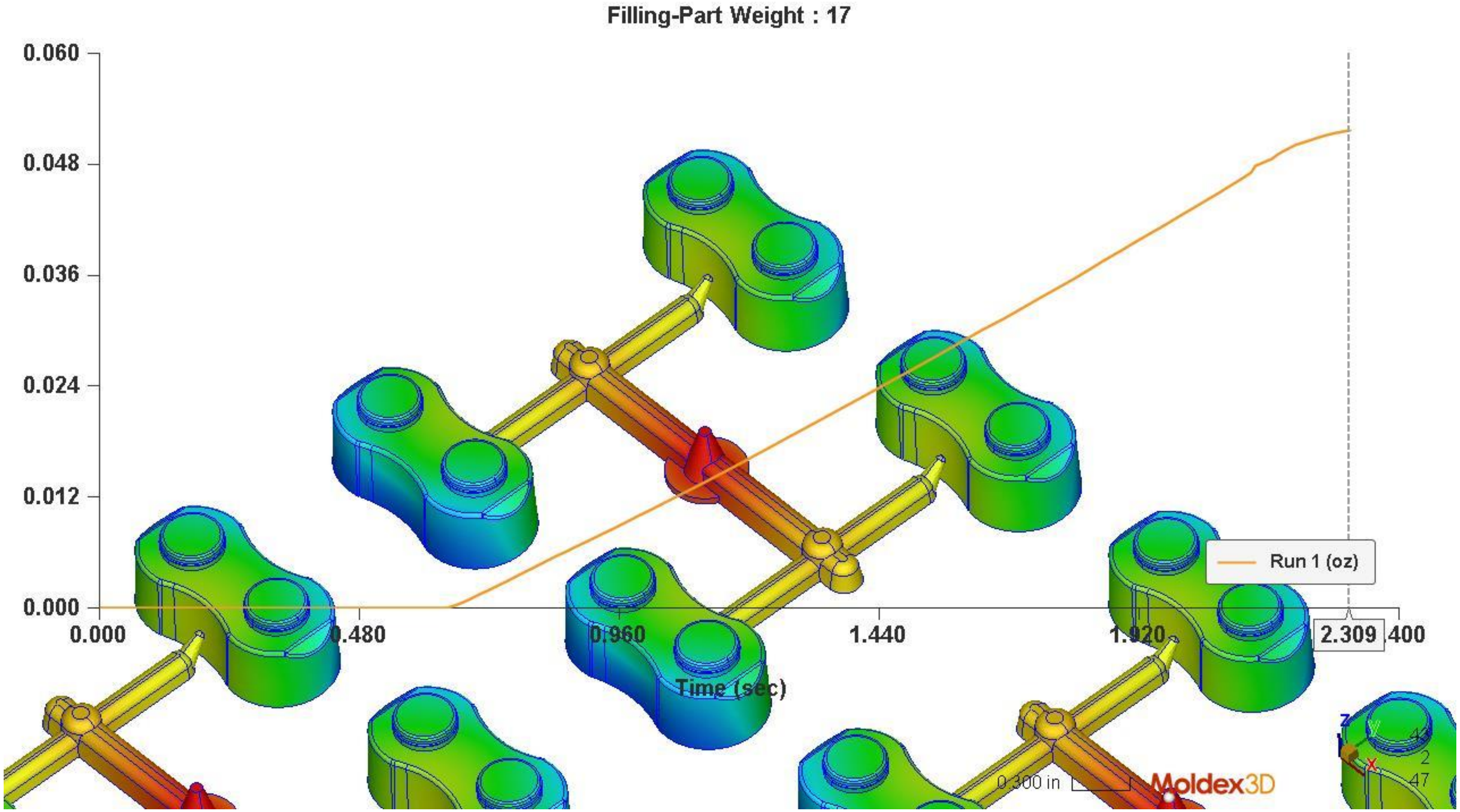
Max	Unit
0.052	oz

Filling_XY_Part Weight#16



Max	Unit
0.052	oz

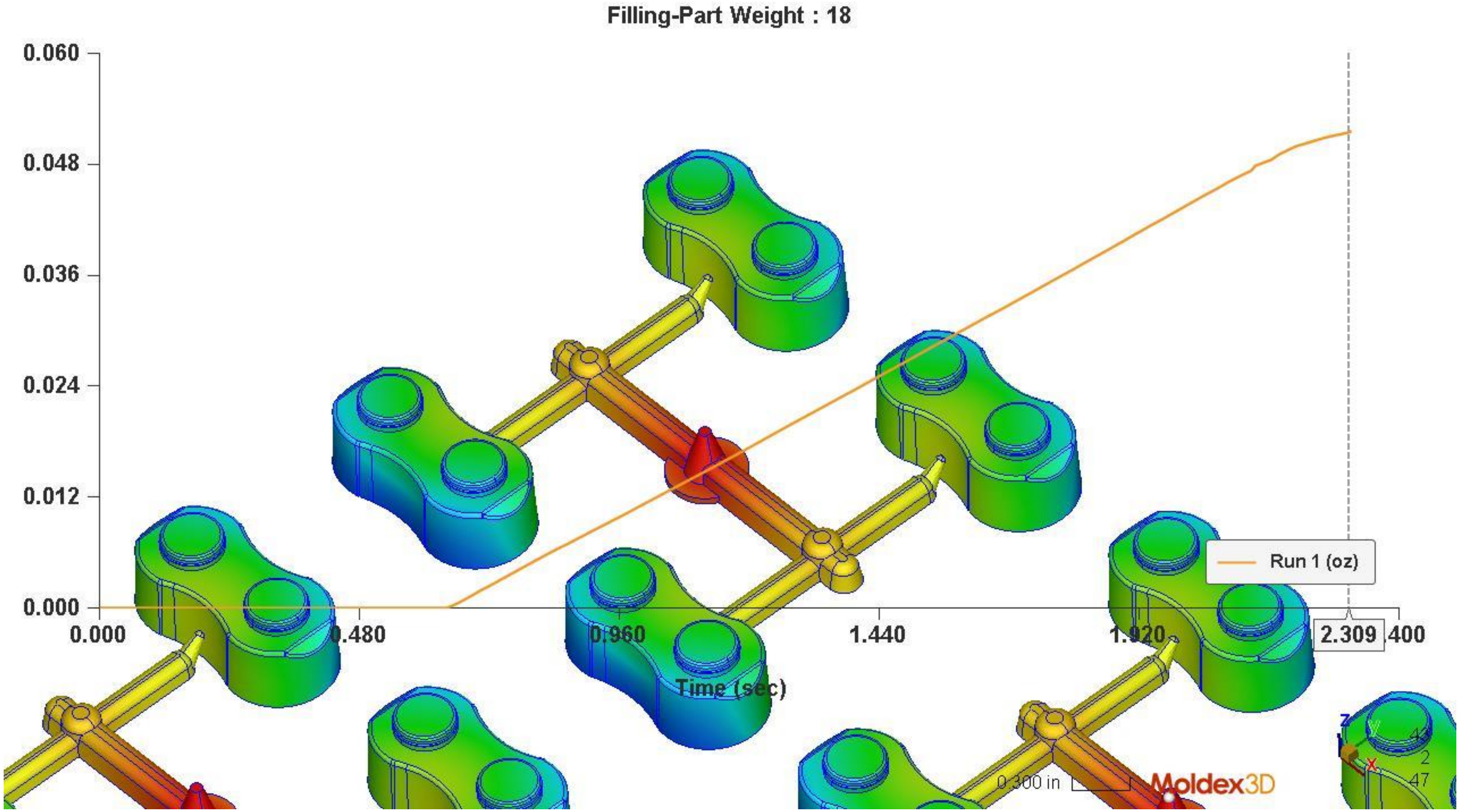
Filling_XY_Part Weight#17



Max	Unit
0.052	oz

Moldex3D

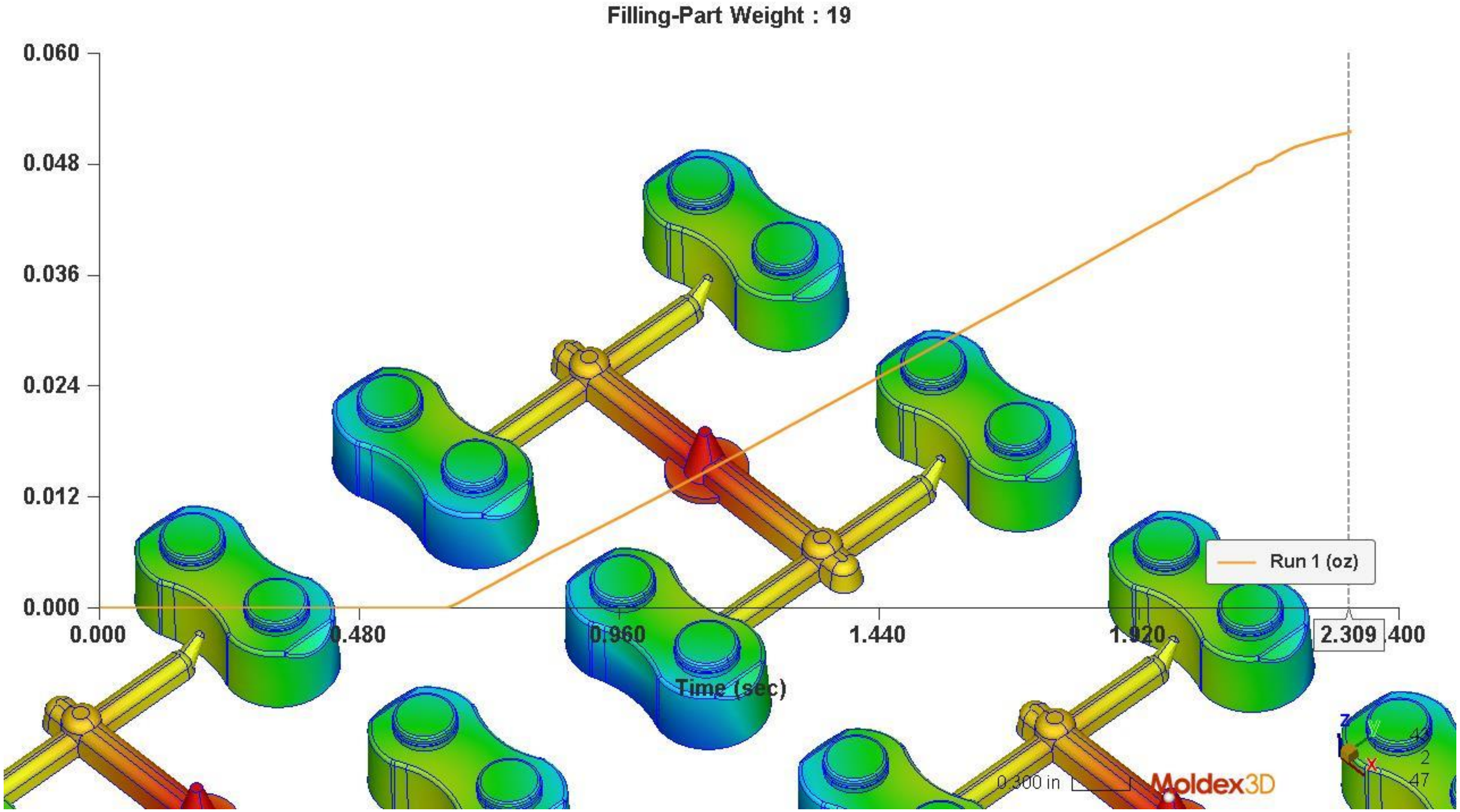
Filling_XY_Part Weight#18



Max	Unit
0.052	oz

Moldex3D

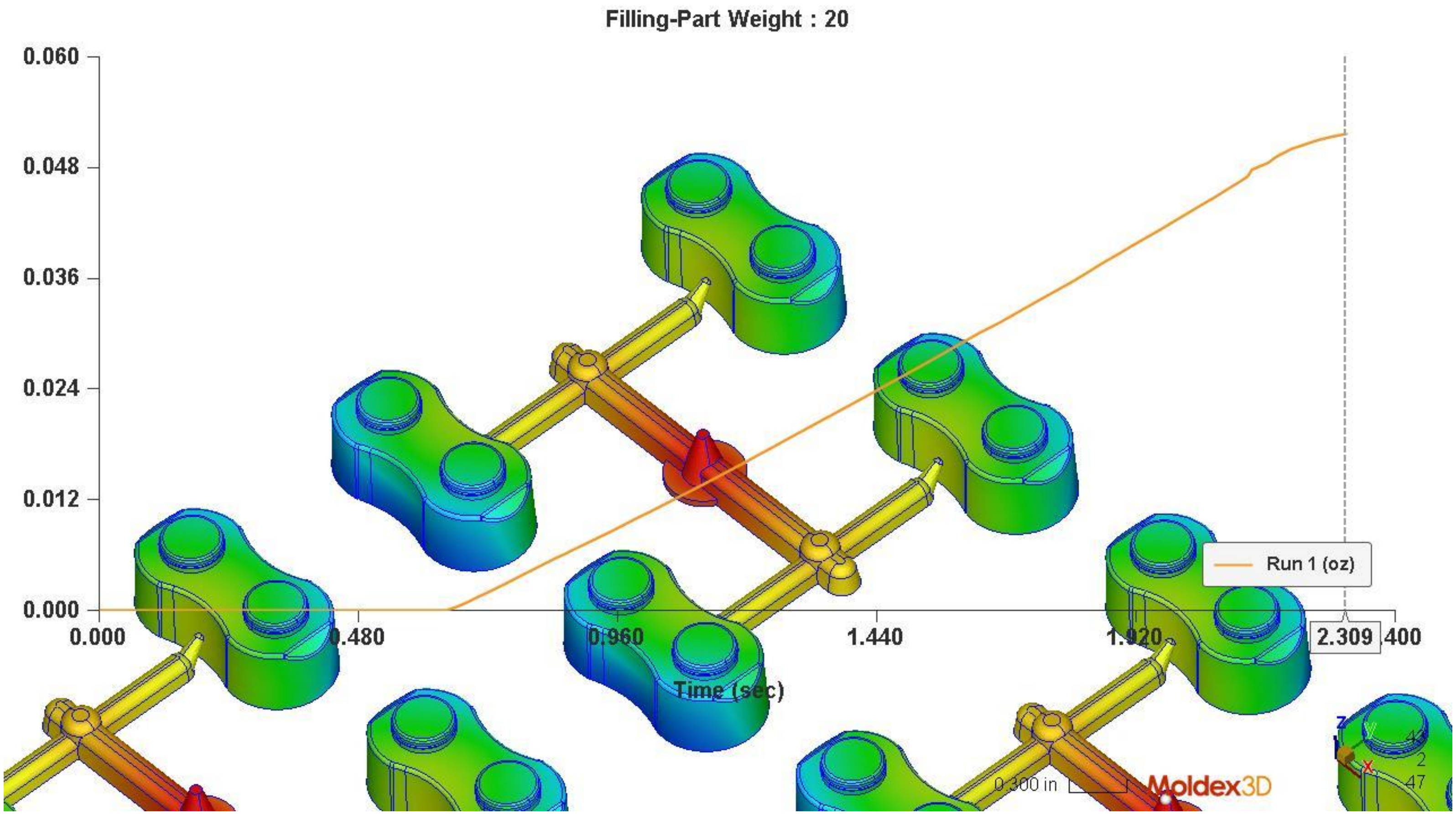
Filling_XY_Part Weight#19



Max	Unit
0.052	oz

Moldex3D

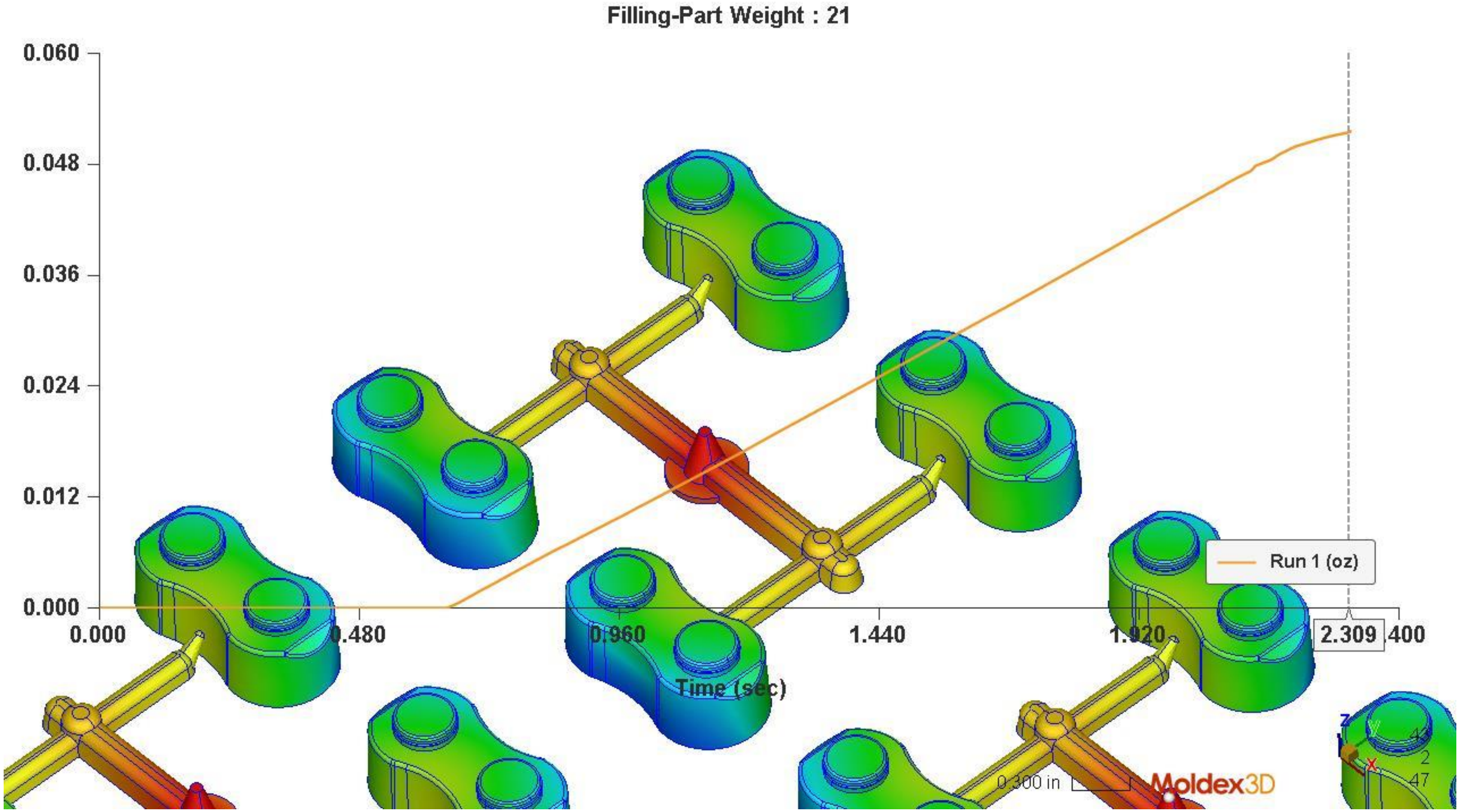
Filling_XY_Part Weight#20



Max	Unit
0.052	oz

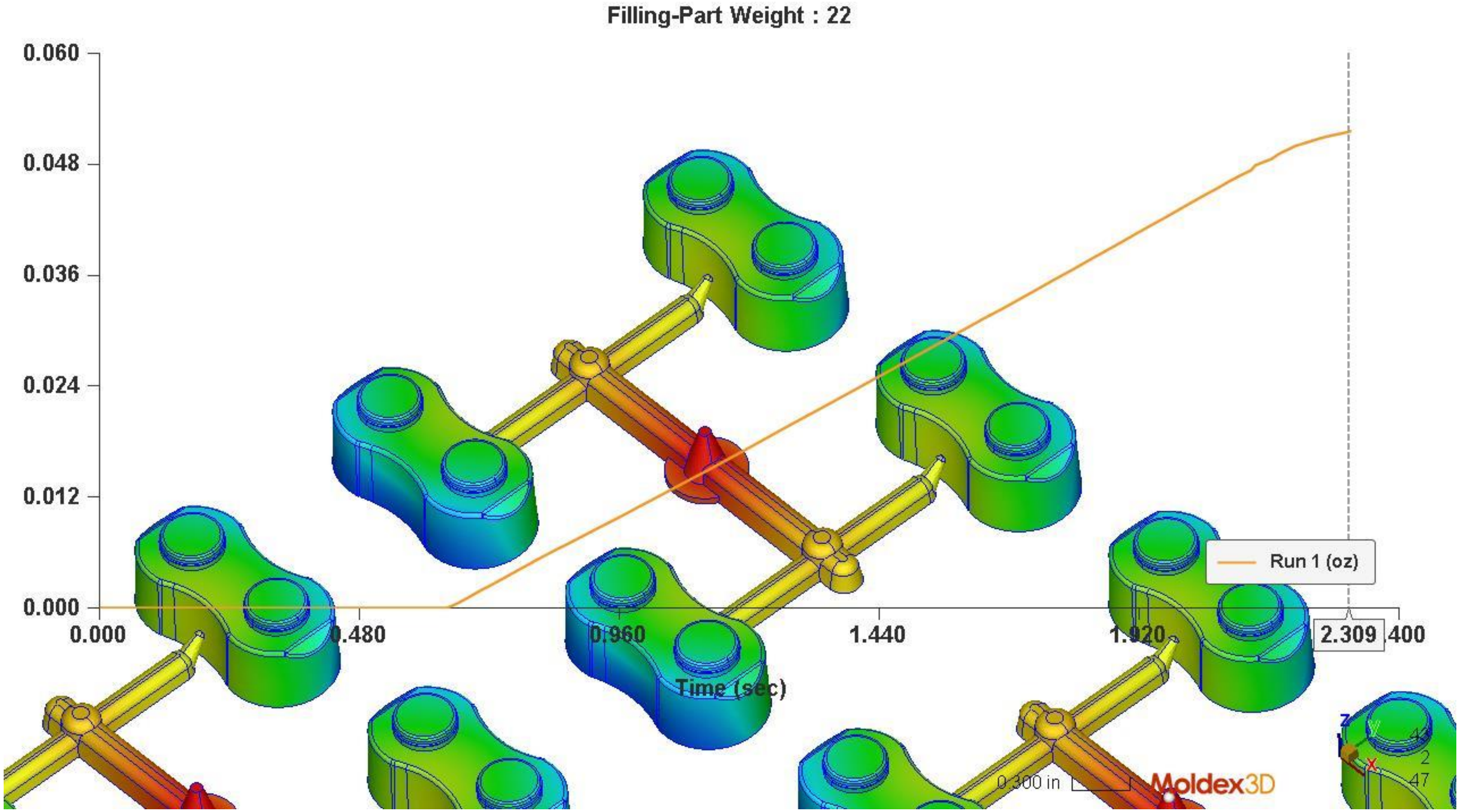
Moldex3D

Filling_XY_Part Weight#21



Max	Unit
0.052	oz

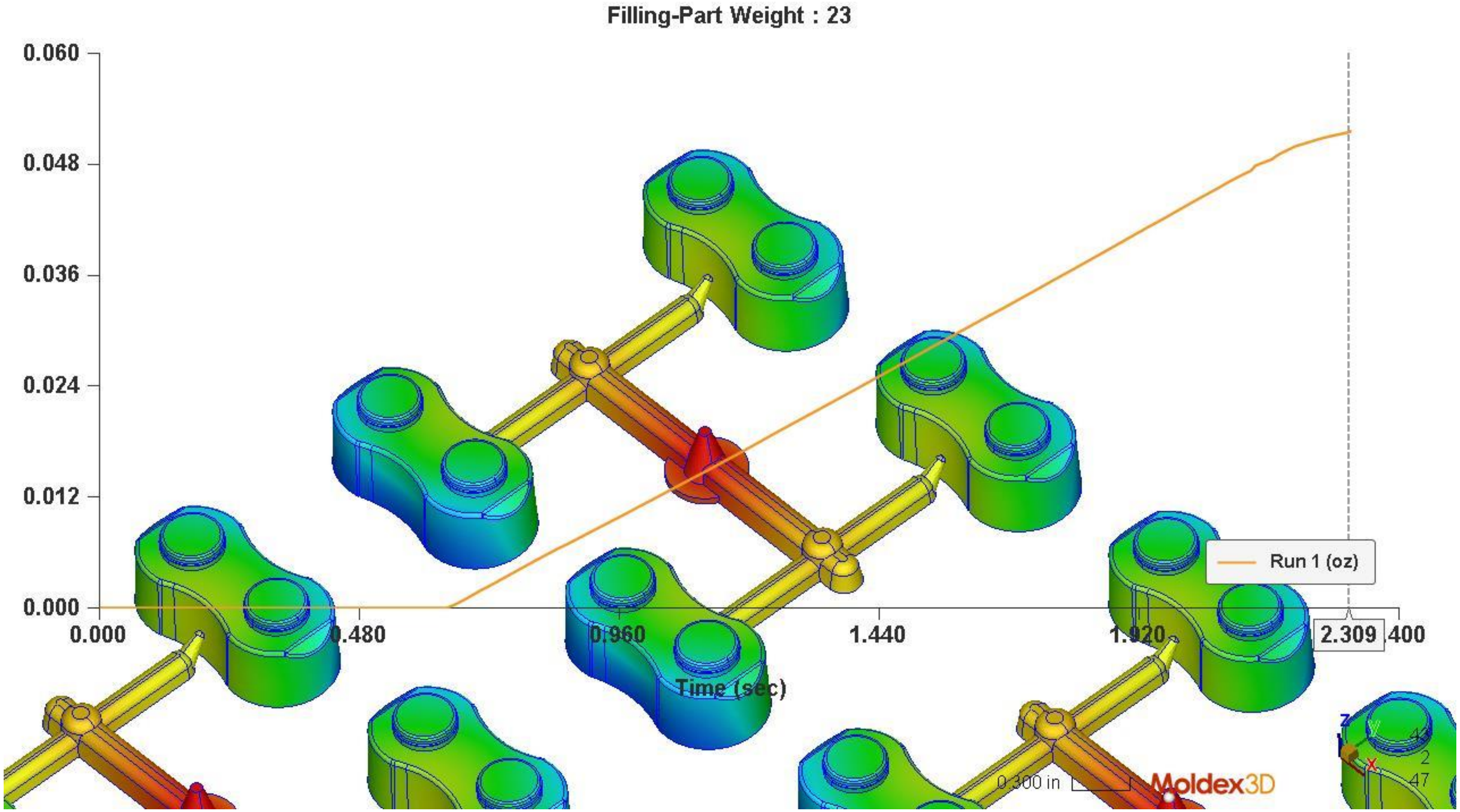
Filling_XY_Part Weight#22



Max	Unit
0.052	oz

Moldex3D

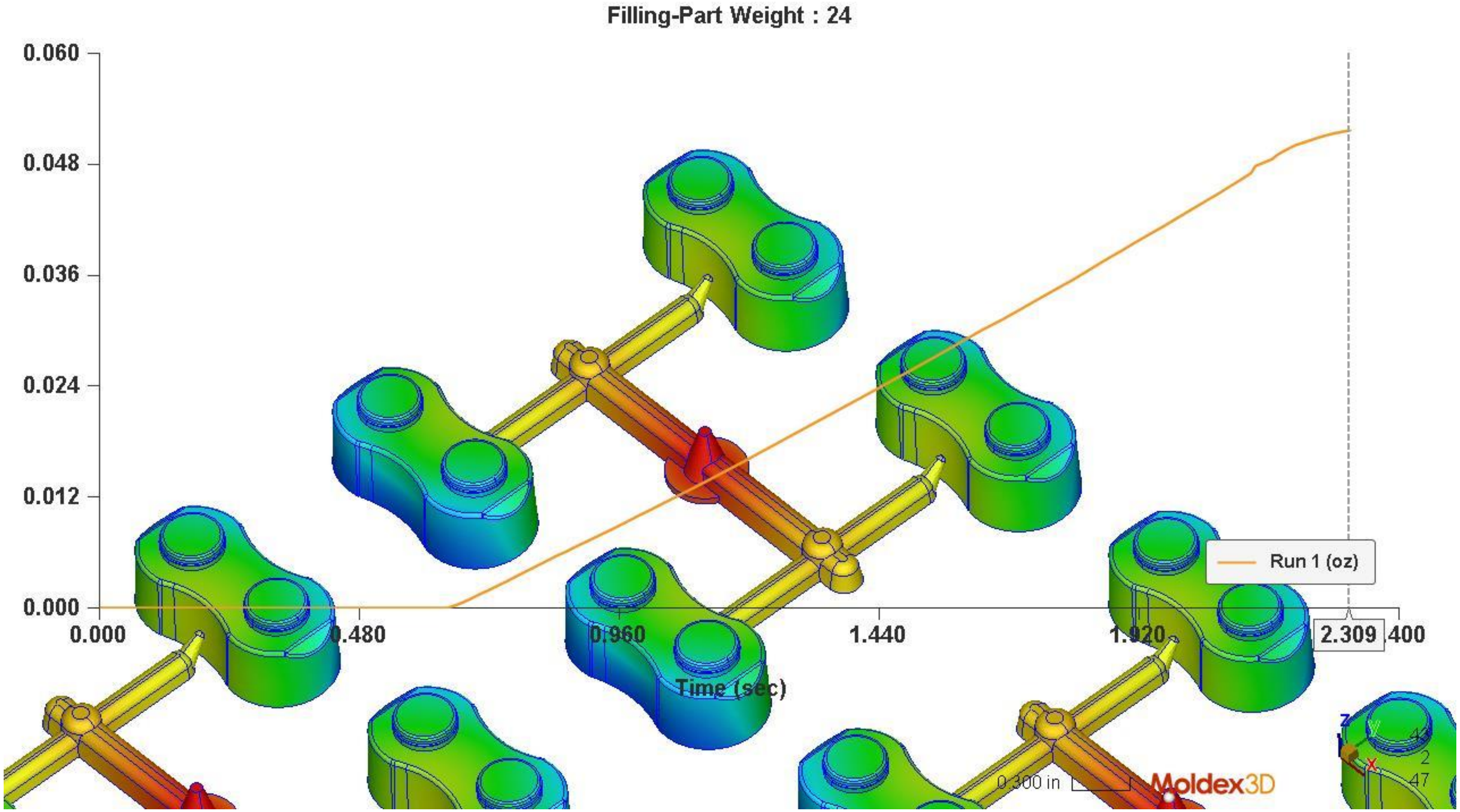
Filling_XY_Part Weight#23



Max	Unit
0.052	oz

Moldex3D

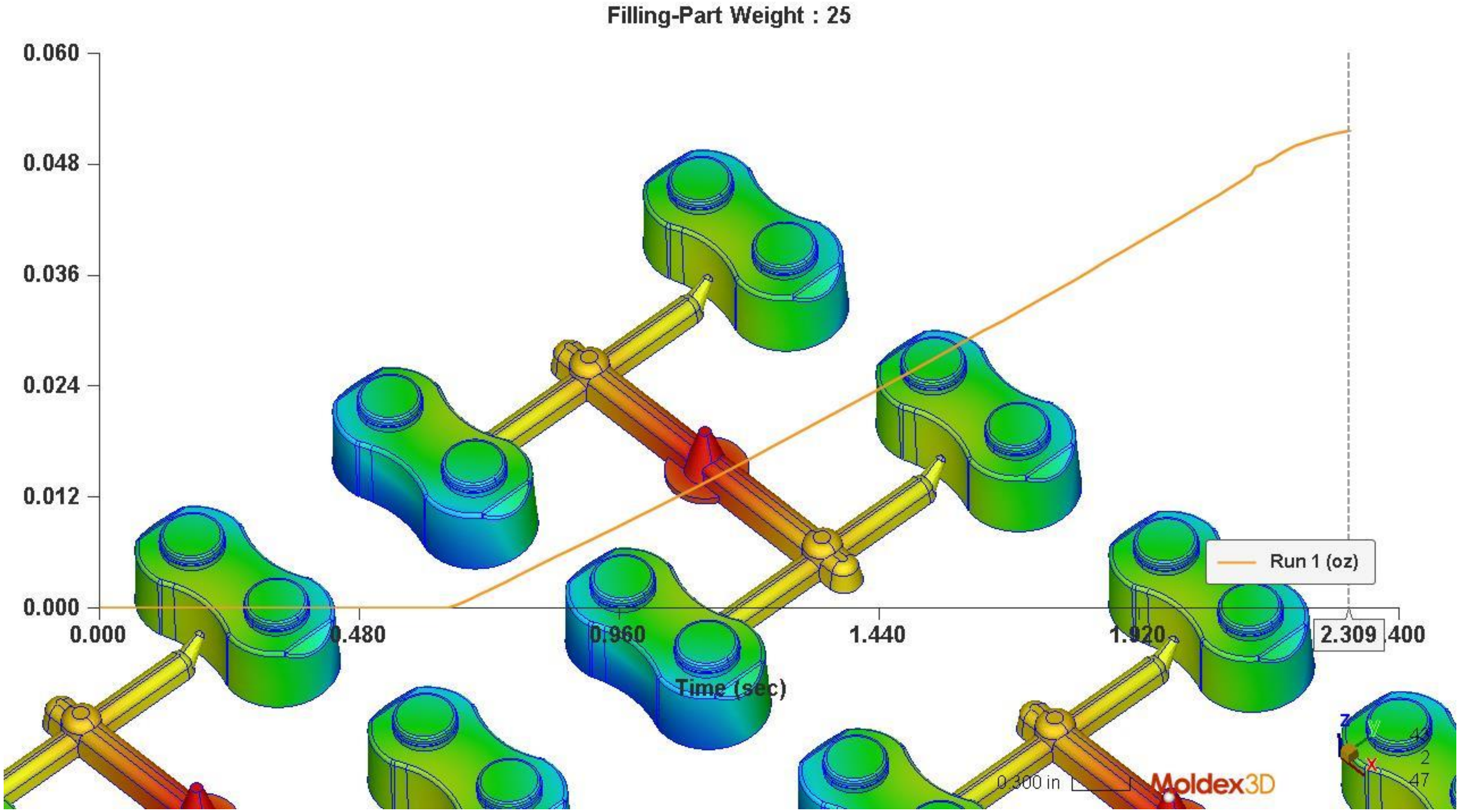
Filling_XY_Part Weight#24



Max	Unit
0.052	oz

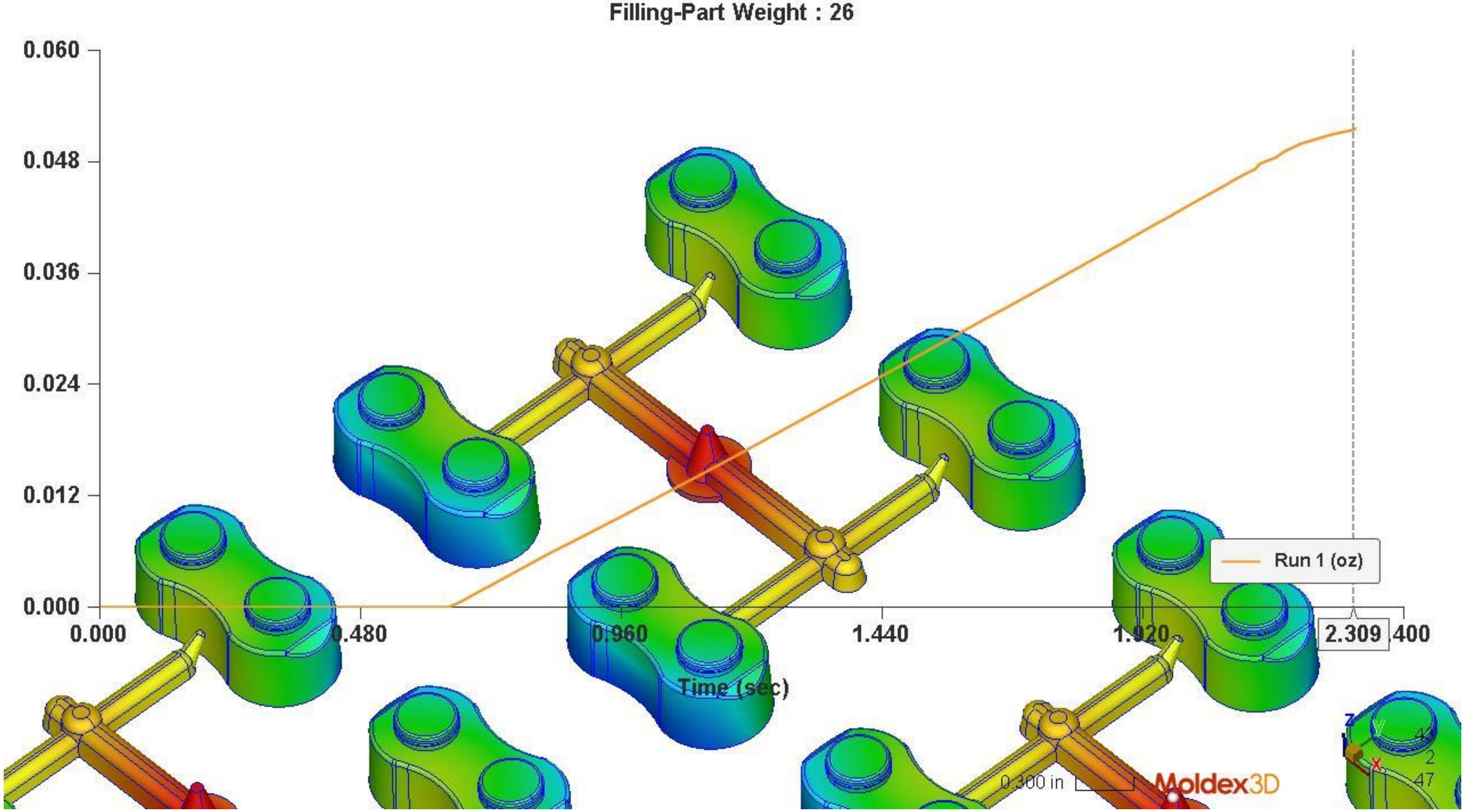
Moldex3D

Filling_XY_Part Weight#25



Max	Unit
0.052	oz

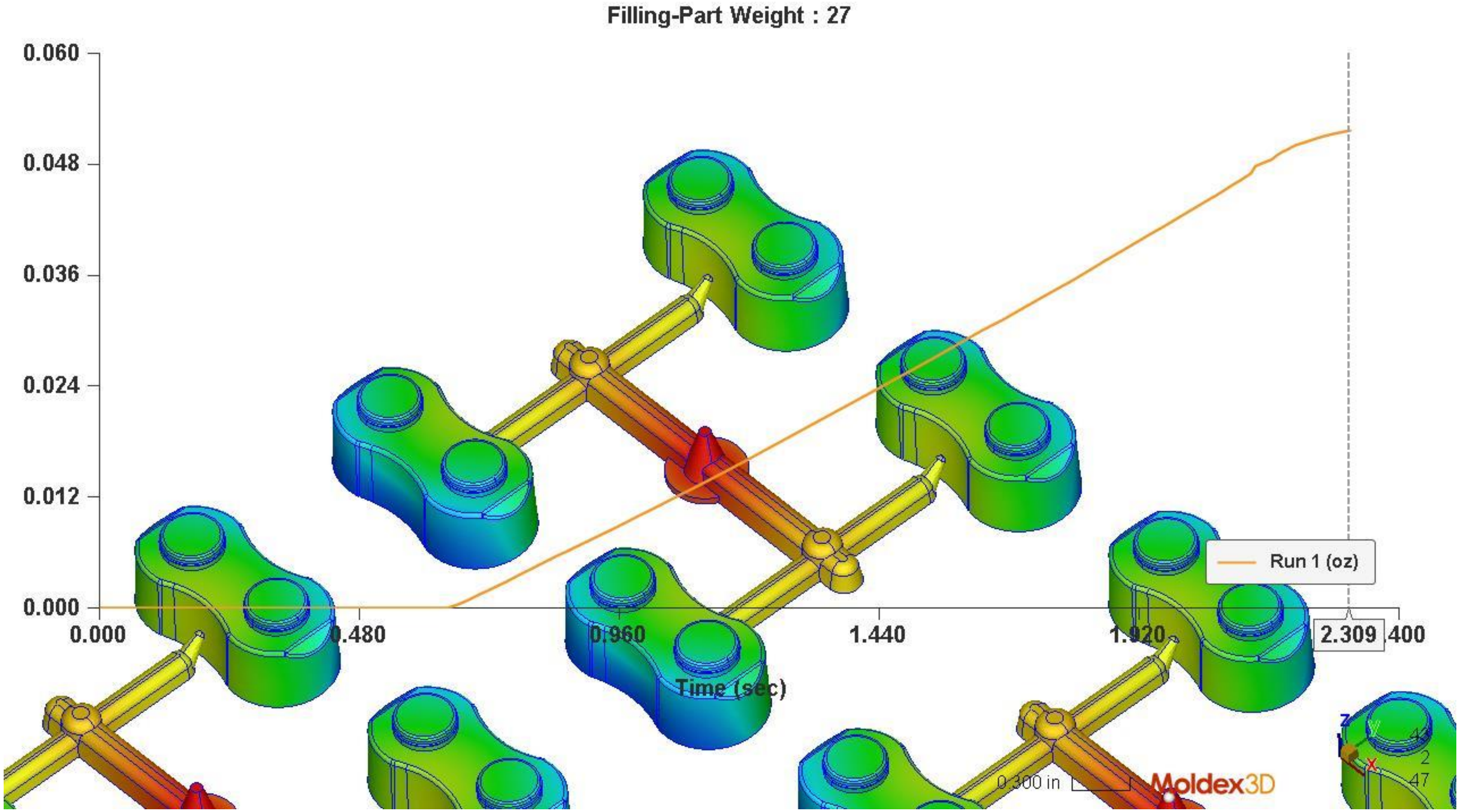
Filling_XY_Part Weight#26



Max	Unit
0.052	oz

Moldex3D

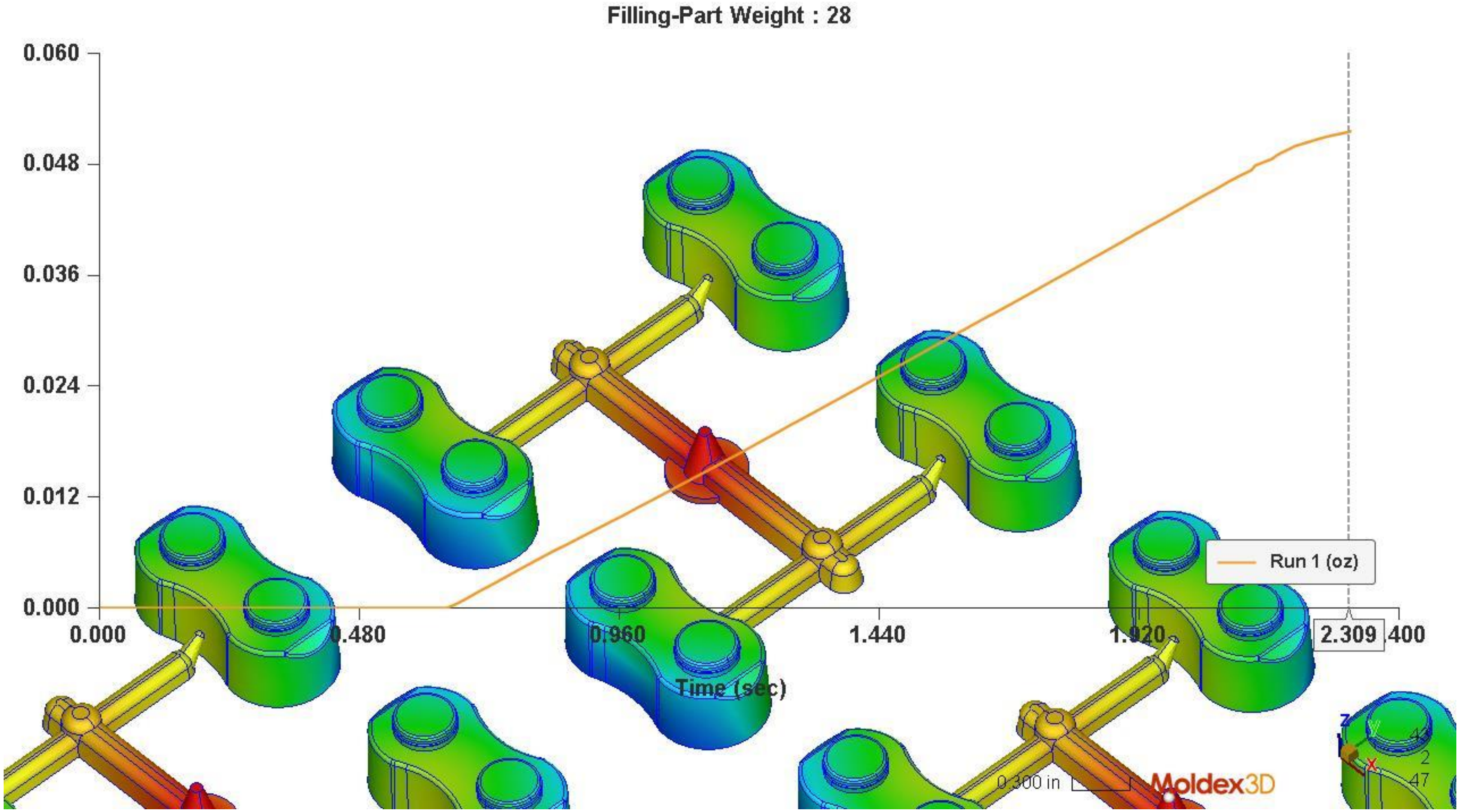
Filling_XY_Part Weight#27



Max	Unit
0.052	oz

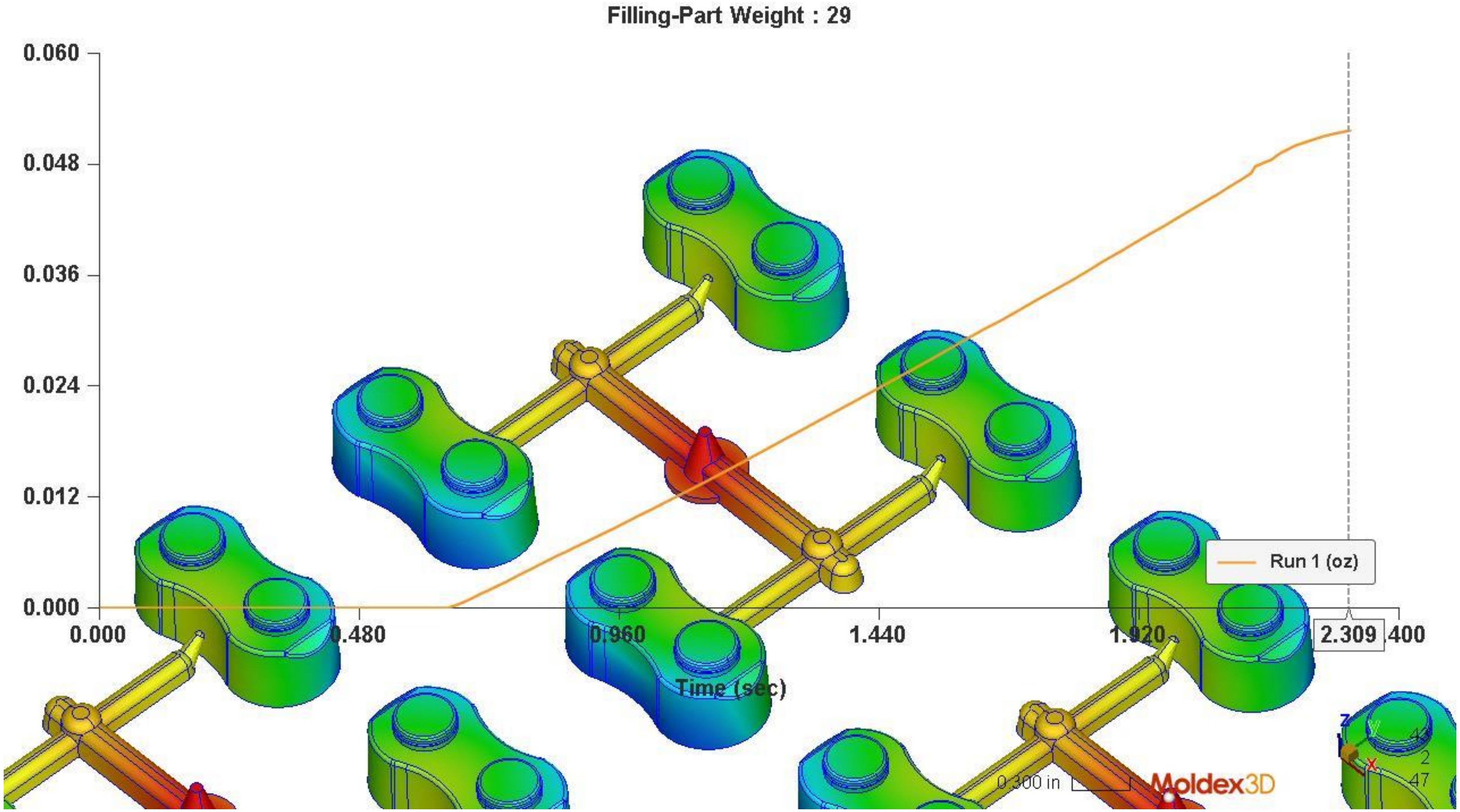
Moldex3D

Filling_XY_Part Weight#28



Max	Unit
0.052	oz

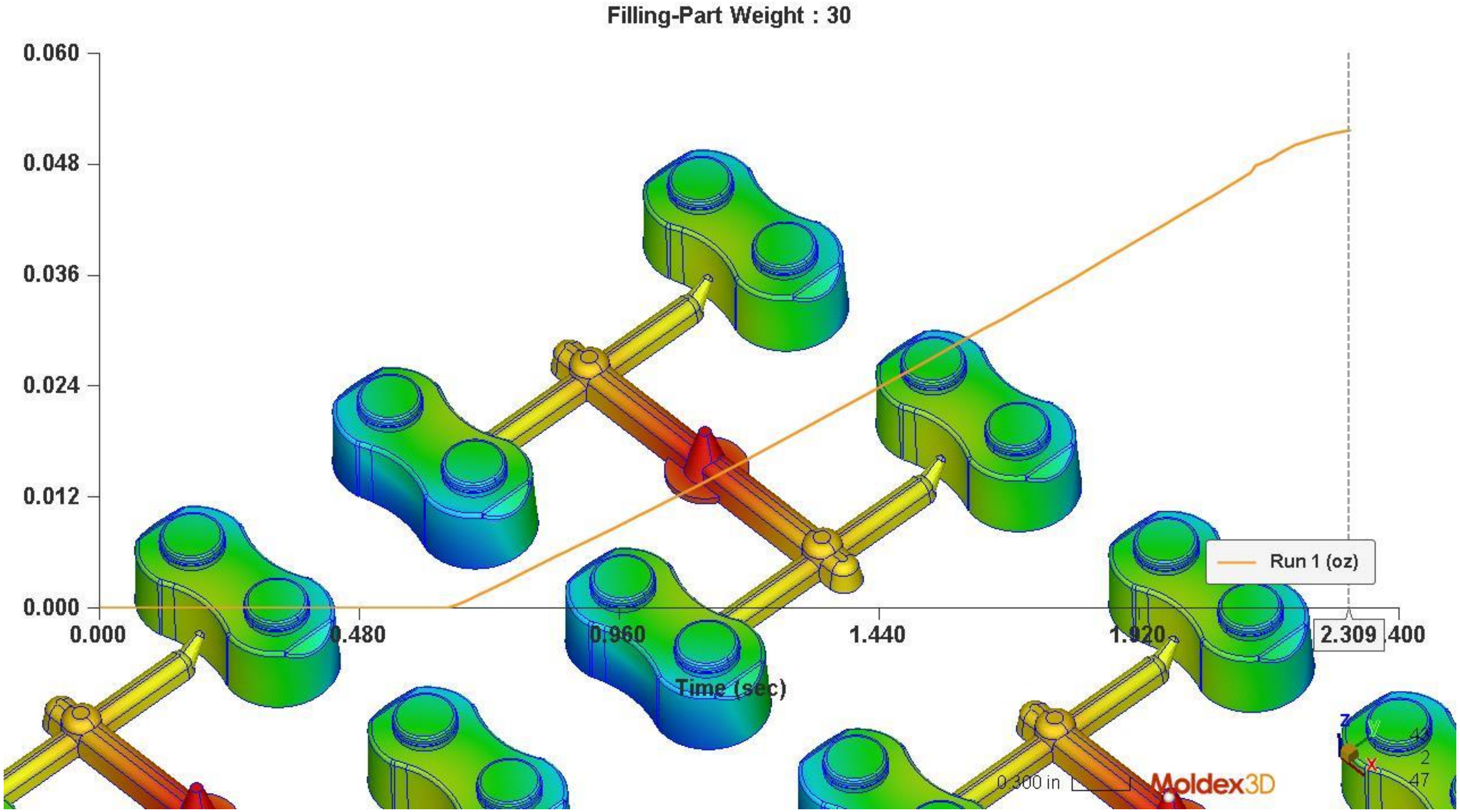
Filling_XY_Part Weight#29



Max	Unit
0.052	oz

Moldex3D

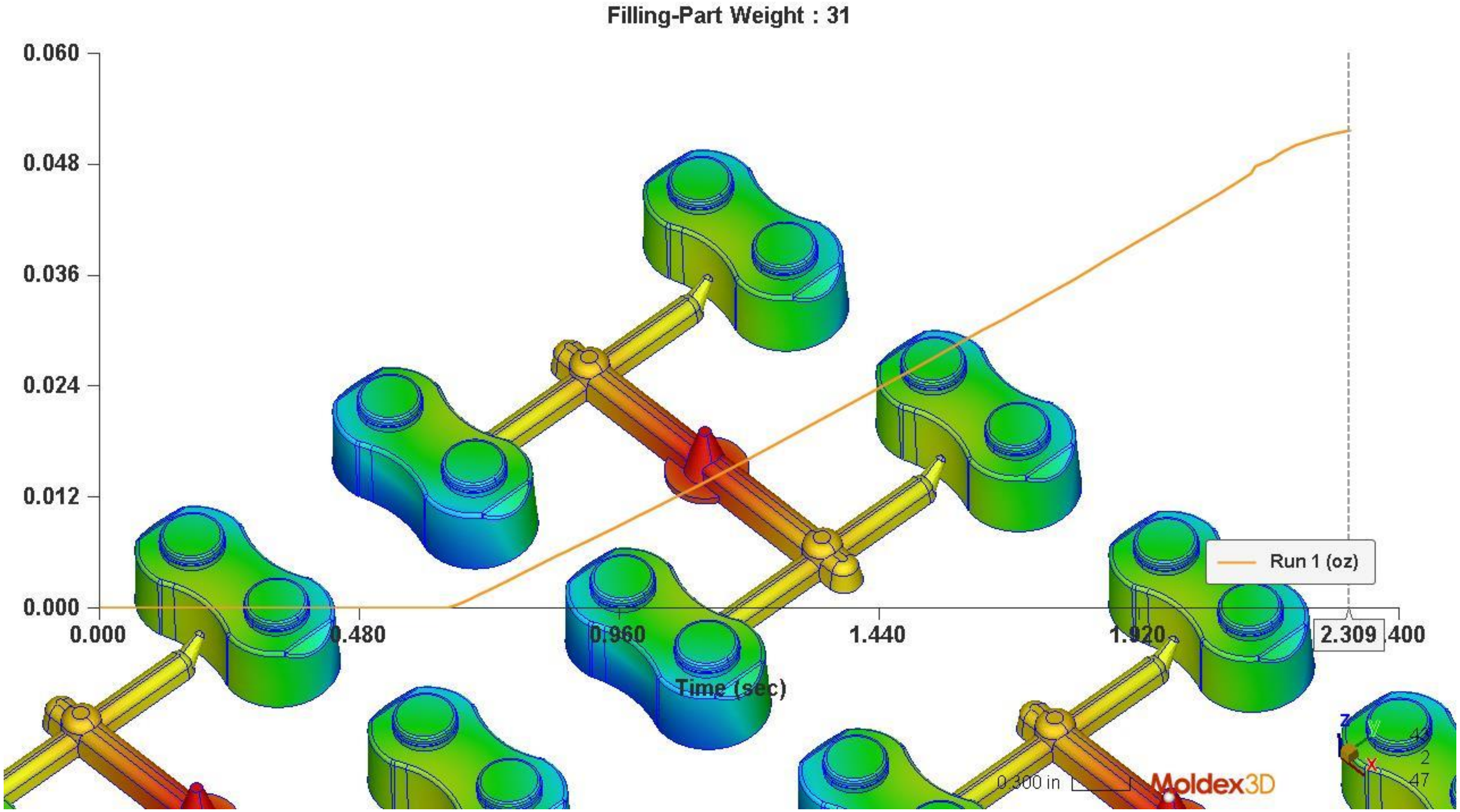
Filling_XY_Part Weight#30



Max	Unit
0.052	oz

Moldex3D

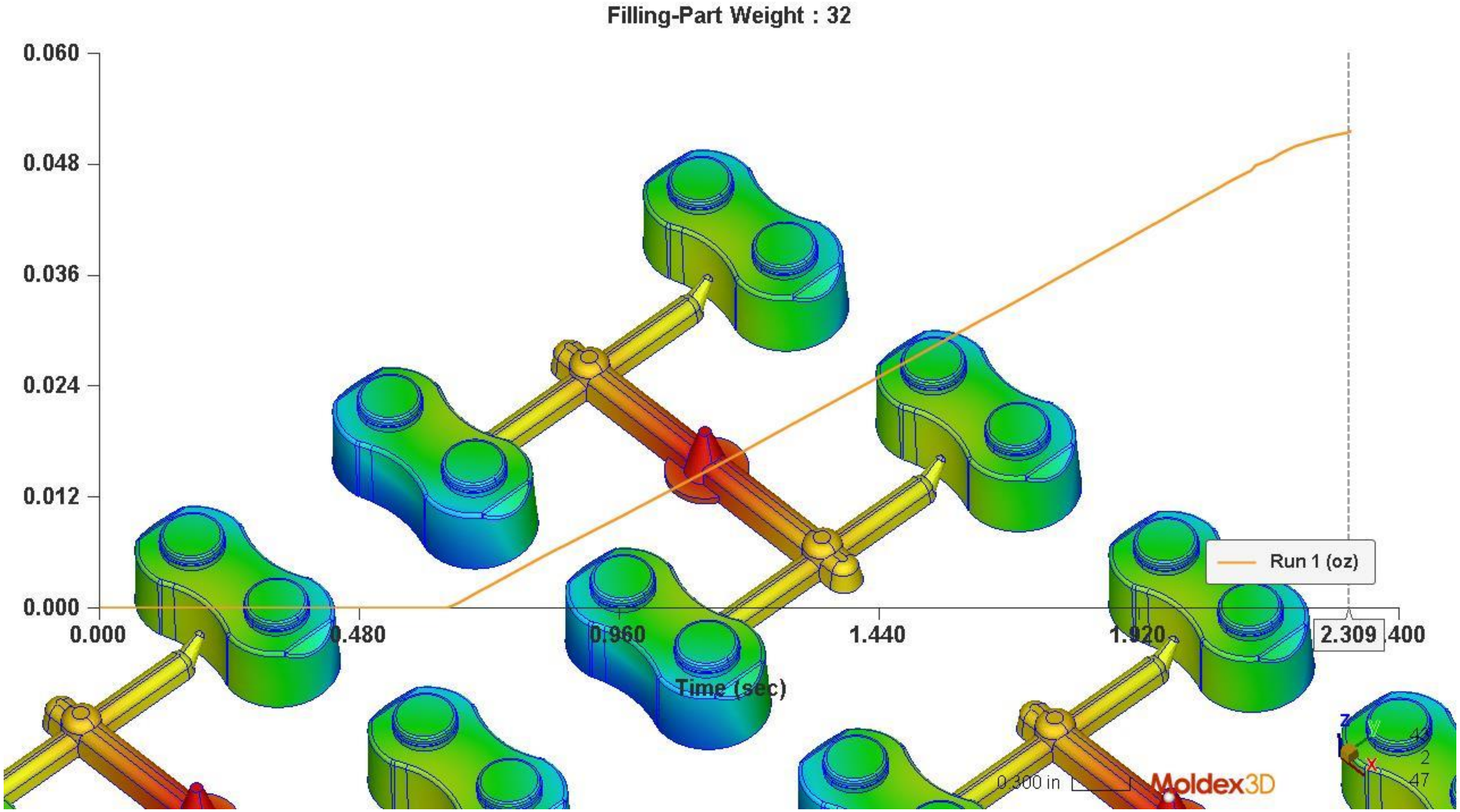
Filling_XY_Part Weight#31



Max	Unit
0.052	oz

Moldex3D

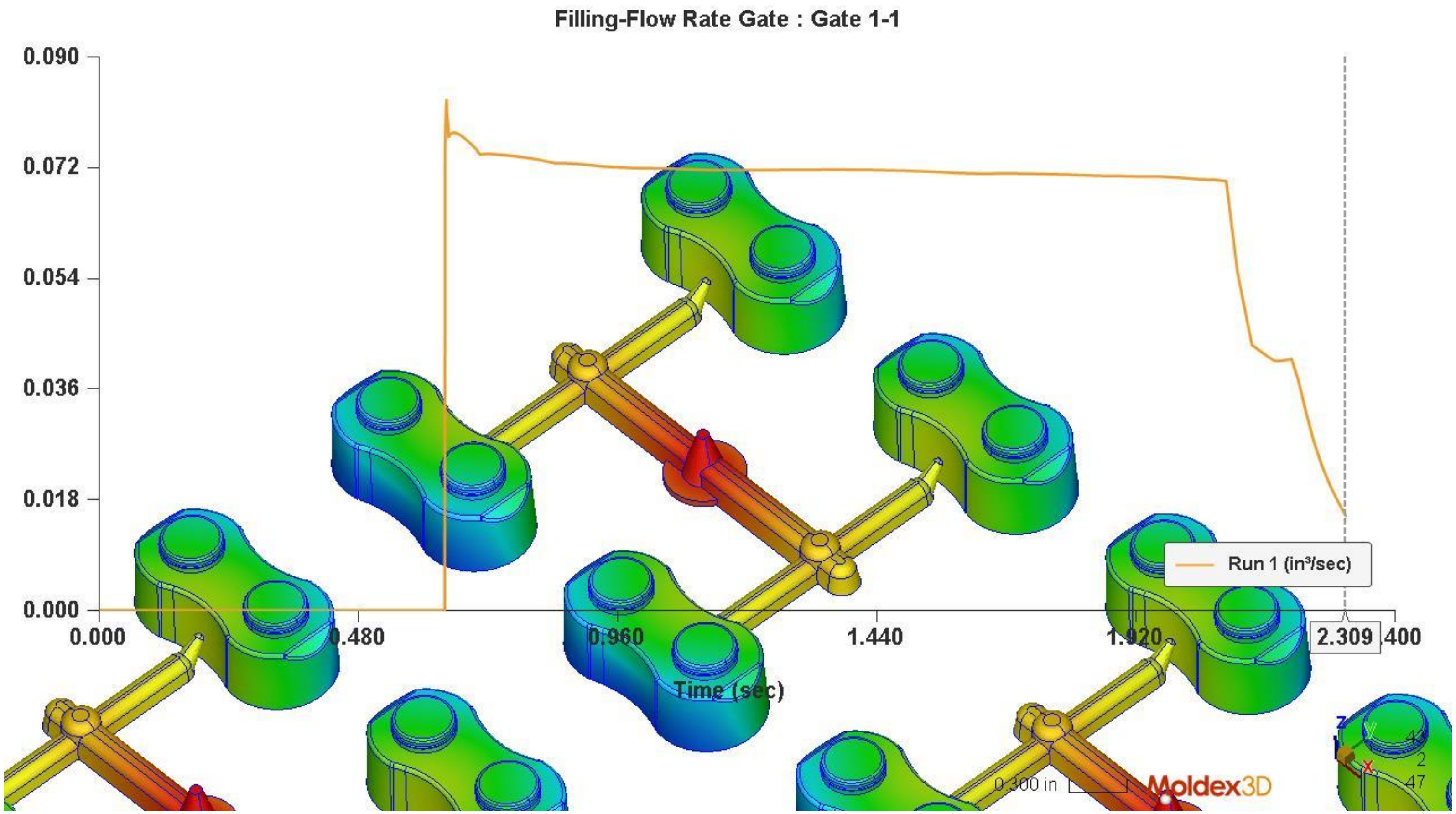
Filling_XY_Part Weight#32



Max	Unit
0.052	oz

Moldex3D

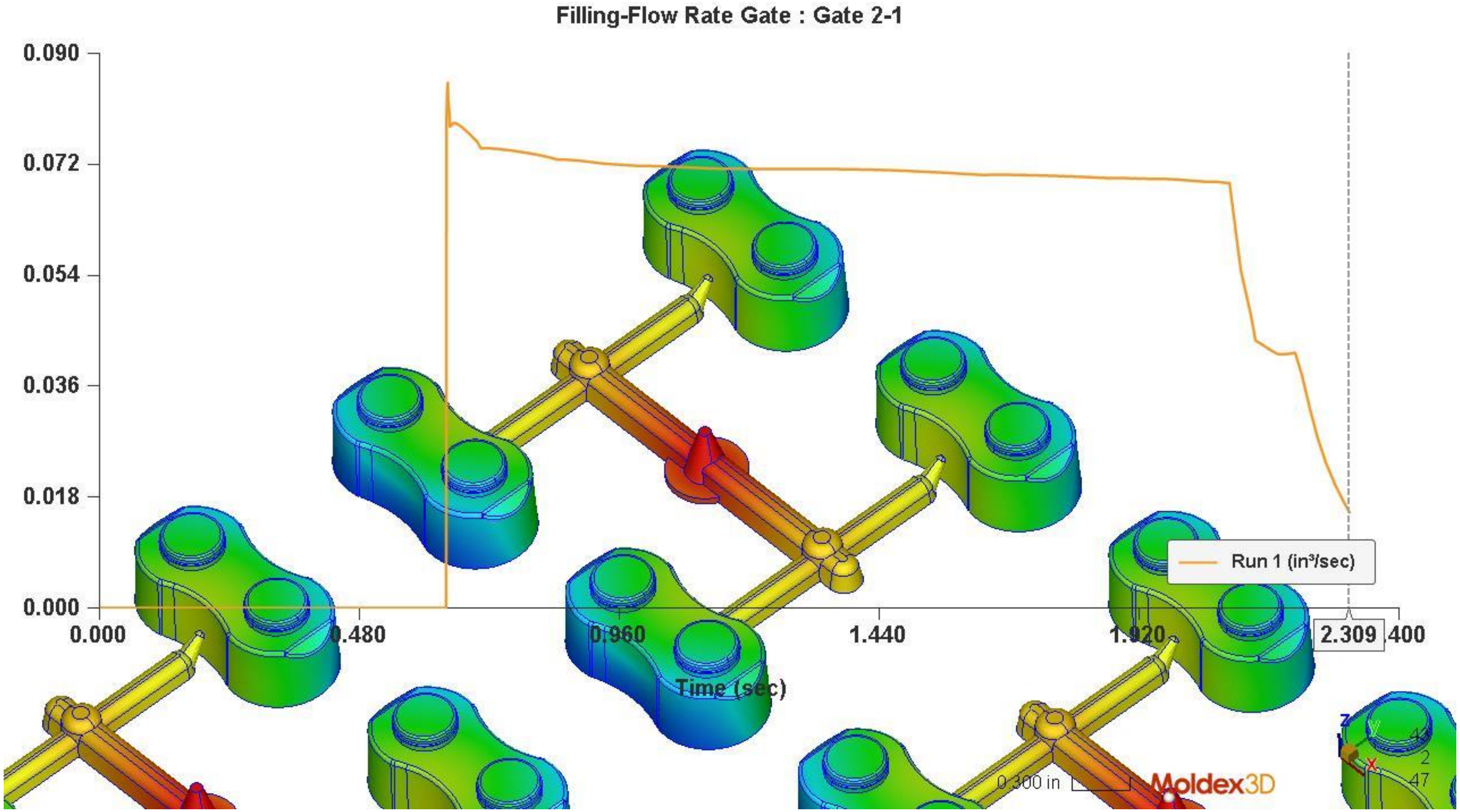
Filling_XY_Flow Rate Gate - Gate 1-1



Max	Unit
0.083	in^3/sec

Moldex3D

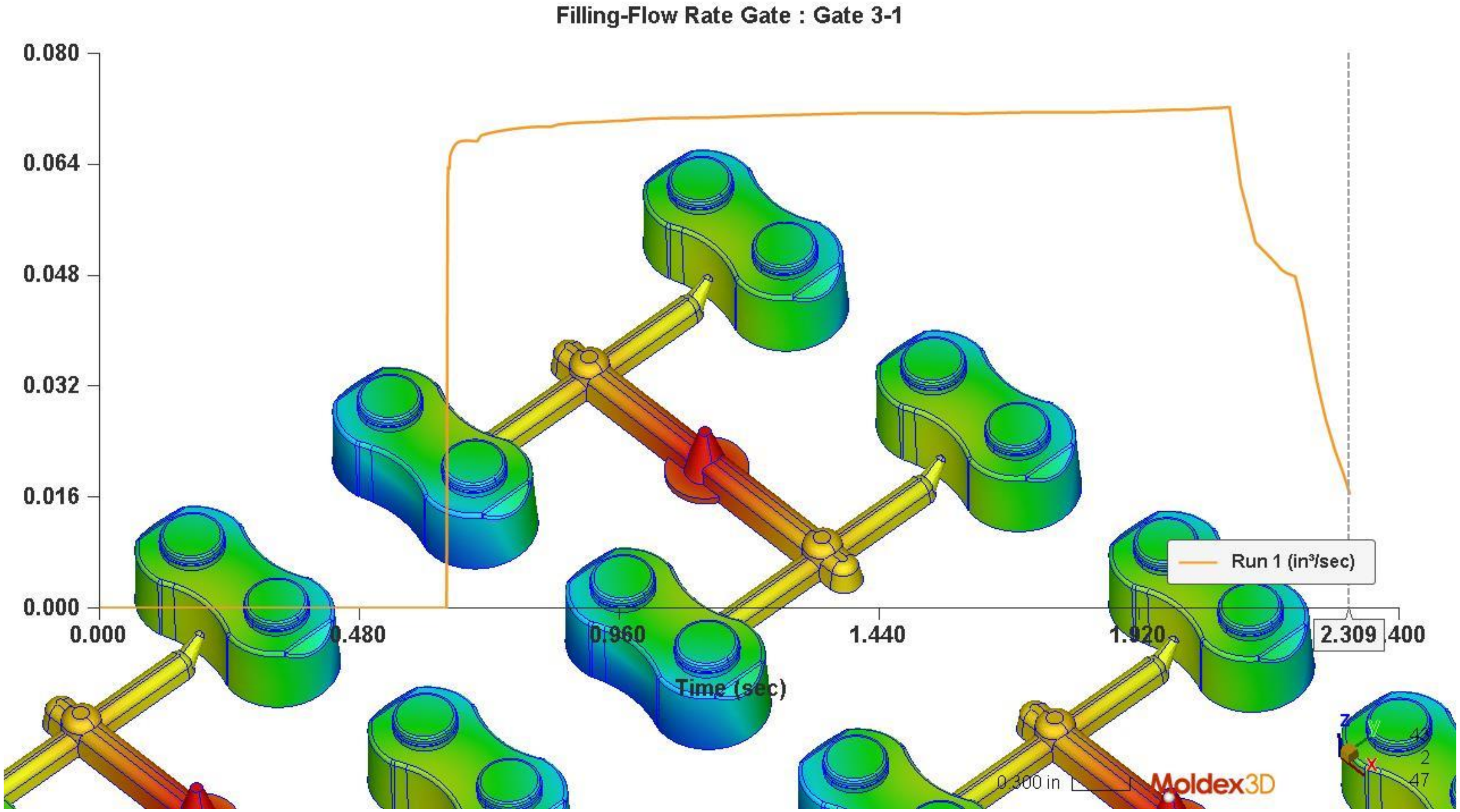
Filling_XY_Flow Rate Gate - Gate 2-1



Max	Unit
0.085	in³/sec

Moldex3D

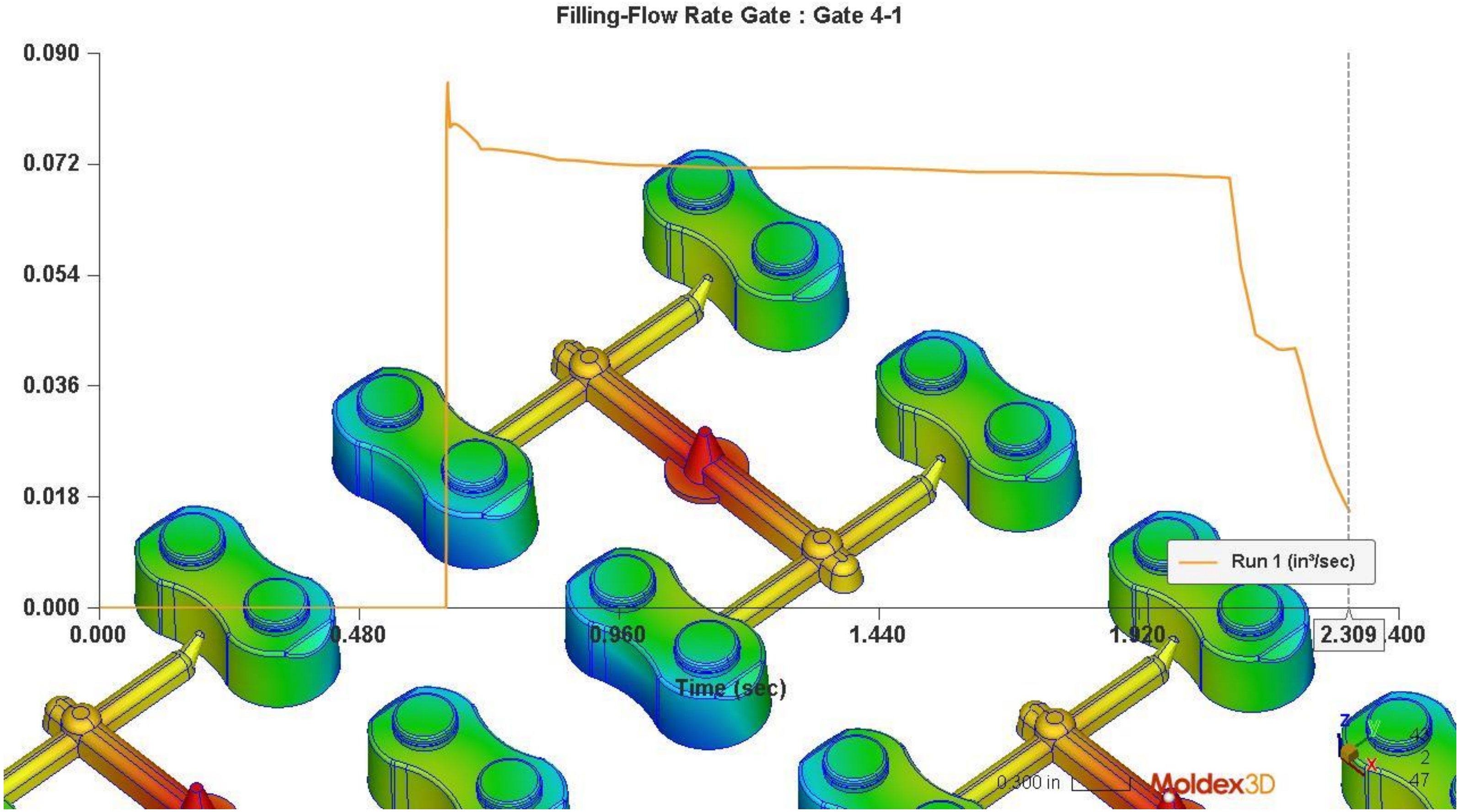
Filling_XY_Flow Rate Gate - Gate 3-1



Max	Unit
0.072	in³/sec

Moldex3D

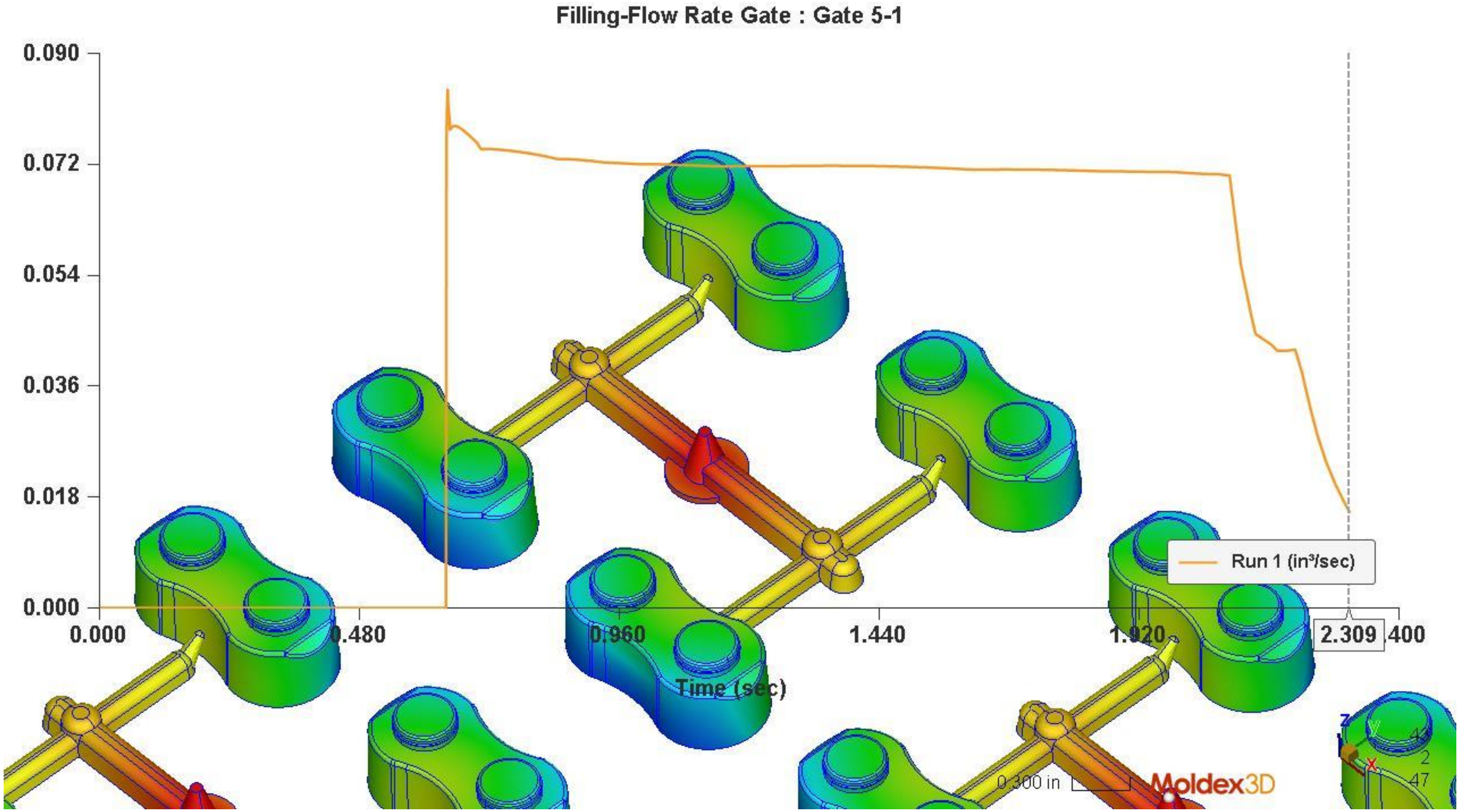
Filling_XY_Flow Rate Gate - Gate 4-1



Max	Unit
0.085	in³/sec

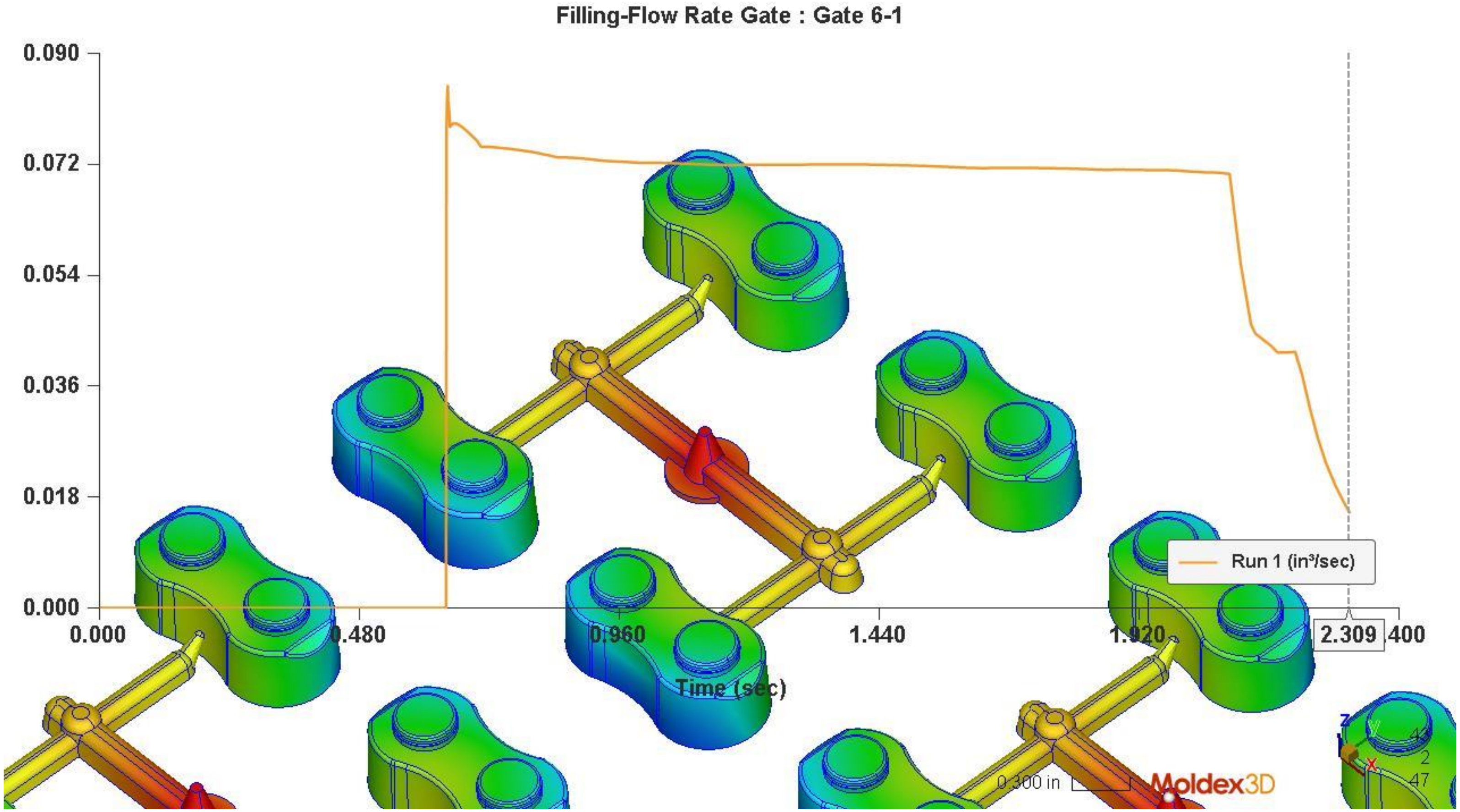
Moldex3D

Filling_XY_Flow Rate Gate - Gate 5-1



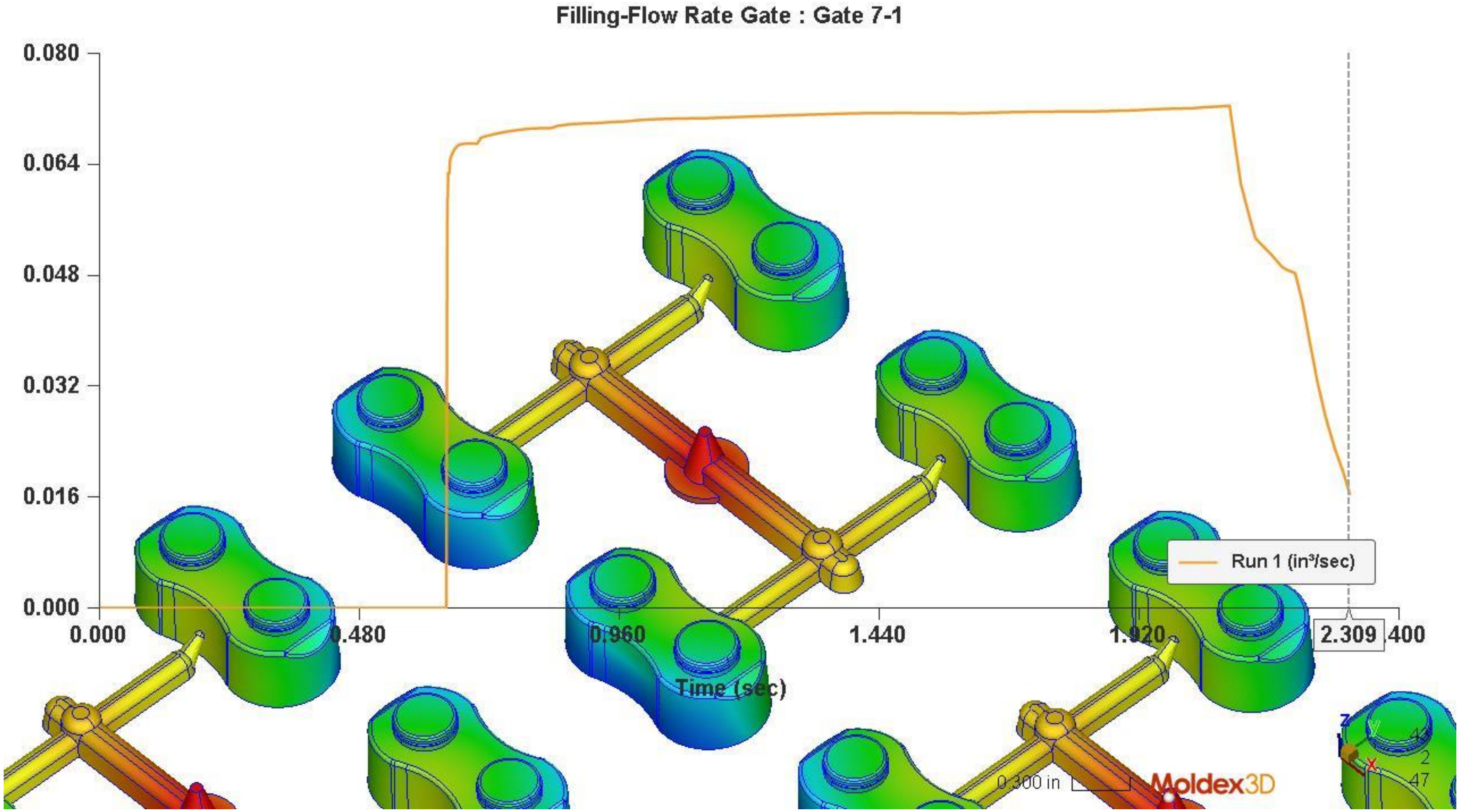
Max	Unit
0.084	in³/sec

Filling_XY_Flow Rate Gate - Gate 6-1



Max	Unit
0.085	in³/sec

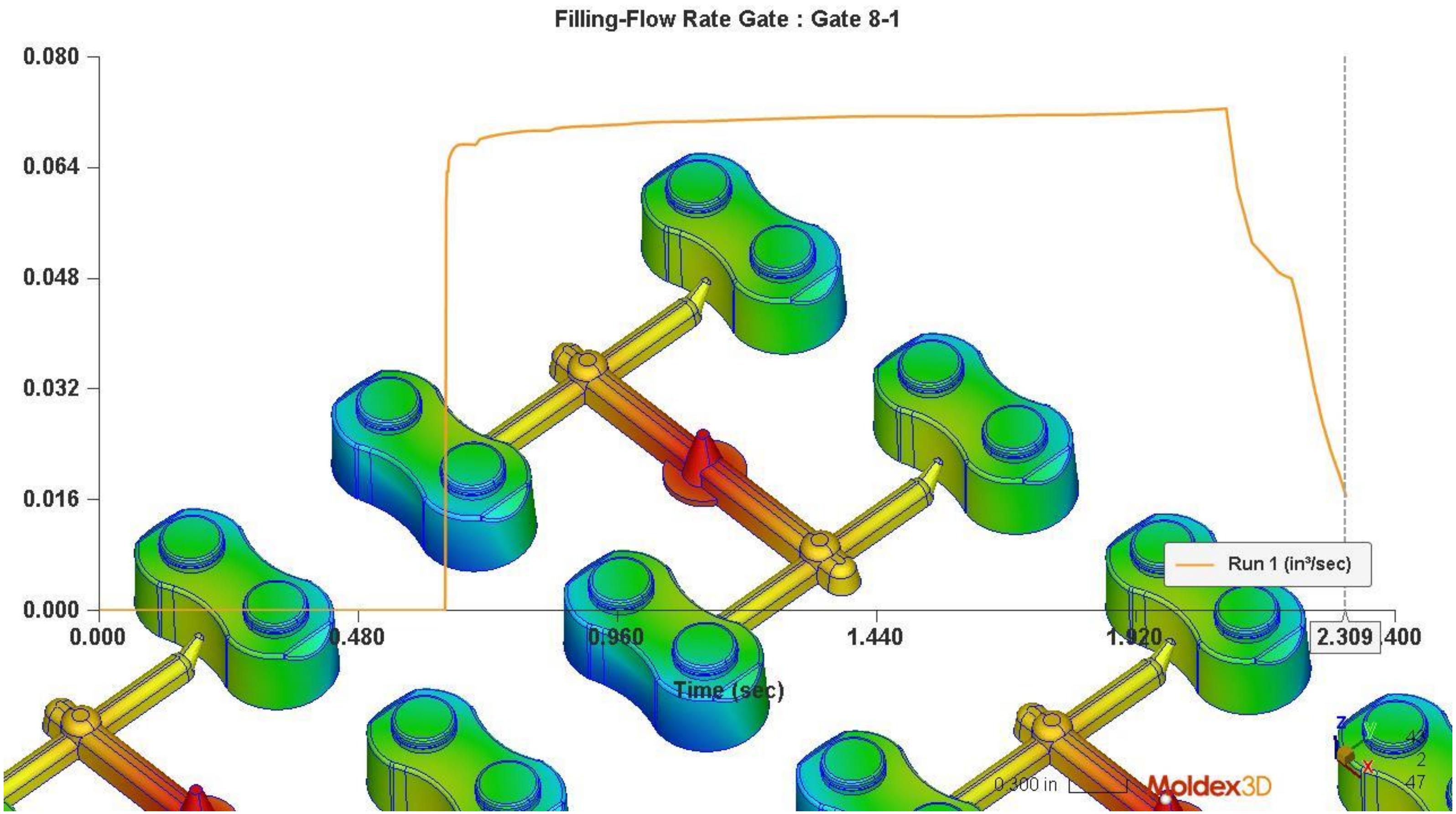
Filling_XY_Flow Rate Gate - Gate 7-1



Max	Unit
0.072	in³/sec

Moldex3D

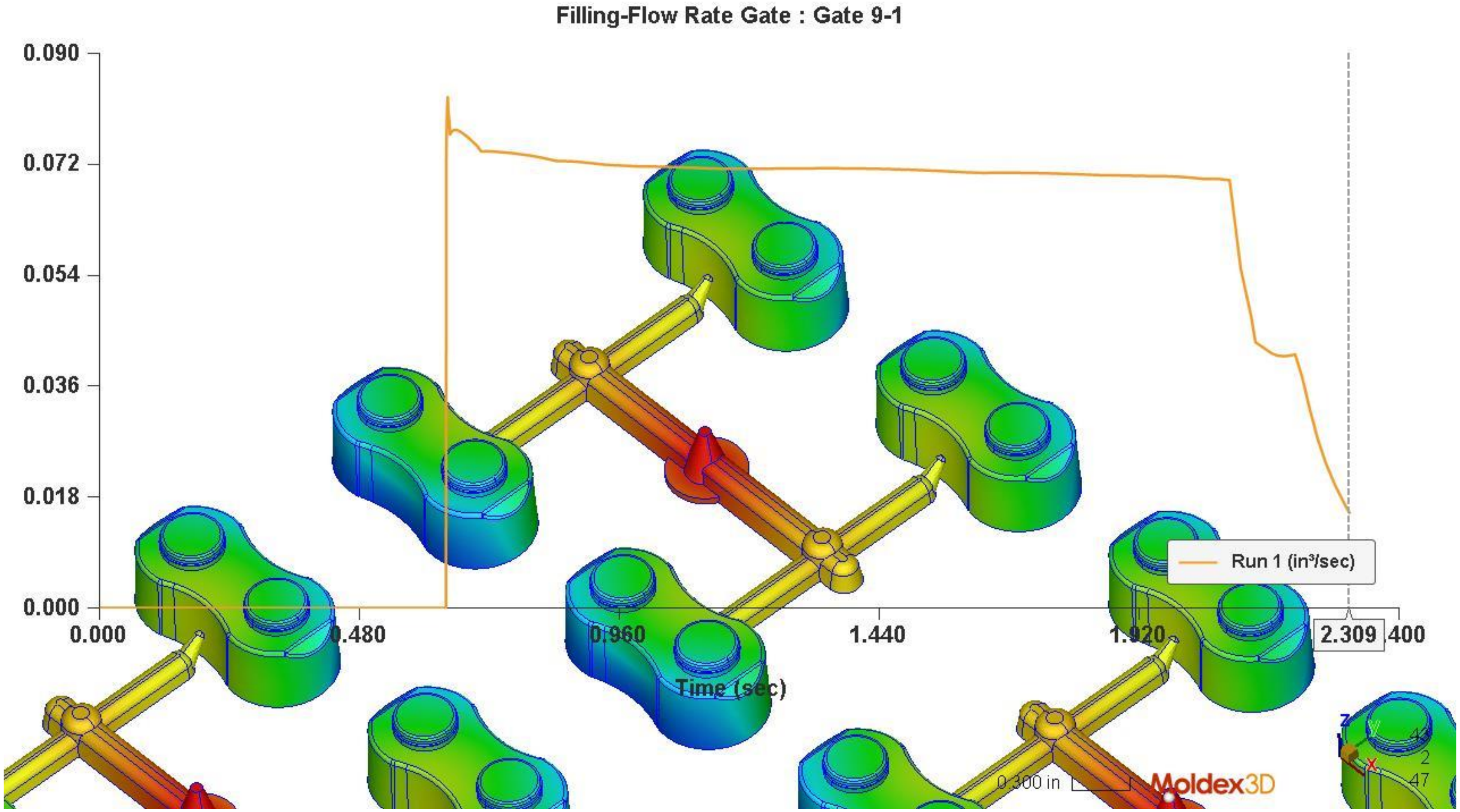
Filling_XY_Flow Rate Gate - Gate 8-1



Max	Unit
0.073	in³/sec

Moldex3D

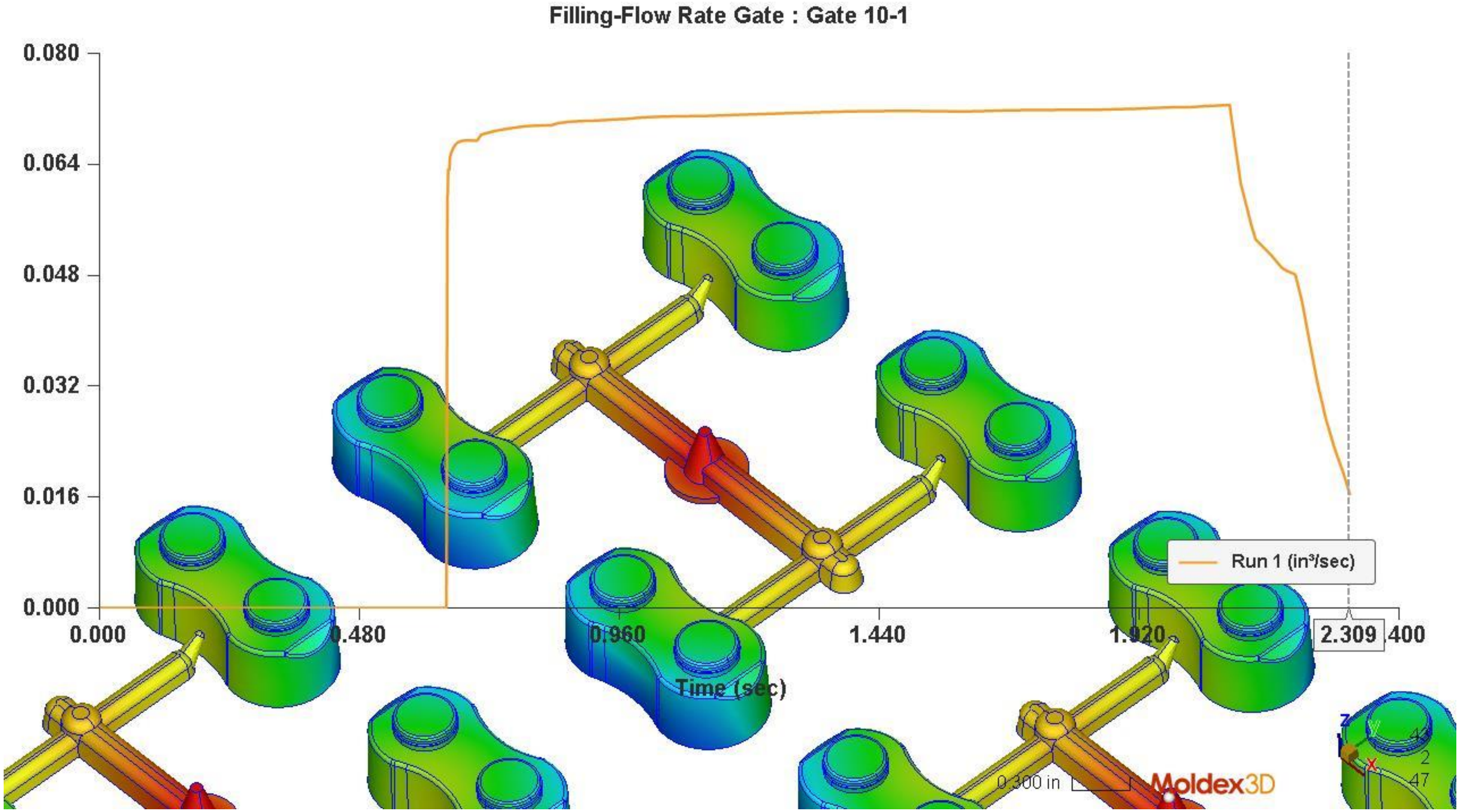
Filling_XY_Flow Rate Gate - Gate 9-1



Max	Unit
0.083	in³/sec

Moldex3D

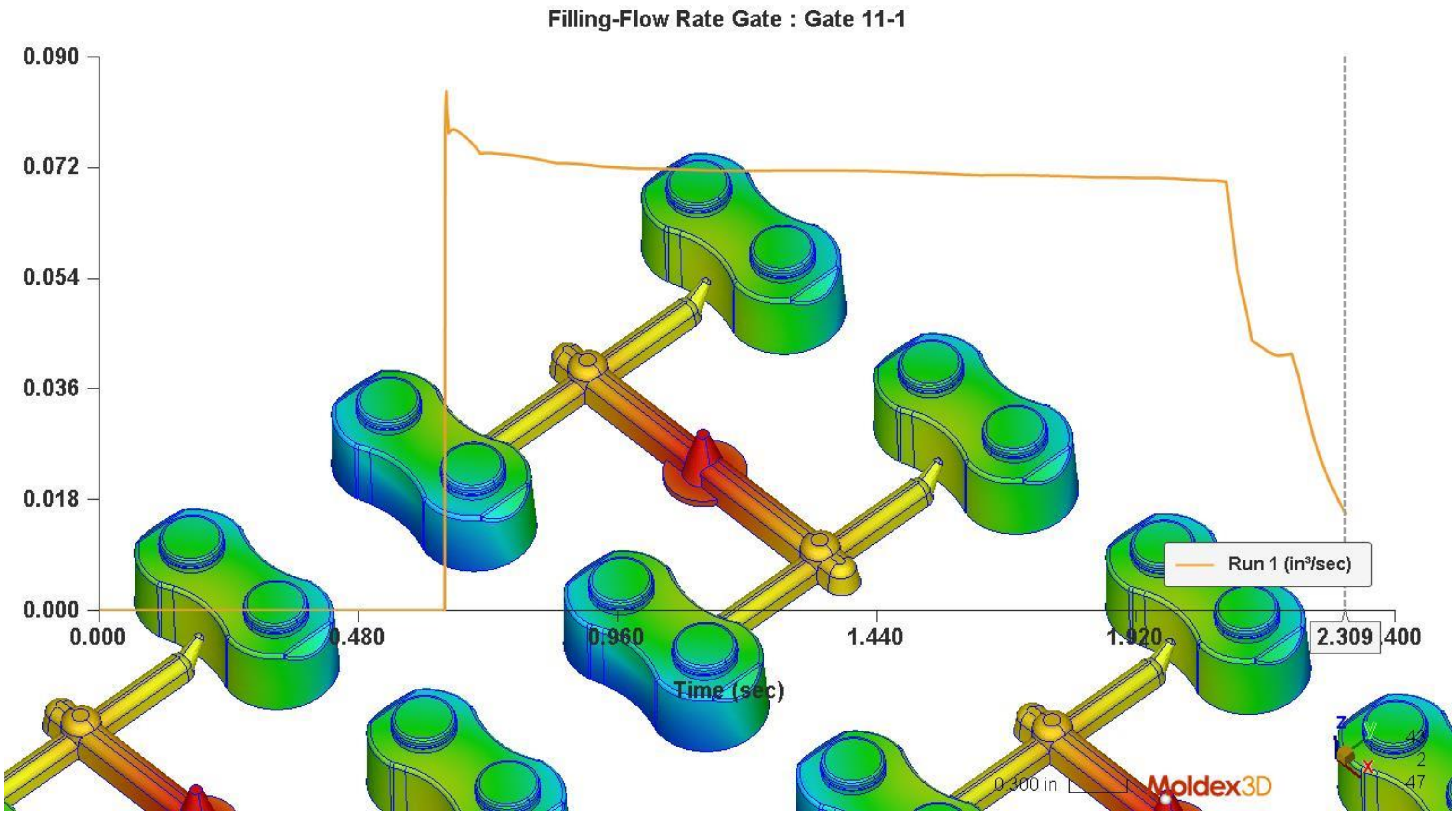
Filling_XY_Flow Rate Gate - Gate 10-1



Max	Unit
0.073	in³/sec

Moldex3D

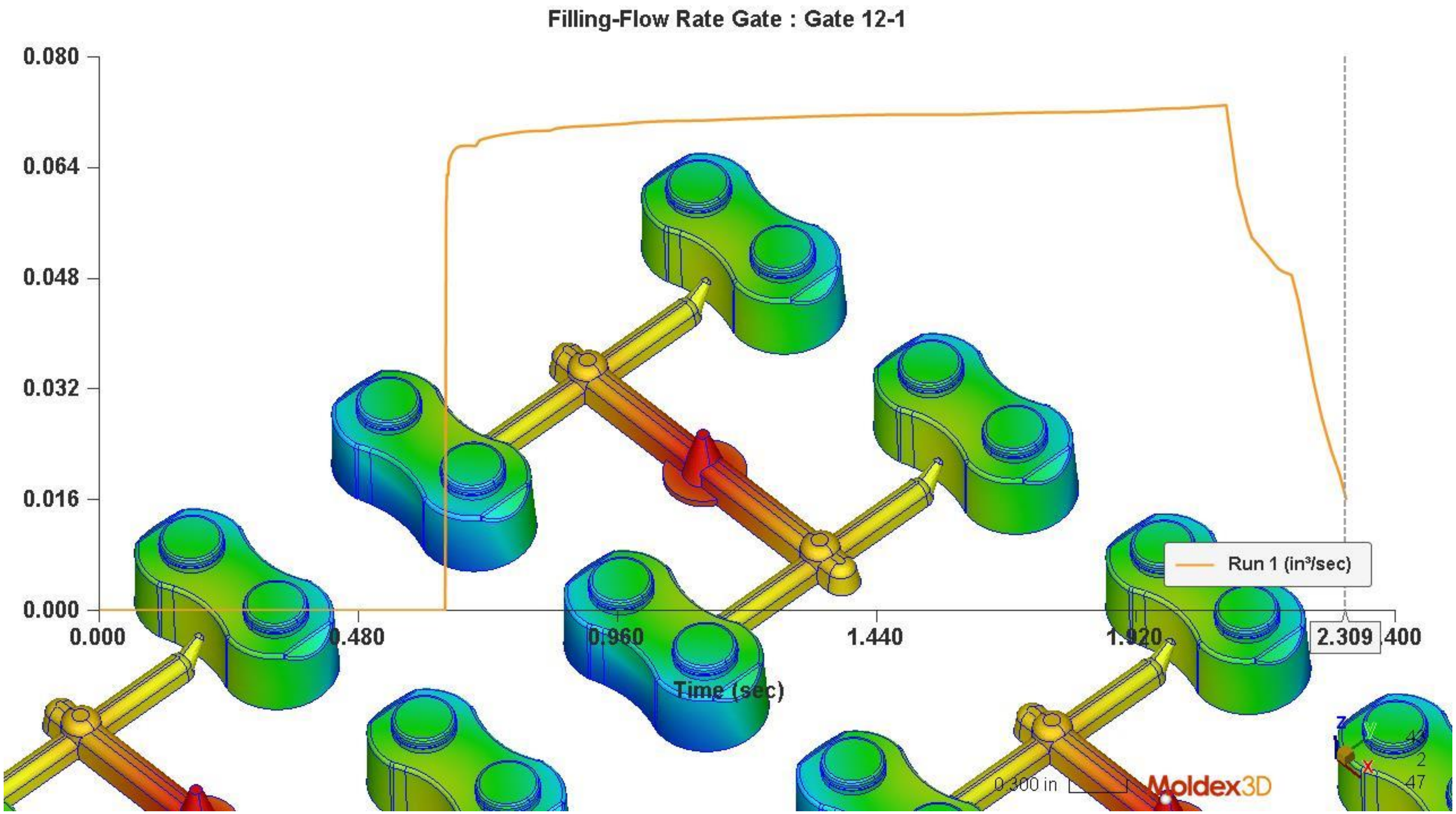
Filling_XY_Flow Rate Gate - Gate 11-1



Max	Unit
0.084	in³/sec

Moldex3D

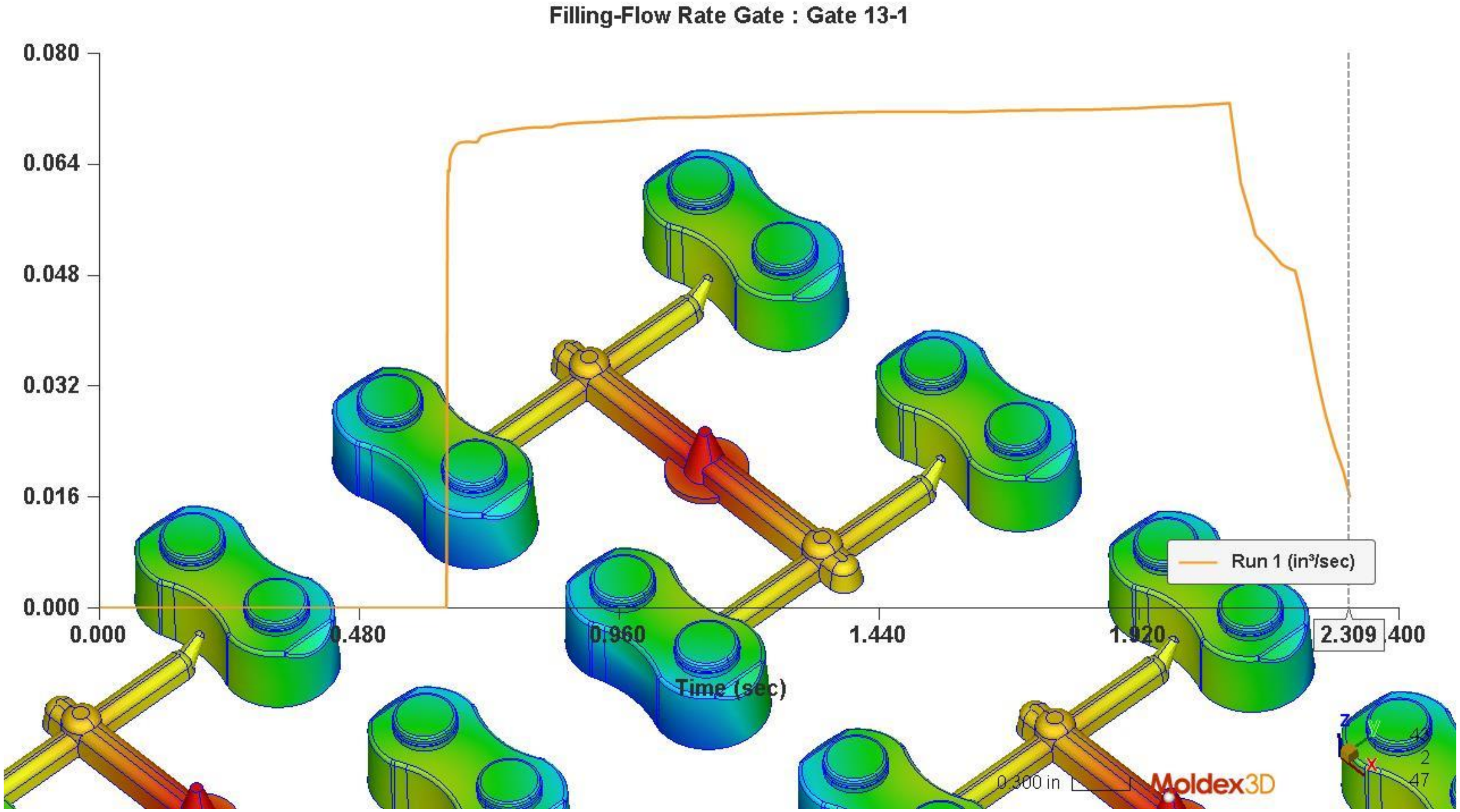
Filling_XY_Flow Rate Gate - Gate 12-1



Max	Unit
0.073	in³/sec

Moldex3D

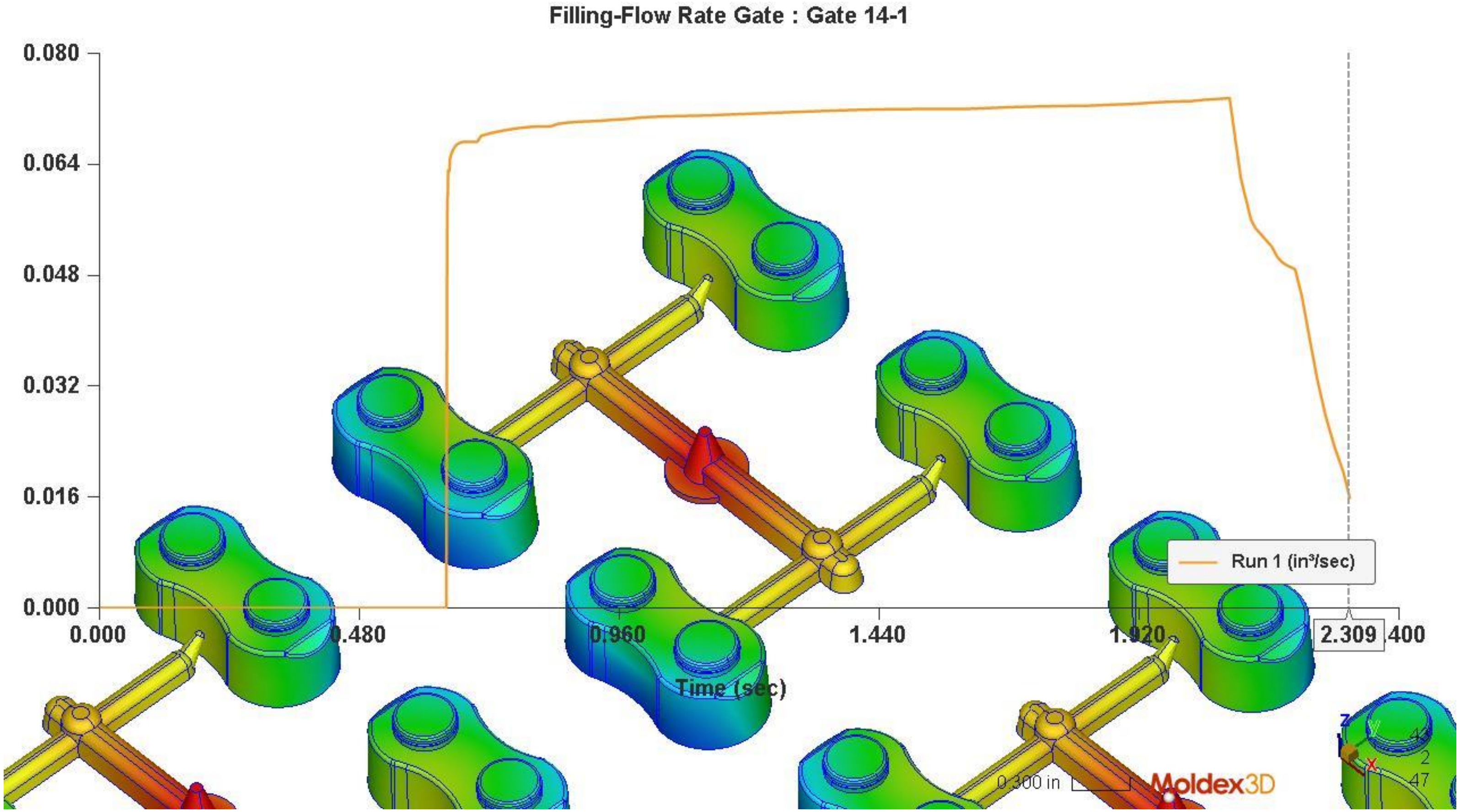
Filling_XY_Flow Rate Gate - Gate 13-1



Max	Unit
0.073	in³/sec

Moldex3D

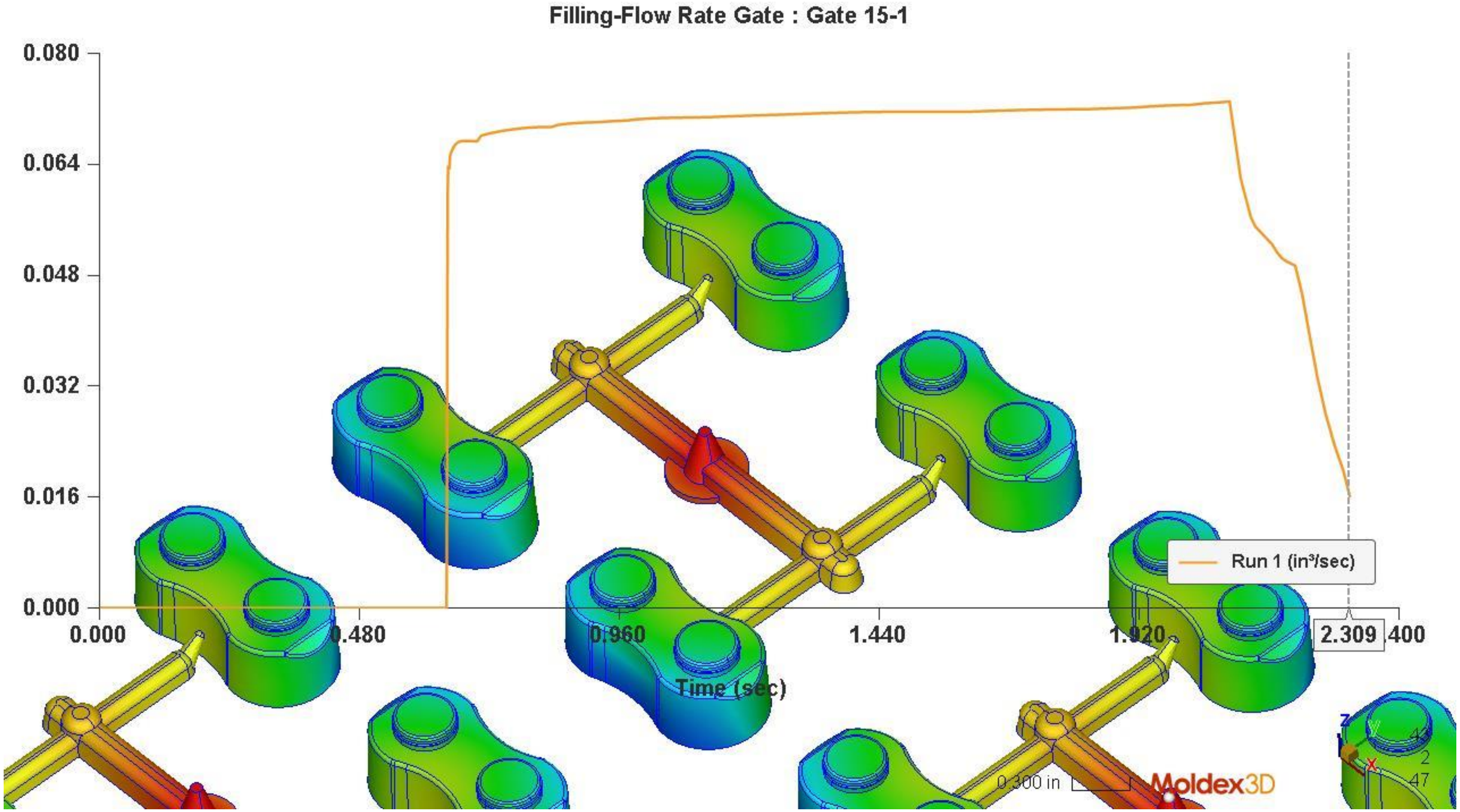
Filling_XY_Flow Rate Gate - Gate 14-1



Max	Unit
0.074	in^3/sec

Moldex3D

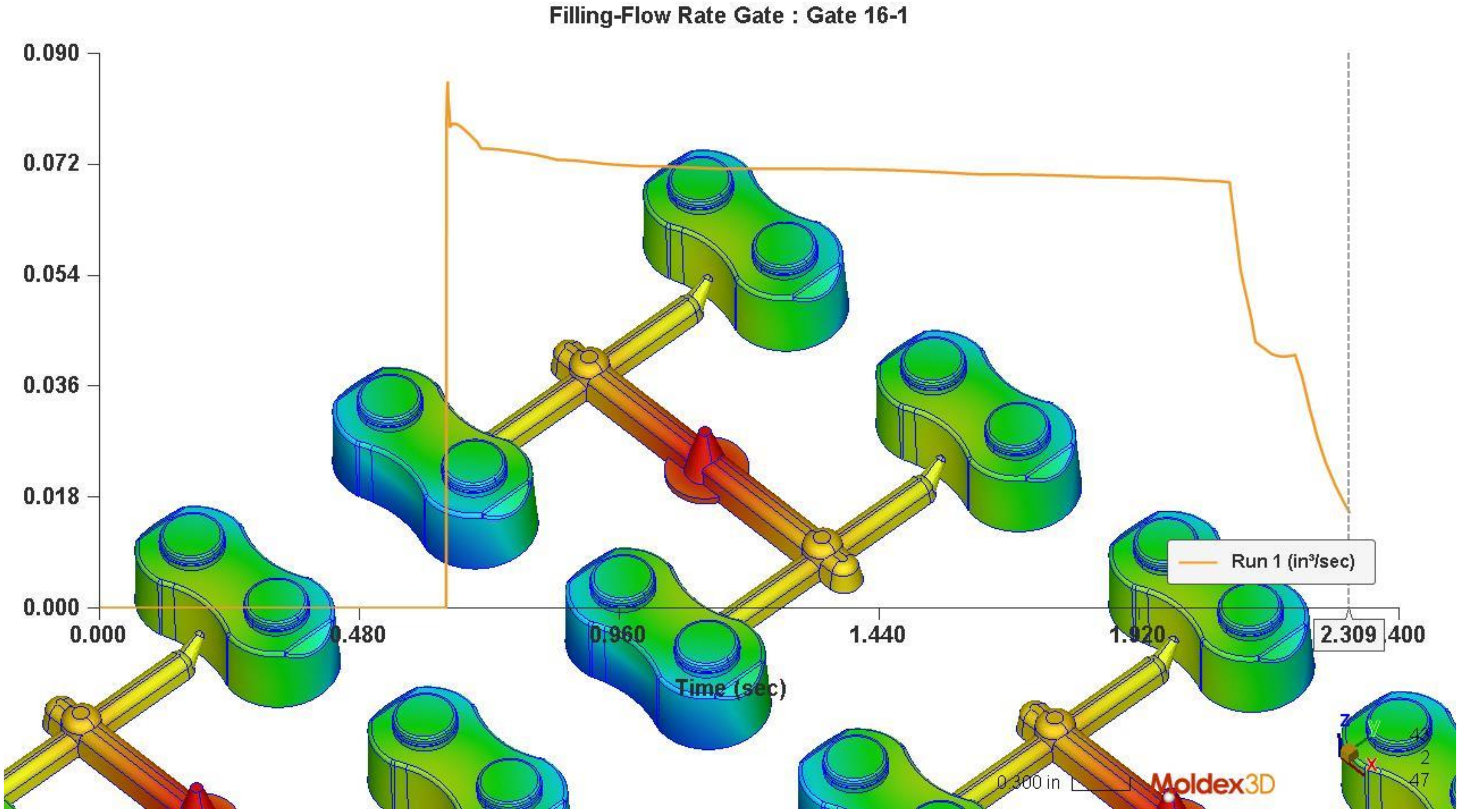
Filling_XY_Flow Rate Gate - Gate 15-1



Max	Unit
0.073	in³/sec

Moldex3D

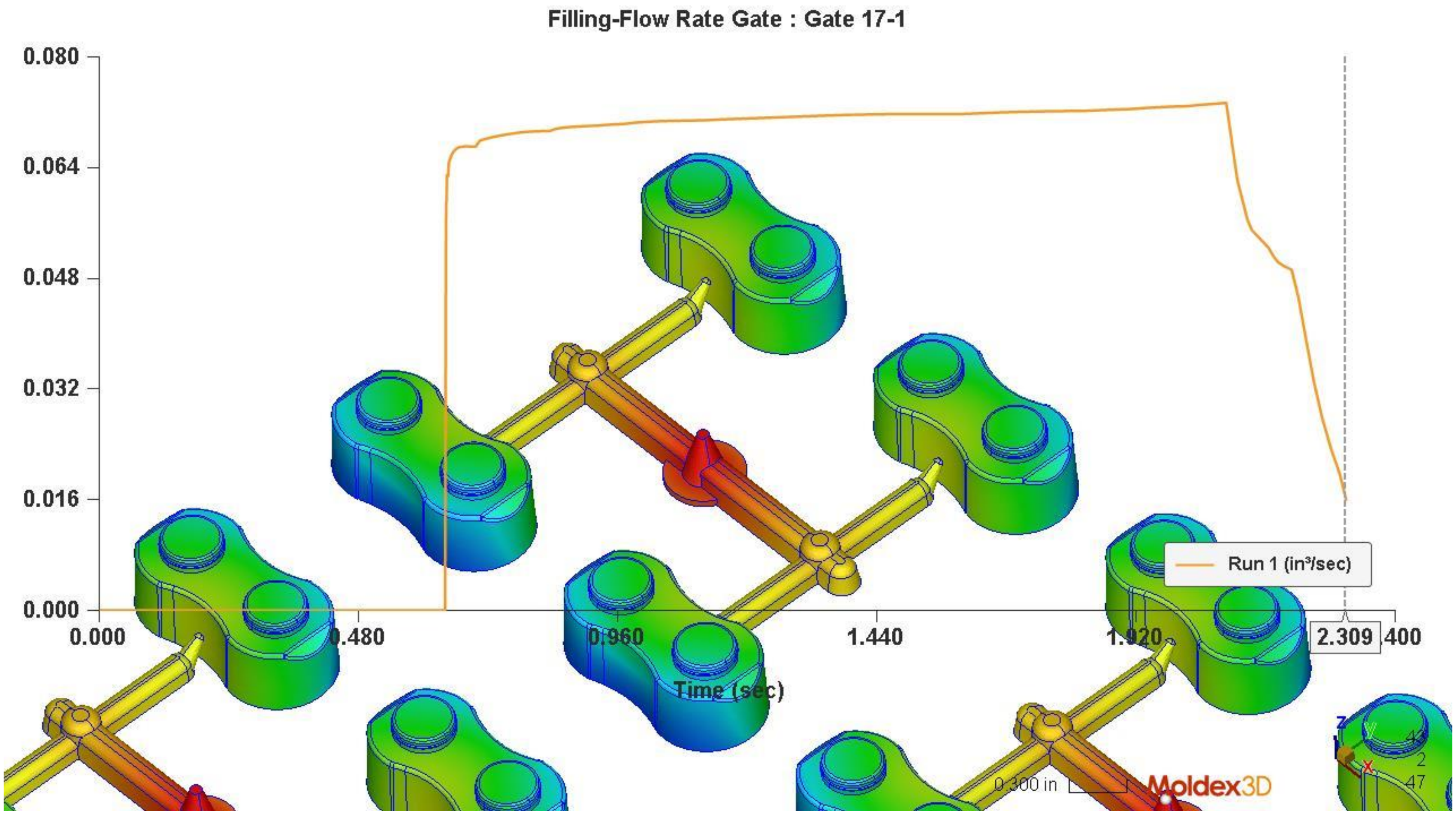
Filling_XY_Flow Rate Gate - Gate 16-1



Max	Unit
0.085	in³/sec

Moldex3D

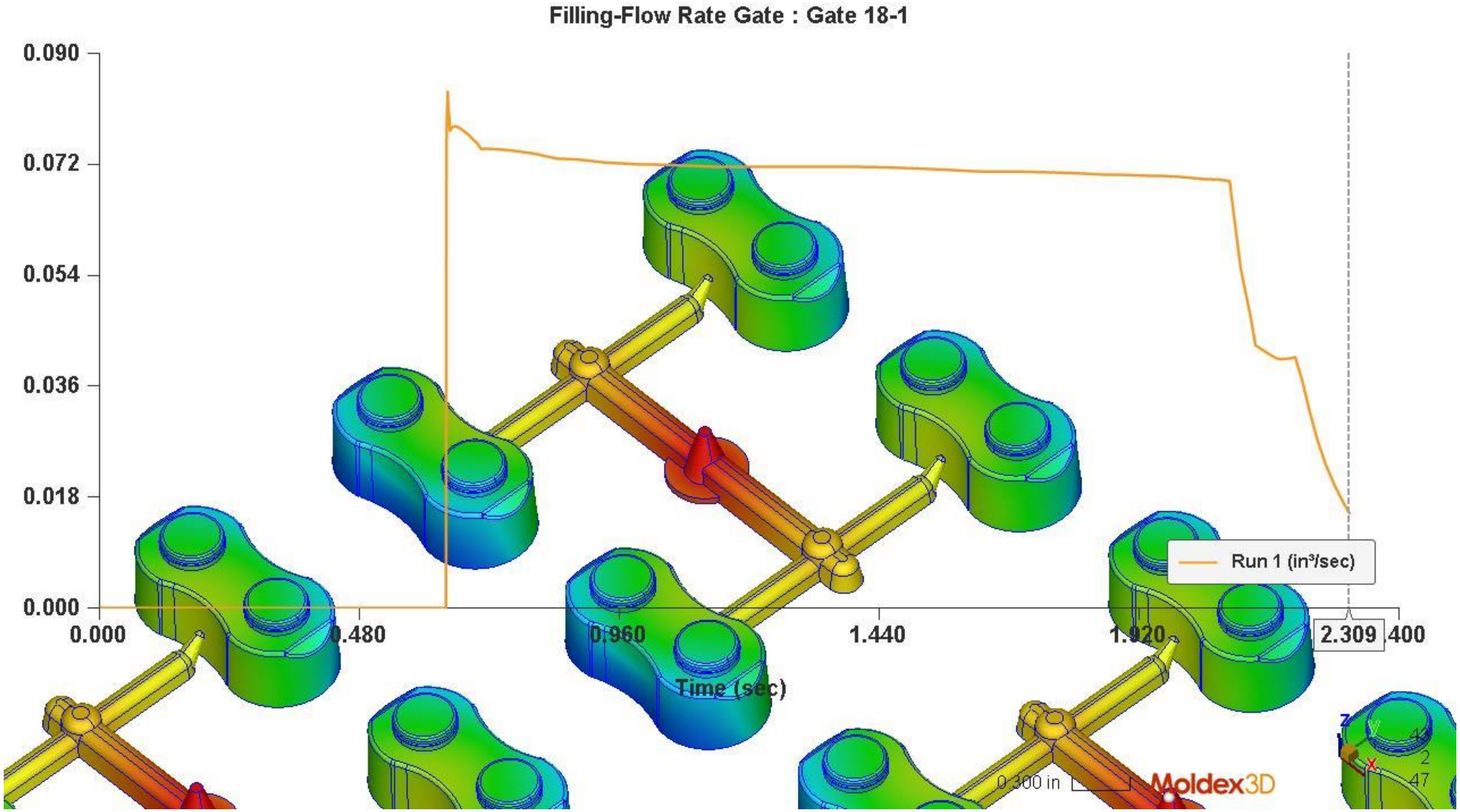
Filling_XY_Flow Rate Gate - Gate 17-1



Max	Unit
0.073	in³/sec

Moldex3D

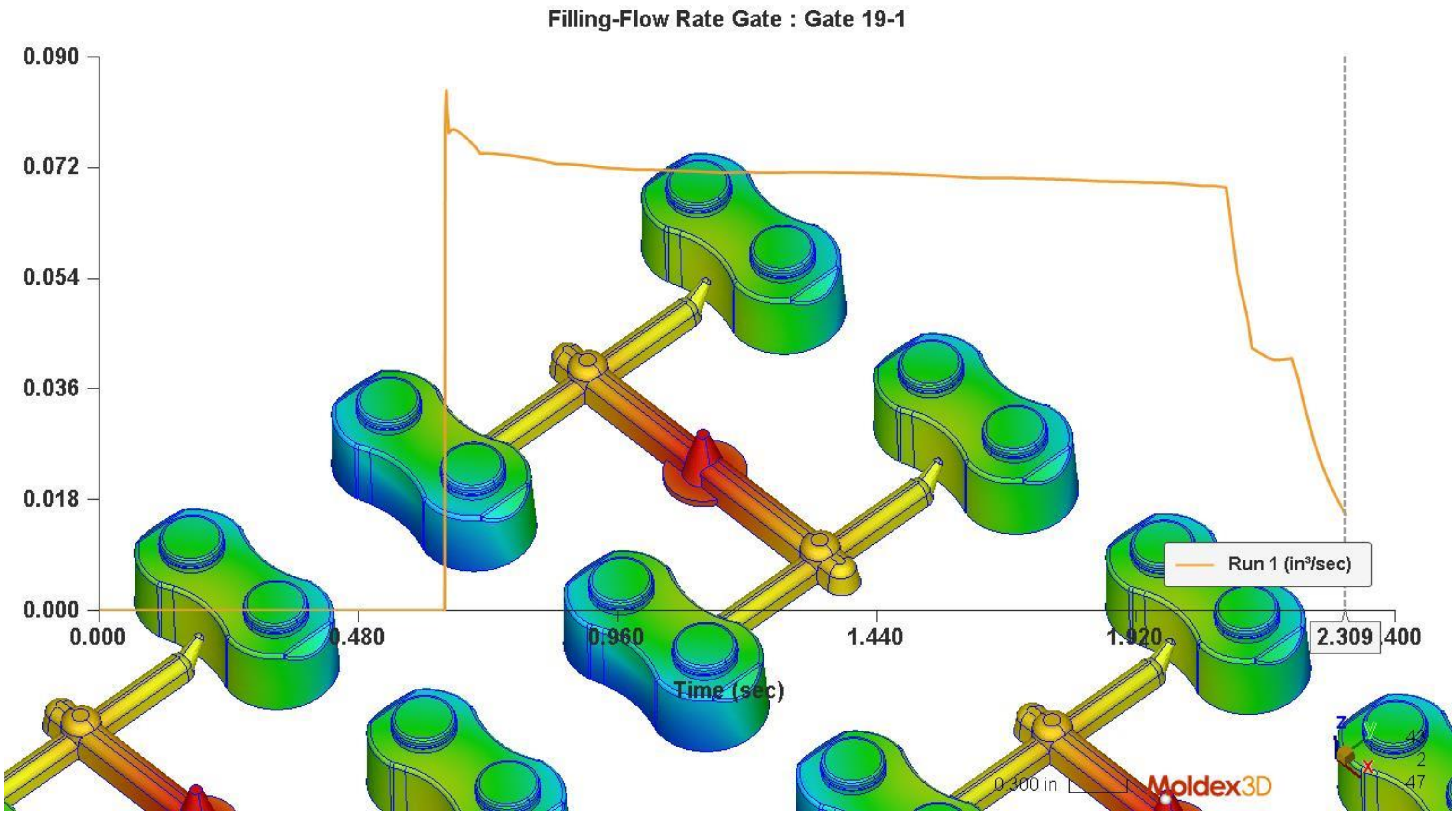
Filling_XY_Flow Rate Gate - Gate 18-1



Max	Unit
0.084	in³/sec

Moldex3D

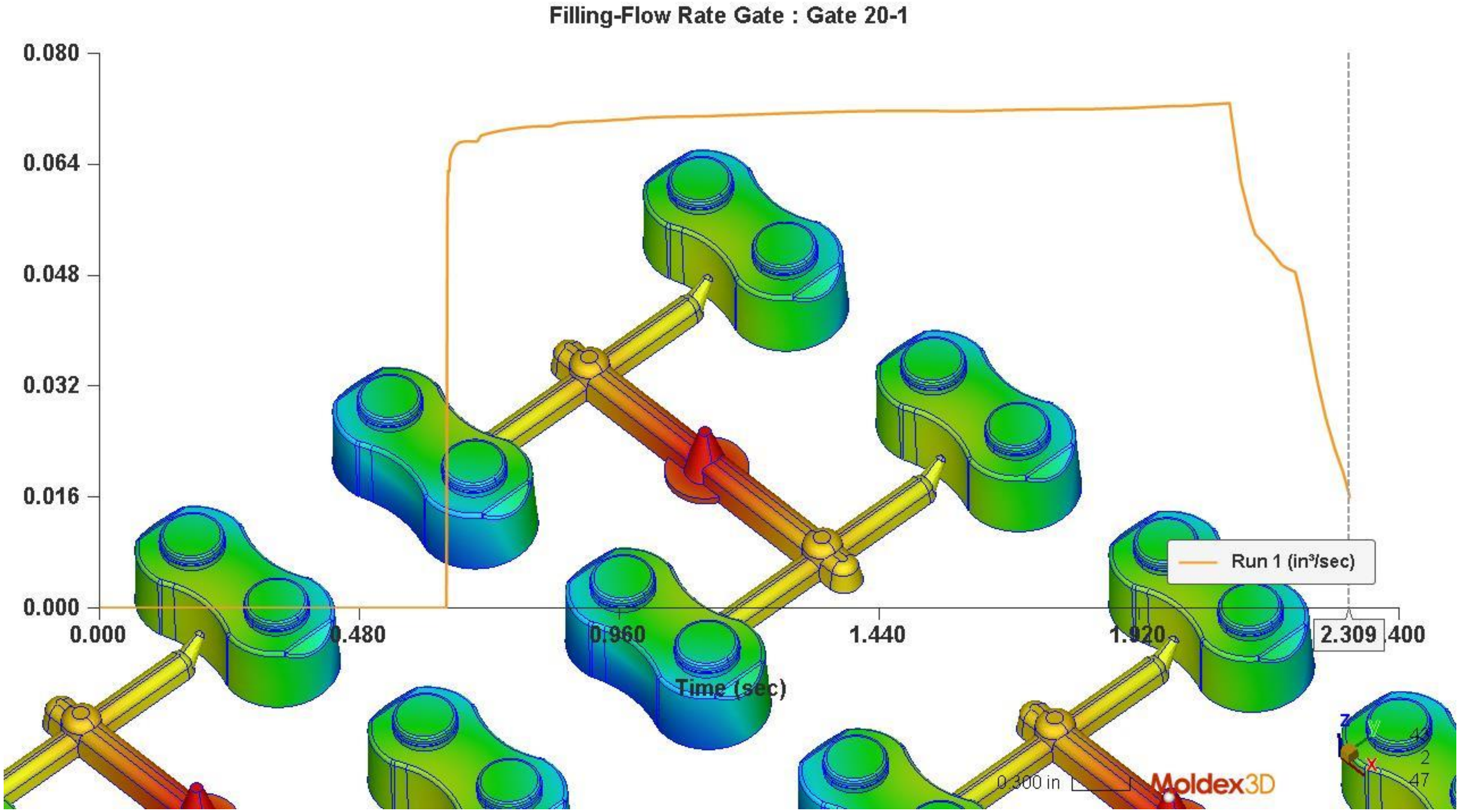
Filling_XY_Flow Rate Gate - Gate 19-1



Max	Unit
0.085	in³/sec

Moldex3D

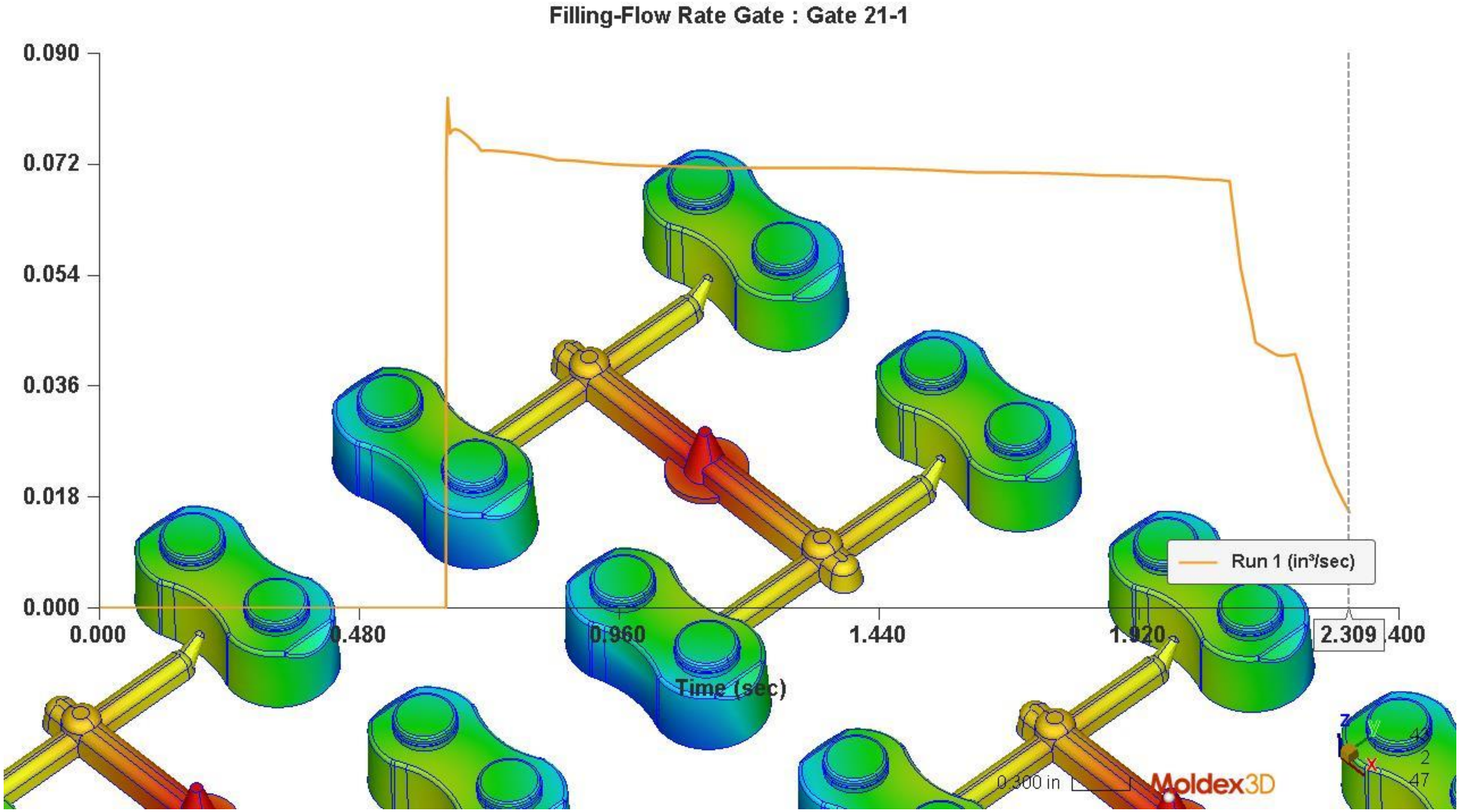
Filling_XY_Flow Rate Gate - Gate 20-1



Max	Unit
0.073	in³/sec

Moldex3D

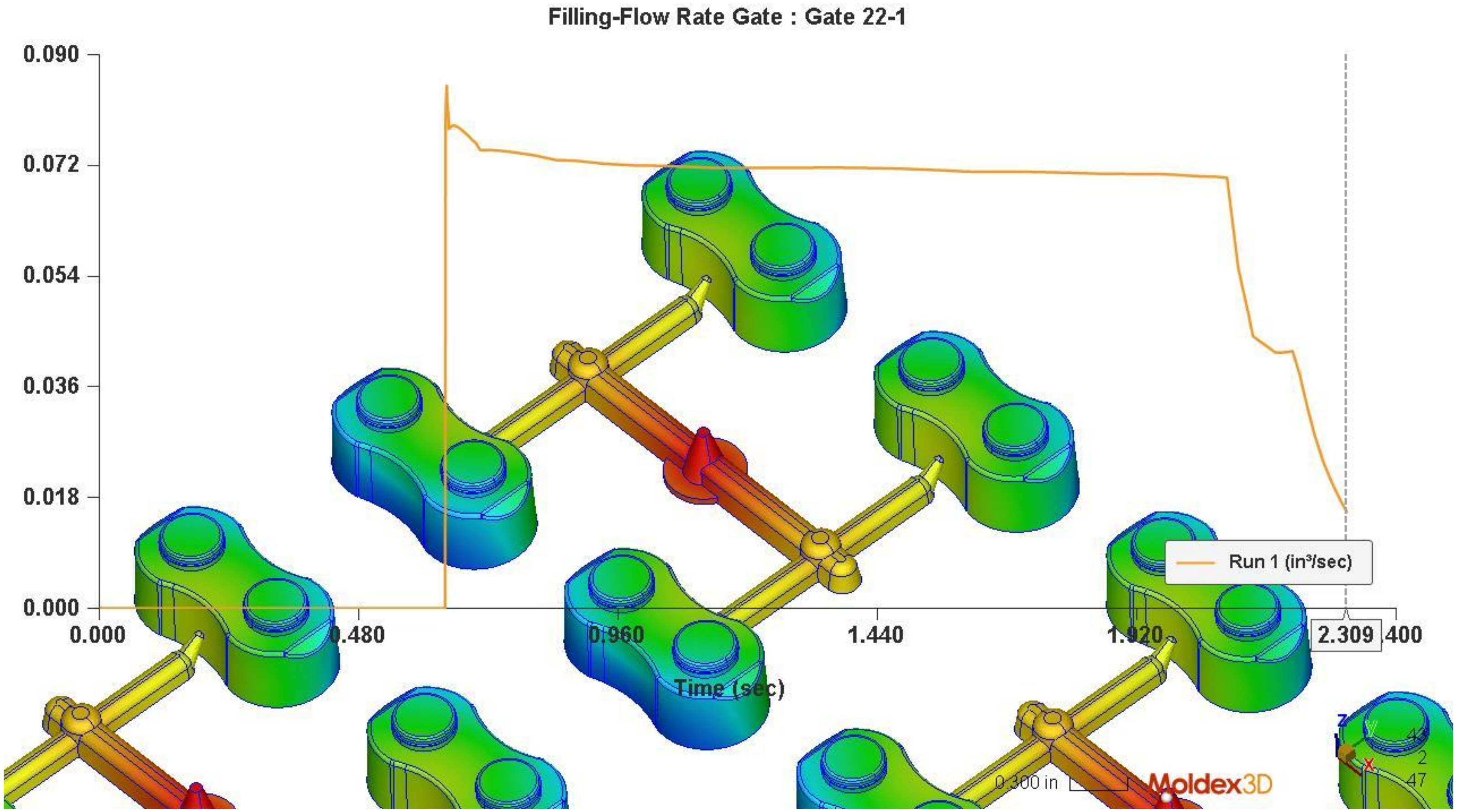
Filling_XY_Flow Rate Gate - Gate 21-1



Max	Unit
0.083	in³/sec

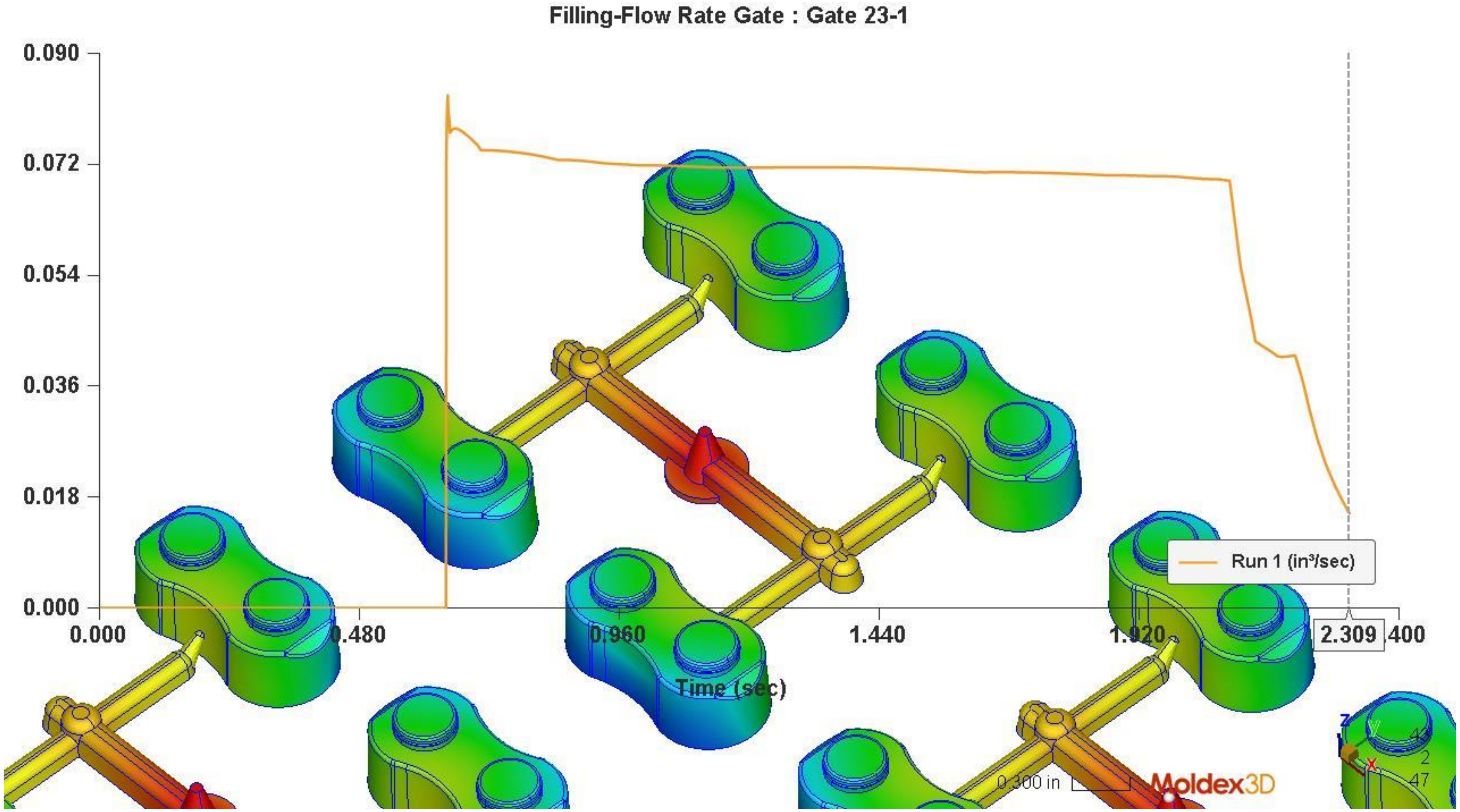
Moldex3D

Filling_XY_Flow Rate Gate - Gate 22-1



Max	Unit
0.085	in³/sec

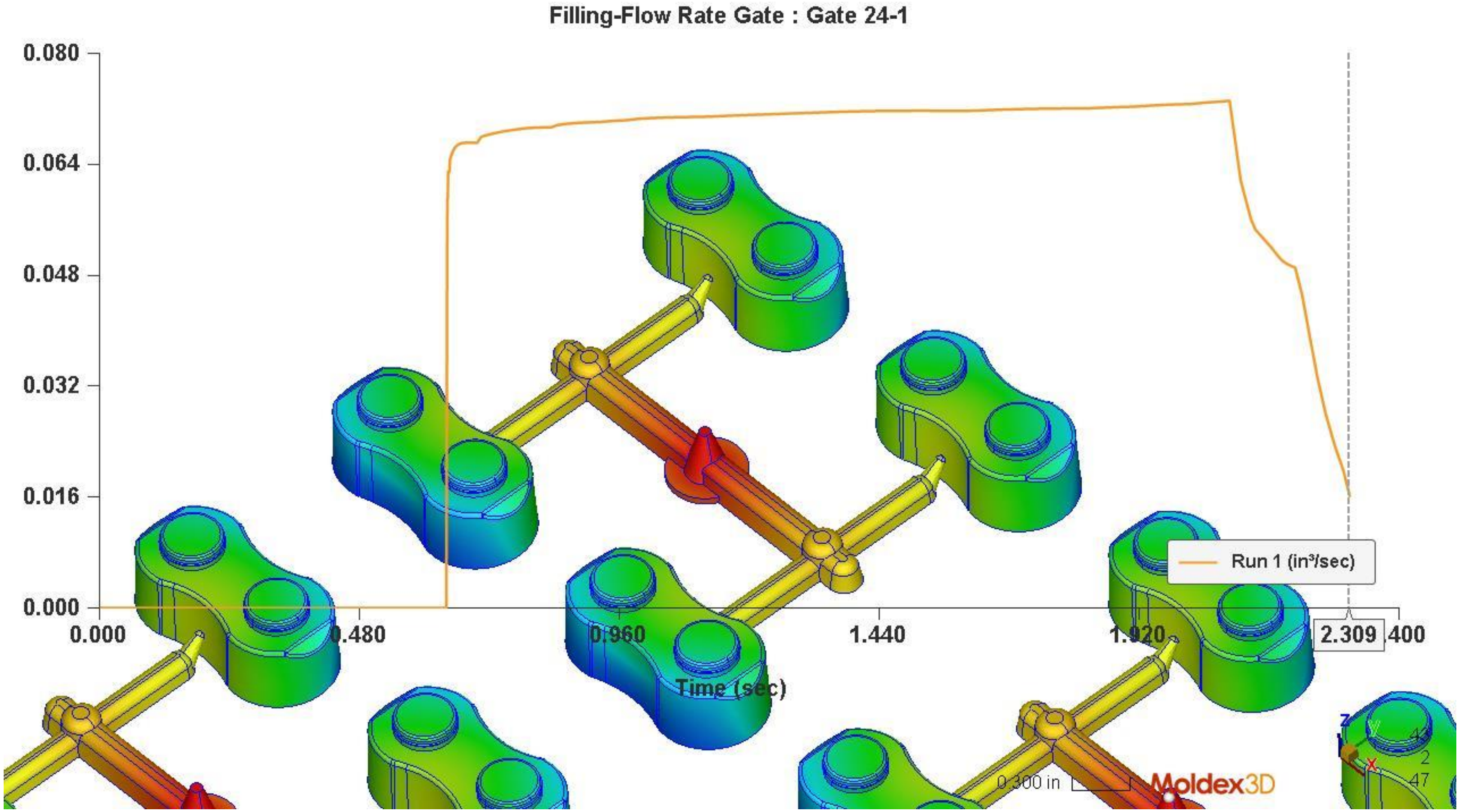
Filling_XY_Flow Rate Gate - Gate 23-1



Max	Unit
0.083	in^3/sec

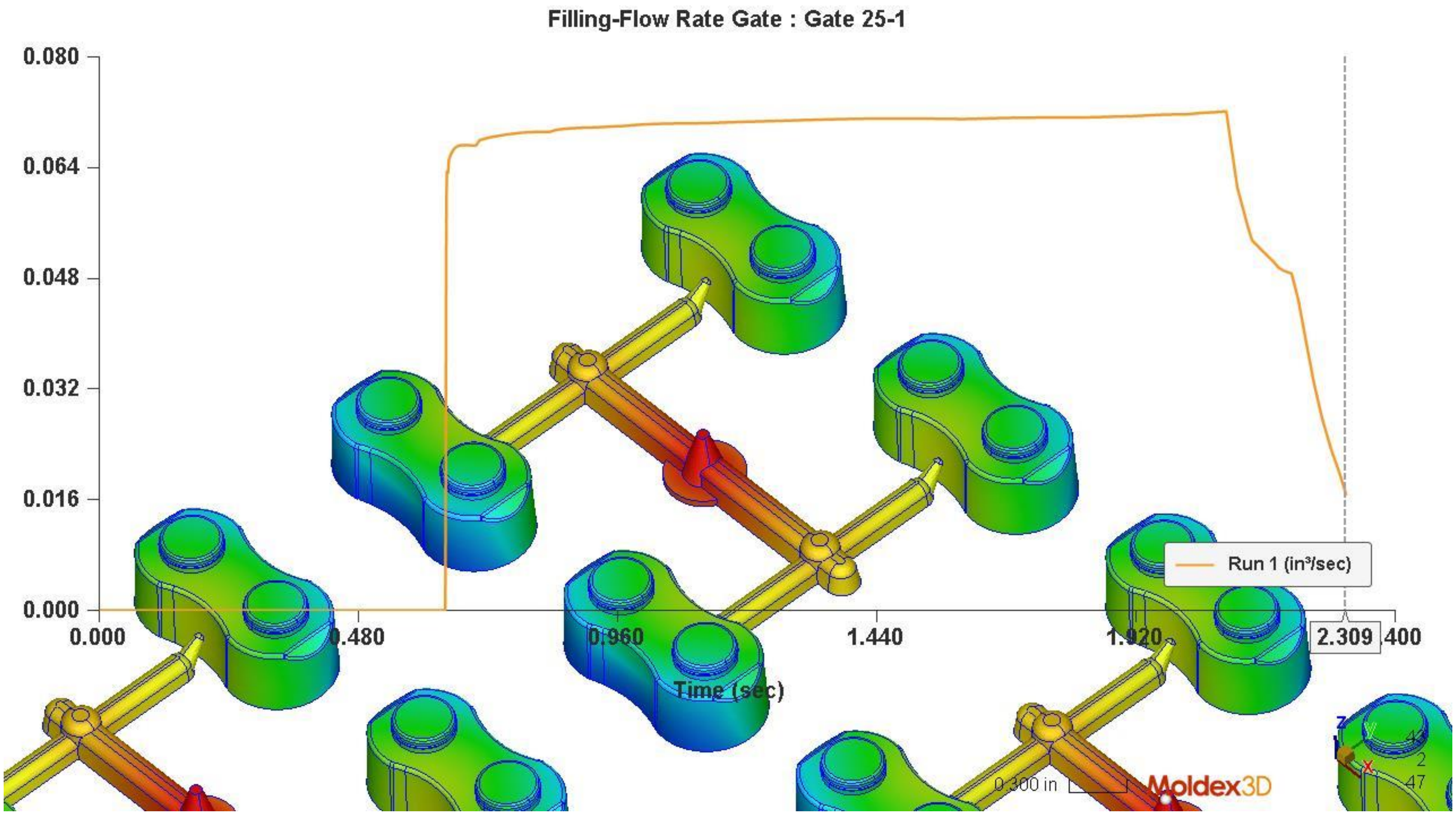
Moldex3D

Filling_XY_Flow Rate Gate - Gate 24-1



Max	Unit
0.073	in^3/sec

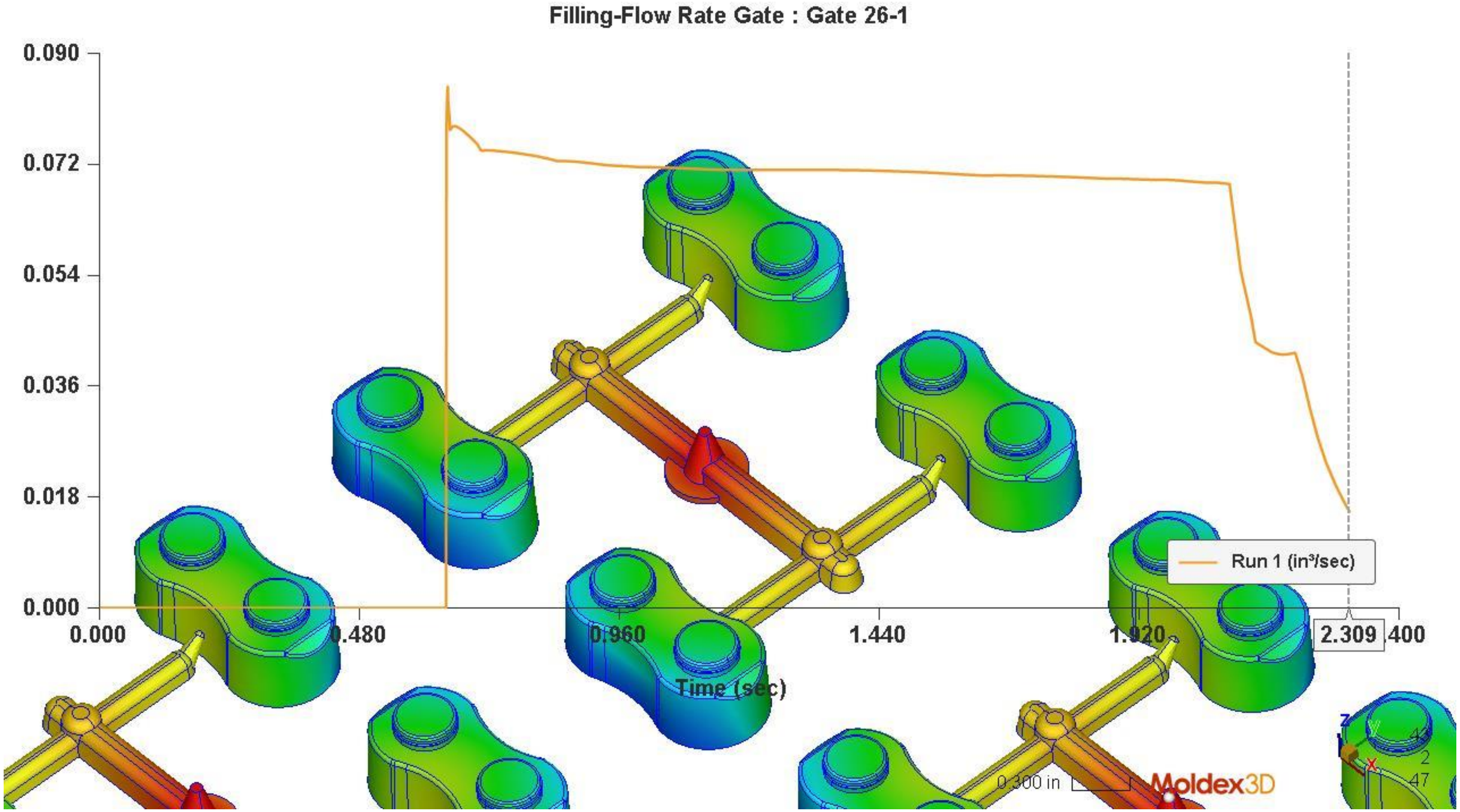
Filling_XY_Flow Rate Gate - Gate 25-1



Max	Unit
0.072	in³/sec

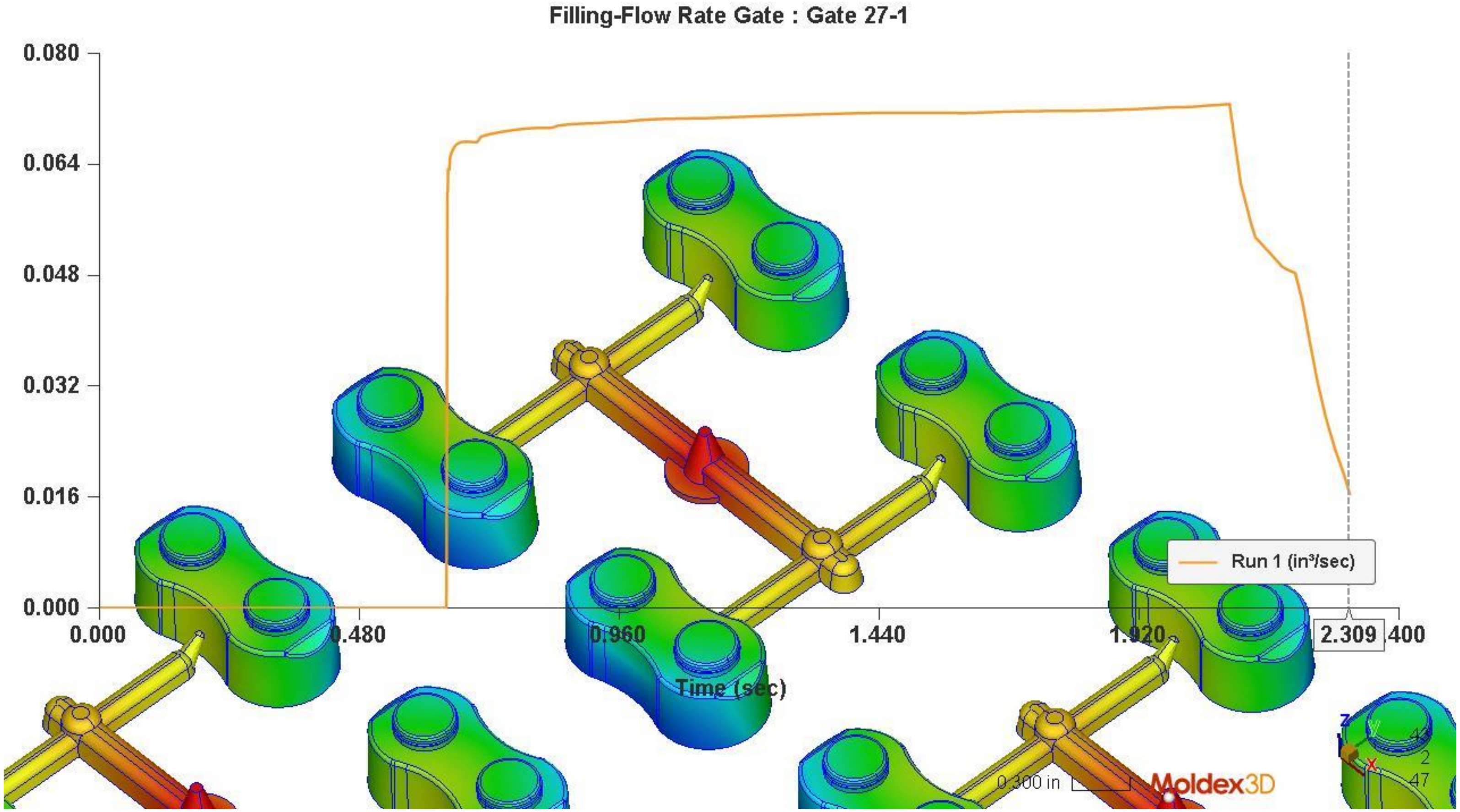
Moldex3D

Filling_XY_Flow Rate Gate - Gate 26-1



Max	Unit
0.085	in³/sec

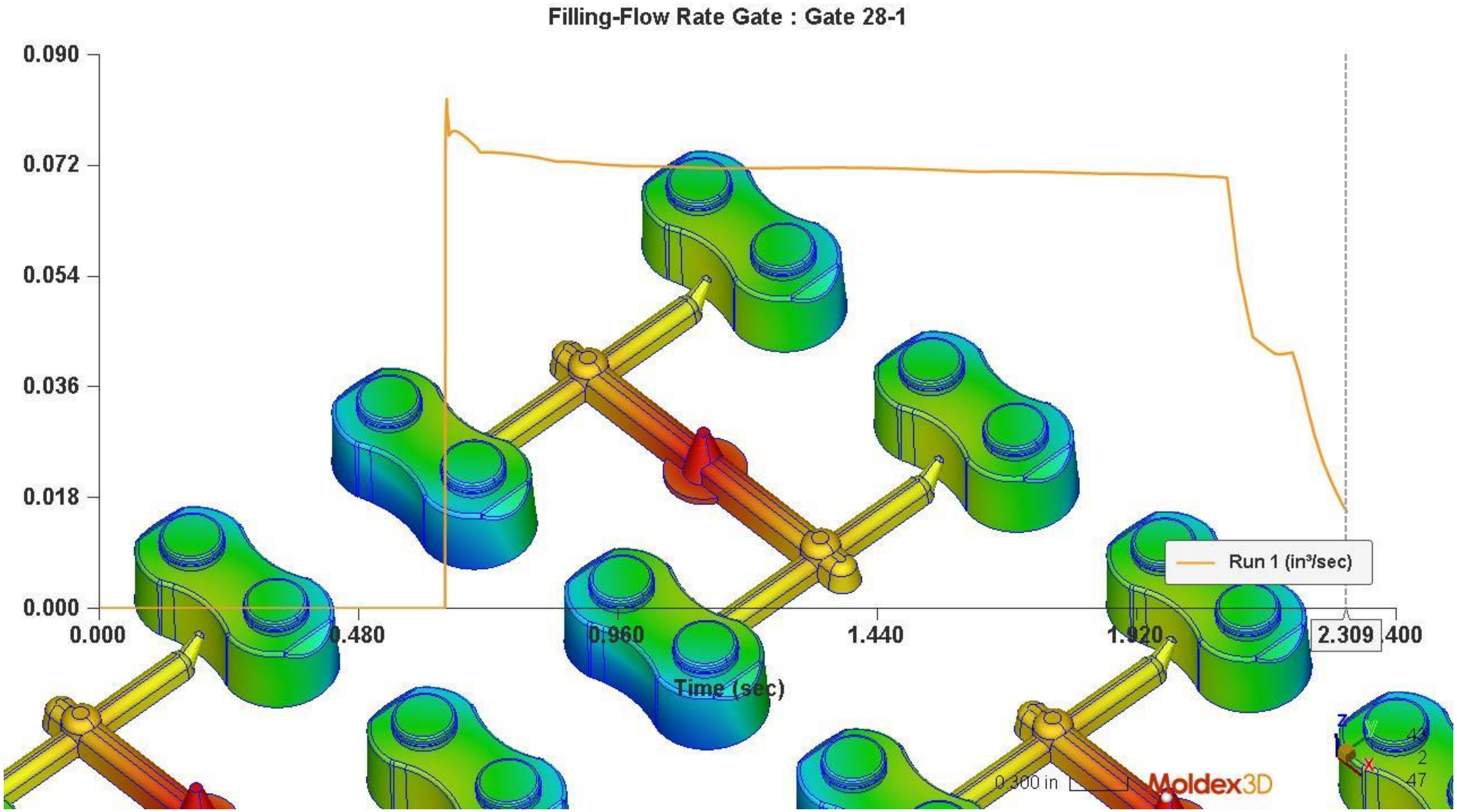
Filling_XY_Flow Rate Gate - Gate 27-1



Max	Unit
0.073	in^3/sec

Moldex3D

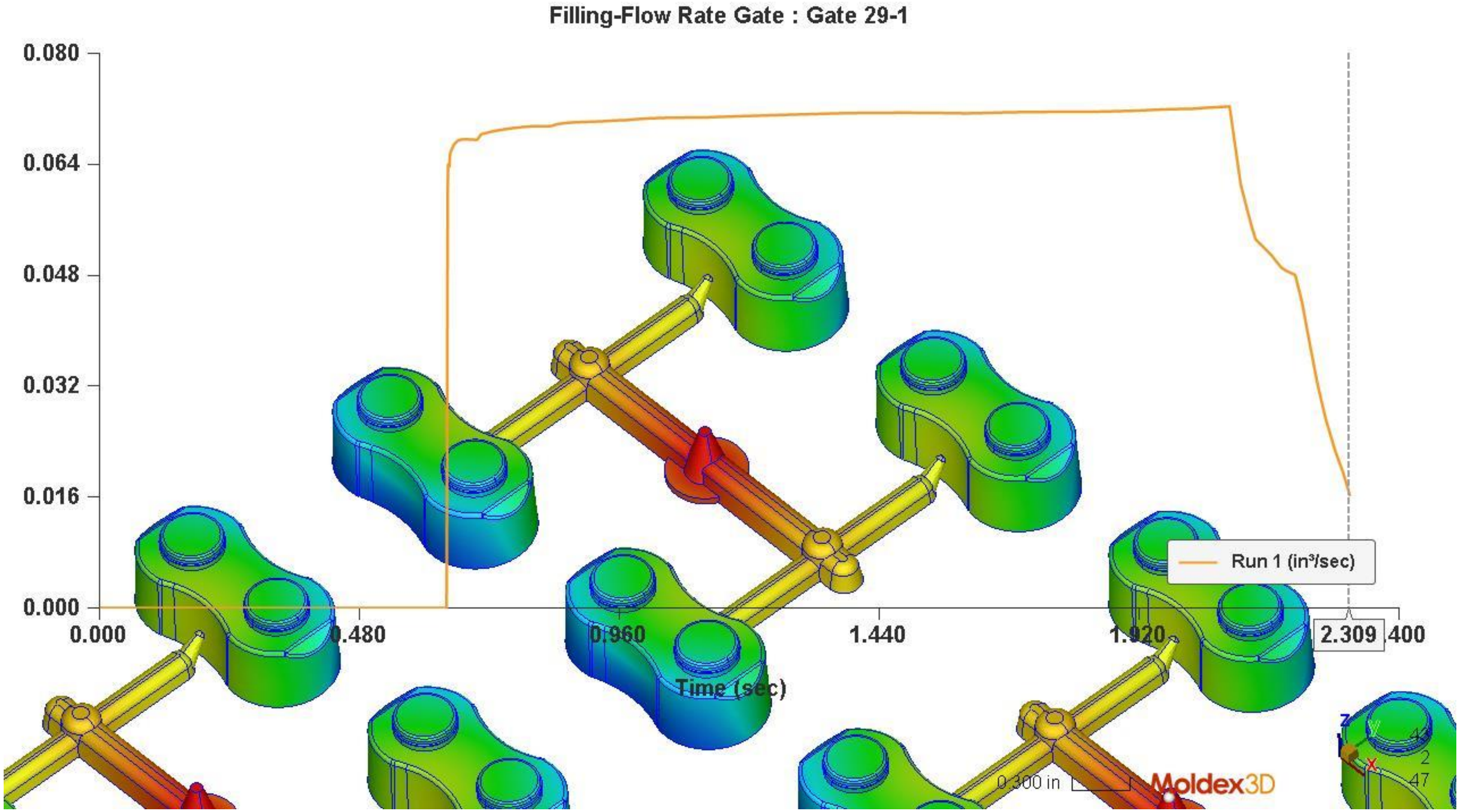
Filling_XY_Flow Rate Gate - Gate 28-1



Max	Unit
0.083	in³/sec

Moldex3D

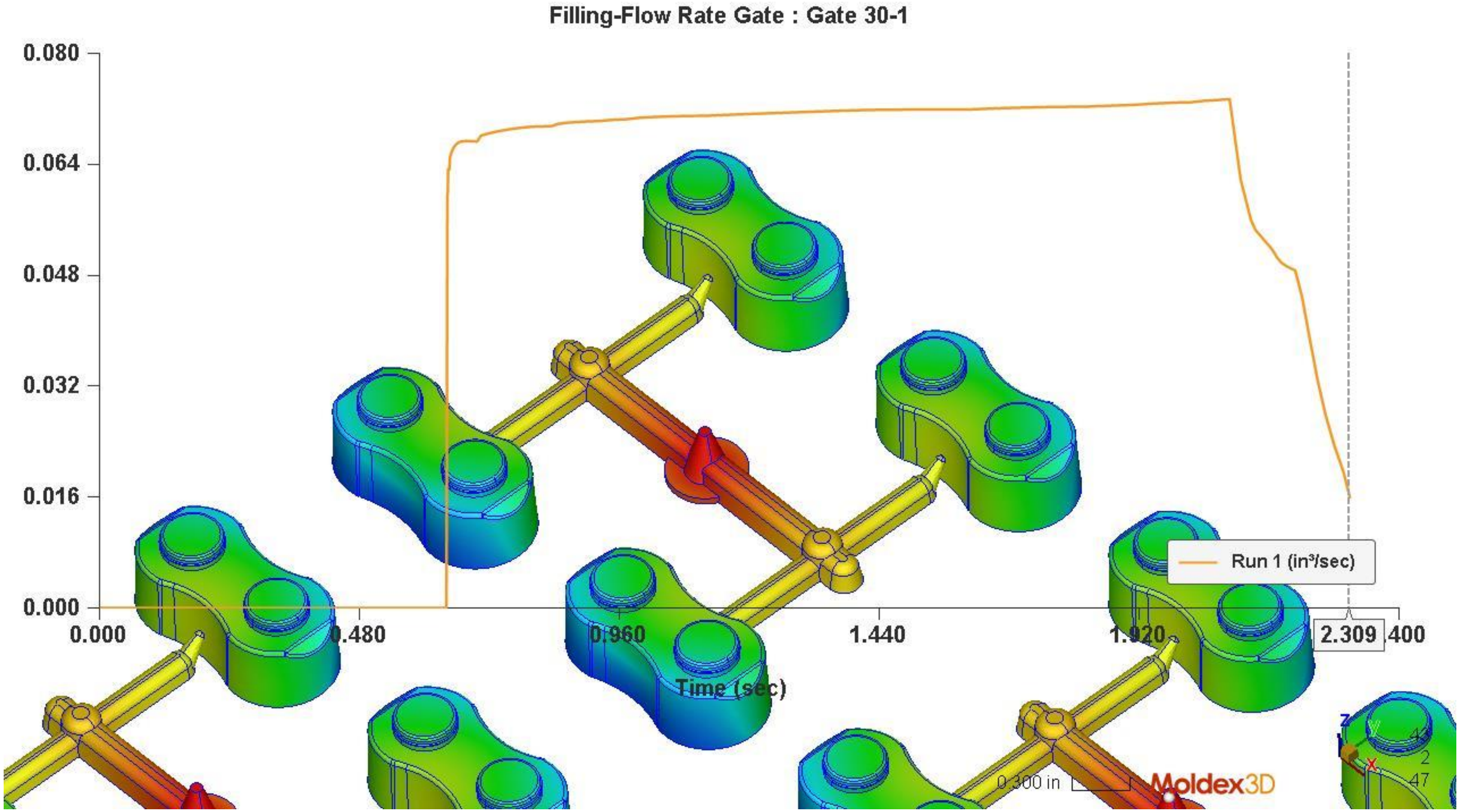
Filling_XY_Flow Rate Gate - Gate 29-1



Max	Unit
0.072	in^3/sec

Moldex3D

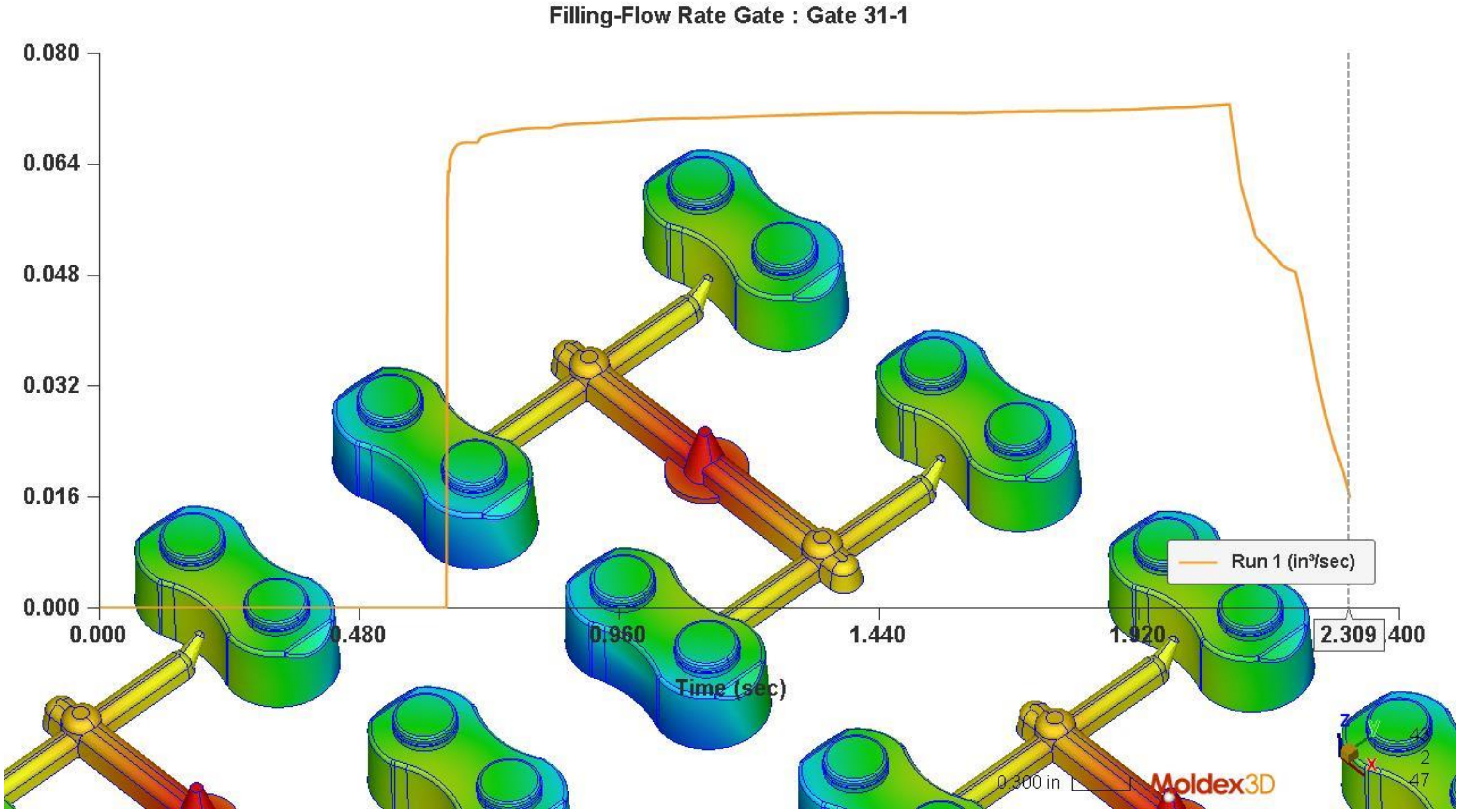
Filling_XY_Flow Rate Gate - Gate 30-1



Max	Unit
0.073	in^3/sec

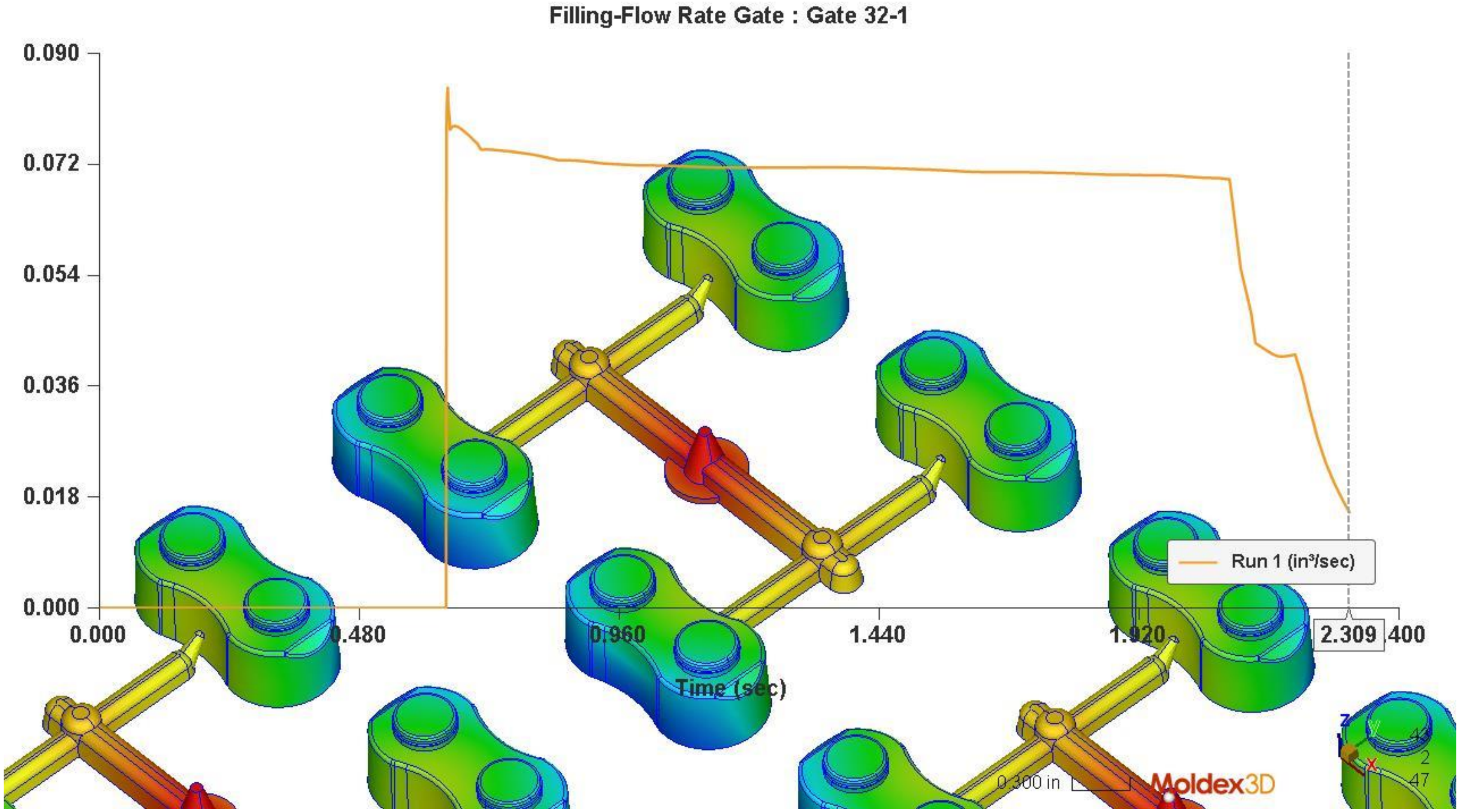
Moldex3D

Filling_XY_Flow Rate Gate - Gate 31-1



Max	Unit
0.073	in^3/sec

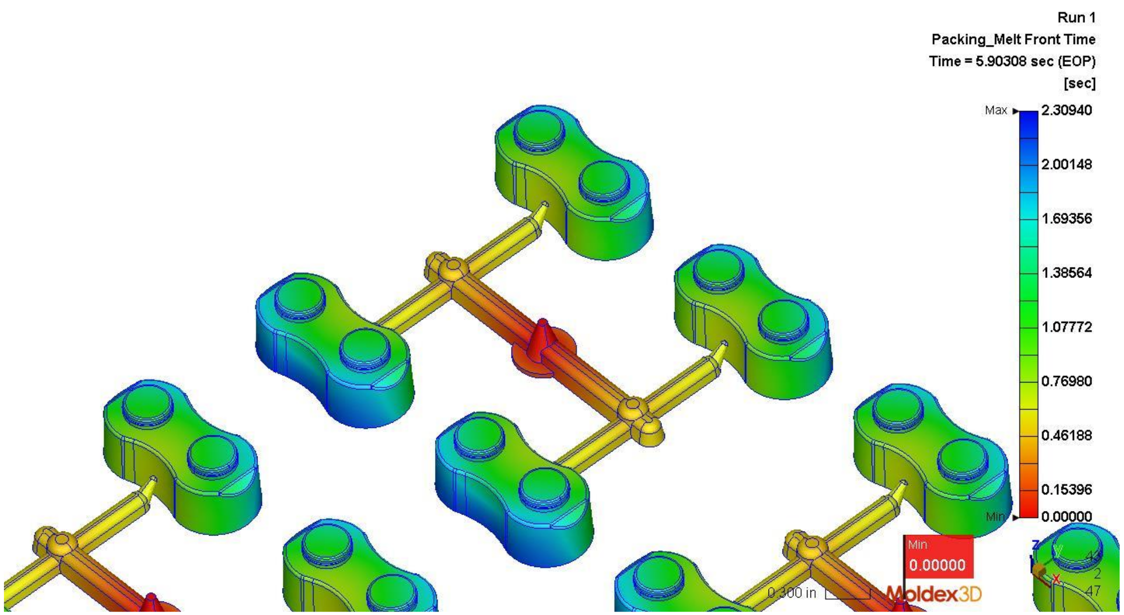
Filling_XY_Flow Rate Gate - Gate 32-1



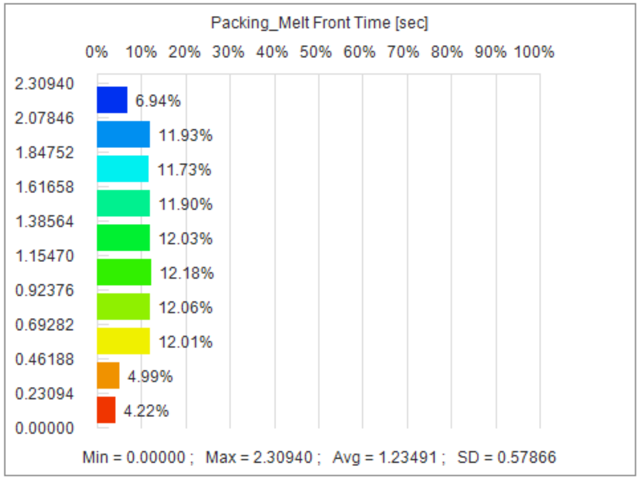
Max	Unit
0.084	in³/sec

Moldex3D

Packing_Melt Front Time



Histogram



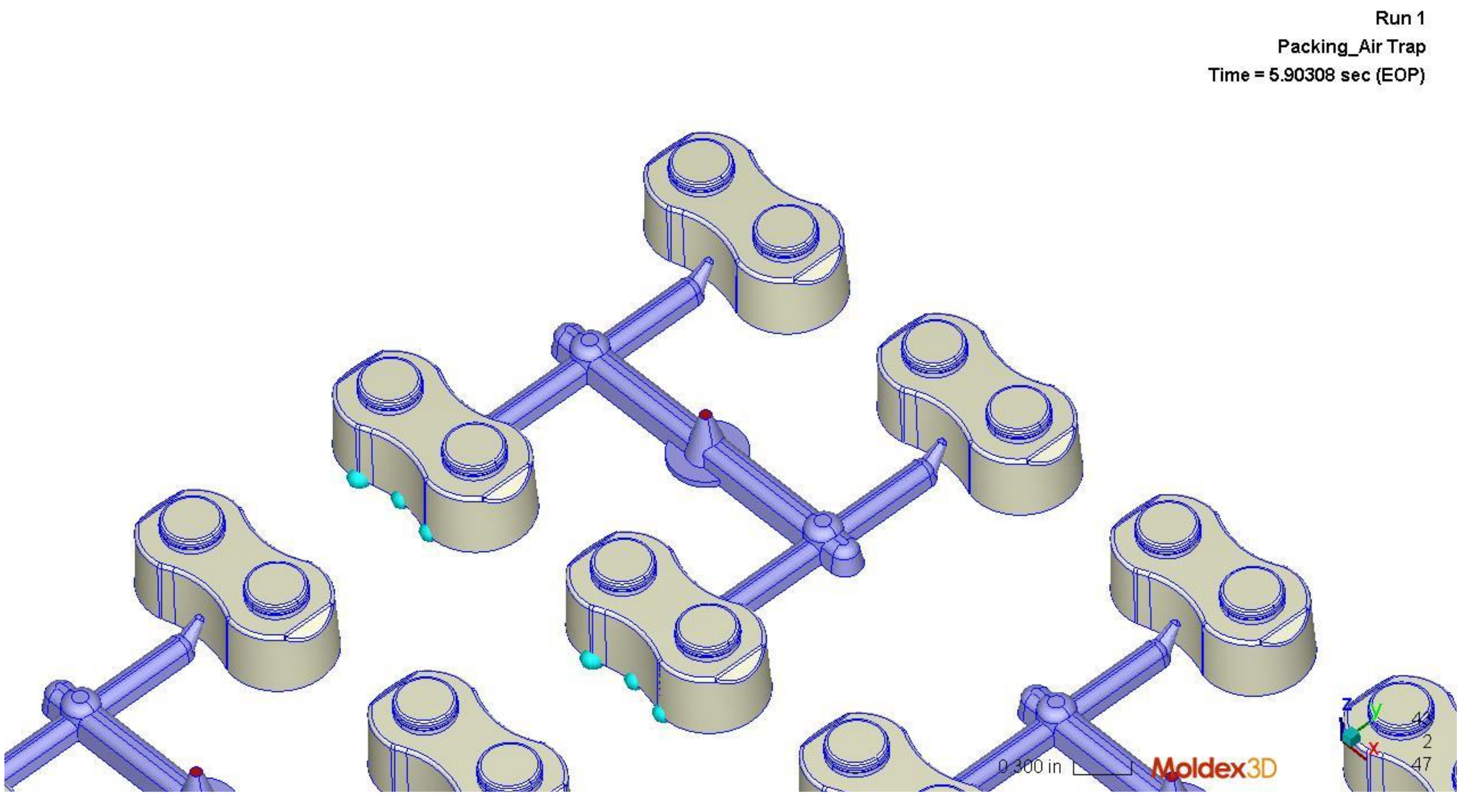
Max	Min
2.30940	0.00000

Avg	SD
1.23491	0.57866

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.

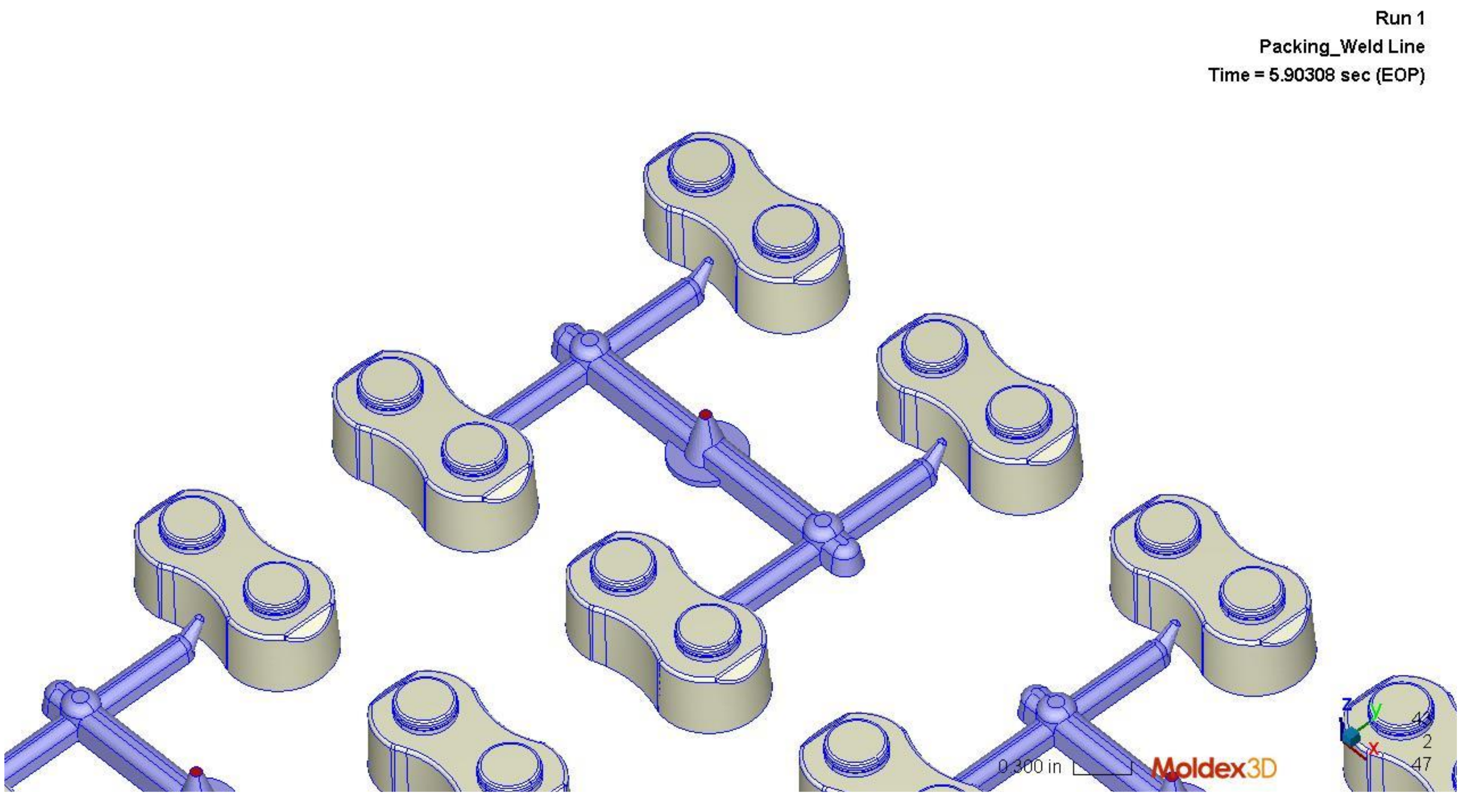
Packing_Air Trap



Air Trap

Moldex3D

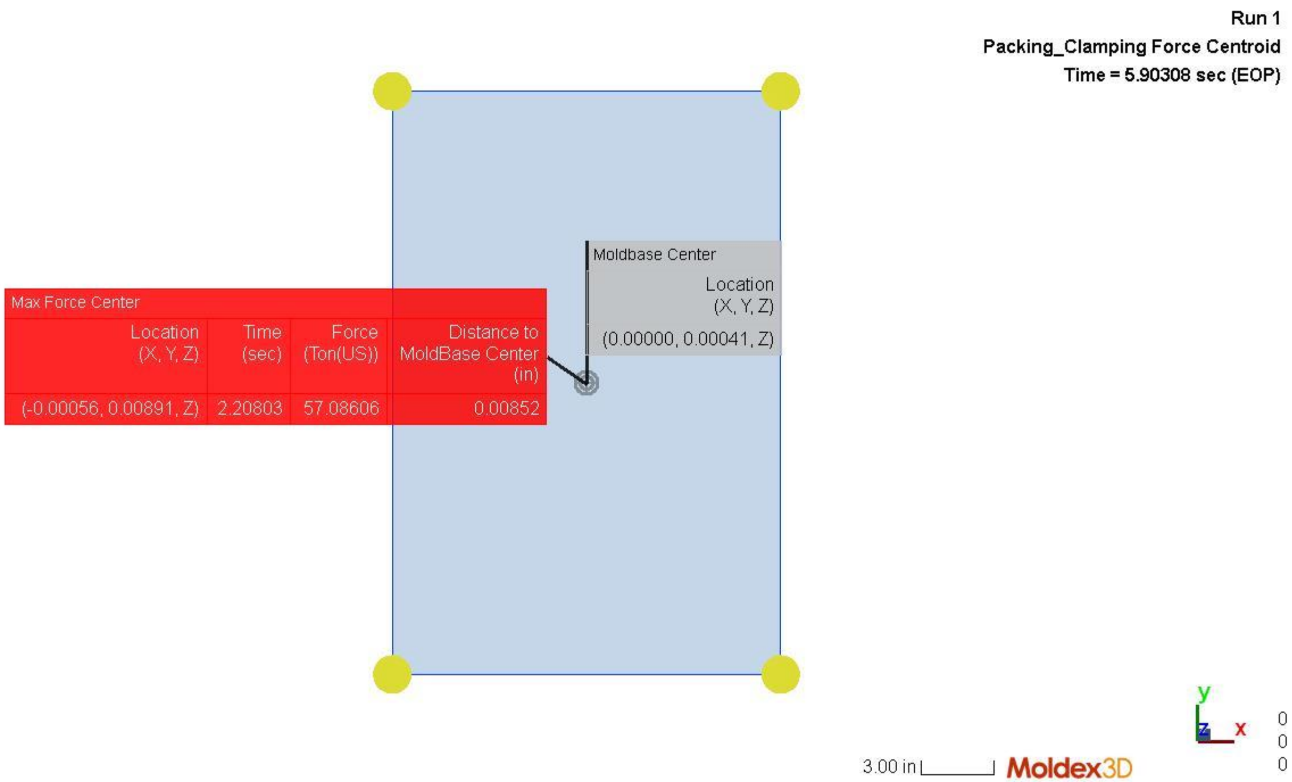
Packing_Weld Line



Weld Line

Moldex3D

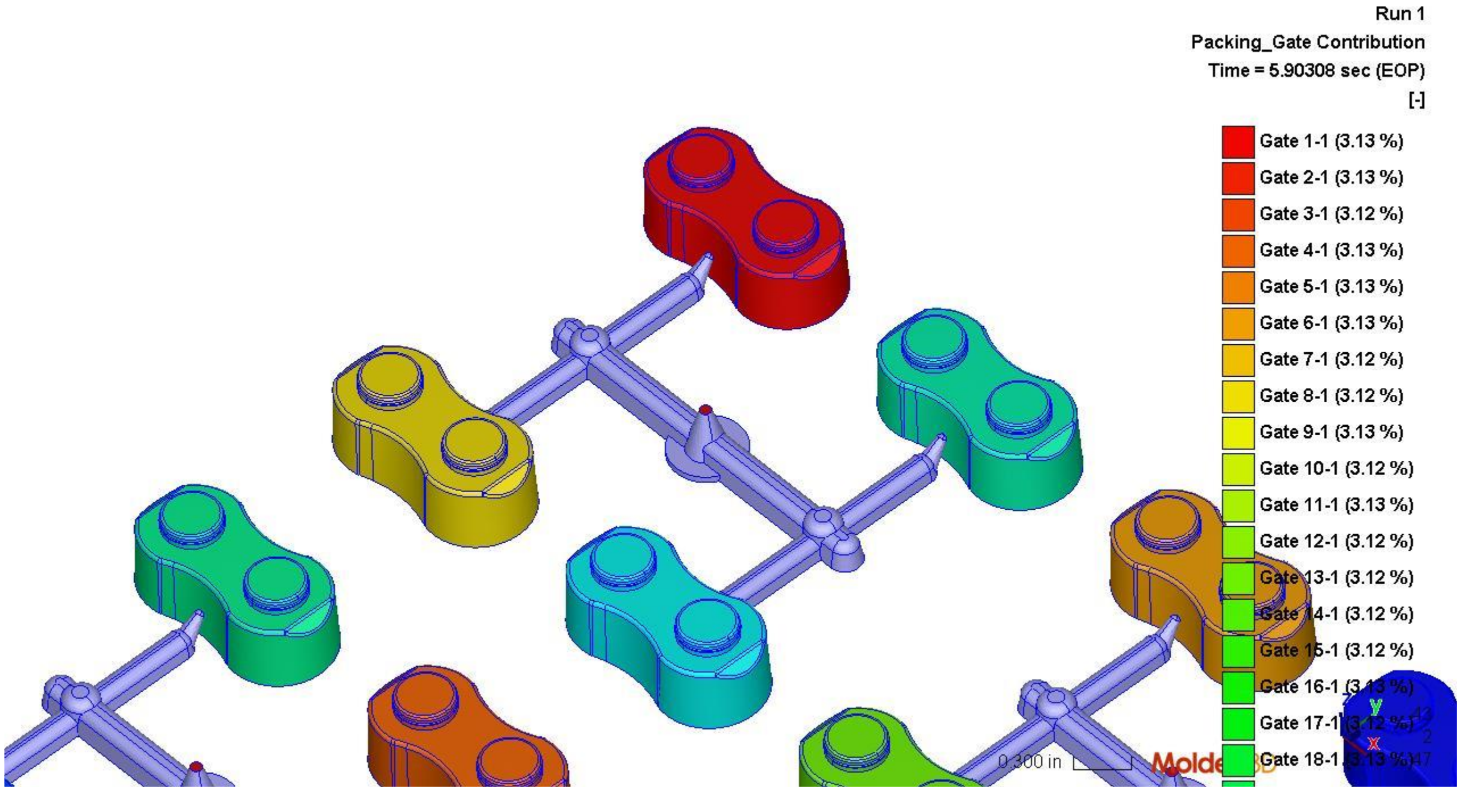
Packing_Clamping Force Centroid



Clamping Force Centroid result draws the centroid points of clamping force (Max) and moldbase. The more distance between two centroid points means more unbalanced force applied inside cavity, and may cause clamping issue or even damage to molding machine. To balance clamping force, it requires proper mold cavity arrangement.

Moldex3D

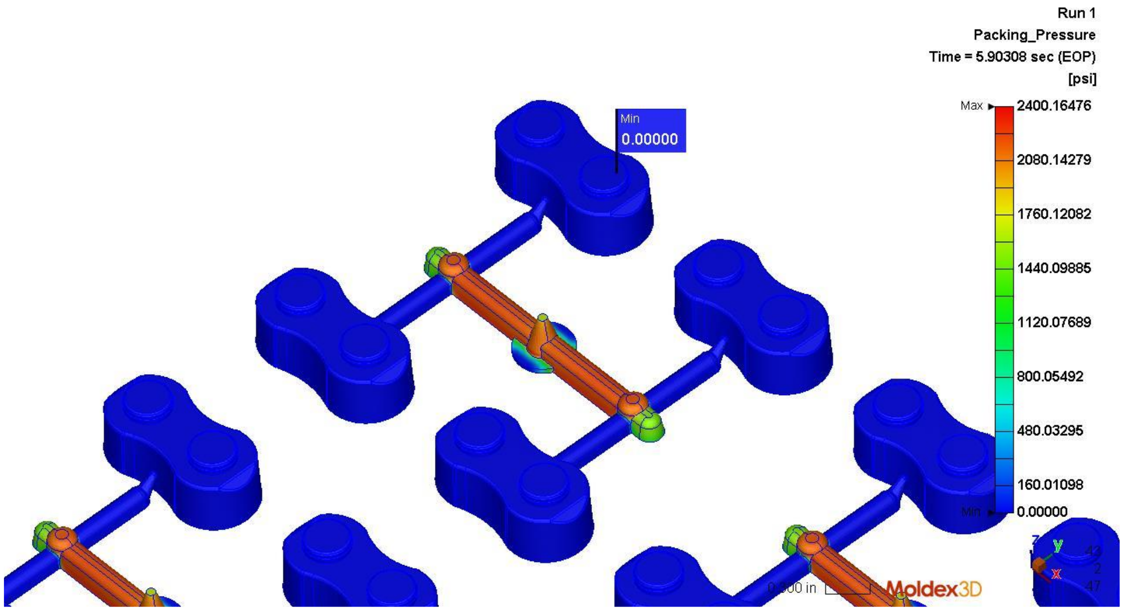
Packing_Gate Contribution



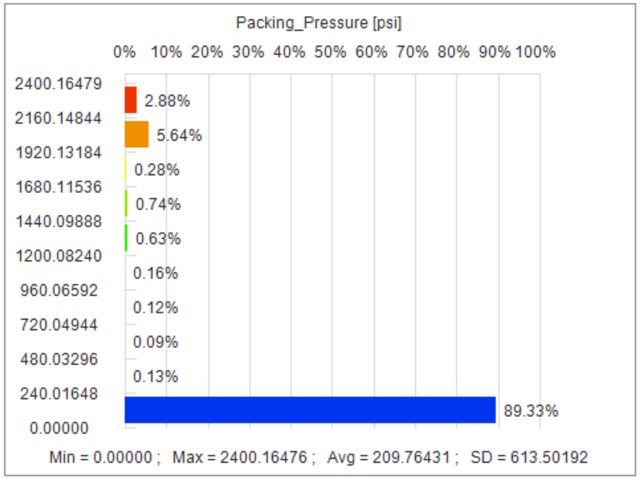
Gate Contribution

Moldex3D

Packing_Pressure



Histogram



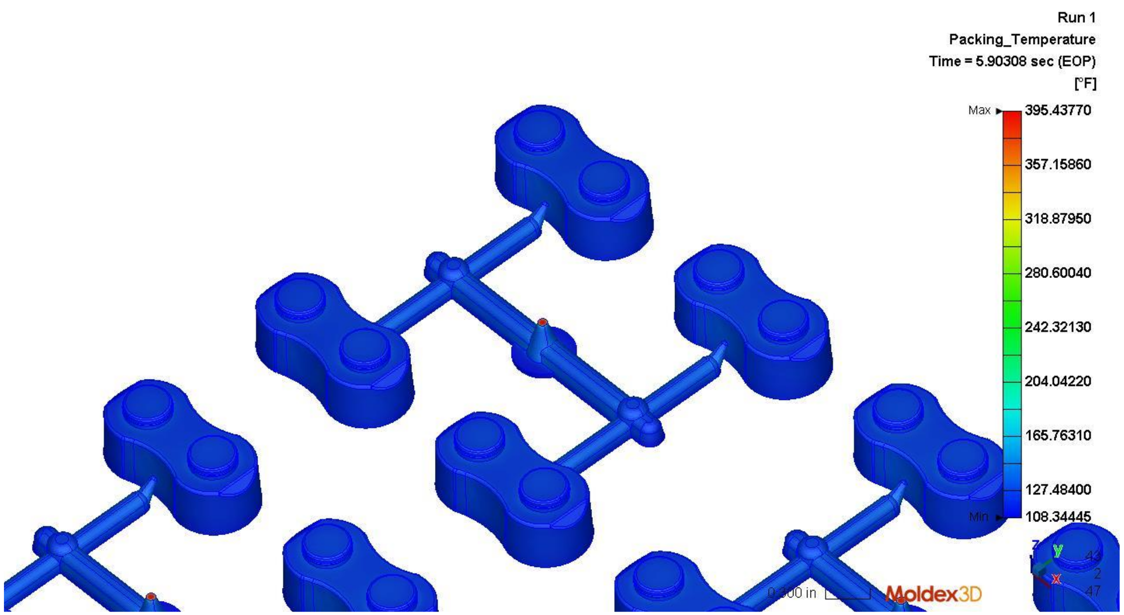
Max	Min
2400.16476	0.00000

Avg	SD
209.76431	613.50192

Pressure distribution of the cavity is shown in different colors at current instant. Based on the pressure drop and distribution, users can revise the part and mold design. From the pressure distribution one can:

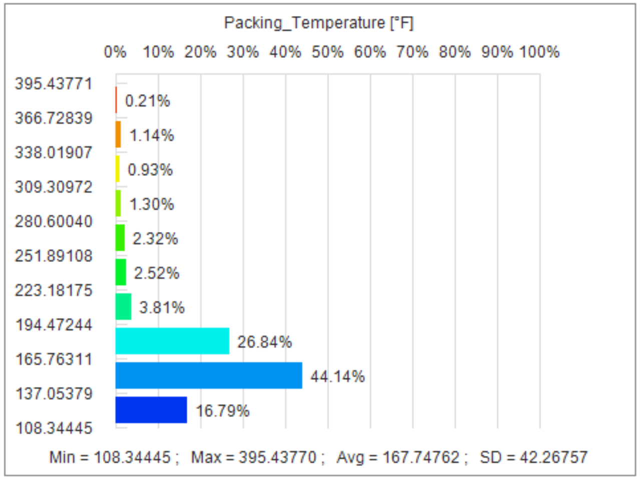
-Check the pressure transmission situation
-Check runner system pressure drop
-Check flow balance of the design
-Avoid overpacking and flashing of melt
-Examine the extent of packing/holding.

Packing_Temperature



Plastic melt temperature distribution at current instant. For 3D calculation, the temperature distribution expresses temperatures in all three dimensional for the fully cavity.

Histogram

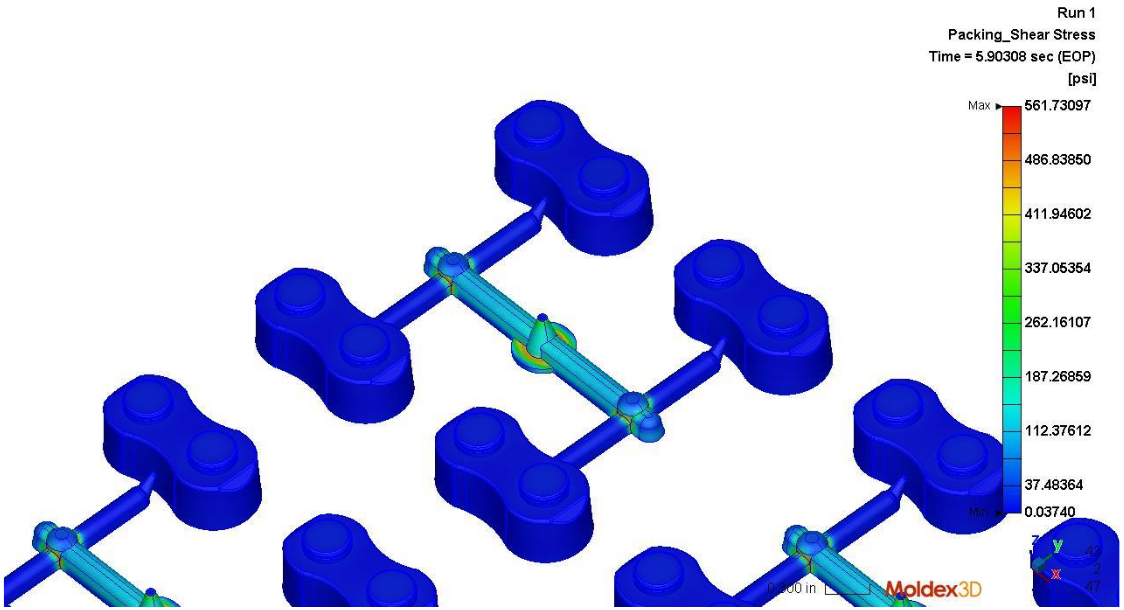


Max	Min
395.43770	108.34445

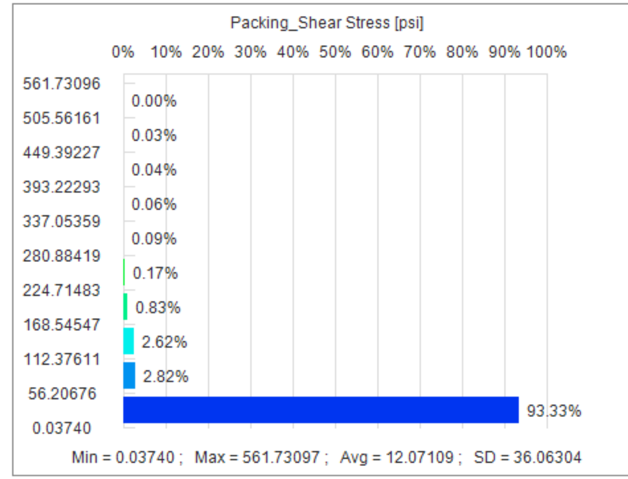
Avg	SD
167.74762	42.26757

Moldex3D

Packing_Shear Stress



Histogram



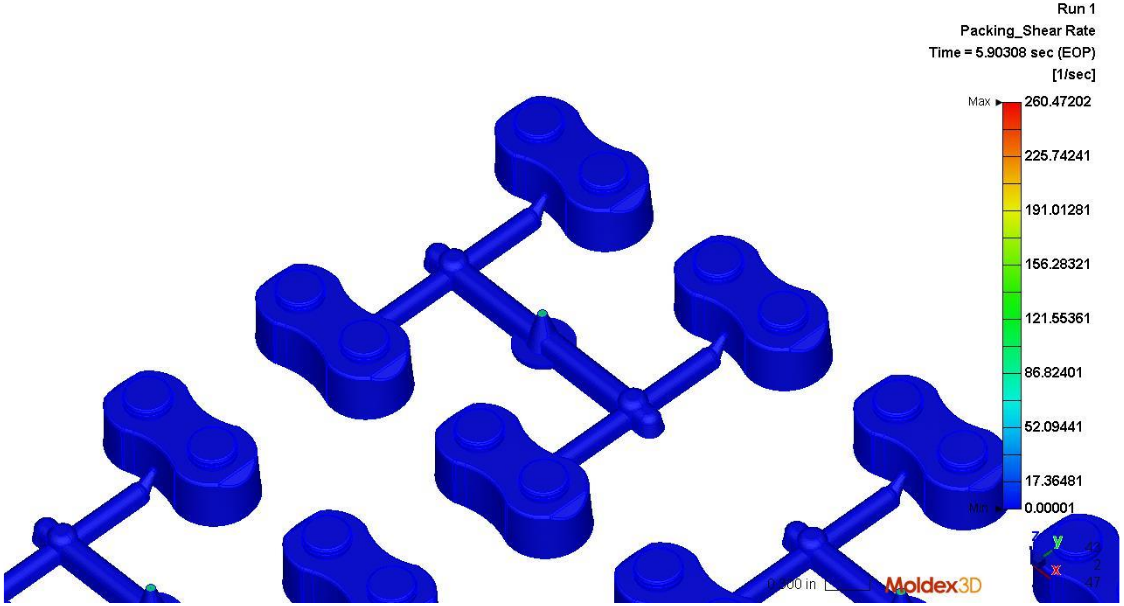
Max	Min
561.73097	0.03740

Avg	SD
12.07109	36.06304

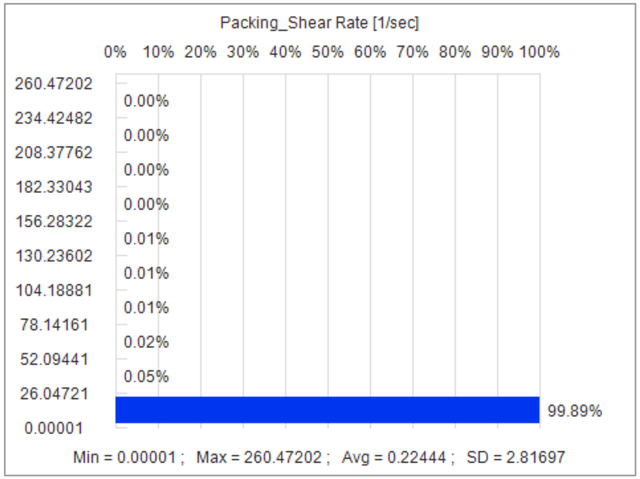
Shear stress at current instant is shown in different color according to different stress level. Shear stress is one of source of the molded-in residual stress in molded parts. If the shear stress is not distributed evenly, it will cause some dimensional problems. Too high the shear stress level will result in stress-induced problems in the molded part.

Moldex3D

Packing_Shear Rate



Histogram



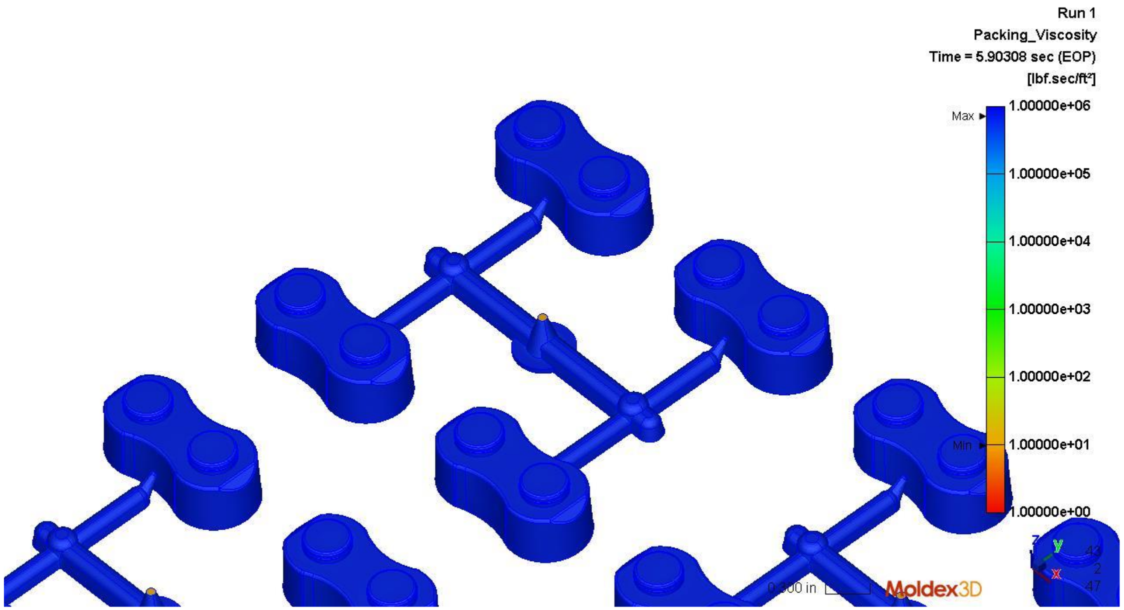
Max	Min
260.47202	0.00001

Avg	SD
0.22444	2.81697

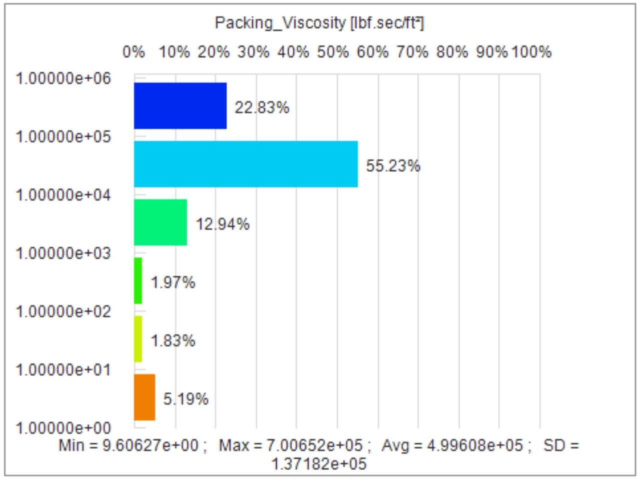
The distribution of shear rate of part cavity is shown in different colors at current instant. Shear rate is the rate of shear deformation of the material during the polymer processing. Shear rate distribution is related to the variation of velocity gradient and molecular orientation. High shear rate tends to drastically deform molecular chains even to break and then weaken the strength of product. Viscous heating due to high shear rate also should be noticed.

Moldex3D

Packing_Viscosity



Histogram



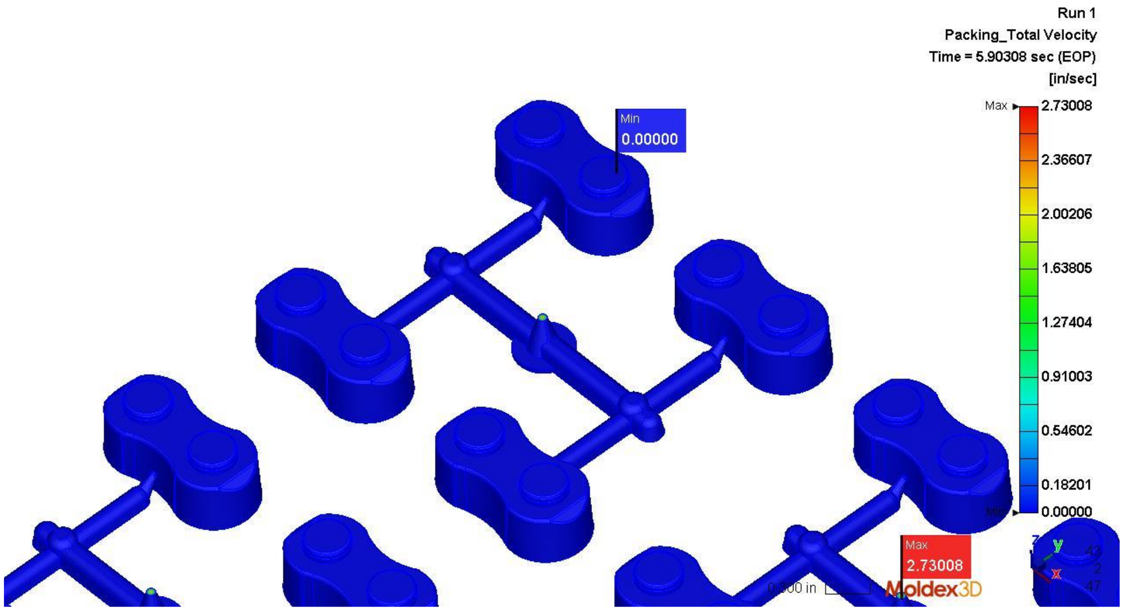
Max	Min
7.00652e+05	9.60627e+00

Avg	SD
4.99608e+05	1.37182e+05

Viscosity is an important property in fluids which can be considered as the resistance of flow. In polymers, both temperature and shear rate will influence the value of viscosity.
The viscosity is constant at low shear rate, and then the viscosity will decrease with increasing shear rate.
Also, the viscosity will decrease as temperature increases.

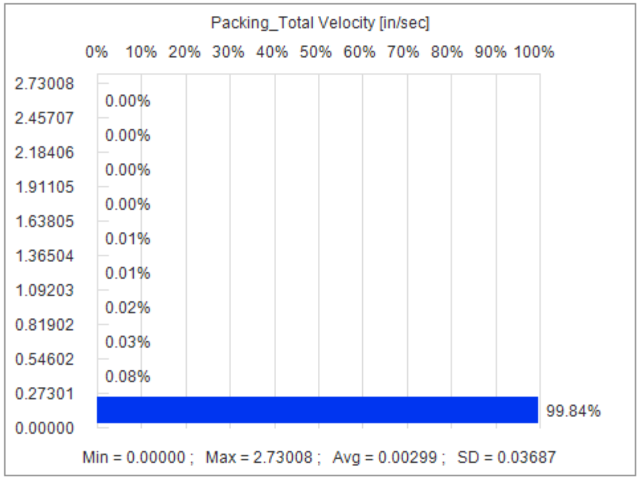
Moldex3D

Packing_Total Velocity



Total velocity is the length (norm) of the velocity vector of plastic melt at current instant. This data can give you the idea about how plastic melt flow at current instant.

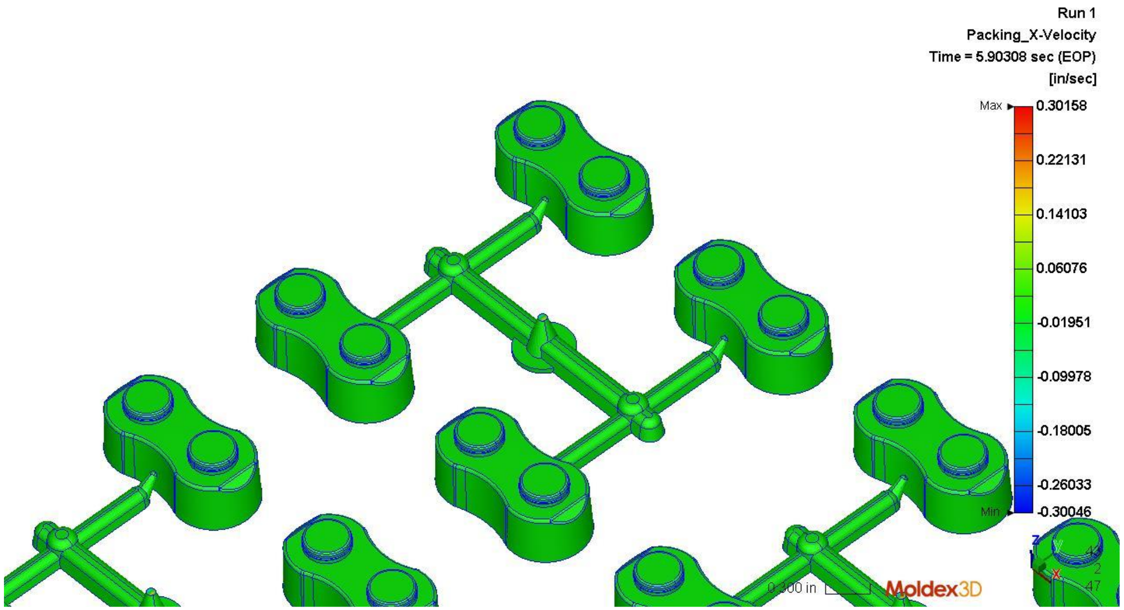
Histogram



Max	Min
2.73008	0.00000

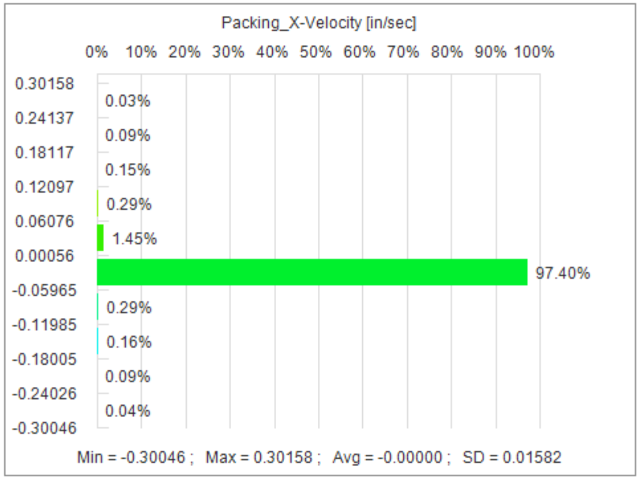
Avg	SD
0.00299	0.03687

Packing_X-Velocity



X-Component of the flow velocity of plastic melt at current instant.

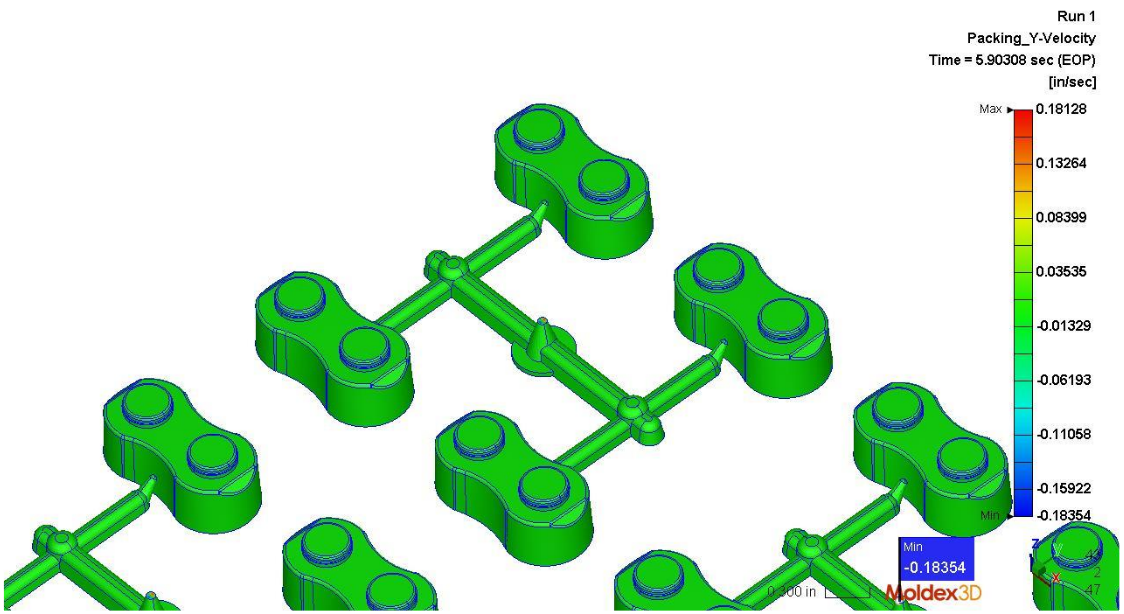
Histogram



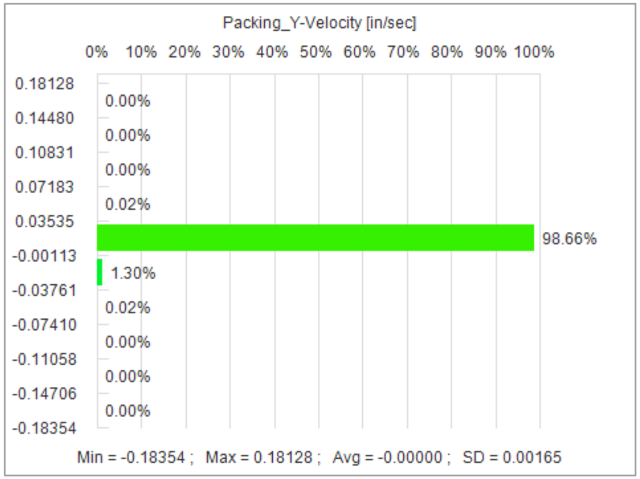
Max	Min
0.30158	-0.30046

Avg	SD
-0.00000	0.01582

Packing_Y-Velocity



Histogram

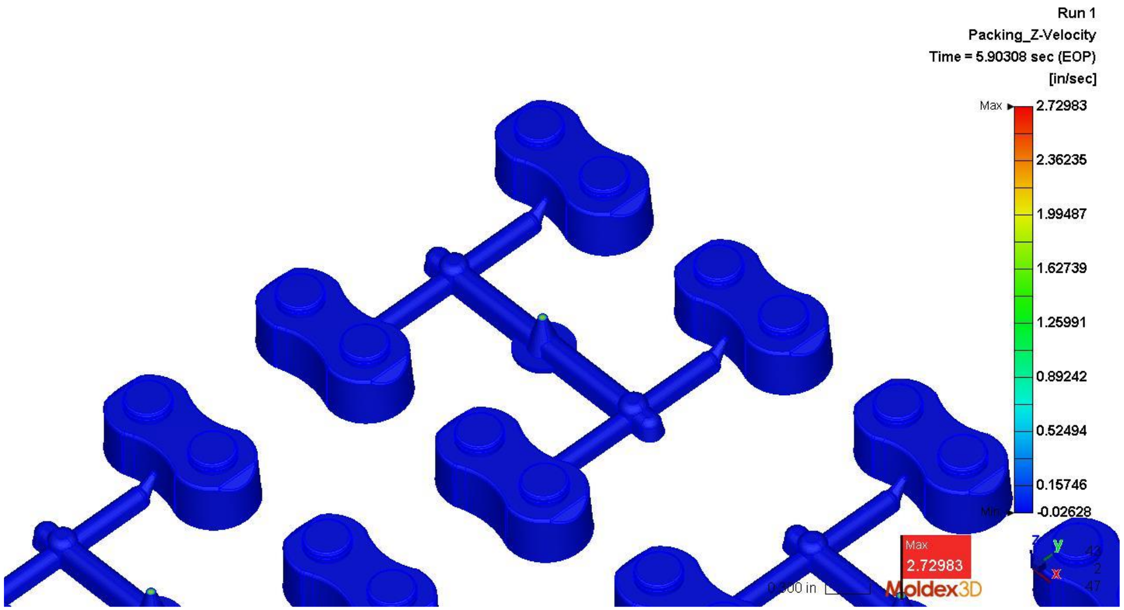


Max	Min
0.18128	-0.18354

Avg	SD
-0.00000	0.00165

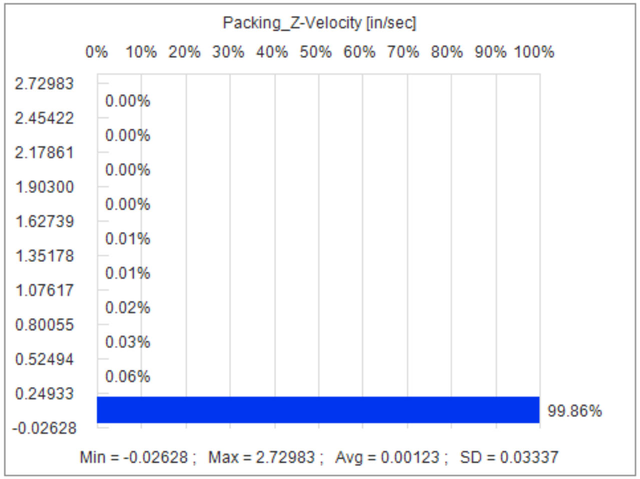
Y-Component of the flow velocity of plastic melt at current instant.

Packing_Z-Velocity



Z-Component of the flow velocity of plastic melt at current instant.

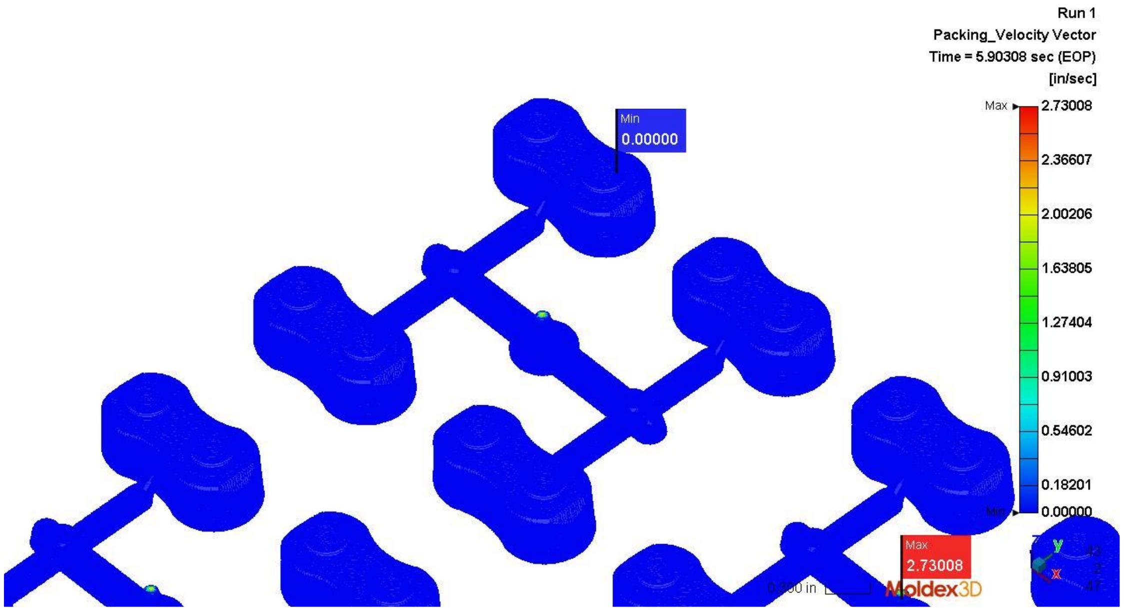
Histogram



Max	Min
2.72983	-0.02628

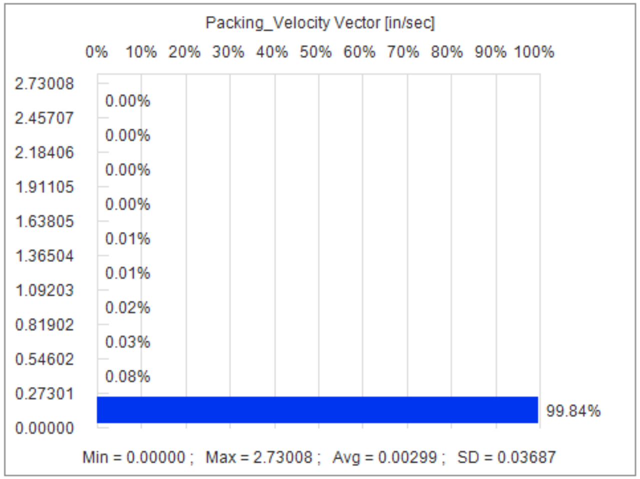
Avg	SD
0.00123	0.03337

Packing_Velocity Vector



Velocity vector is the vector plot of the velocity vector at current instant.

Histogram

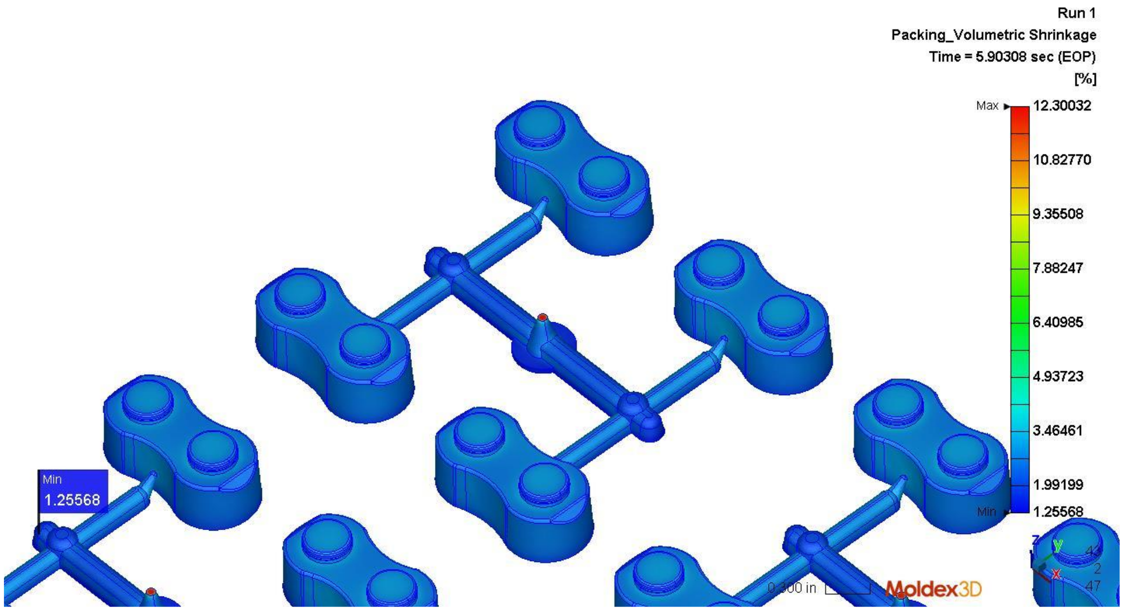


Max	Min
2.73008	0.00000

Avg	SD
0.00299	0.03687

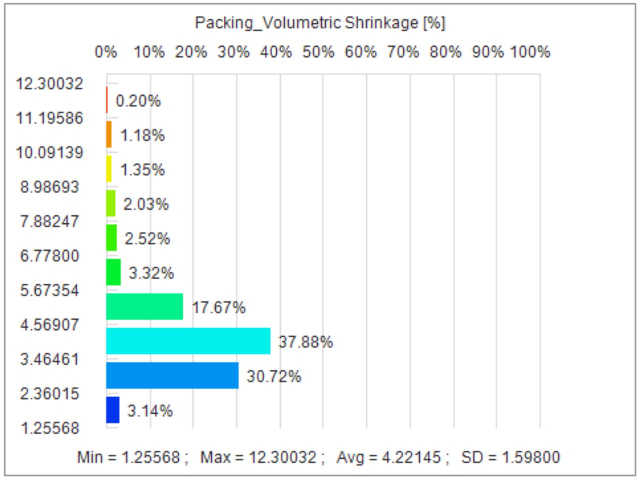
Moldex3D

Packing_Volumetric Shrinkage



Volumetric shrinkage shows the percentage of part volume change due to PVT change as the part is cooled from high temperature, high pressure conditions at current instant to room temperature, ambient pressure conditions. Positive value represents volume shrinkage while negative value represents volume expansion due to over-pack. Non-uniform volumetric shrinkage will lead to warpage and distortion of demolded parts.

Histogram

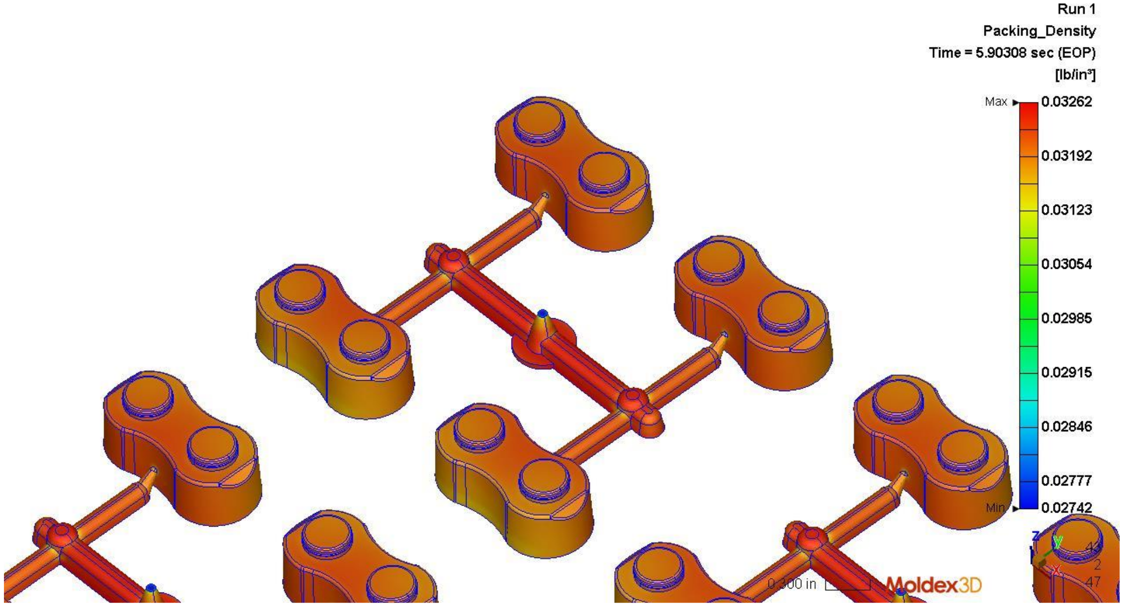


Max	Min
12.30032	1.25568

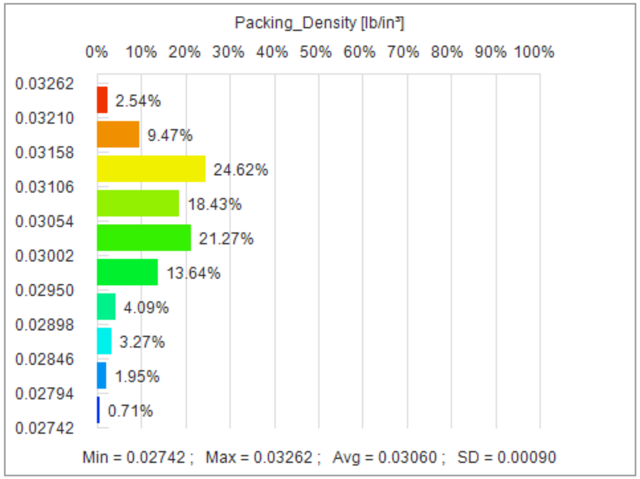
Avg	SD
4.22145	1.59800

Moldex3D

Packing_Density



Histogram



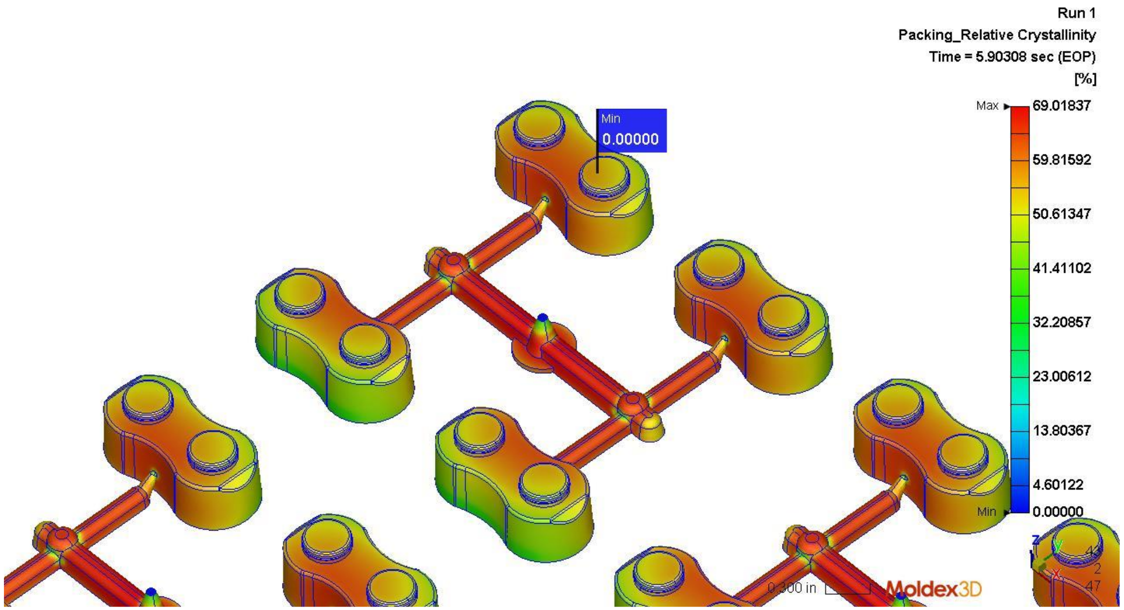
Max	Min
0.03262	0.02742

Avg	SD
0.03060	0.00090

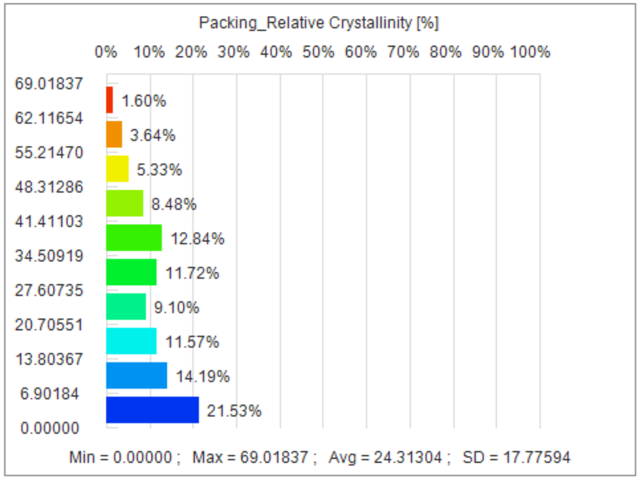
This shows the density distribution at current instant. In general, frozen region will show a greater value of density and molten region will have a lower density value. Non-uniformity in density is a source of part warpage.

Moldex3D

Packing_Relative Crystallinity



Histogram

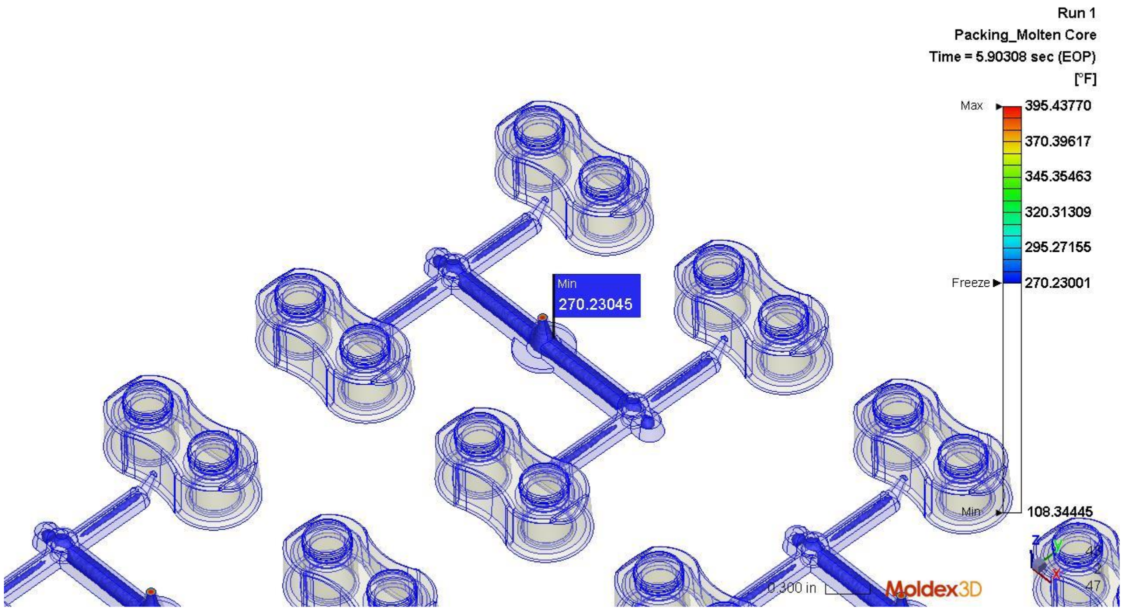


Max	Min
69.01837	0.00000

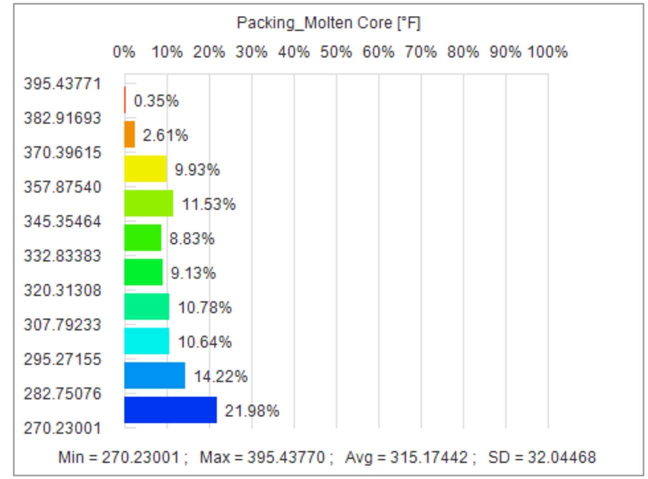
Avg	SD
24.31304	17.77594

Show three dimensional relative crystallinity distribution with the cavity at current instant.

Packing_Molten Core



Histogram



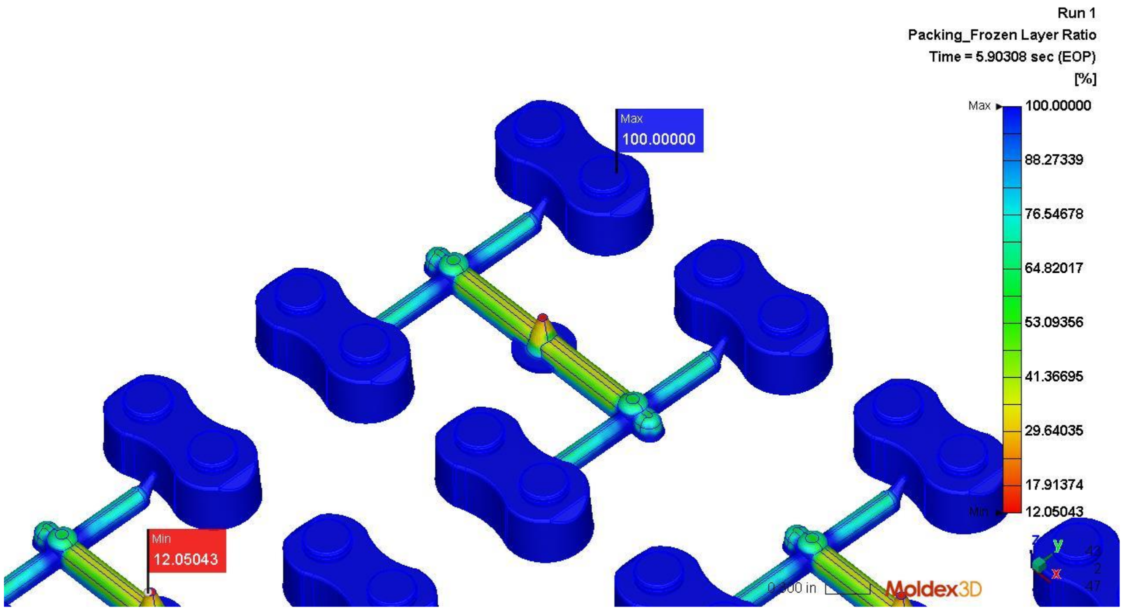
Max	Min
395.43770	270.23001

Avg	SD
315.17442	32.04468

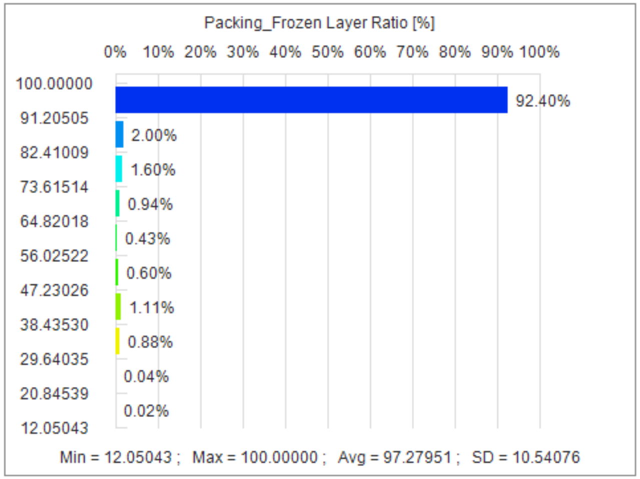
Molten Core result shows the temperature distribution specifically inside the molten plastic, so in other words, the enclosed region is the molding plastic that have not solidified. This 3D isosurface display can be used to check melt freeze condition such around the gate area, and thus to better evaluate packing pressure setting, gating design, etc..Note: the freeze temperature applied here is defined in the selected material.

Moldex3D

Packing_Frozen Layer Ratio



Histogram



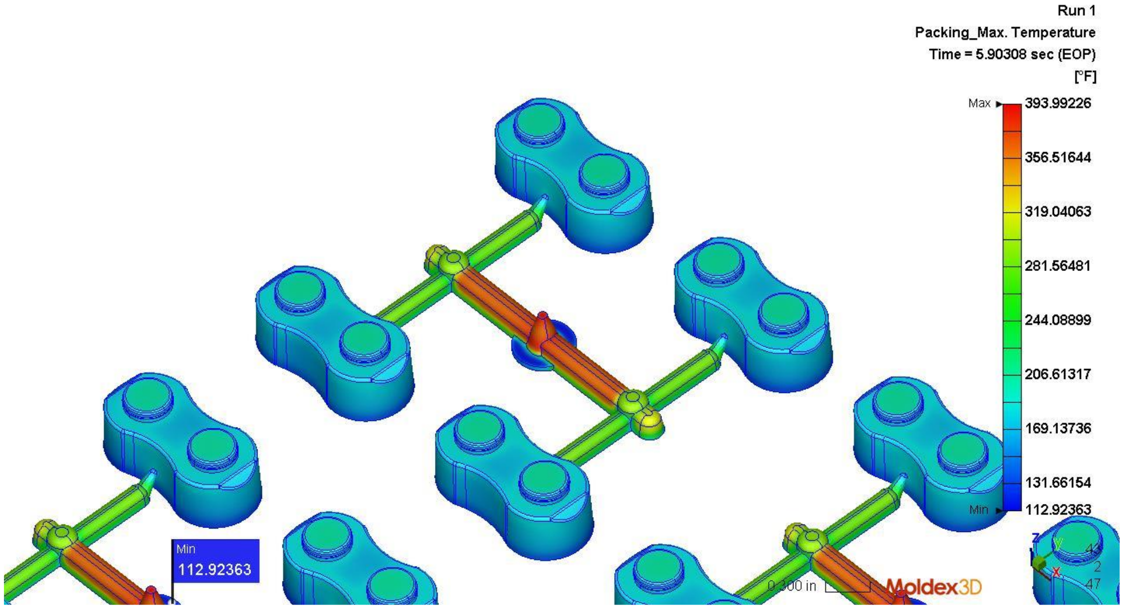
Max	Min
100.00000	12.05043

Avg	SD
97.27951	10.54076

Solidification caused by cooling results in the forming of frozen layer near the cavity surface. With the increasing of time, the frozen ratio increases. The increase of frozen ratio not only reduces the cross-section along the flow path, but also increases the flow resistance and sprue pressure. Furthermore, the residual stress and flow-induced orientation will be affected.

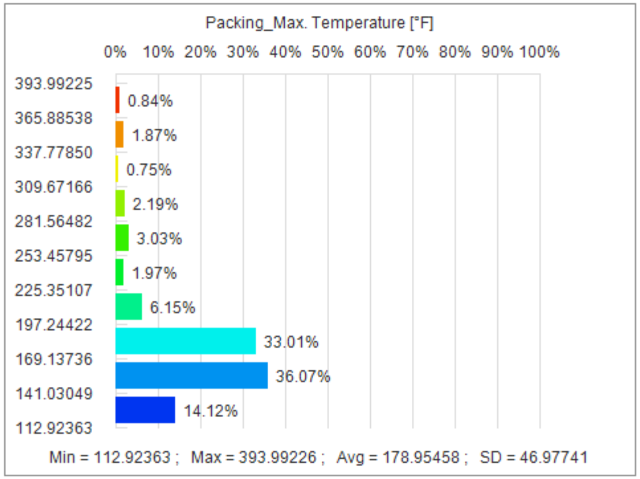
Moldex3D

Packing_Max. Temperature



Shows the maximum temperature in the thickness direction of the part.

Histogram

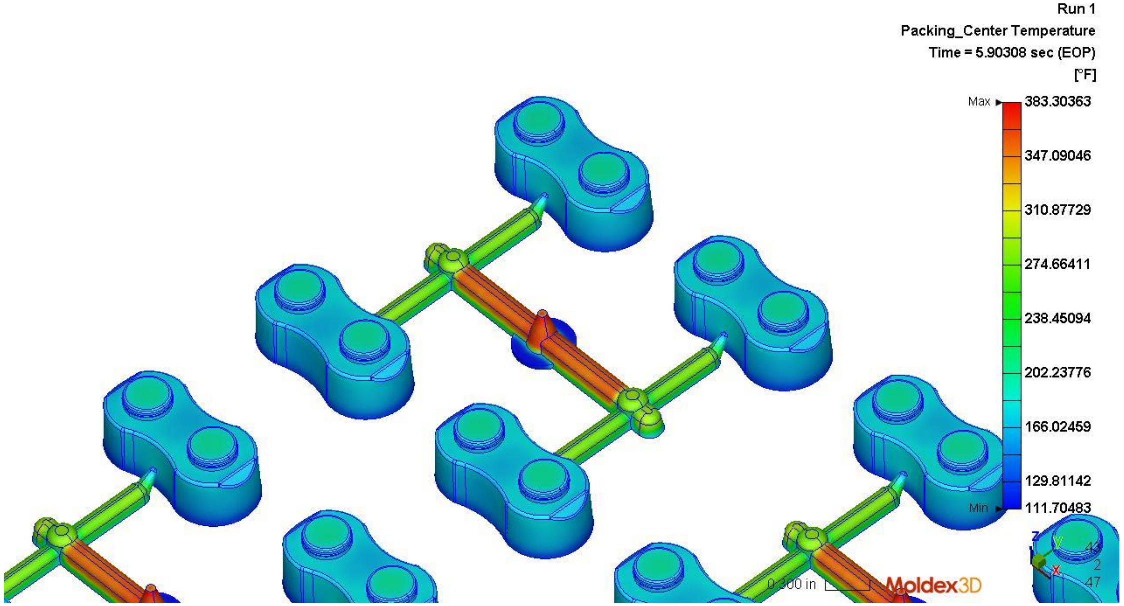


Max	Min
393.99226	112.92363

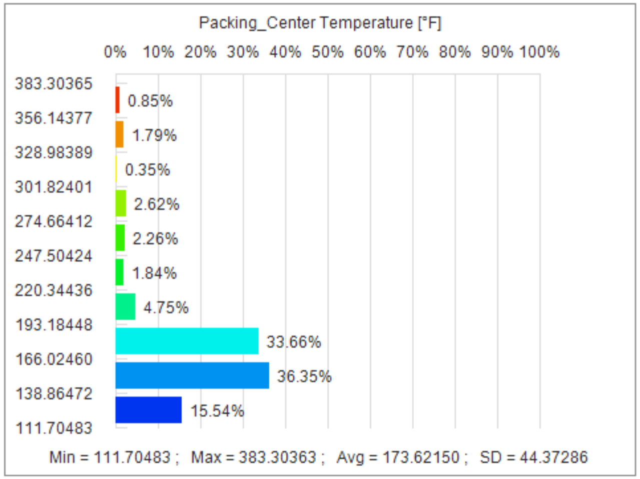
Avg	SD
178.95458	46.97741

Moldex3D

Packing_Center Temperature



Histogram

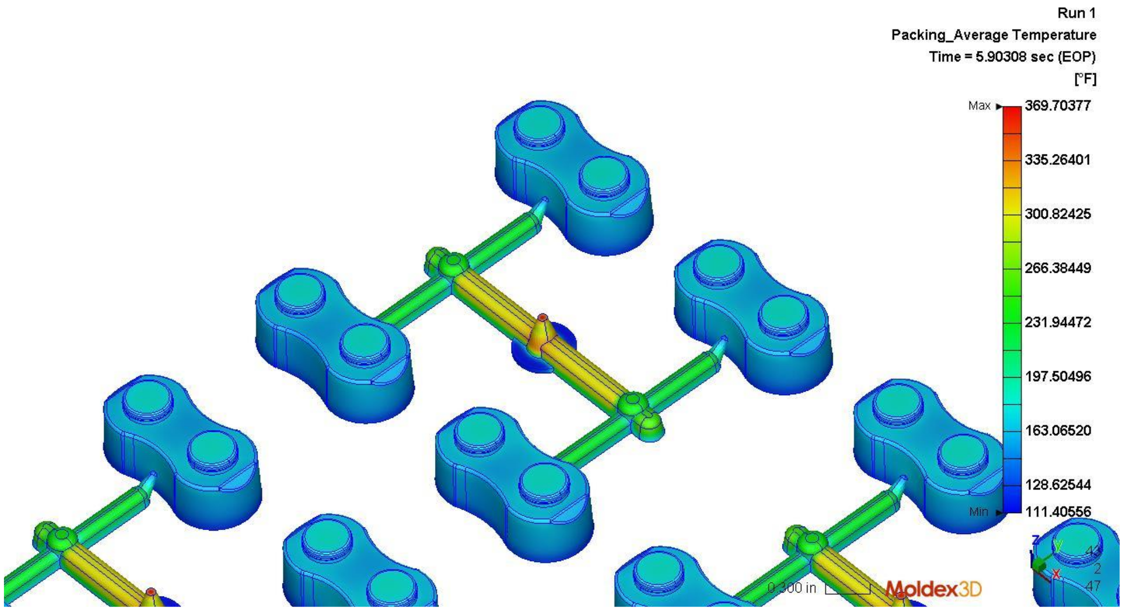


Max	Min
383.30363	111.70483

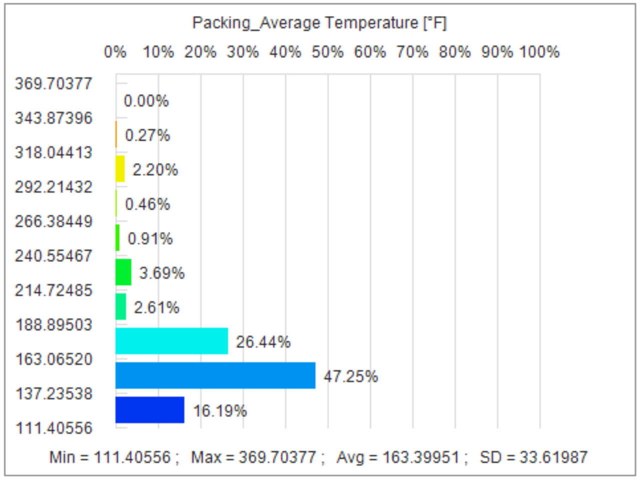
Avg	SD
173.62150	44.37286

Center temperature is the melt temperature of the middle layer (part line) in the thickness direction at current instant. Center temperature is an indicator of thermal energy supply of the fresh hot melt. In general, the center temperature is an indicator of incomplete filling (short shot). If the center temperature is too low, flow hesitation happens and there will be a short shot problem.

Packing_Average Temperature



Histogram



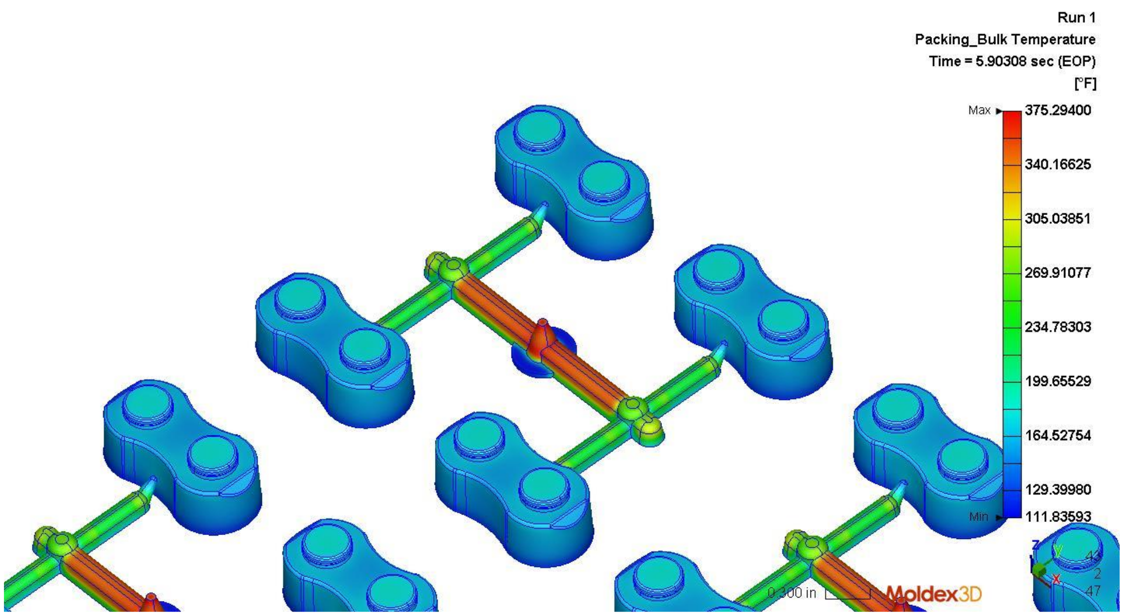
Max	Min
369.70377	111.40556

Avg	SD
163.39951	33.61987

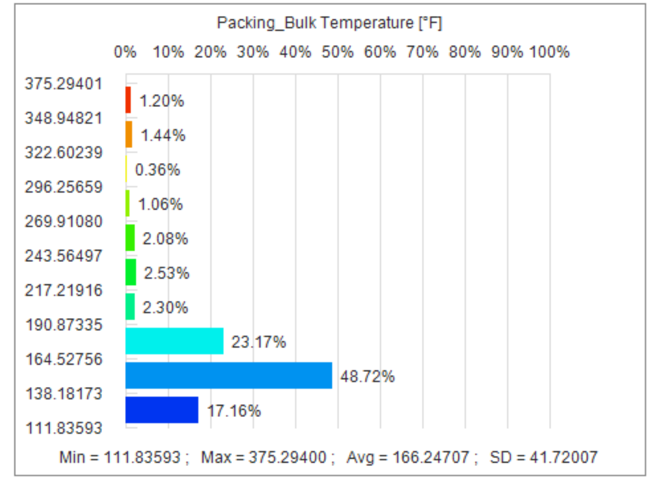
Average temperature is the averaged temperature across the part thickness at current instant.
It considers the effect of mold cooling and viscous heating of melt.
Therefore, average temperature is representative for the part temperature.
This data can be used to check the combined effect of viscous heating of polymer melt and mold cooling.
One should examine if there is any hot spot that will cause burning problem and the possibility of short shot due to flow hesitation and excess mold cooling.

Moldex3D

Packing_Bulk Temperature



Histogram

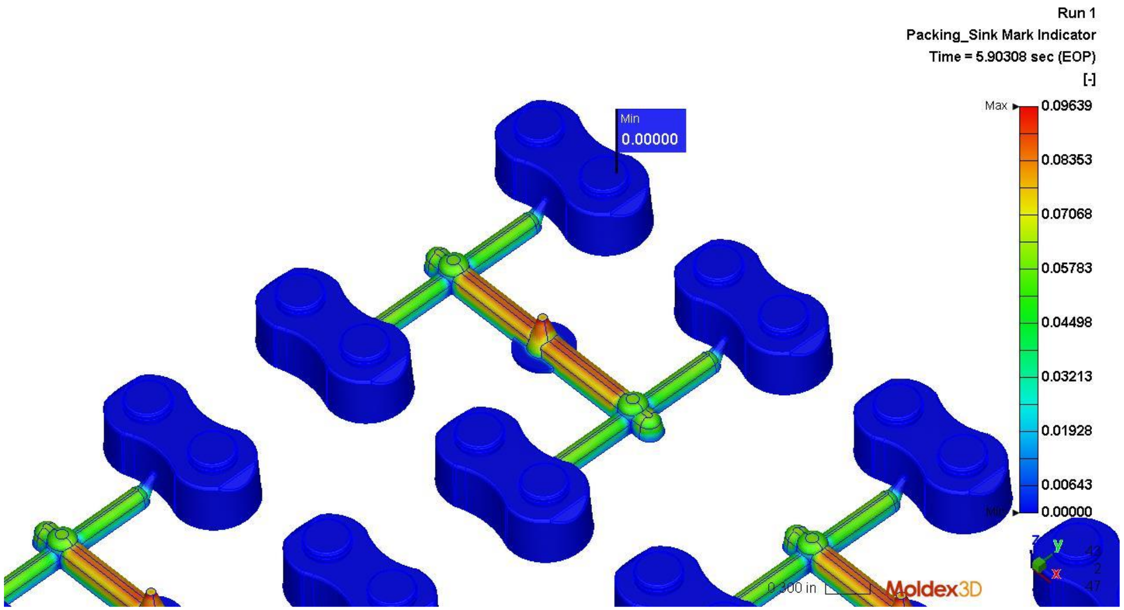


Max	Min
375.29400	111.83593

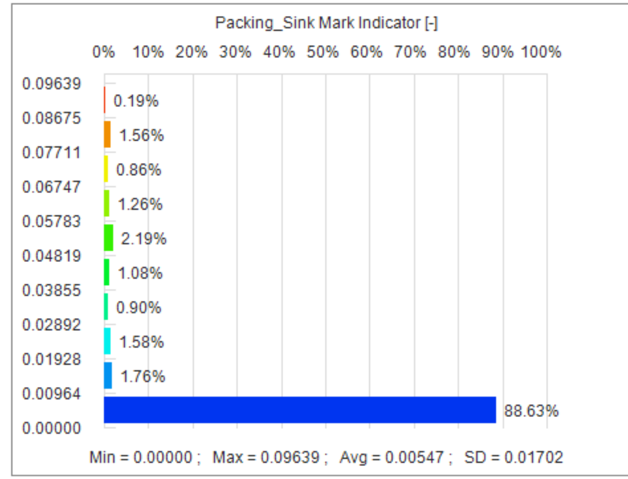
Avg	SD
166.24707	41.72007

Bulk temperature is a velocity-weighted averaged temperature of plastic melt across the thickness at current instant. The contribution 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 hesitation area and viscous heating area. Normally, bulk temperature distribution can reflect the trends or paths of filling flow.

Packing_Sink Mark Indicator



Histogram

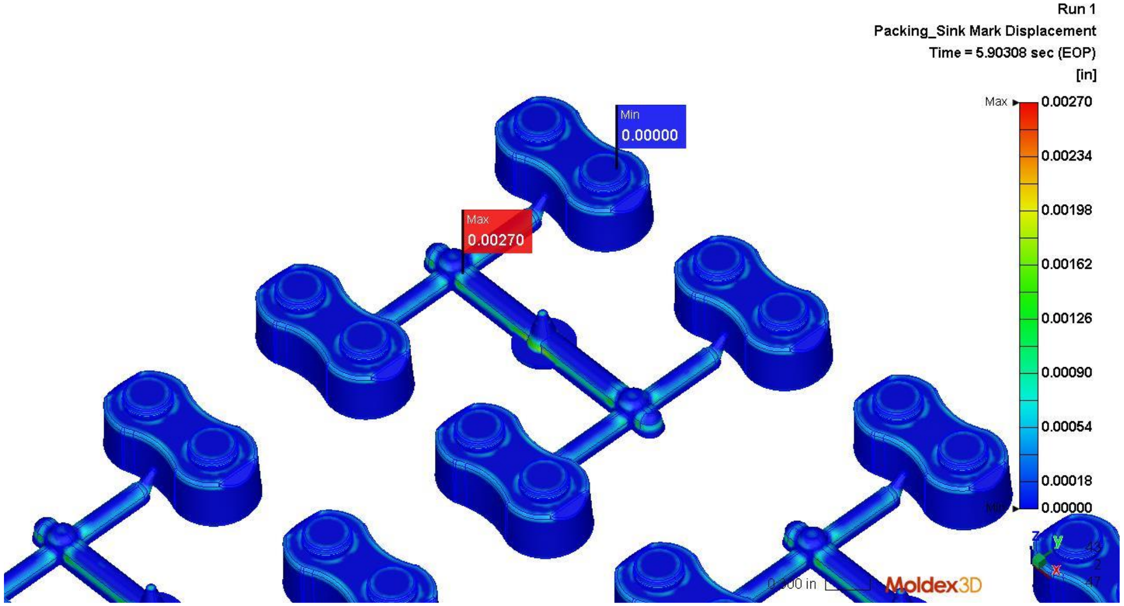


Max	Min
0.09639	0.00000

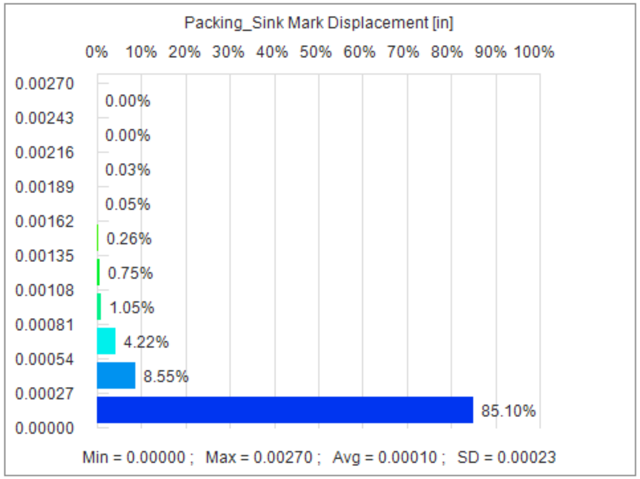
Avg	SD
0.00547	0.01702

Sink Mark Indicator is also an index to evaluate the packing effect.
If the indicator is positive, it means the packing is not enough, which also may lead to sink mark.
If the indicator is negative, it means over packing.
A well packing keeps the indicator close to zero.

Packing_Sink Mark Displacement



Histogram



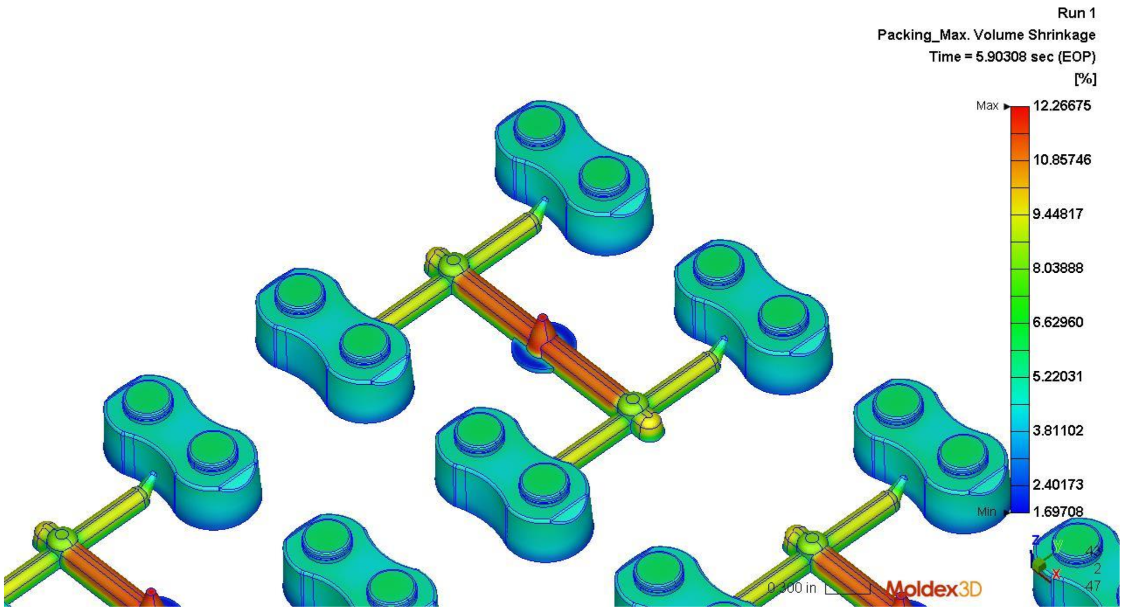
Max	Min
0.00270	0.00000

Avg	SD
0.00010	0.00023

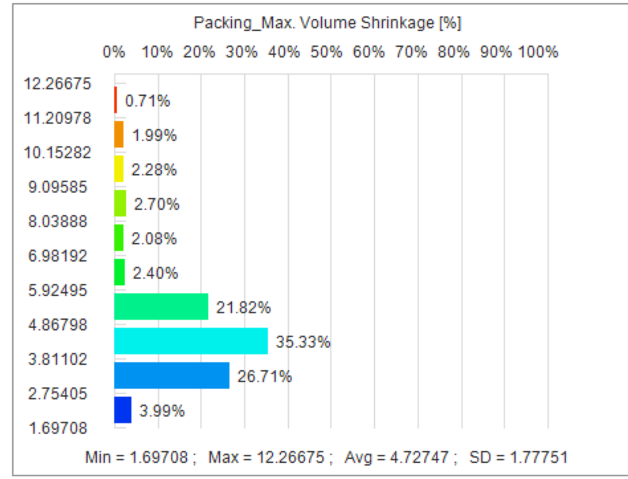
Show the sink mark displacement at possible region. Higher value means serious sink mark defect.

Moldex3D

Packing_Max. Volume Shrinkage



Histogram

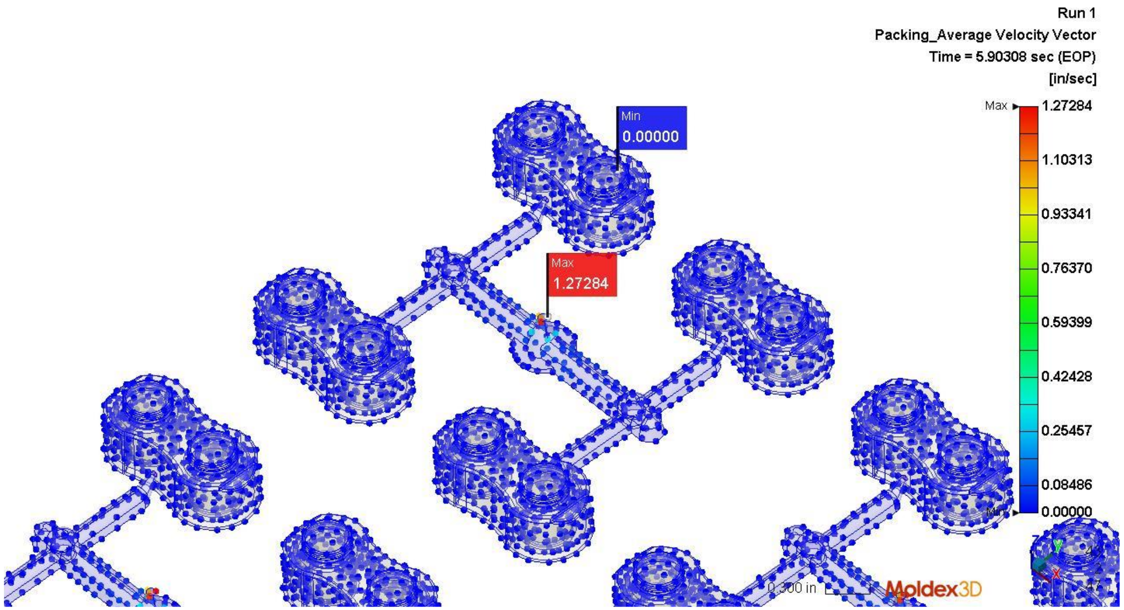


Max	Min
12.26675	1.69708

Avg	SD
4.72747	1.77751

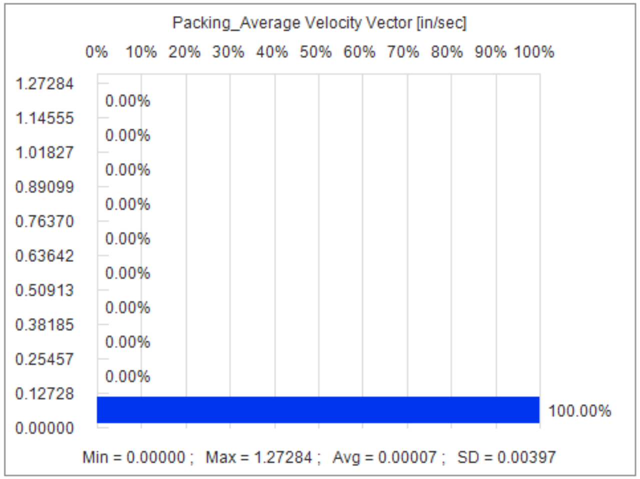
Shows the maximum volume shrinkage across the part thickness at current instant. High positive value represents big volume shrinkage, which may lead to sink mark or void.

Packing_Average Velocity Vector



Show the averaged velocity vector across the part thickness at current instant.

Histogram

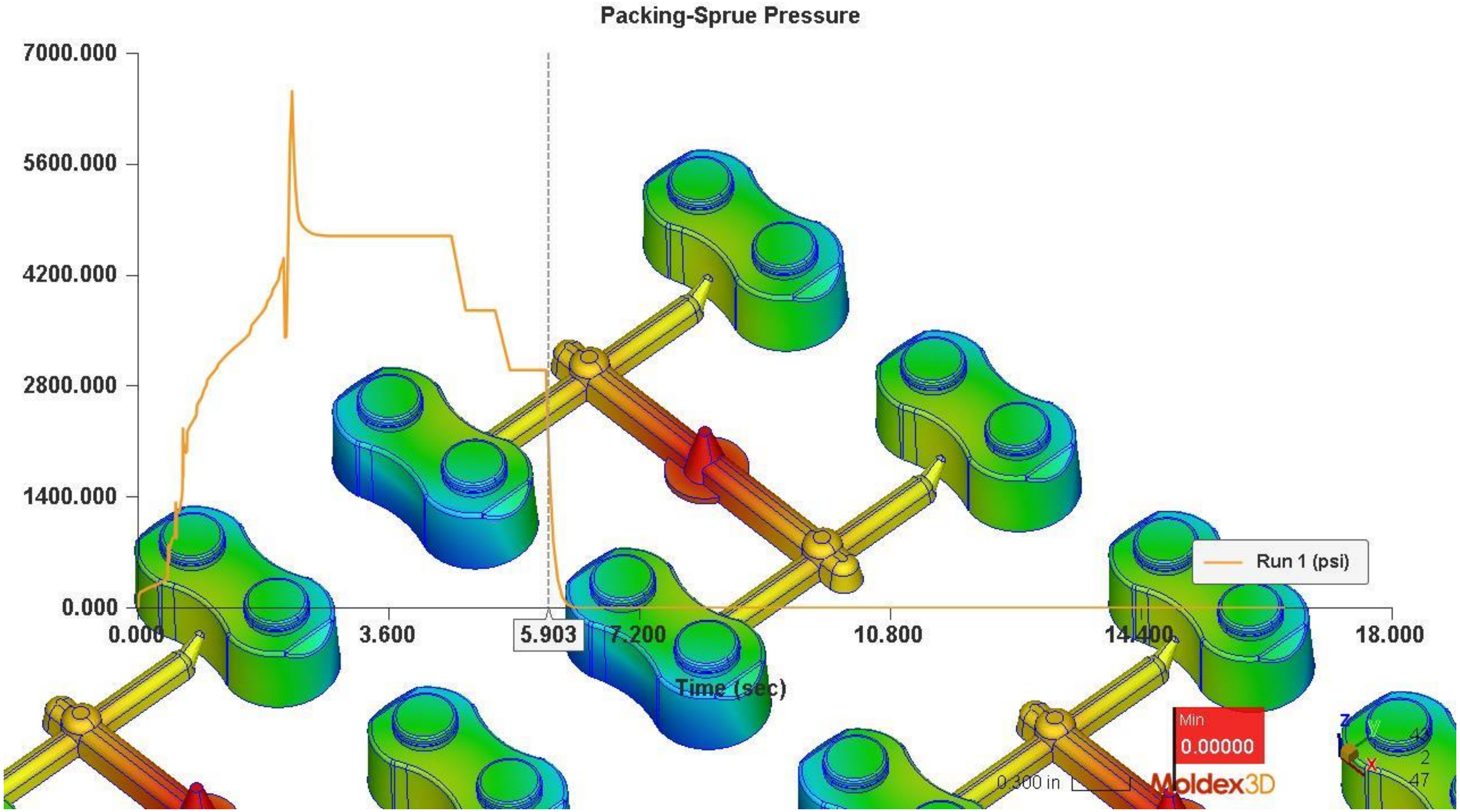


Max	Min
1.27284	0.00000

Avg	SD
0.00007	0.00397

Moldex3D

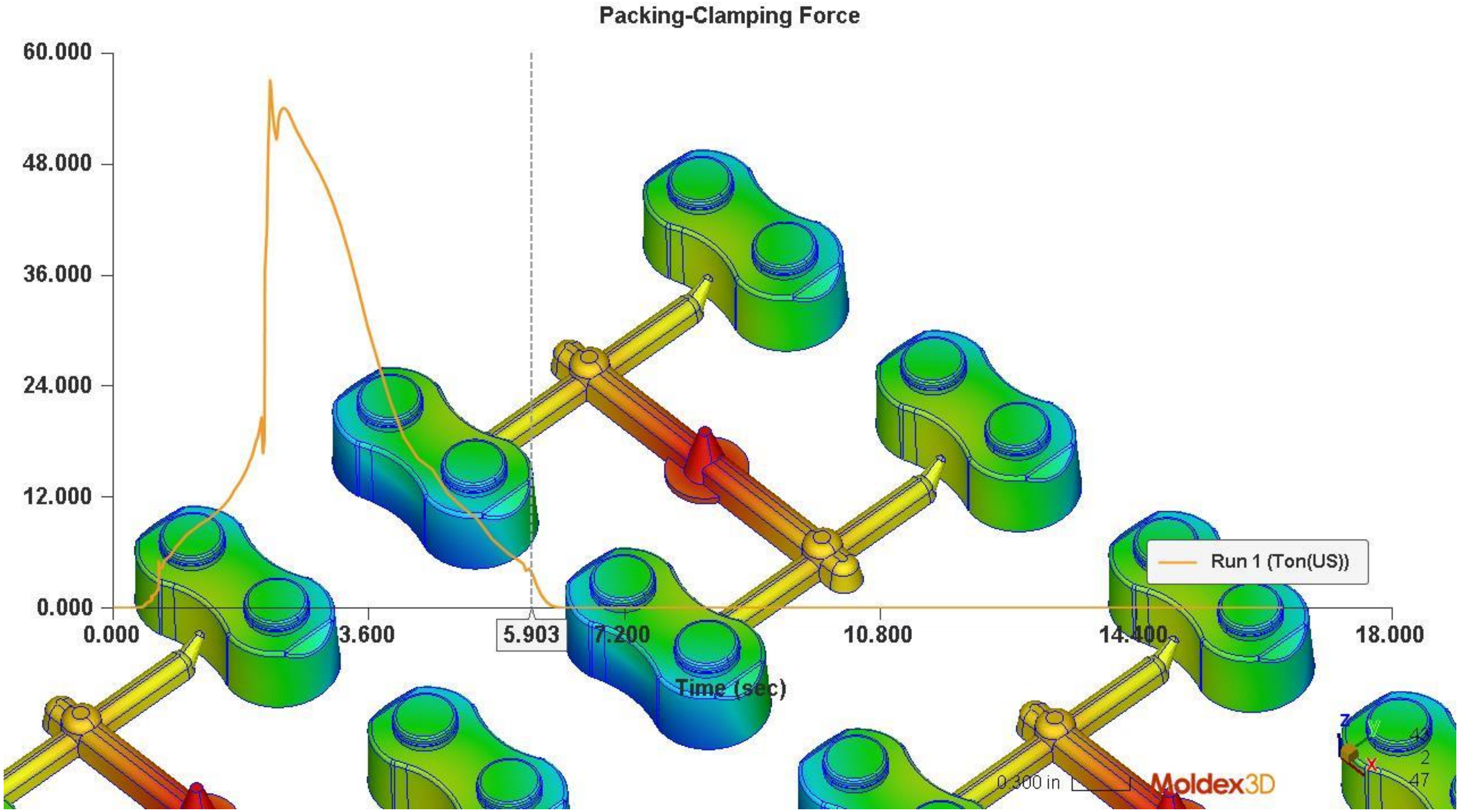
Packing_XY_Sprue Pressure



Max	Unit
6523.261	psi

Moldex3D

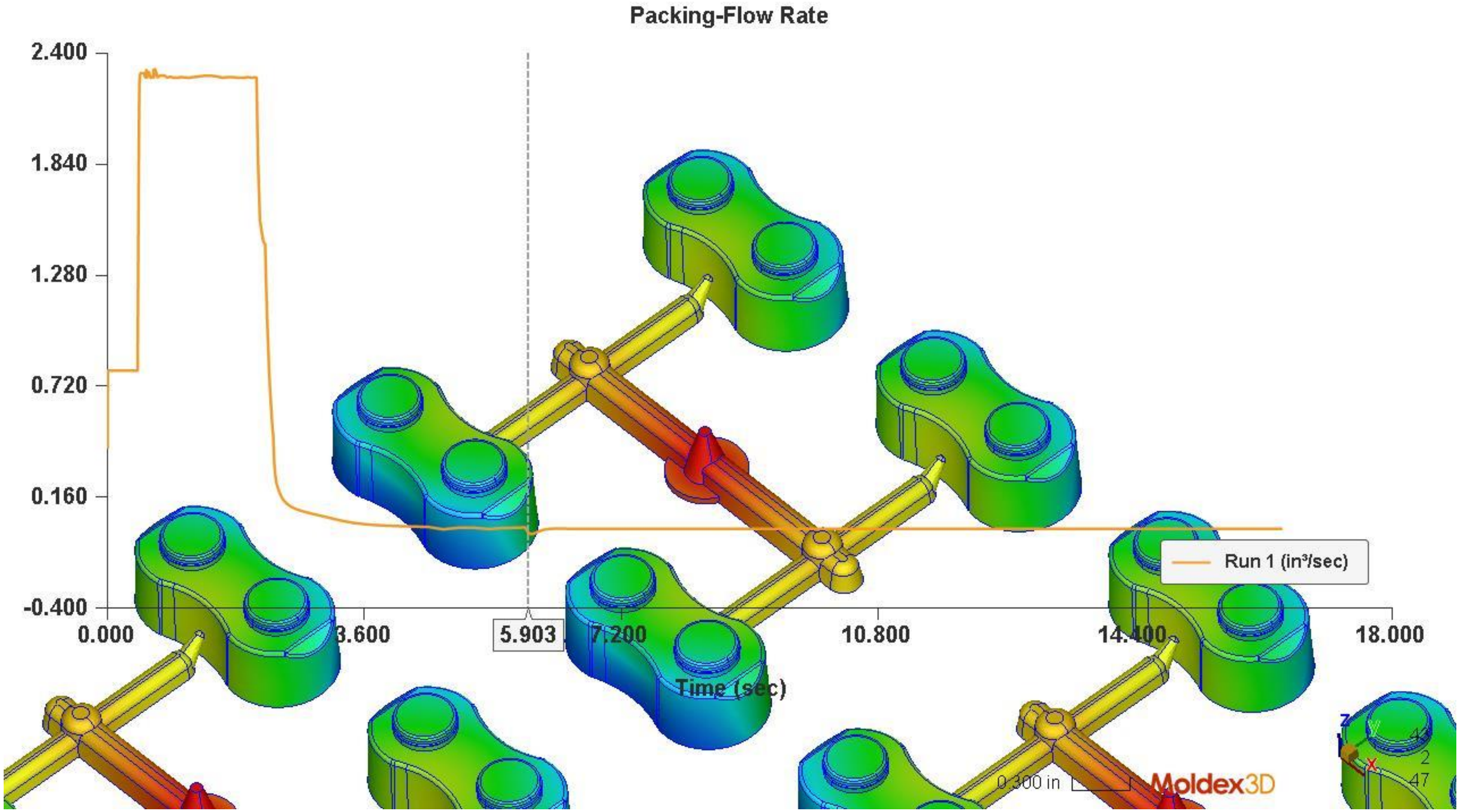
Packing_XY_Clamping Force



Max	Unit
57.086	Ton(US)

Moldex3D

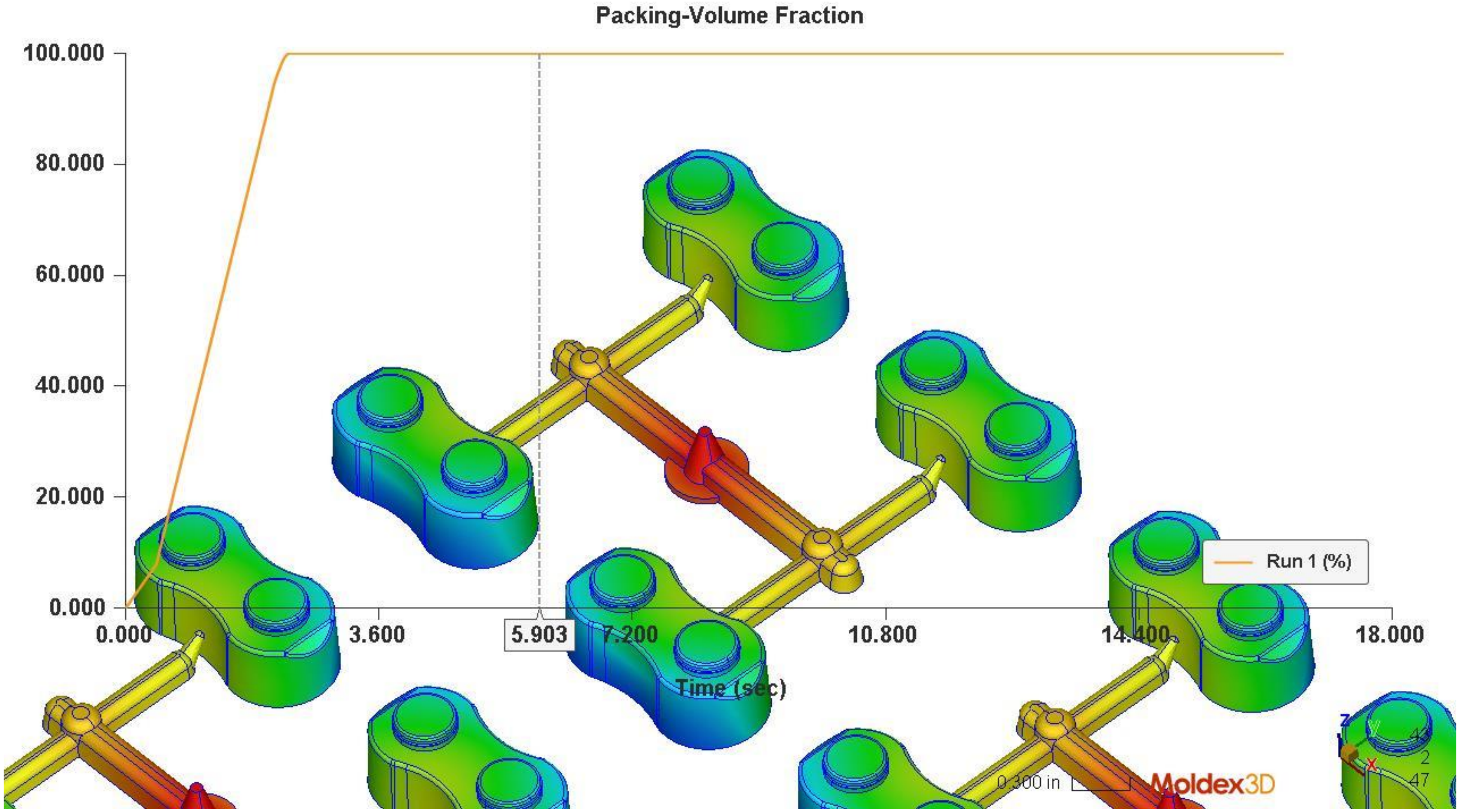
Packing_XY_Flow Rate



Max	Unit
2.321	in³/sec

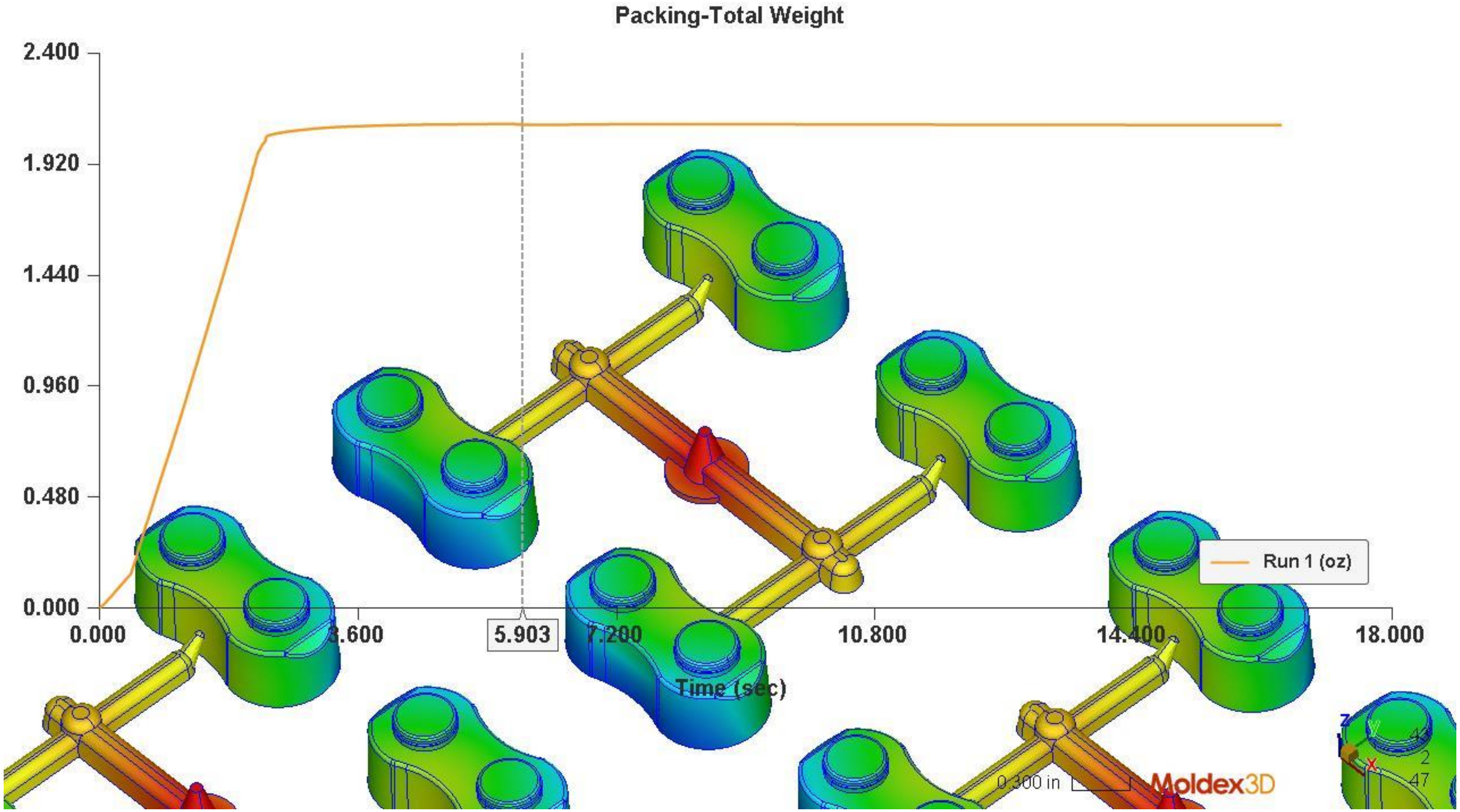
Moldex3D

Packing_XY_Volume Fraction



Max	Unit
100.000	%

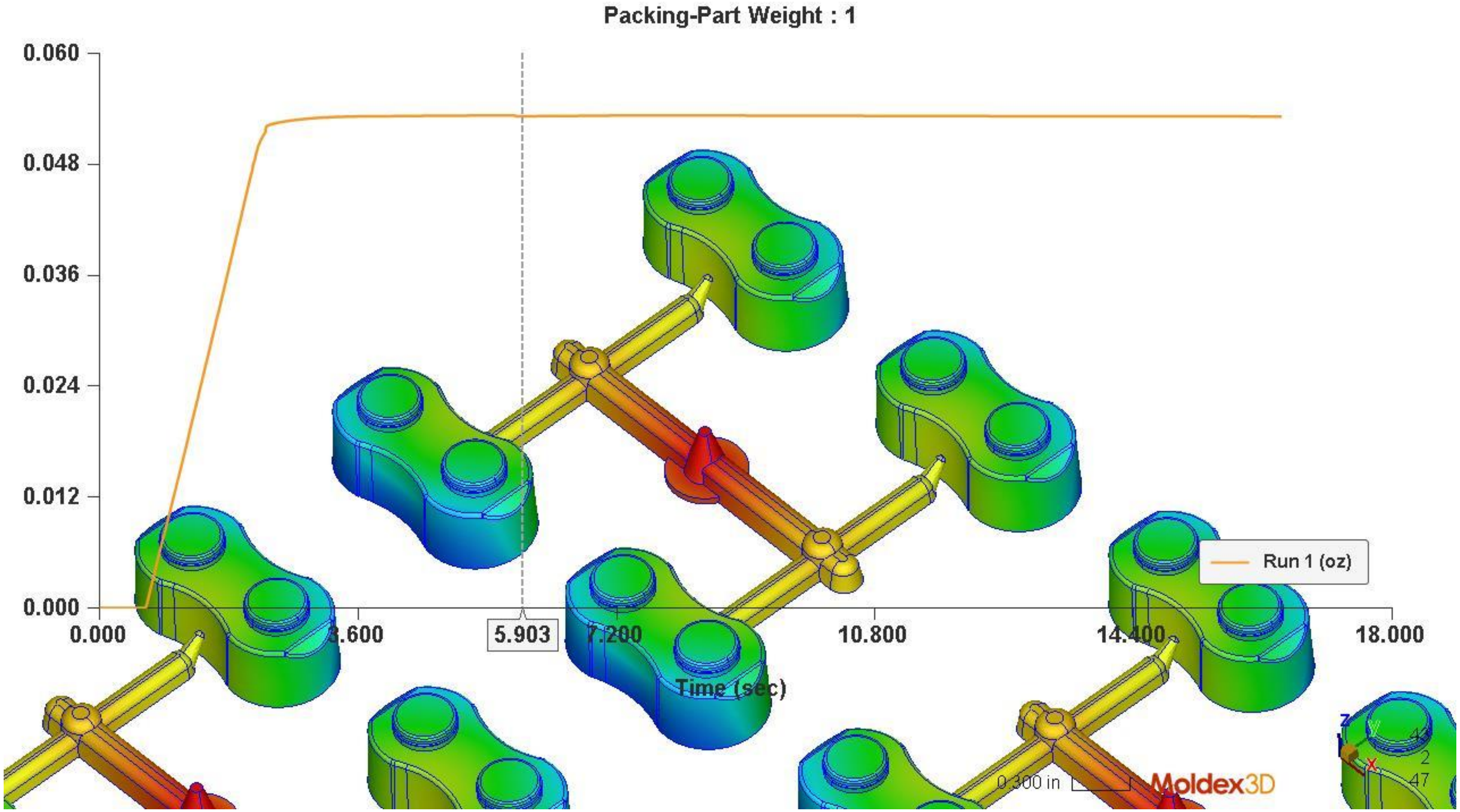
Packing_XY_Total Weight



Max	Unit
2.096	oz

Moldex3D

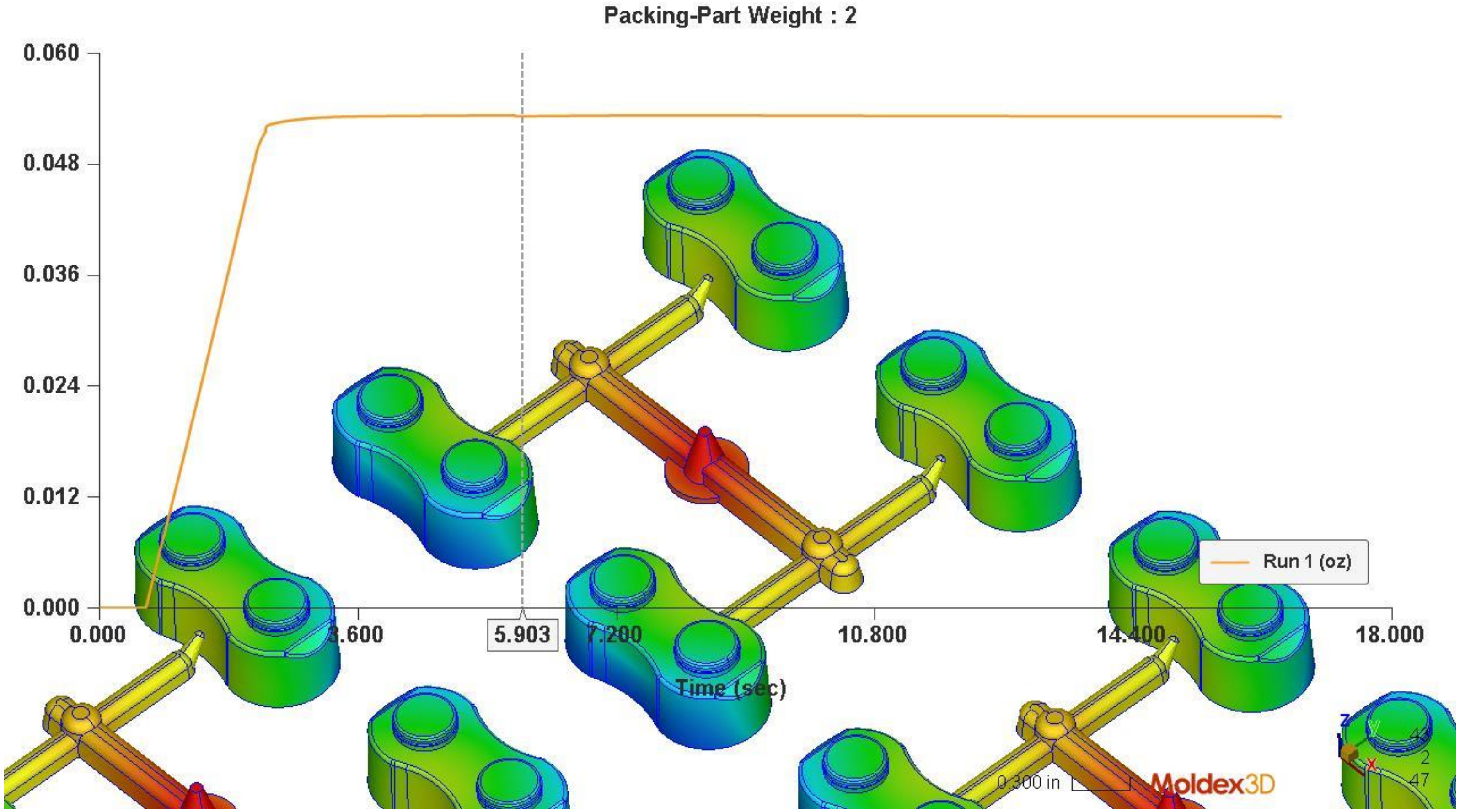
Packing_XY_Part Weight#1



Max	Unit
0.053	oz

Moldex3D

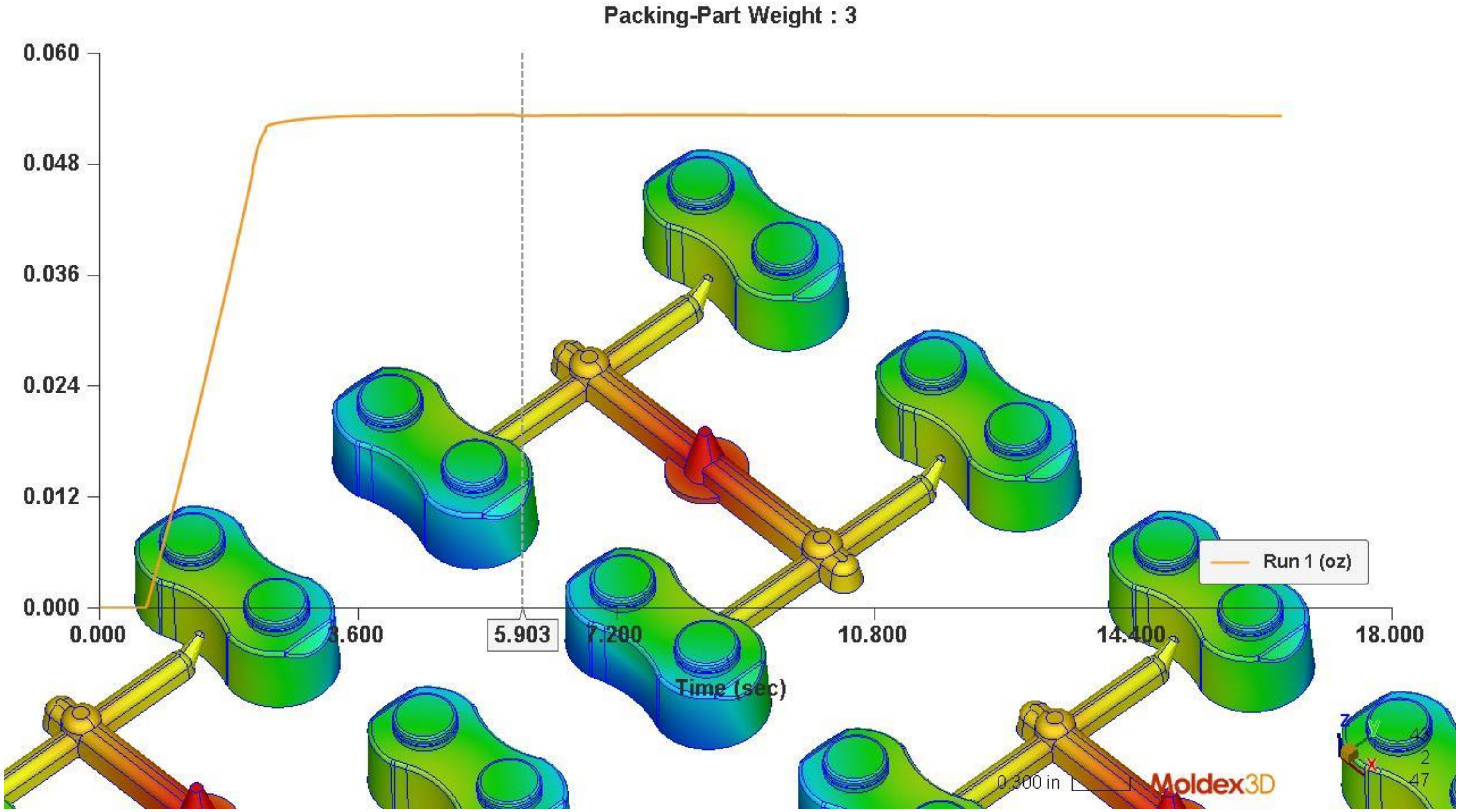
Packing_XY_Part Weight#2



Max	Unit
0.053	oz

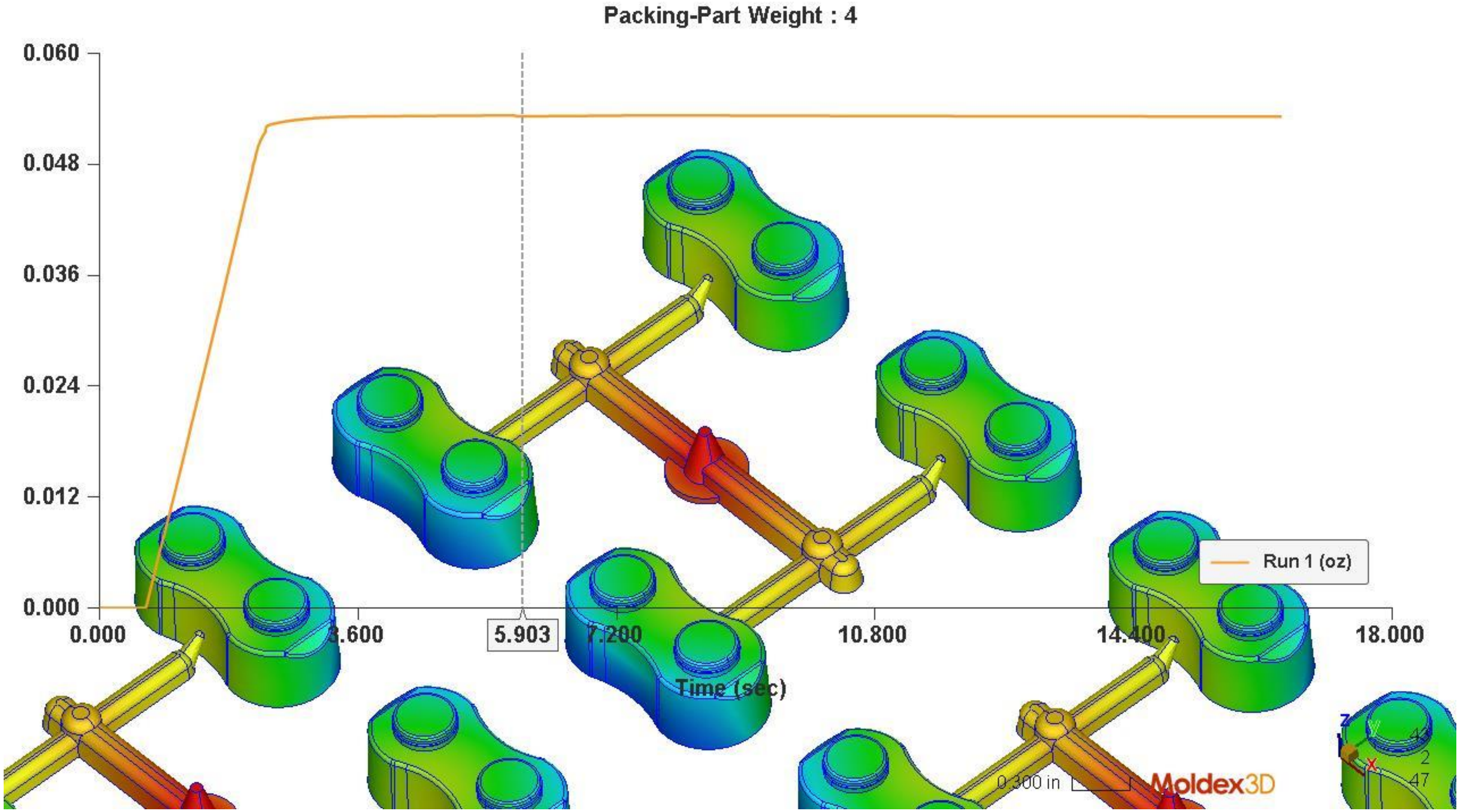
Moldex3D

Packing_XY_Part Weight#3



Max	Unit
0.053	oz

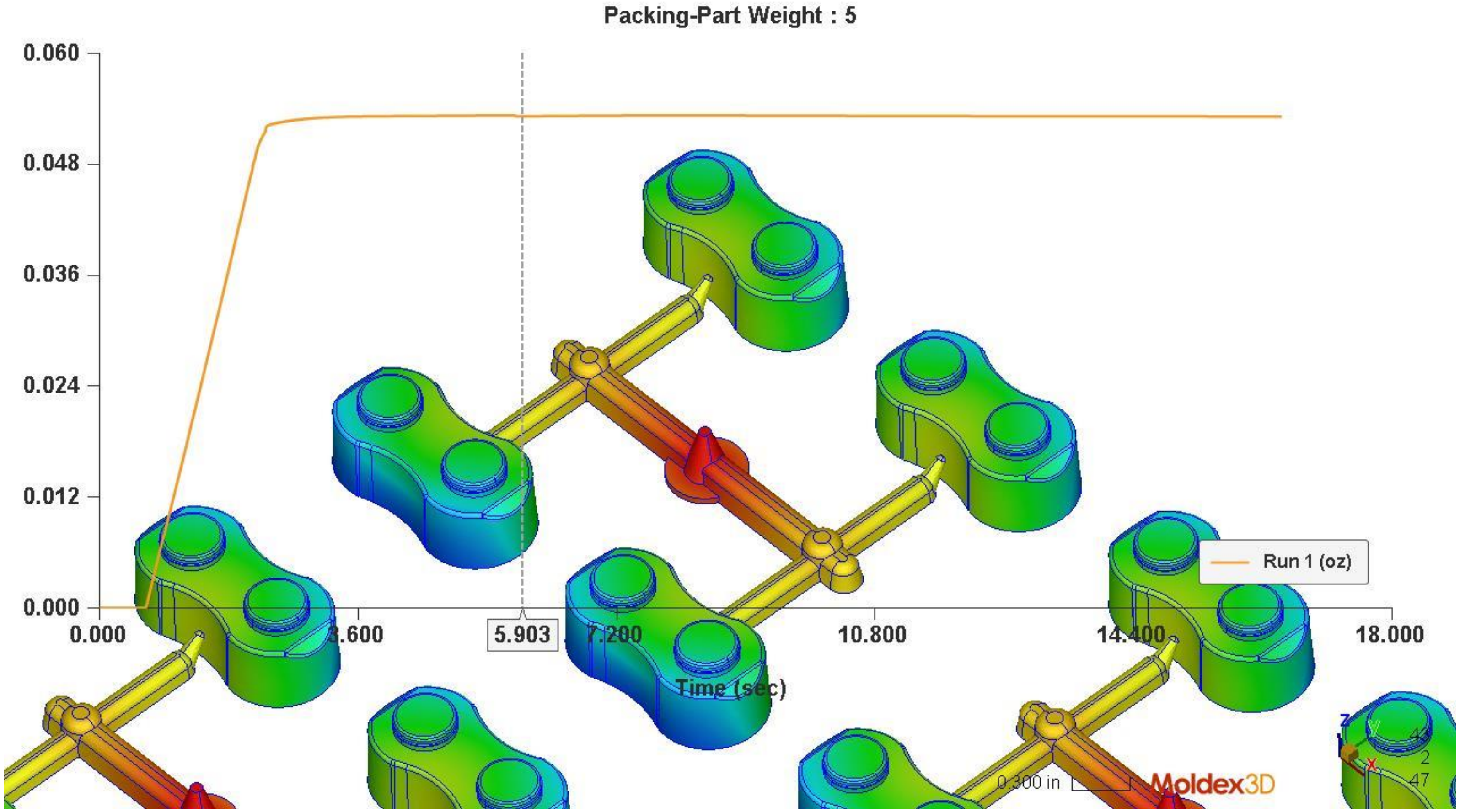
Packing_XY_Part Weight#4



Max	Unit
0.053	oz

Moldex3D

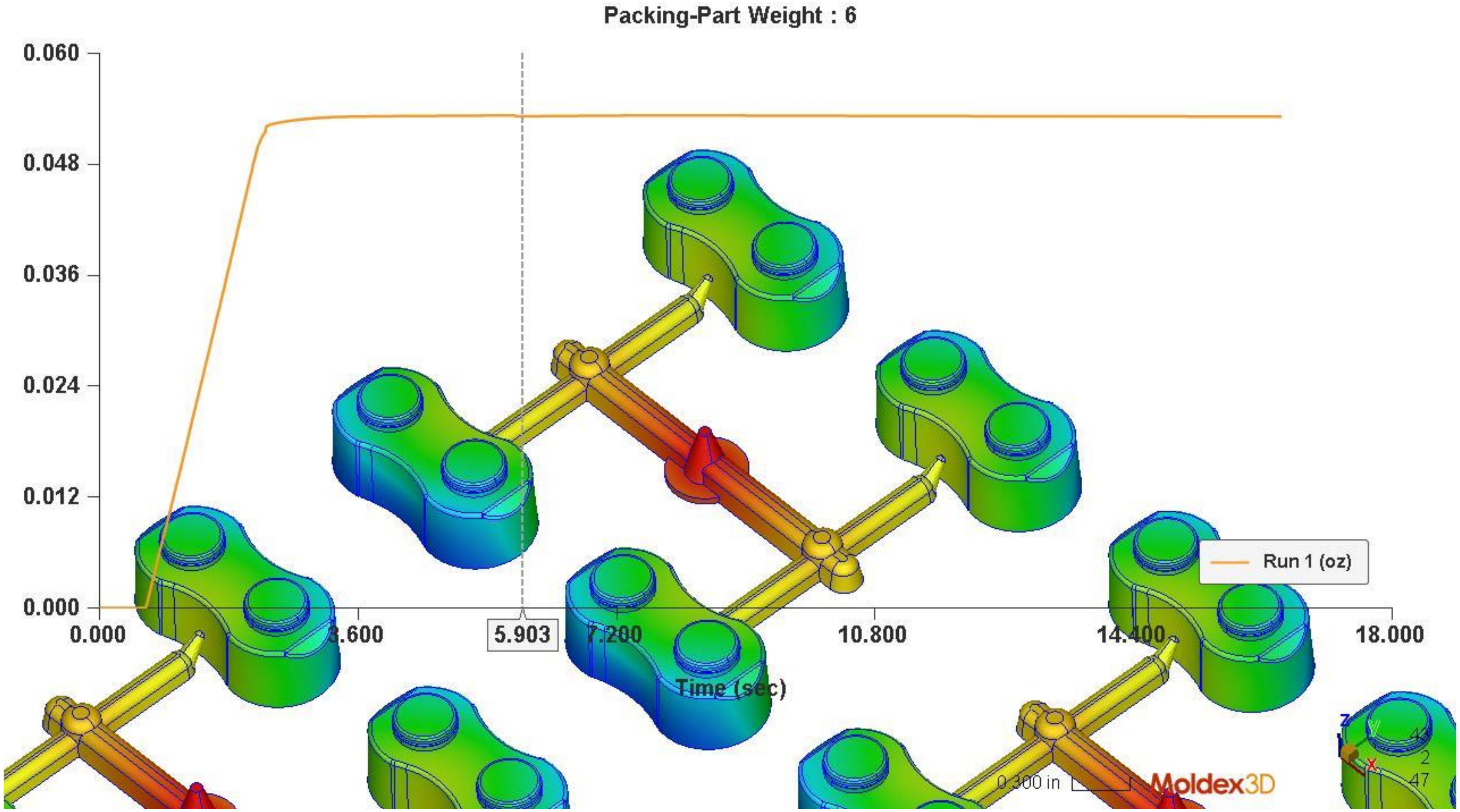
Packing_XY_Part Weight#5



Max	Unit
0.053	oz

Moldex3D

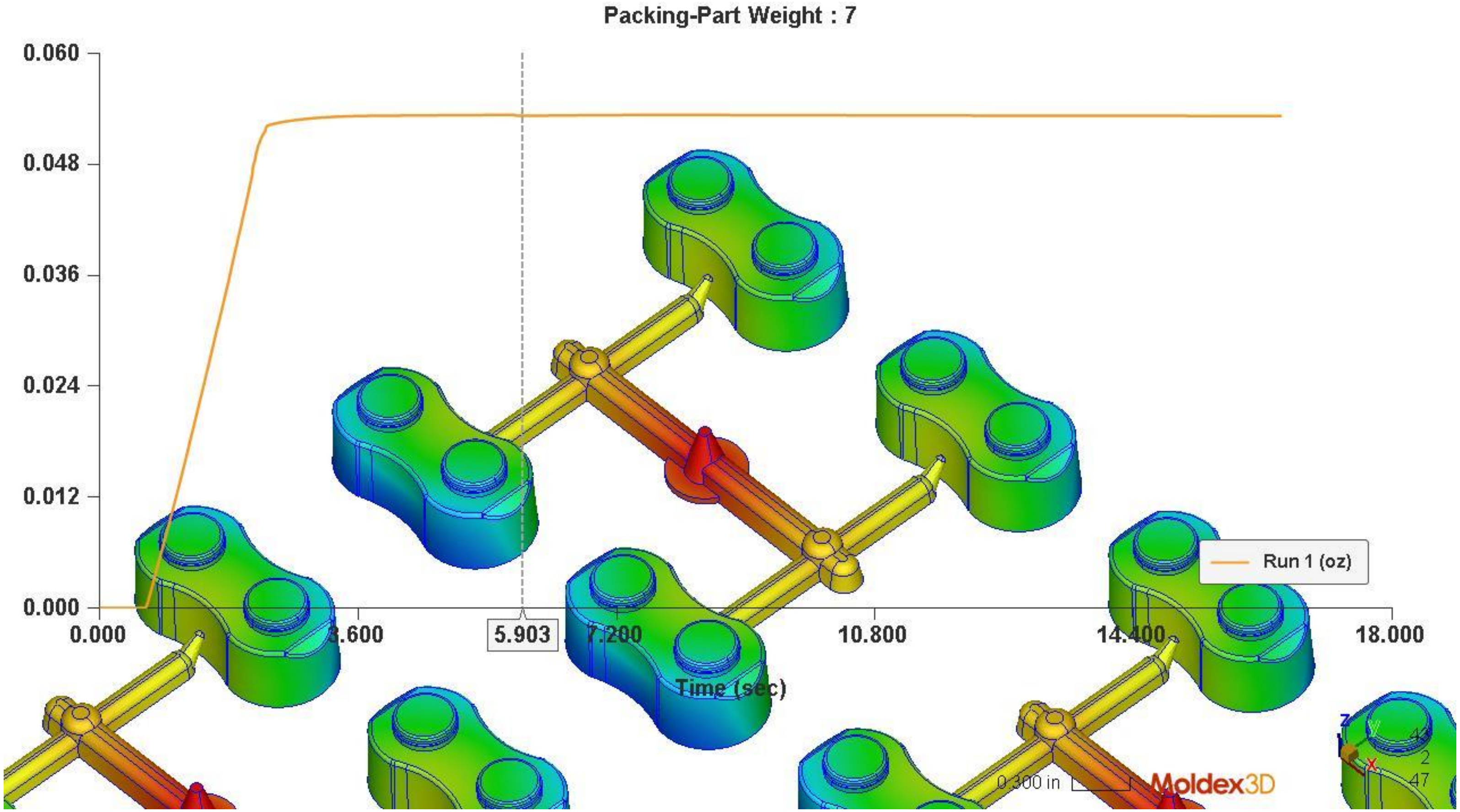
Packing_XY_Part Weight#6



Max	Unit
0.053	oz

Moldex3D

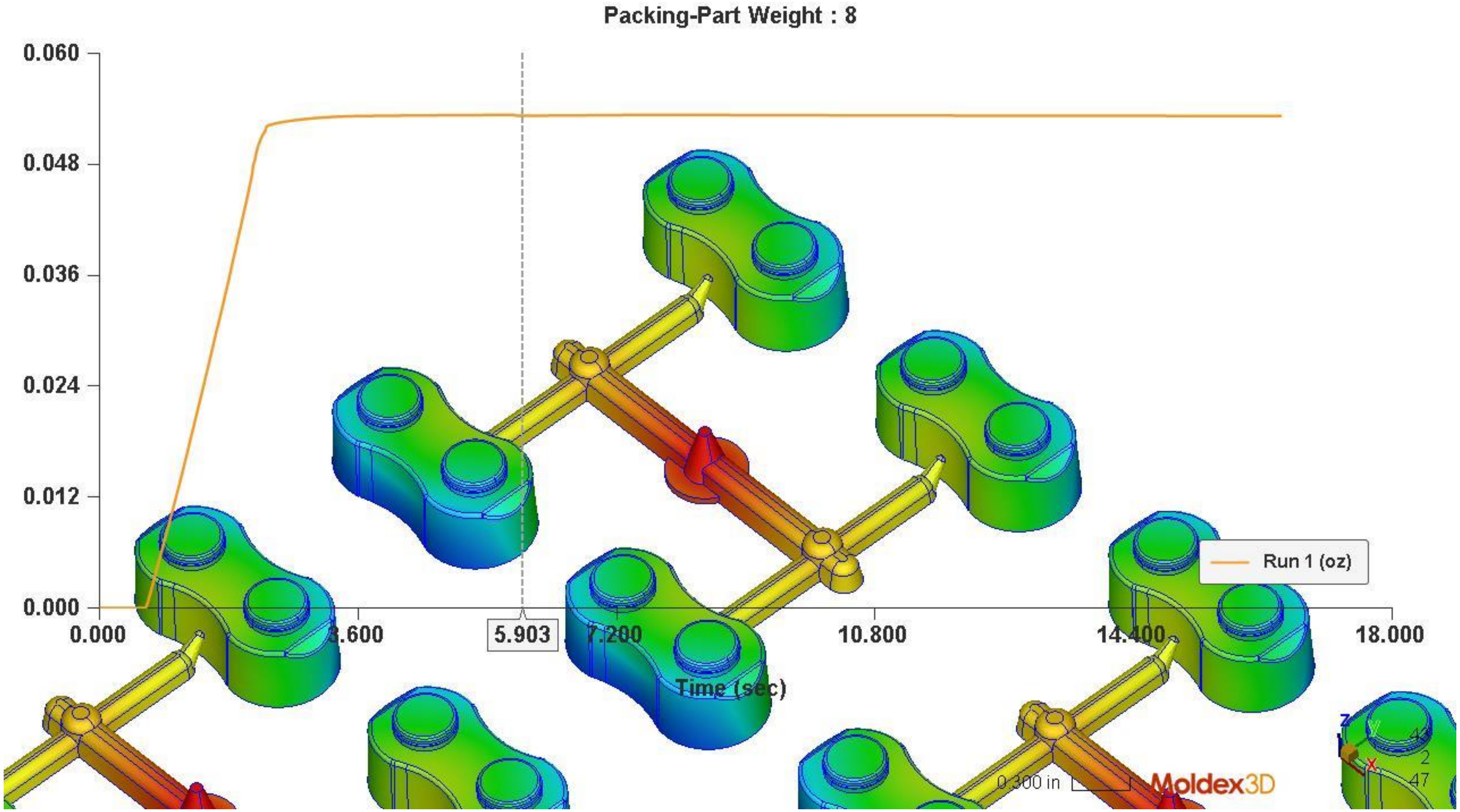
Packing_XY_Part Weight#7



Max	Unit
0.053	oz

Moldex3D

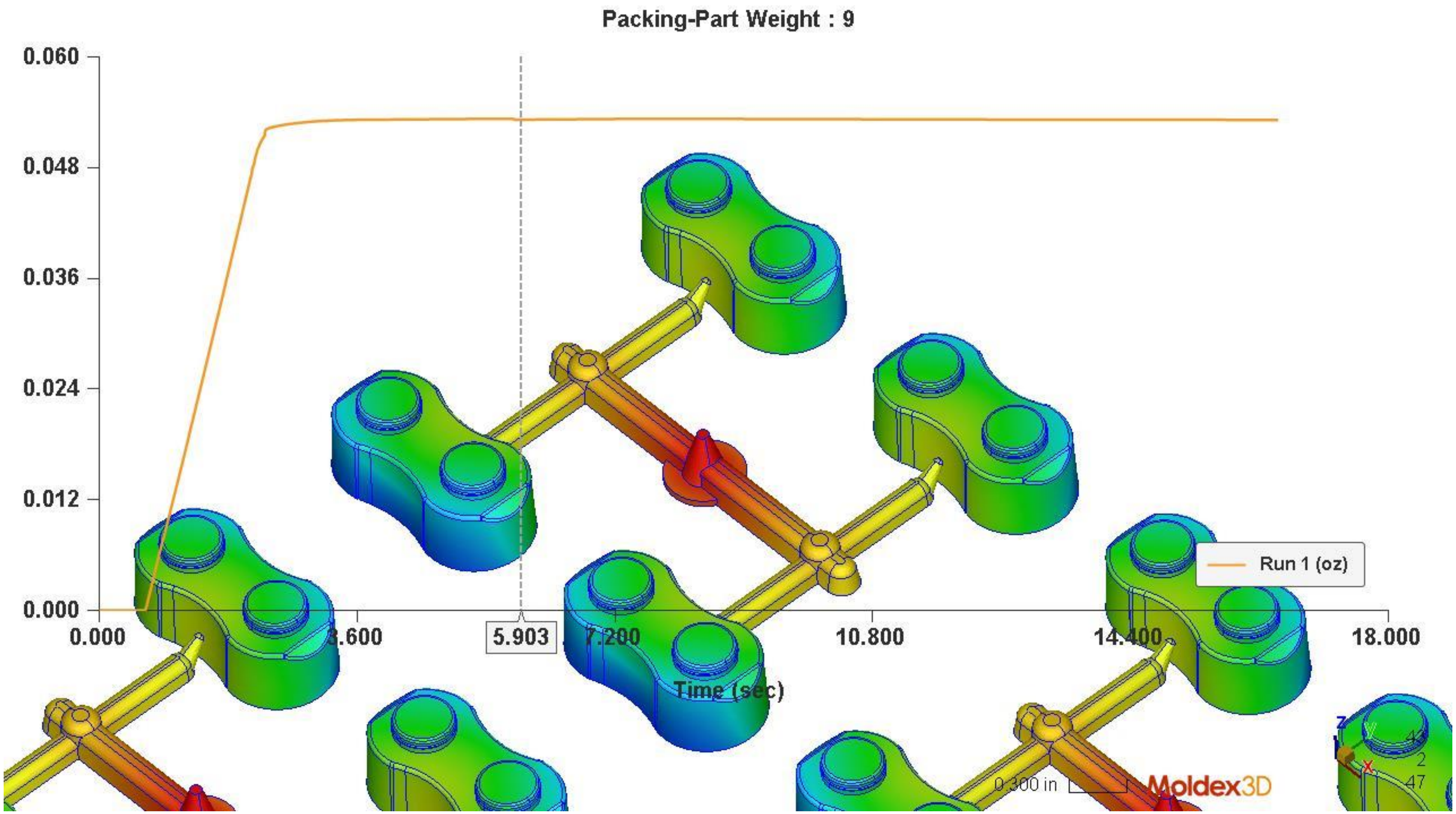
Packing_XY_Part Weight#8



Max	Unit
0.053	oz

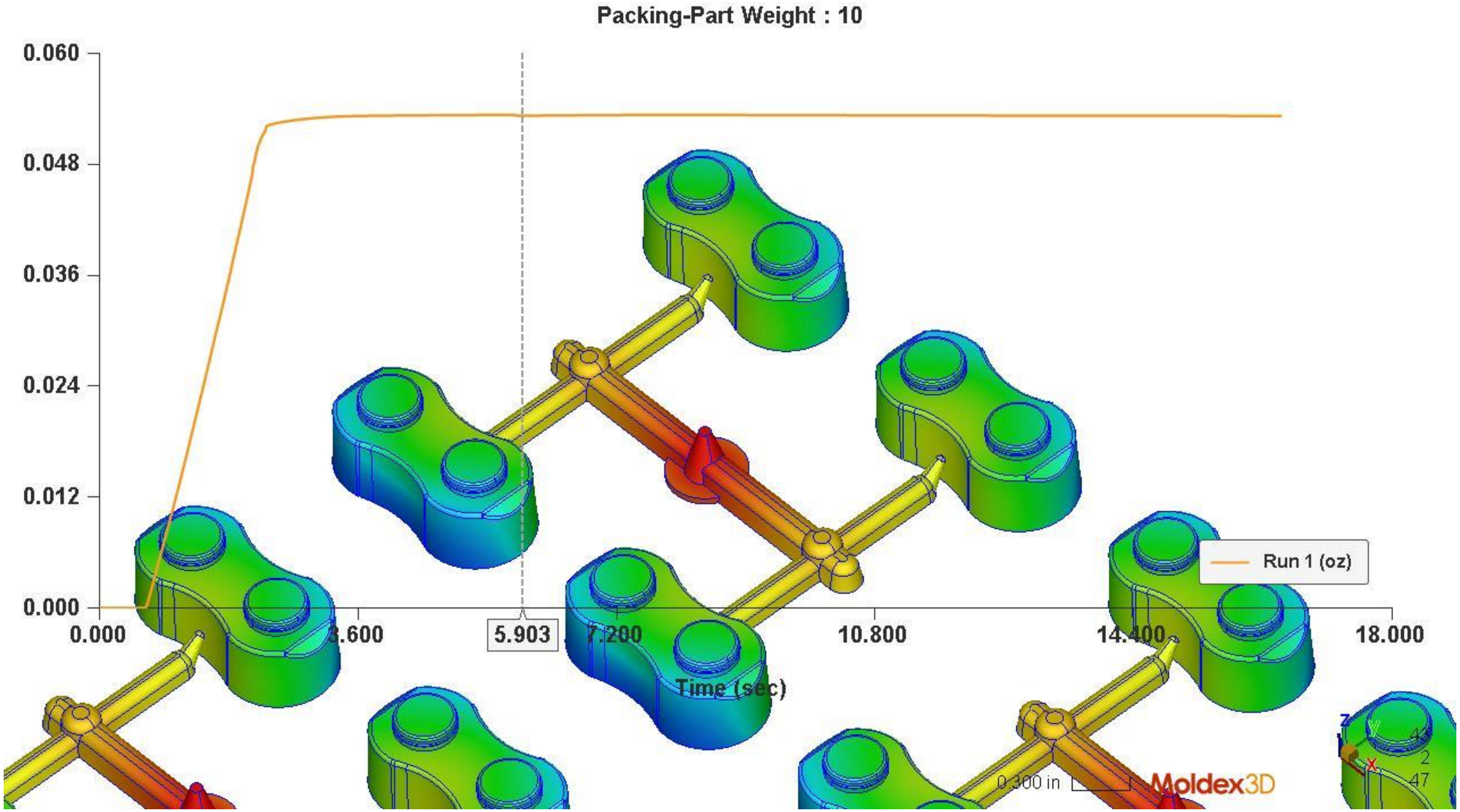
Moldex3D

Packing_XY_Part Weight#9



Max	Unit
0.053	oz

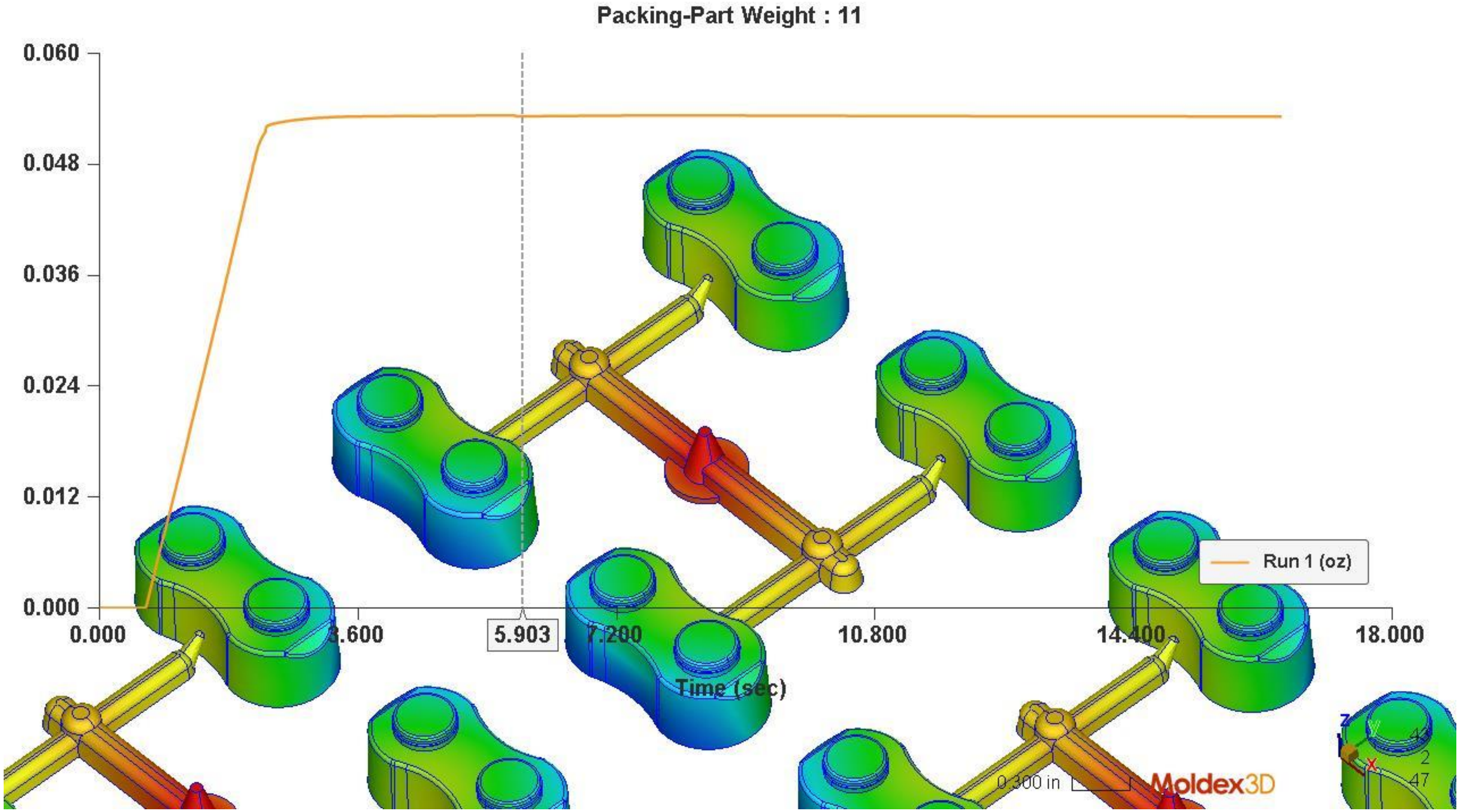
Packing_XY_Part Weight#10



Max	Unit
0.053	oz

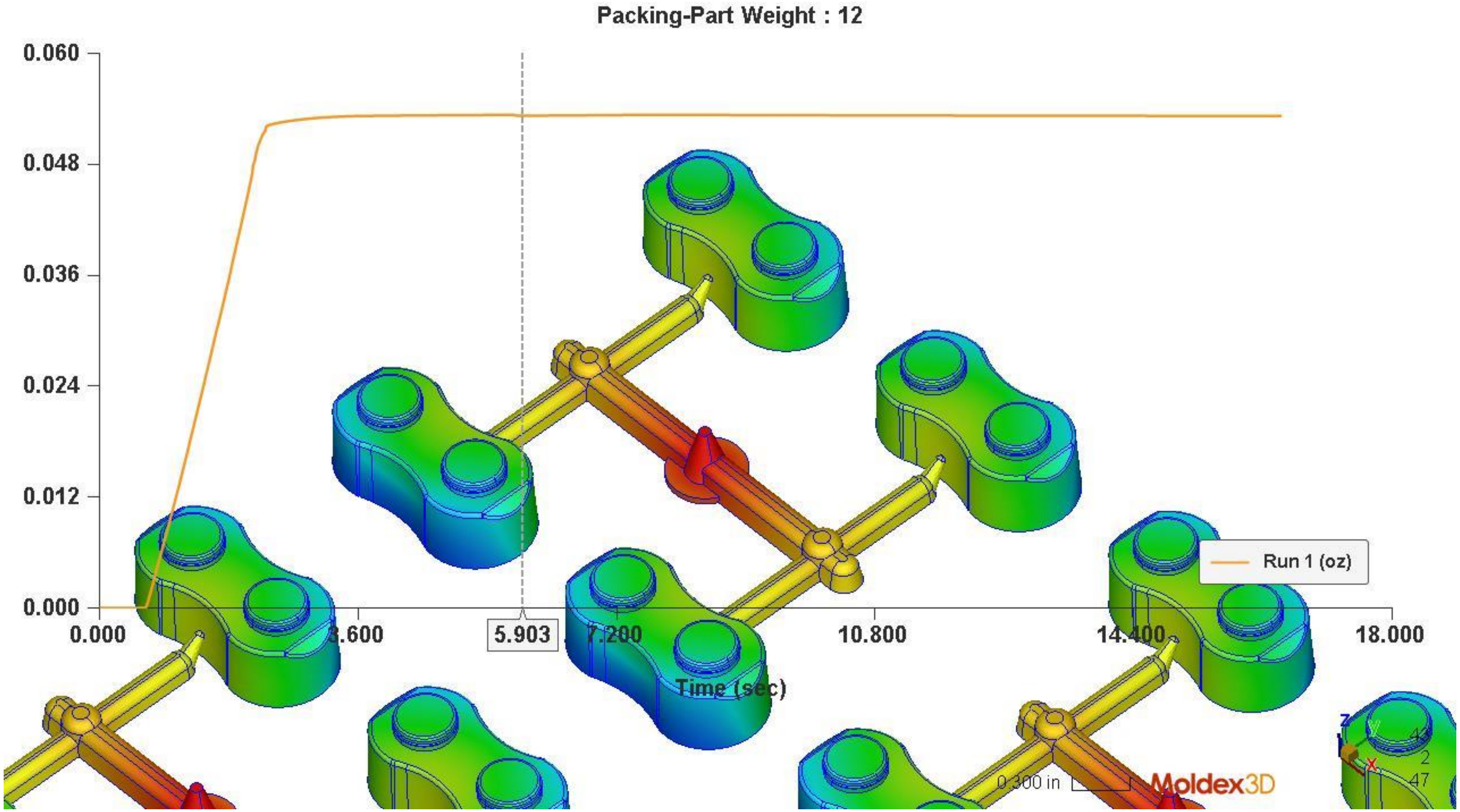
Moldex3D

Packing_XY_Part Weight#11



Max	Unit
0.053	oz

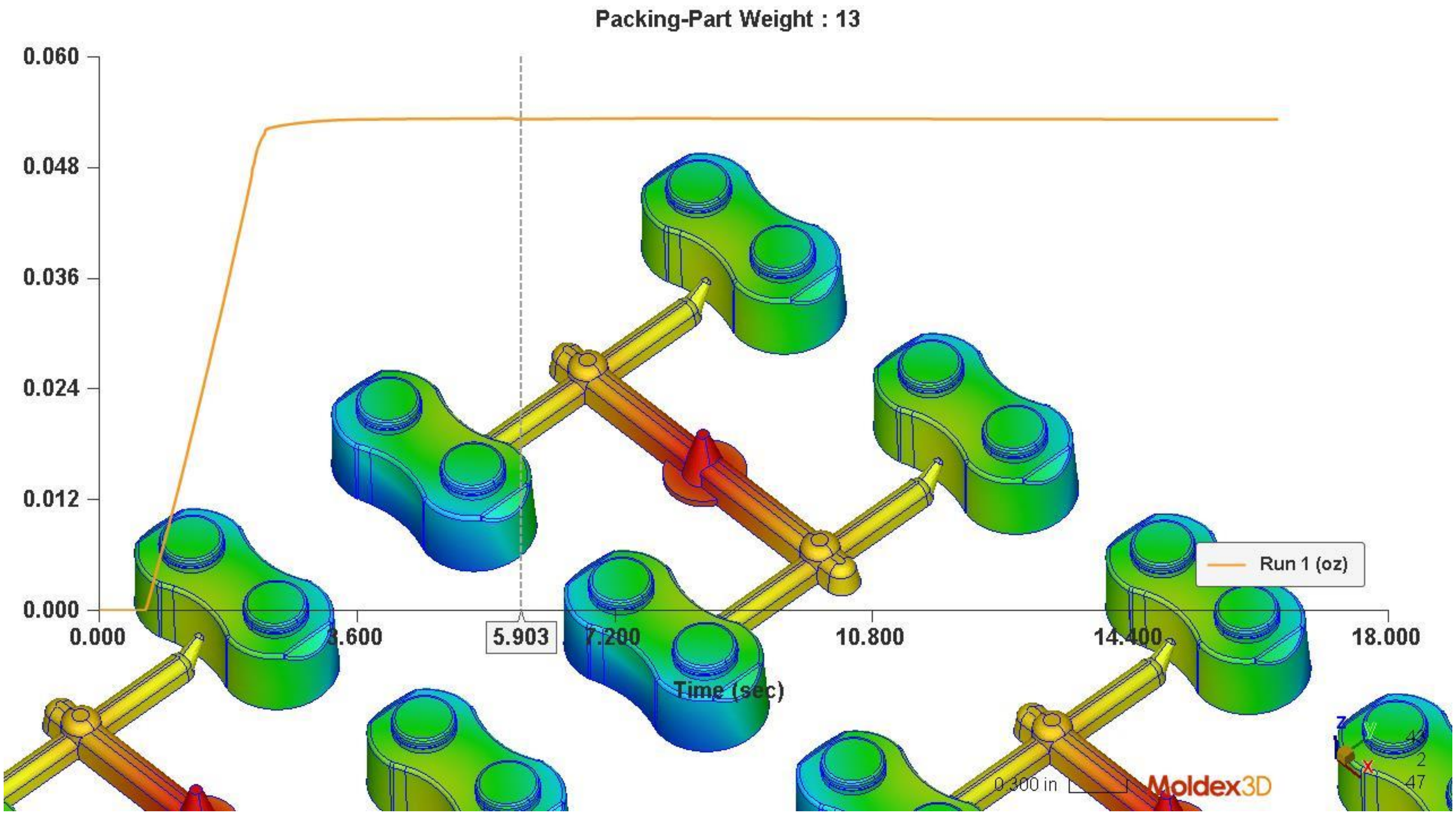
Packing_XY_Part Weight#12



Max	Unit
0.053	oz

Moldex3D

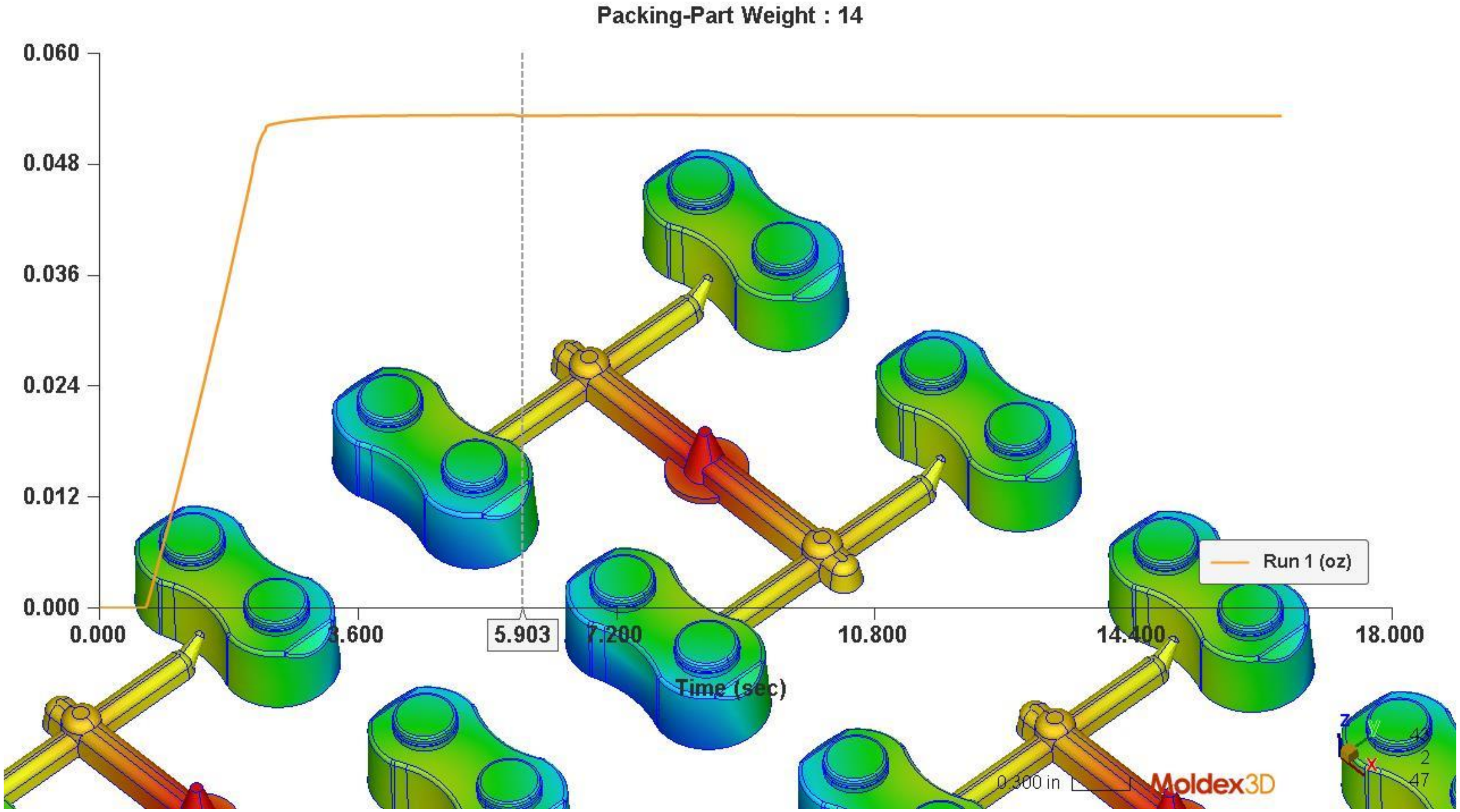
Packing_XY_Part Weight#13



Max	Unit
0.053	oz

Moldex3D

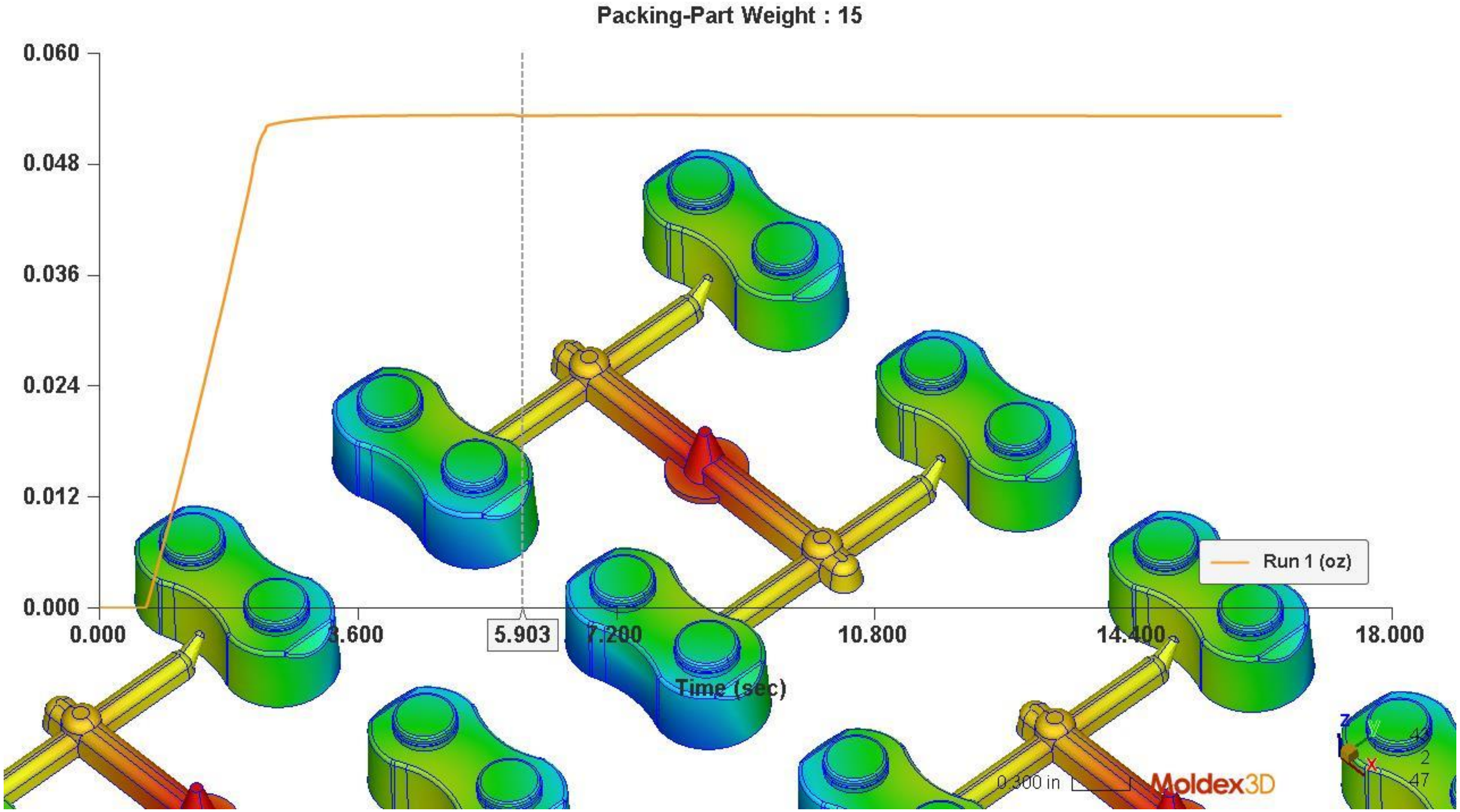
Packing_XY_Part Weight#14



Max	Unit
0.053	oz

Moldex3D

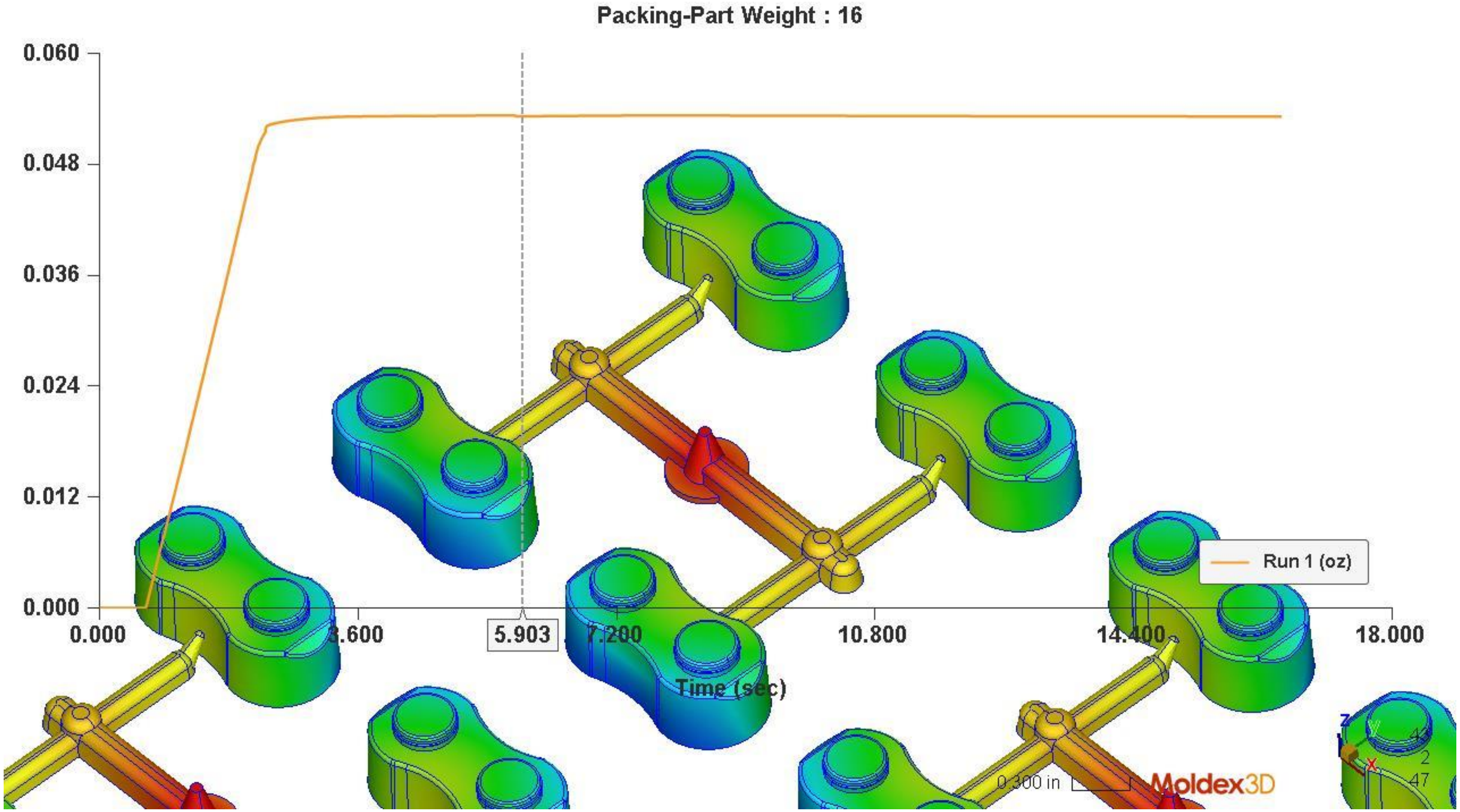
Packing_XY_Part Weight#15



Max	Unit
0.053	oz

Moldex3D

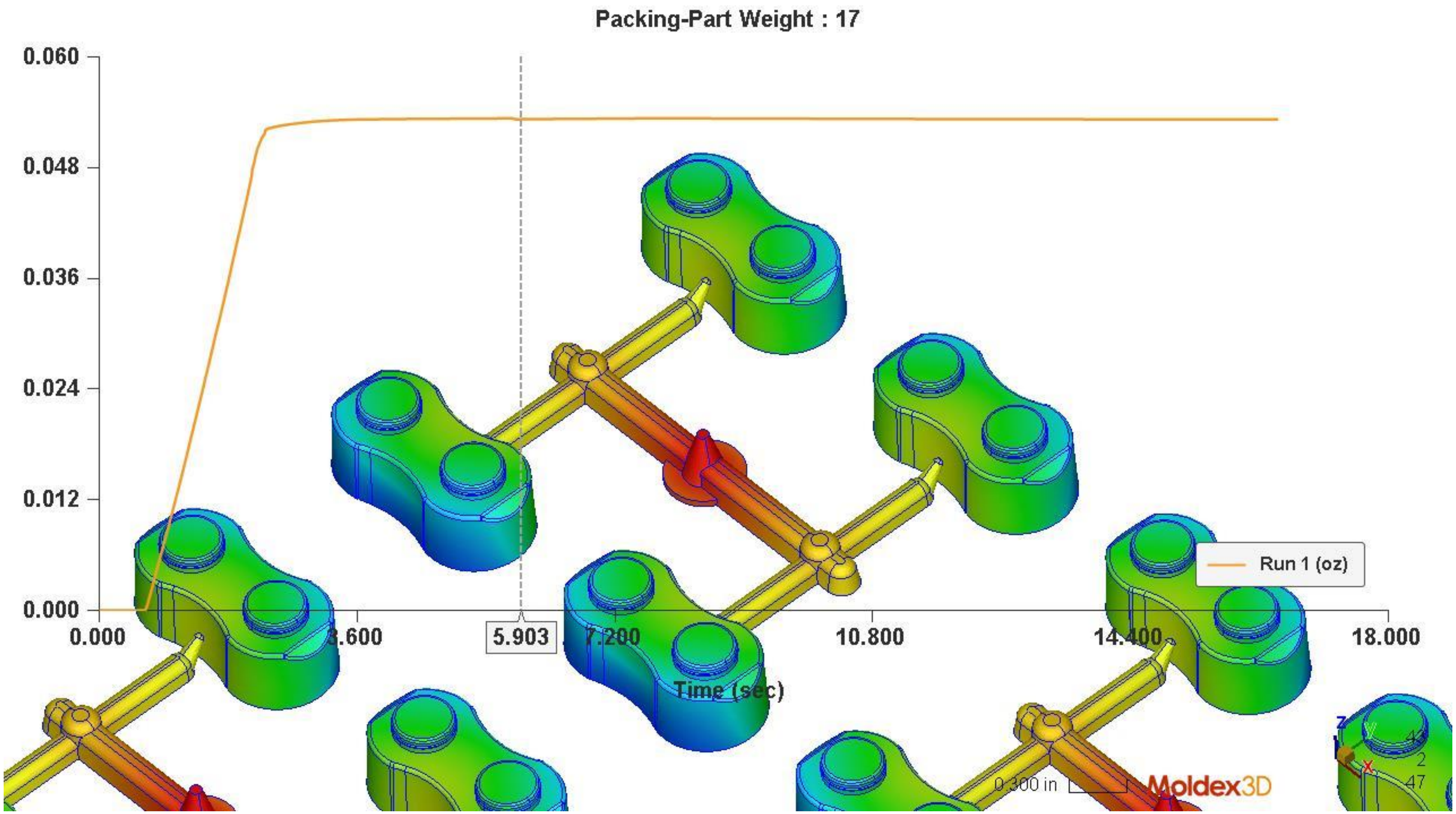
Packing_XY_Part Weight#16



Max	Unit
0.053	oz

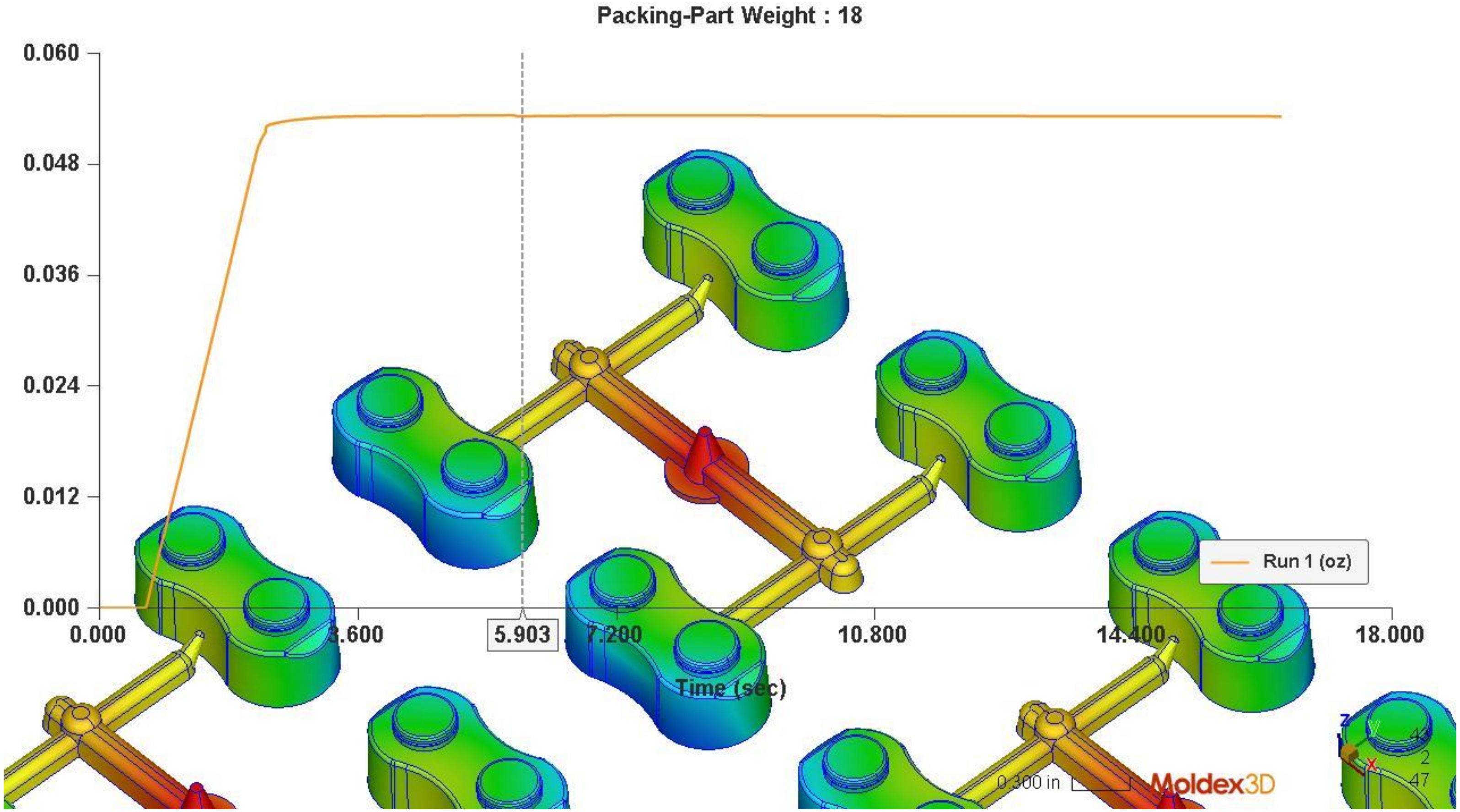
Moldex3D

Packing_XY_Part Weight#17



Max	Unit
0.053	oz

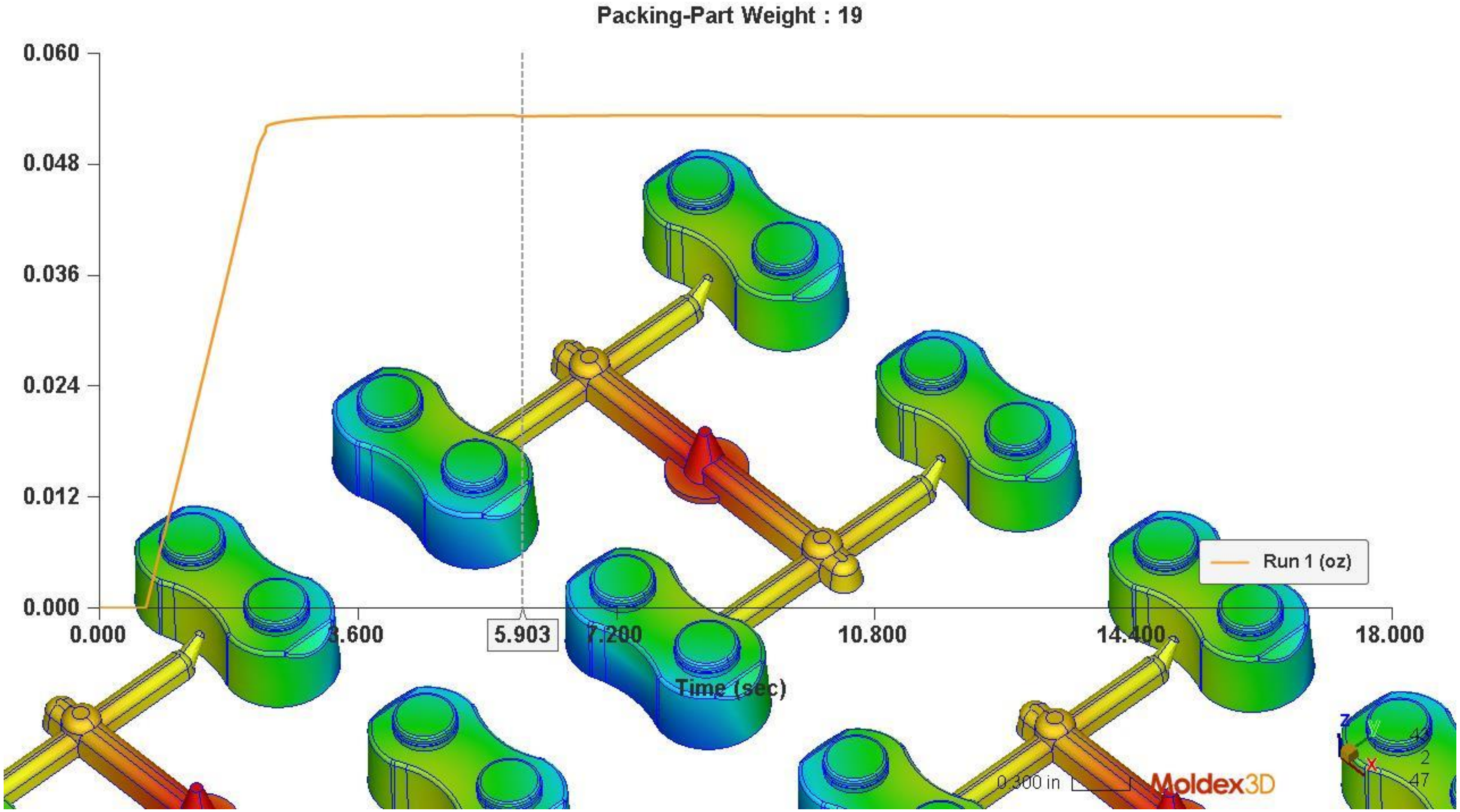
Packing_XY_Part Weight#18



Max	Unit
0.053	oz

Moldex3D

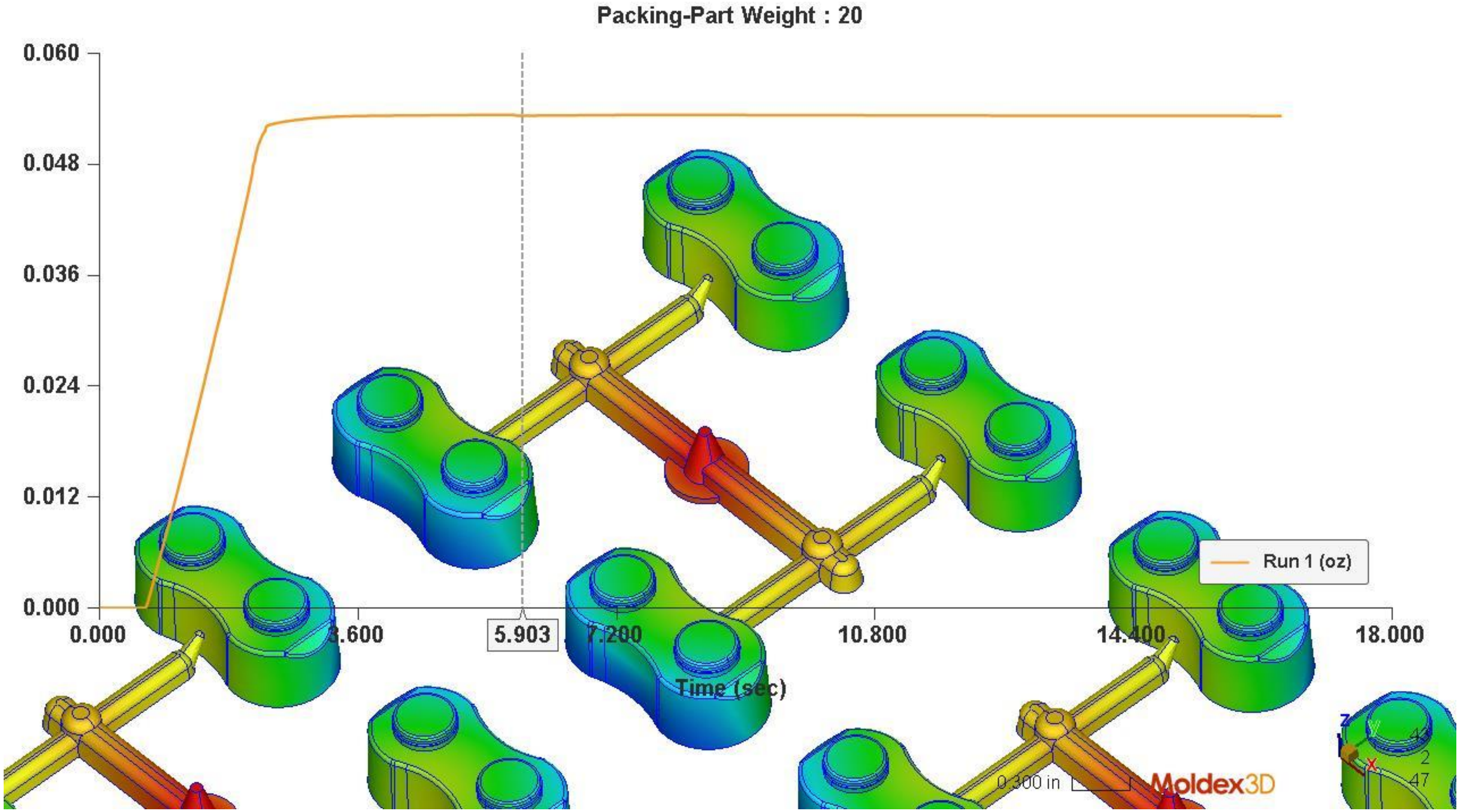
Packing_XY_Part Weight#19



Max	Unit
0.053	oz

Moldex3D

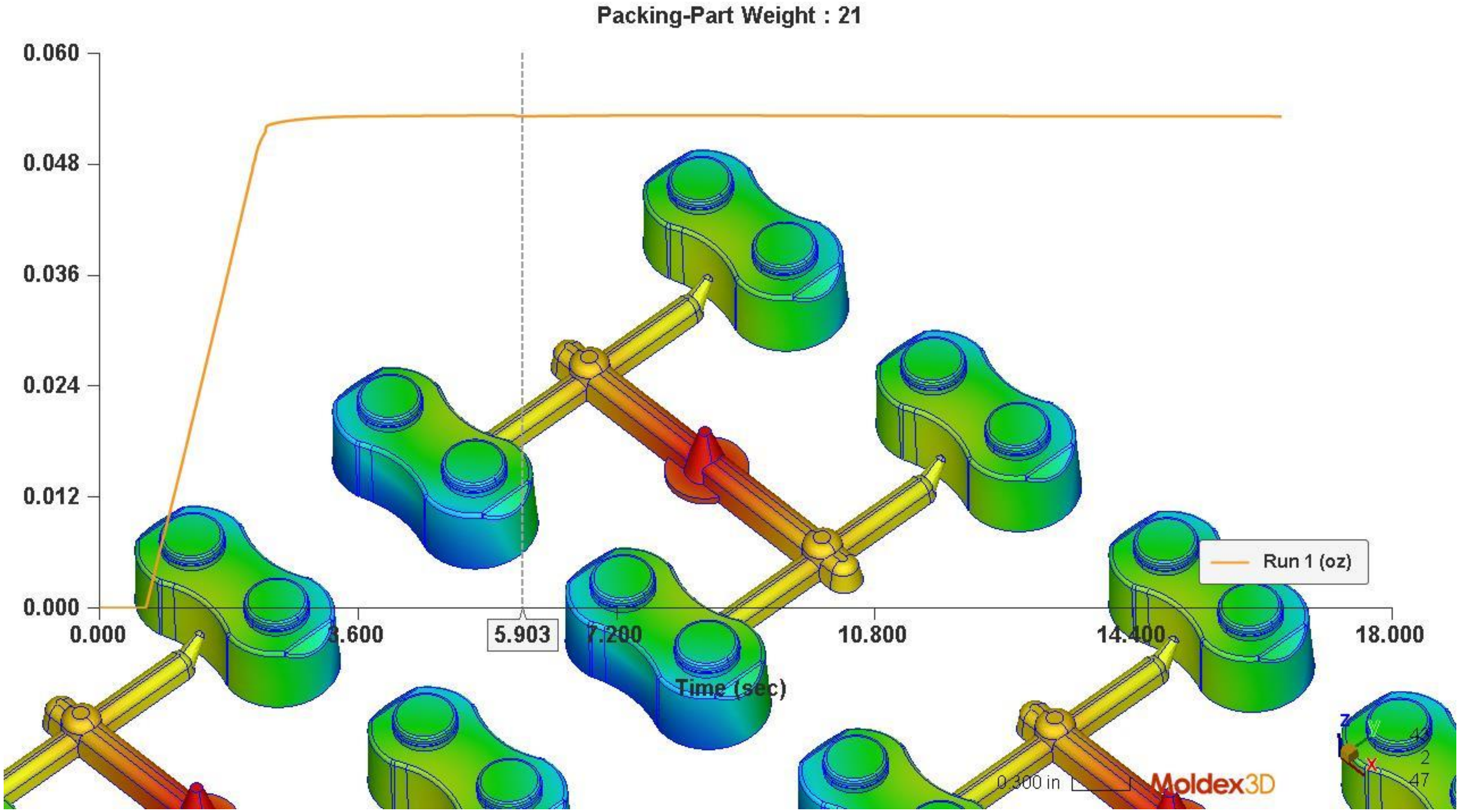
Packing_XY_Part Weight#20



Max	Unit
0.053	oz

Moldex3D

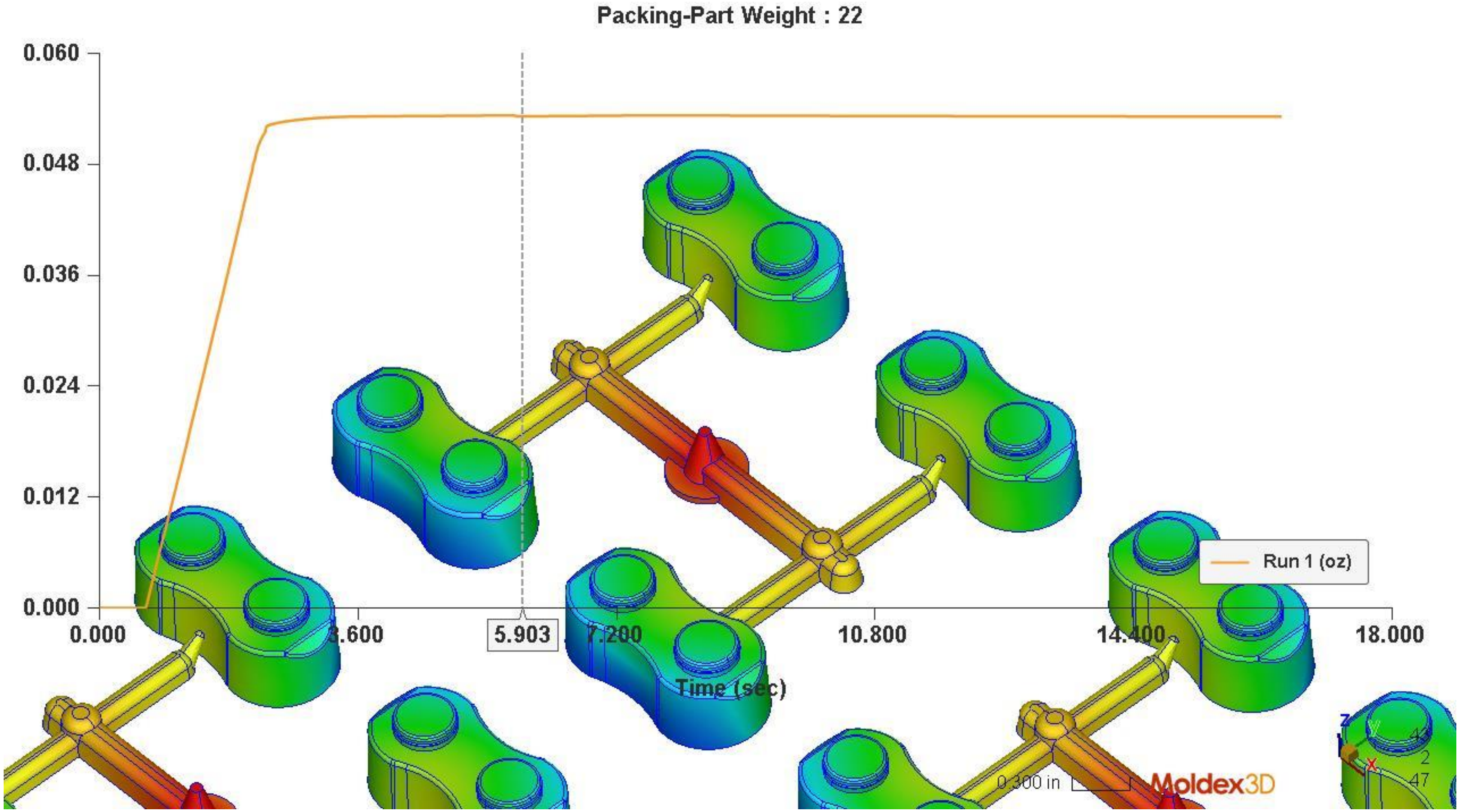
Packing_XY_Part Weight#21



Max	Unit
0.053	oz

Moldex3D

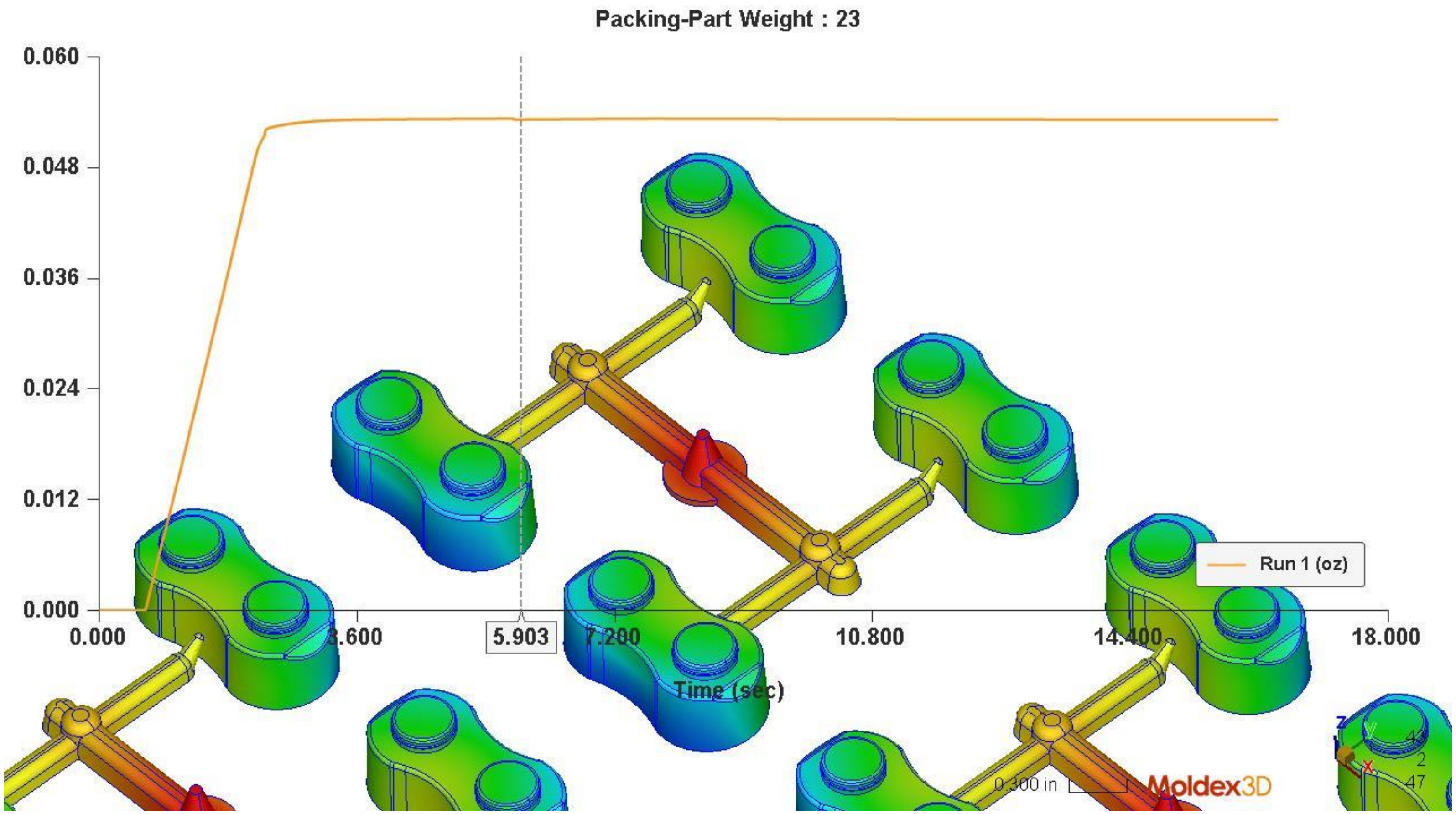
Packing_XY_Part Weight#22



Max	Unit
0.053	oz

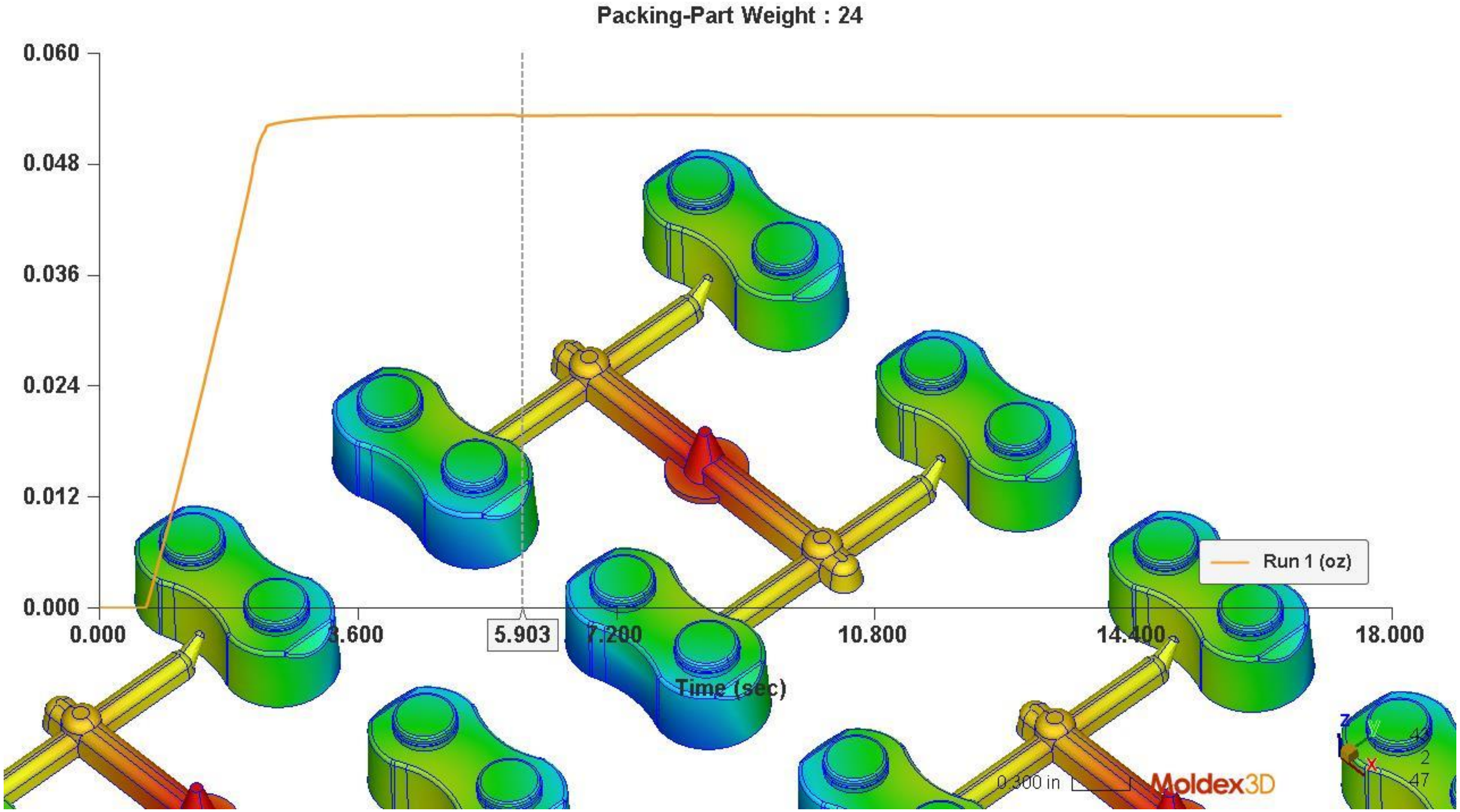
Moldex3D

Packing_XY_Part Weight#23



Max	Unit
0.053	oz

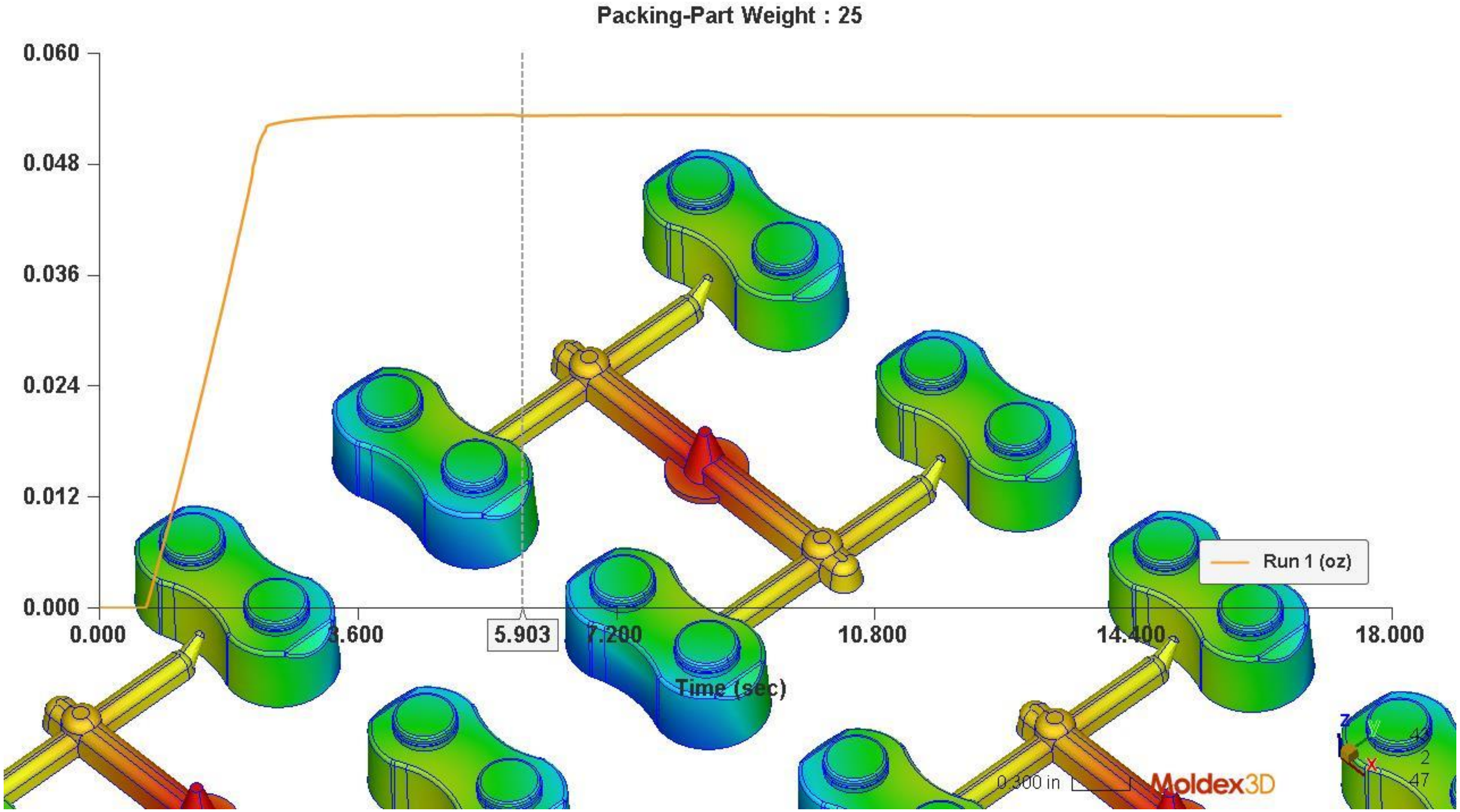
Packing_XY_Part Weight#24



Max	Unit
0.053	oz

Moldex3D

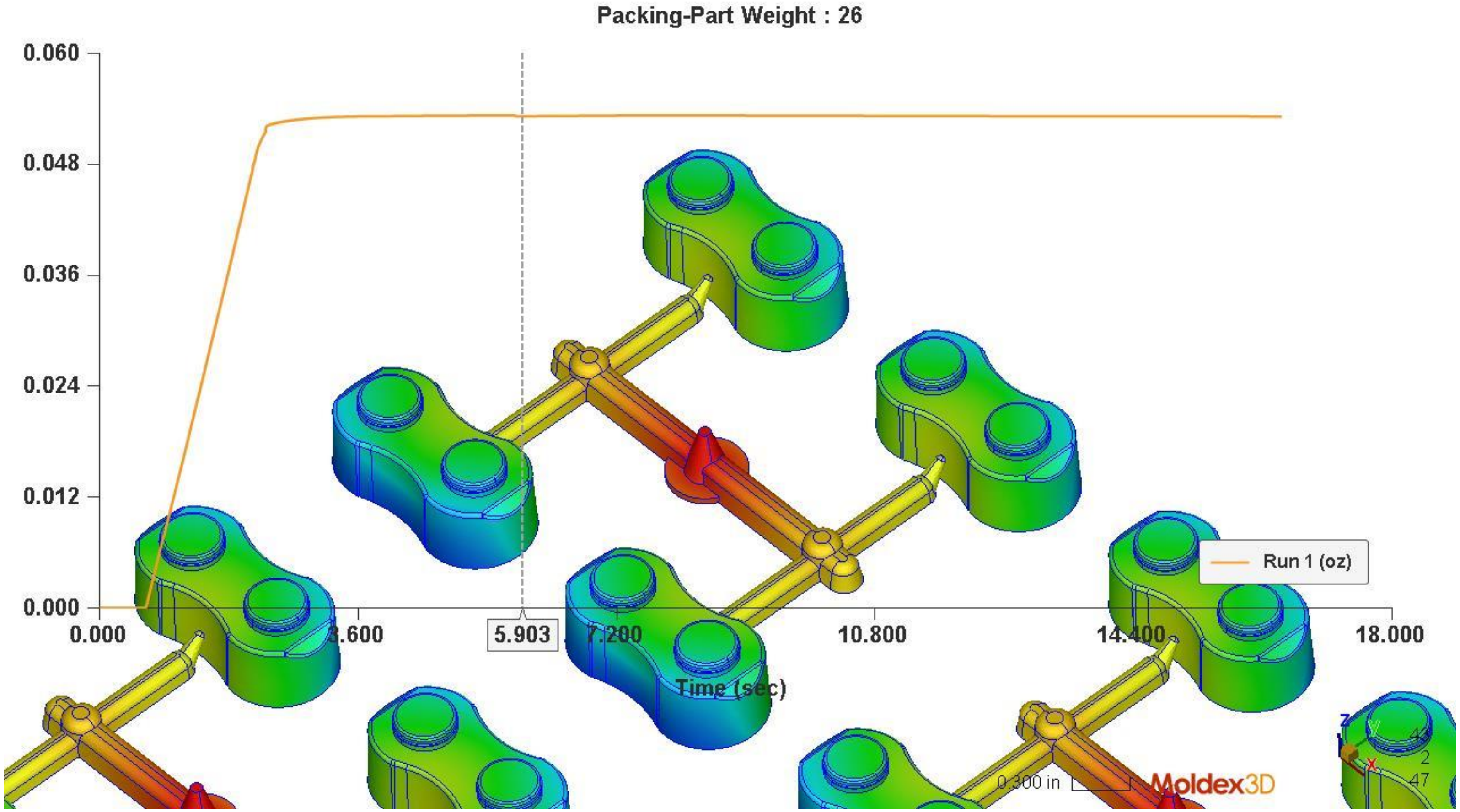
Packing_XY_Part Weight#25



Max	Unit
0.053	oz

Moldex3D

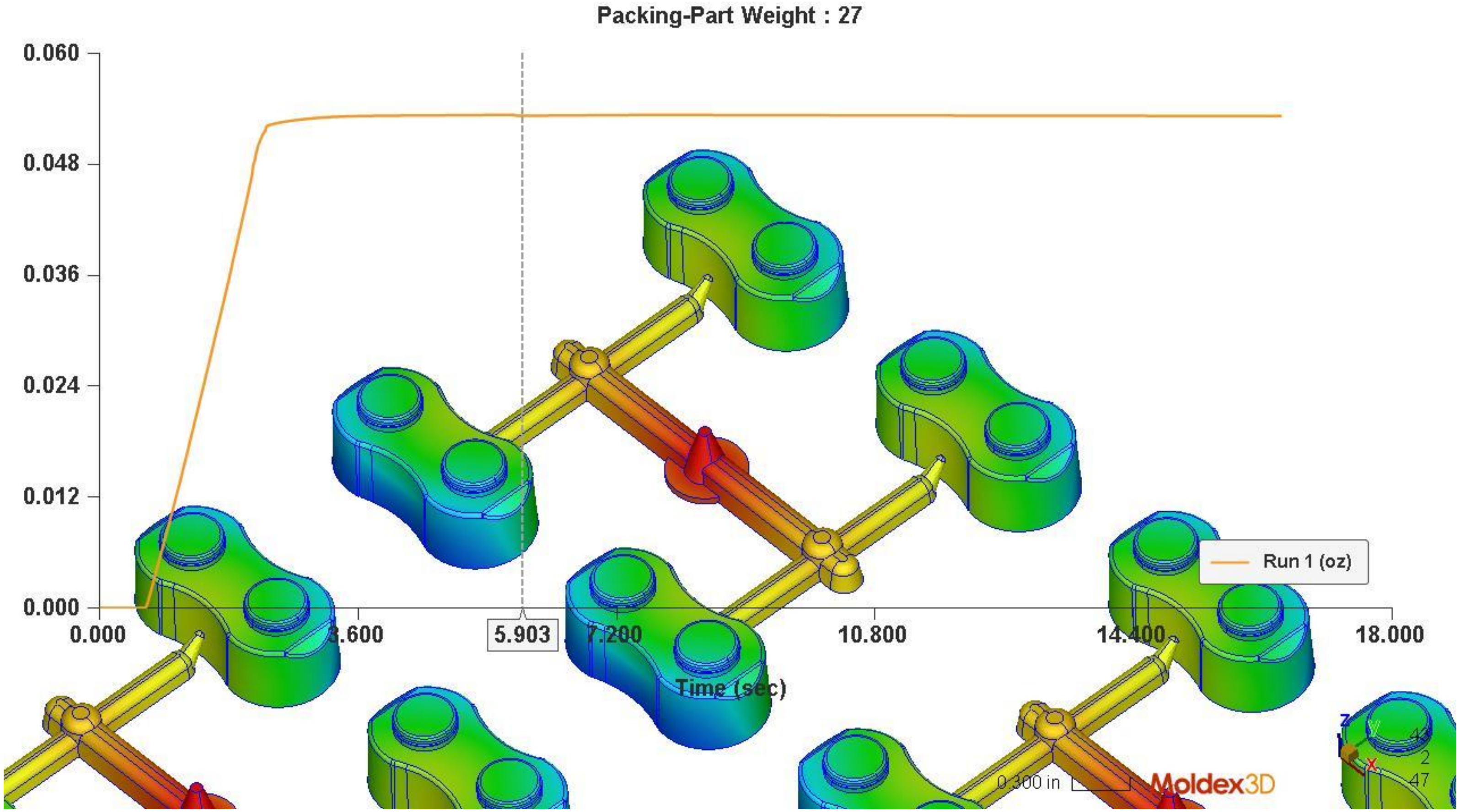
Packing_XY_Part Weight#26



Max	Unit
0.053	oz

Moldex3D

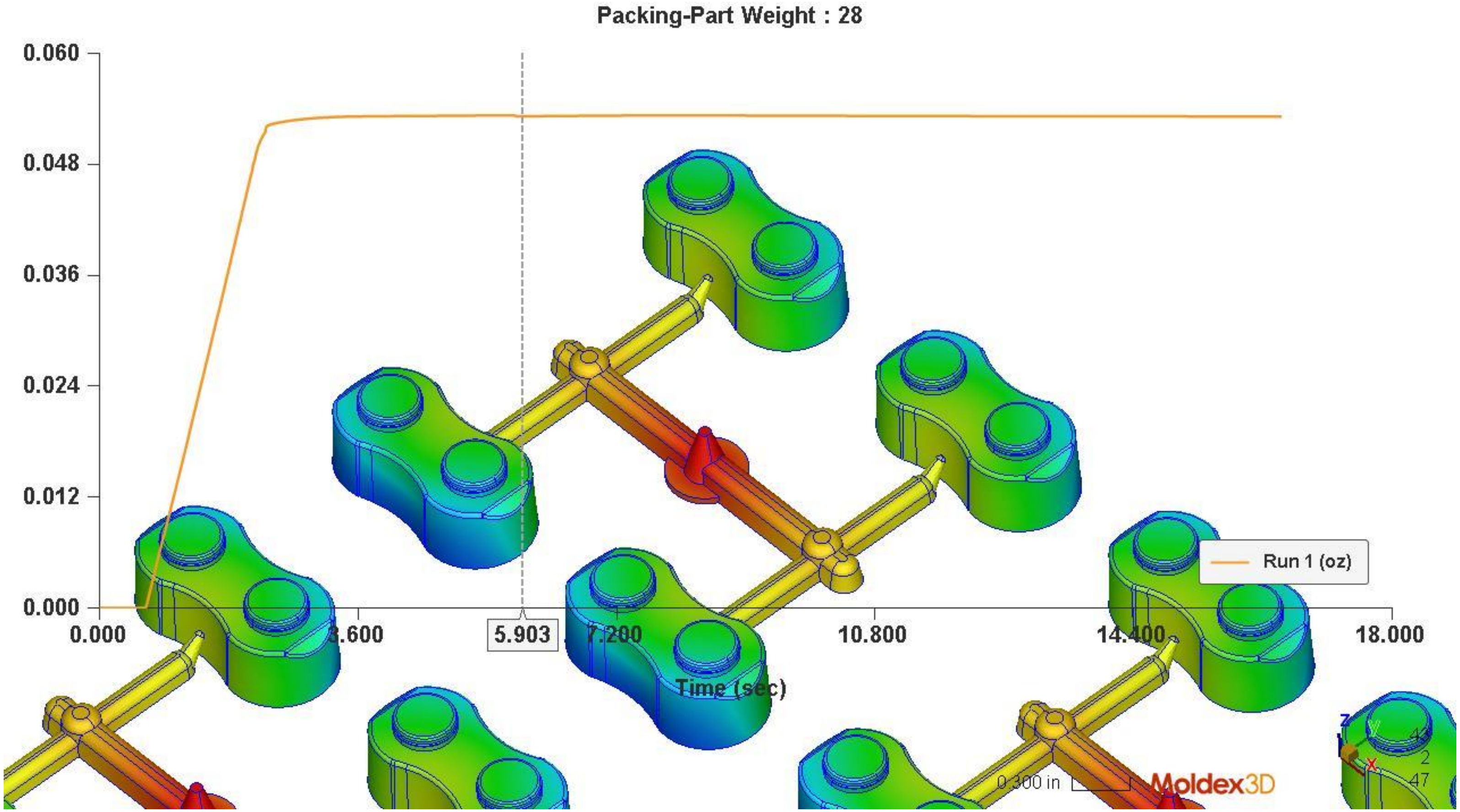
Packing_XY_Part Weight#27



Max	Unit
0.053	oz

Moldex3D

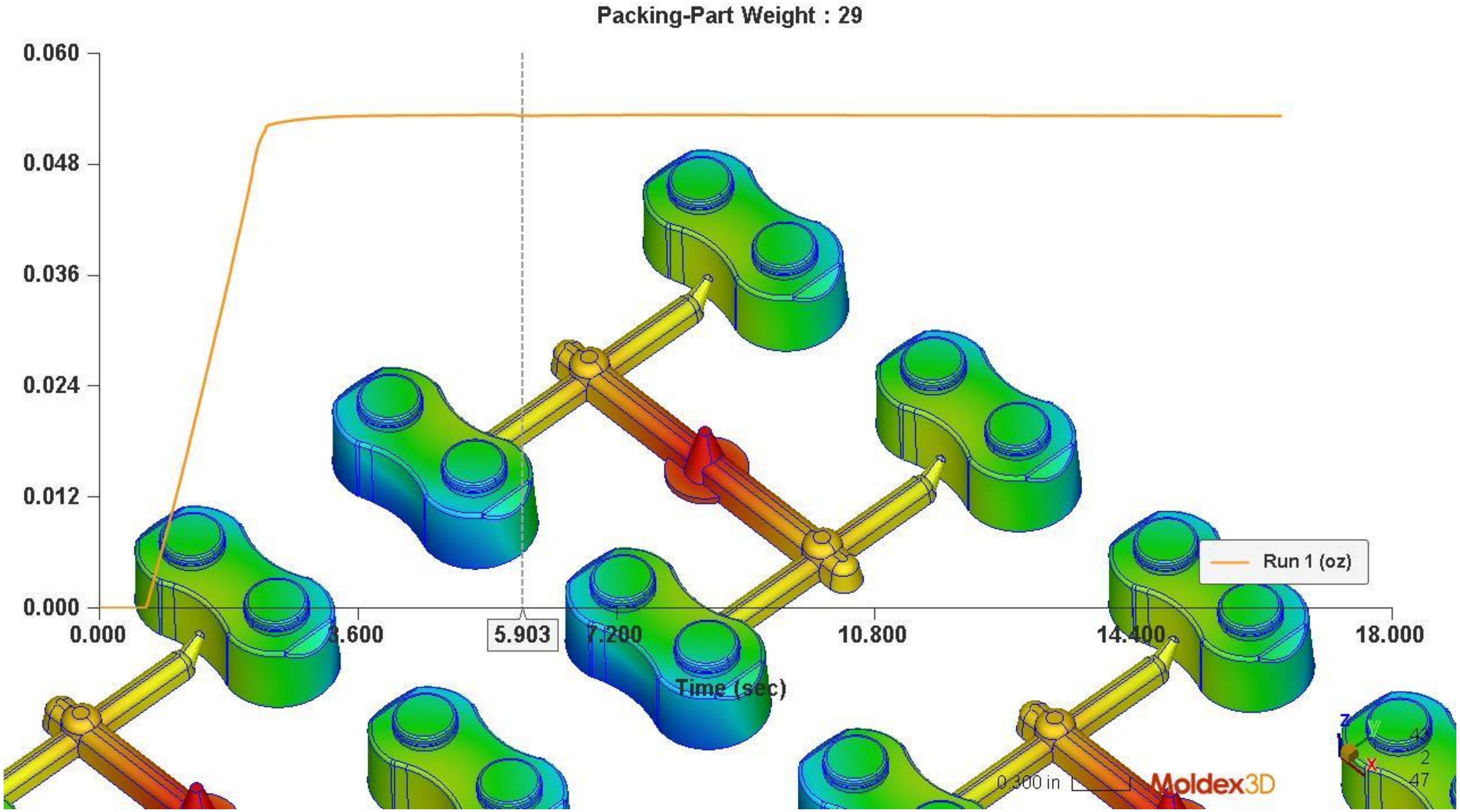
Packing_XY_Part Weight#28



Max	Unit
0.053	oz

Moldex3D

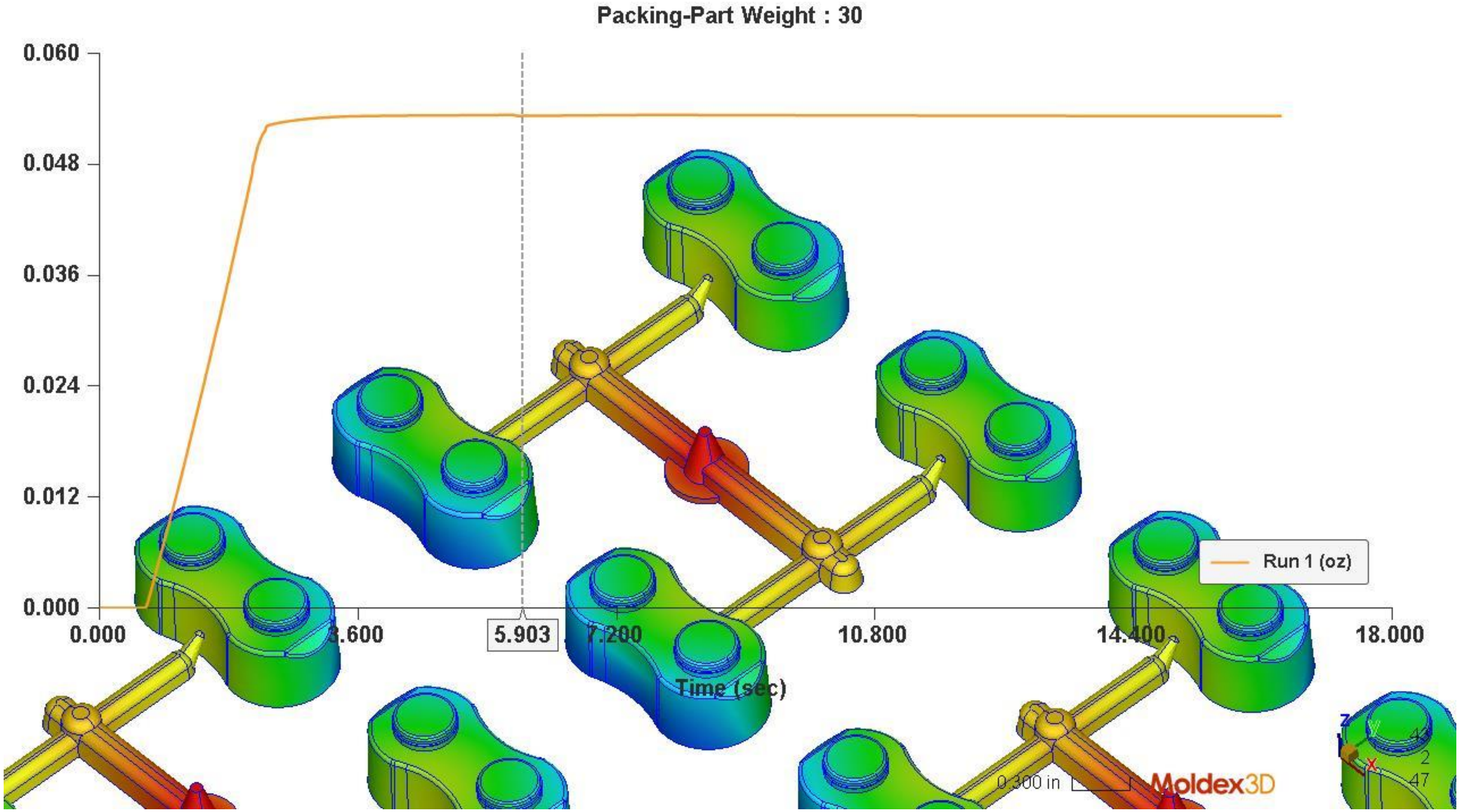
Packing_XY_Part Weight#29



Max	Unit
0.053	oz

Moldex3D

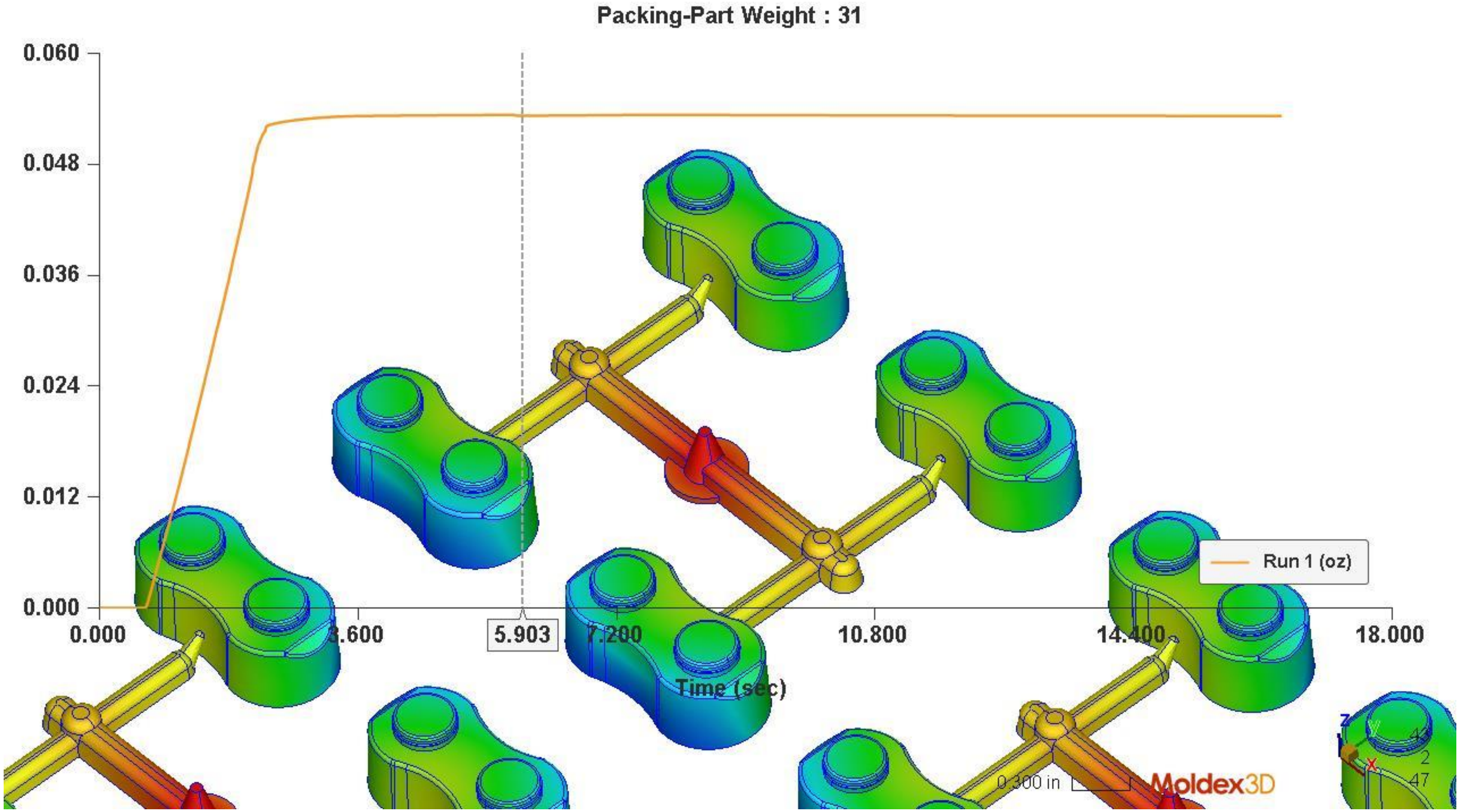
Packing_XY_Part Weight#30



Max	Unit
0.053	oz

Moldex3D

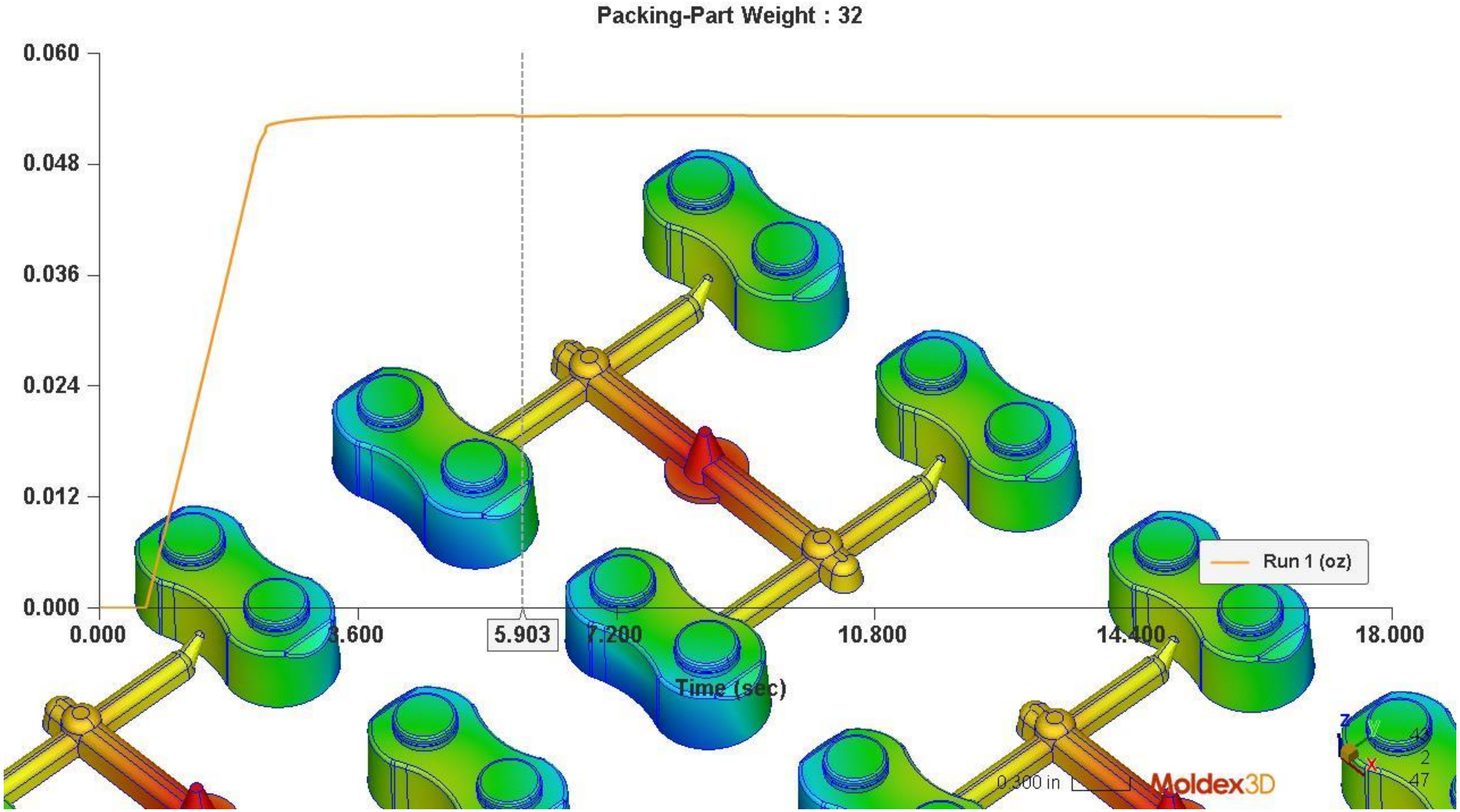
Packing_XY_Part Weight#31



Max	Unit
0.053	oz

Moldex3D

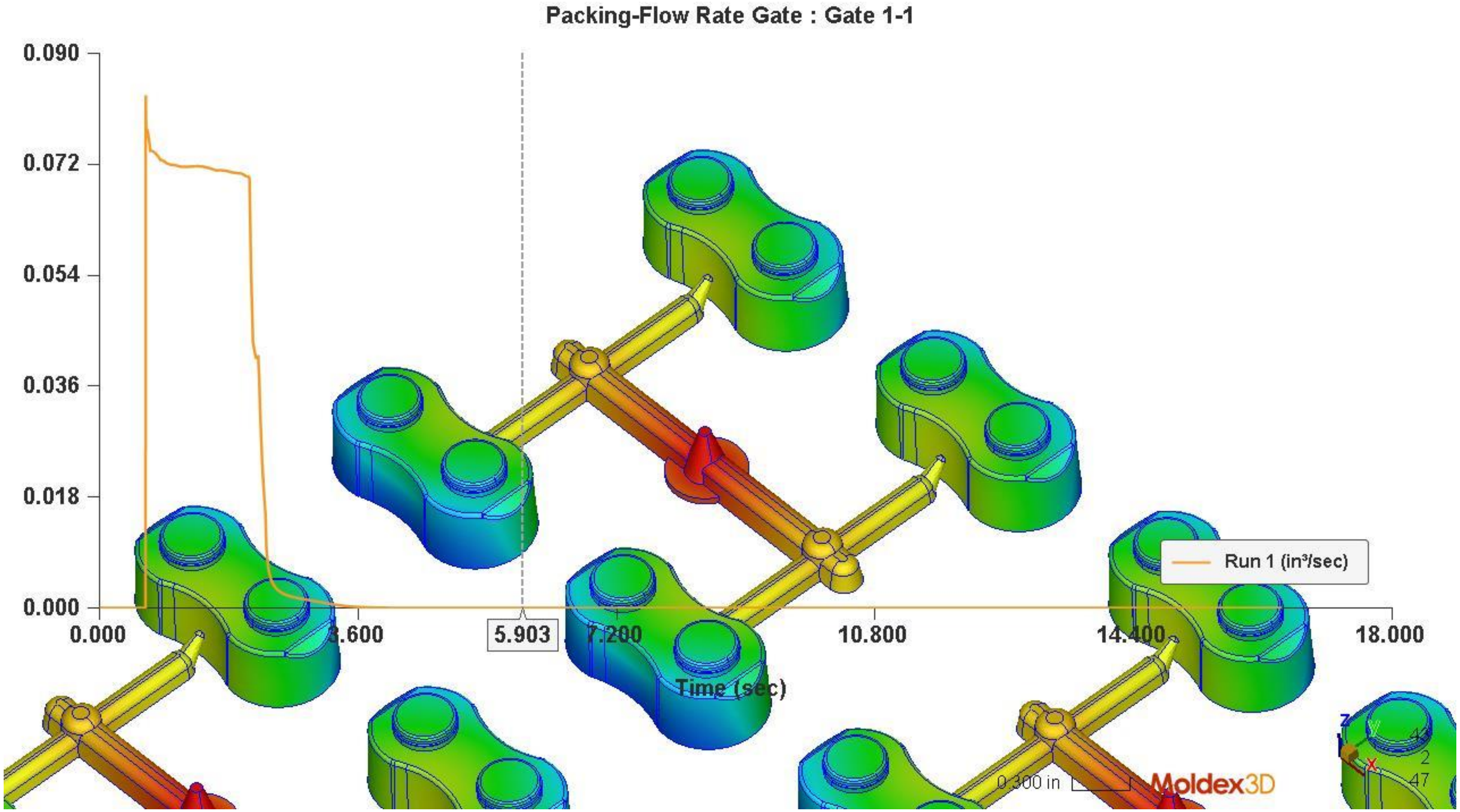
Packing_XY_Part Weight#32



Max	Unit
0.053	oz

Moldex3D

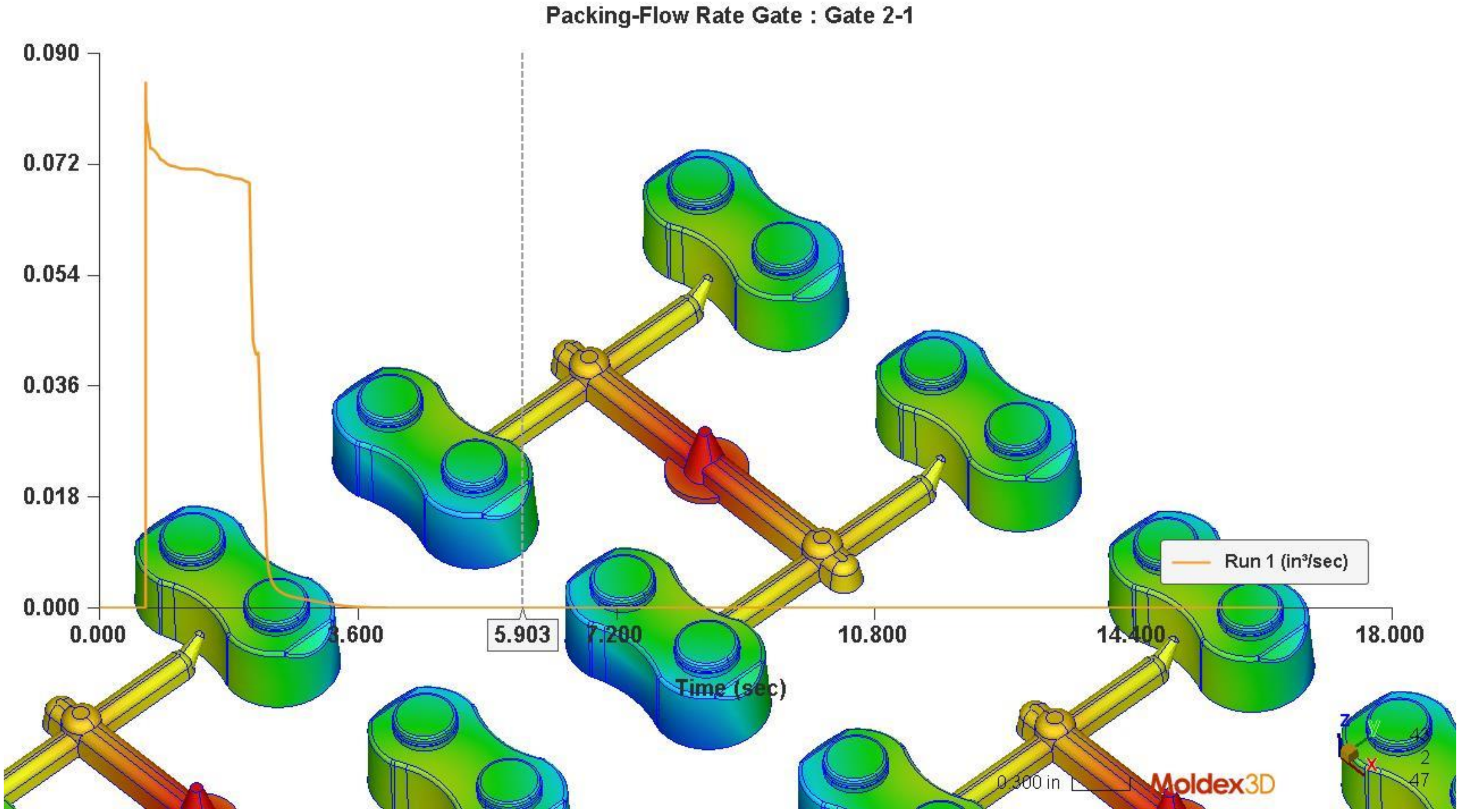
Packing_XY_Flow Rate Gate - Gate 1-1



Max	Unit
0.083	in³/sec

Moldex3D

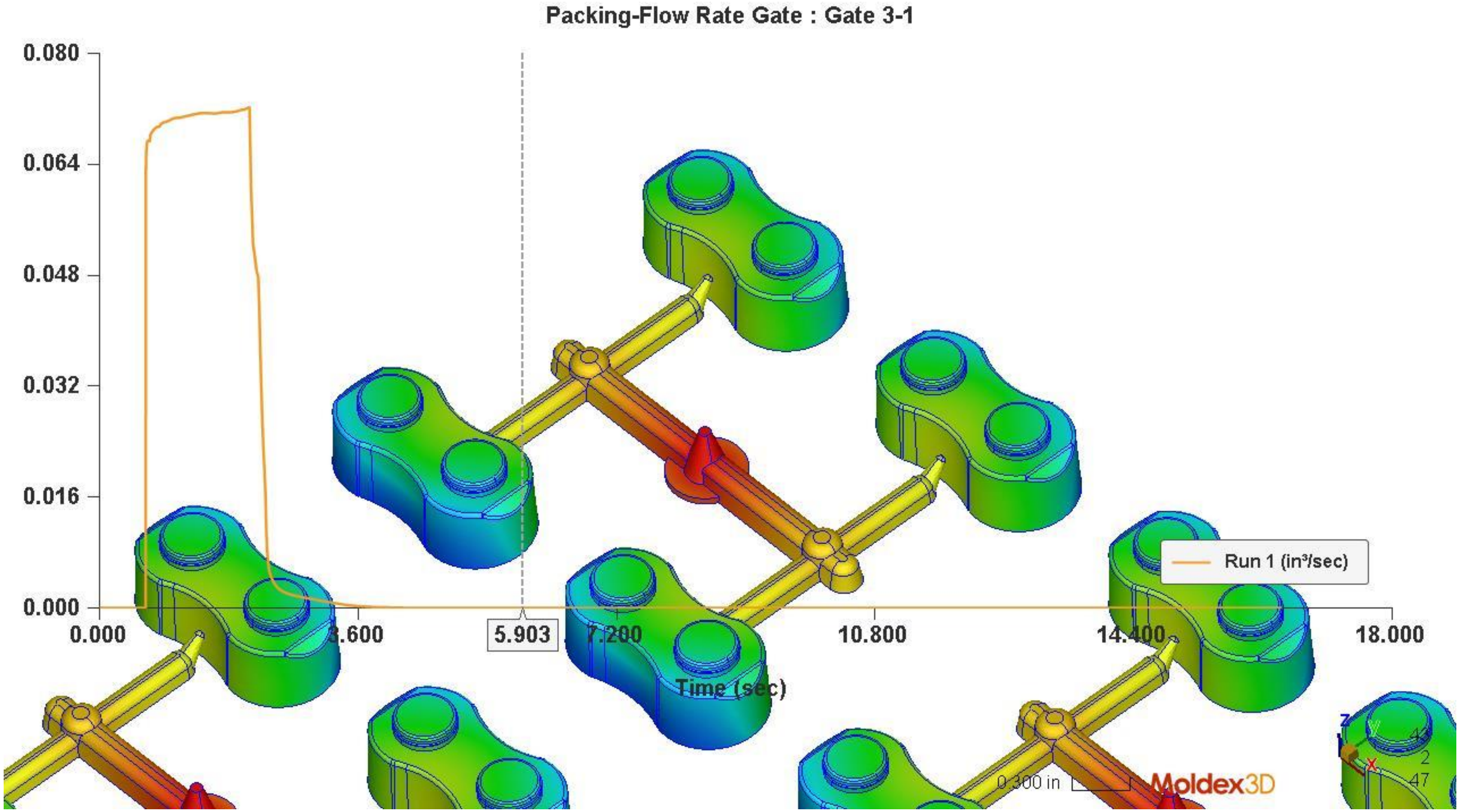
Packing_XY_Flow Rate Gate - Gate 2-1



Max	Unit
0.085	in³/sec

Moldex3D

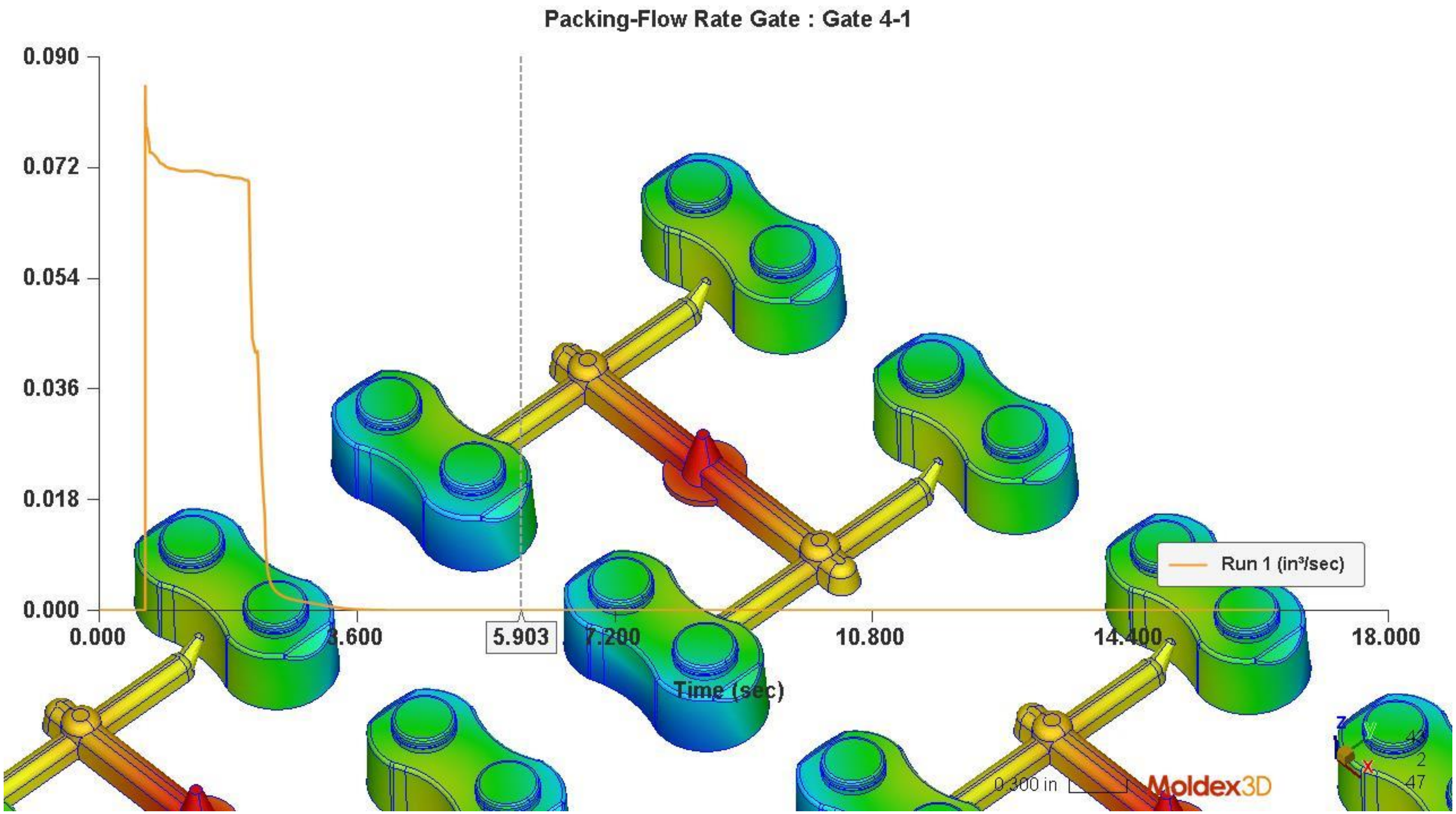
Packing_XY_Flow Rate Gate - Gate 3-1



Max	Unit
0.072	in³/sec

Moldex3D

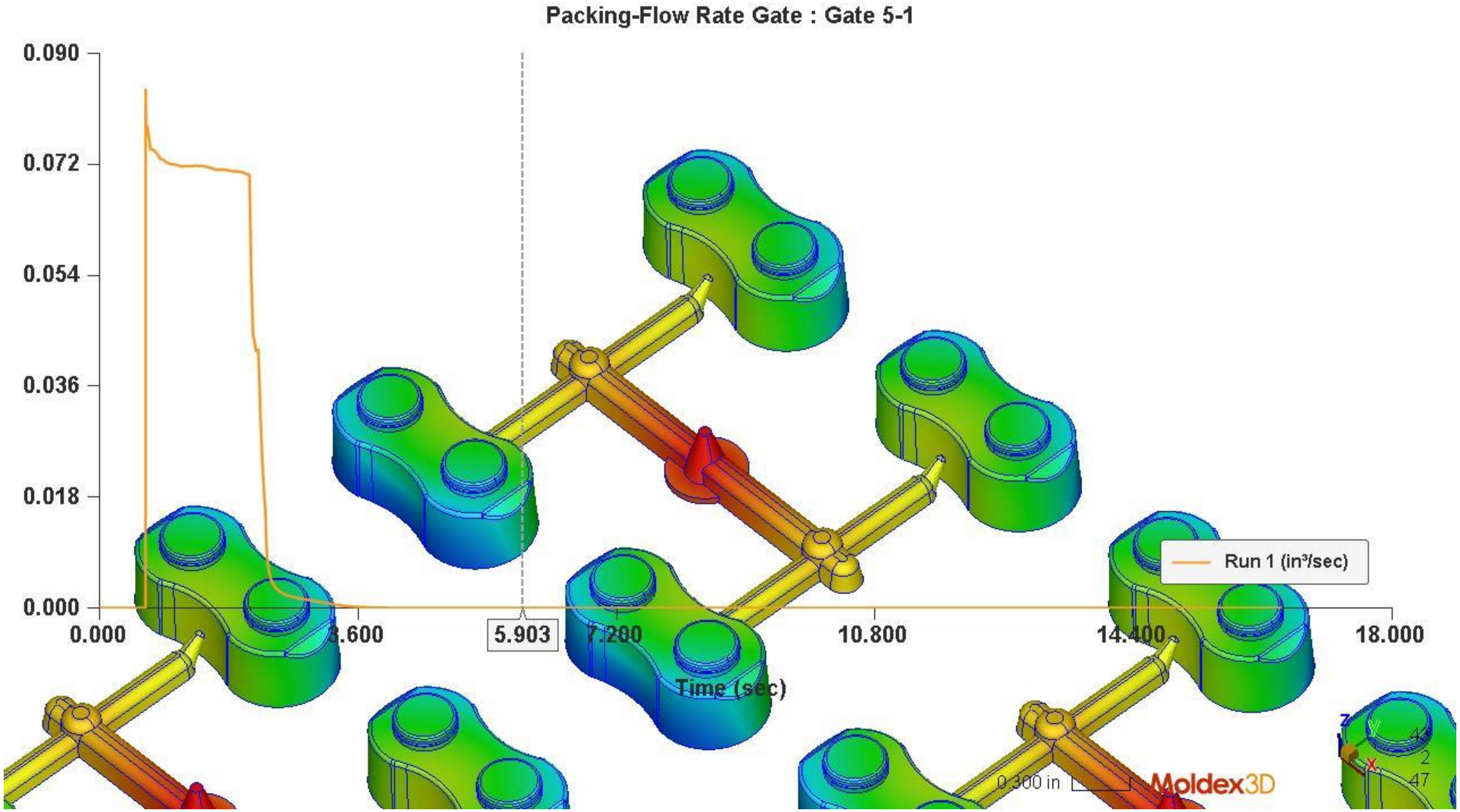
Packing_XY_Flow Rate Gate - Gate 4-1



Max	Unit
0.085	in³/sec

Moldex3D

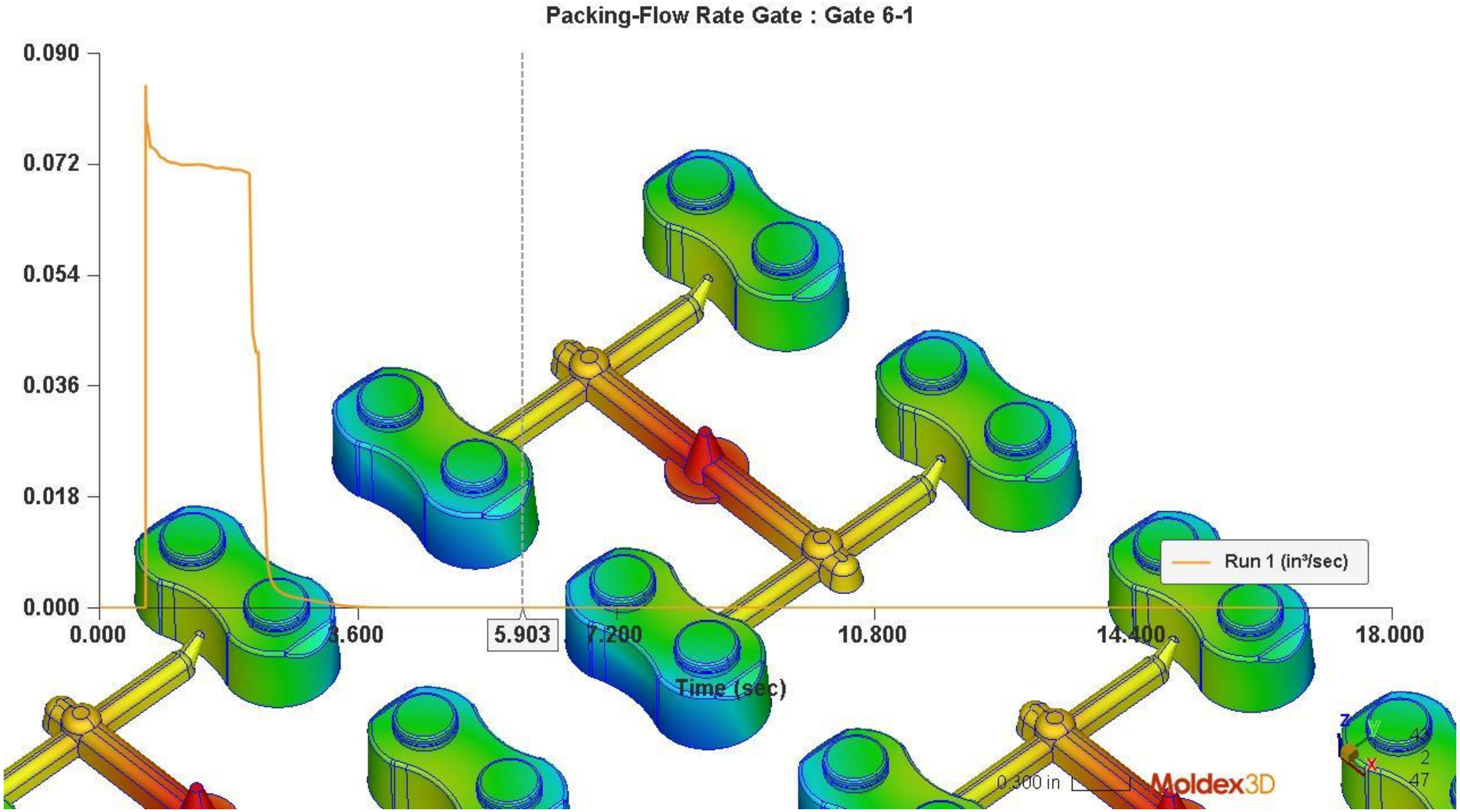
Packing_XY_Flow Rate Gate - Gate 5-1



Max	Unit
0.084	in³/sec

Moldex3D

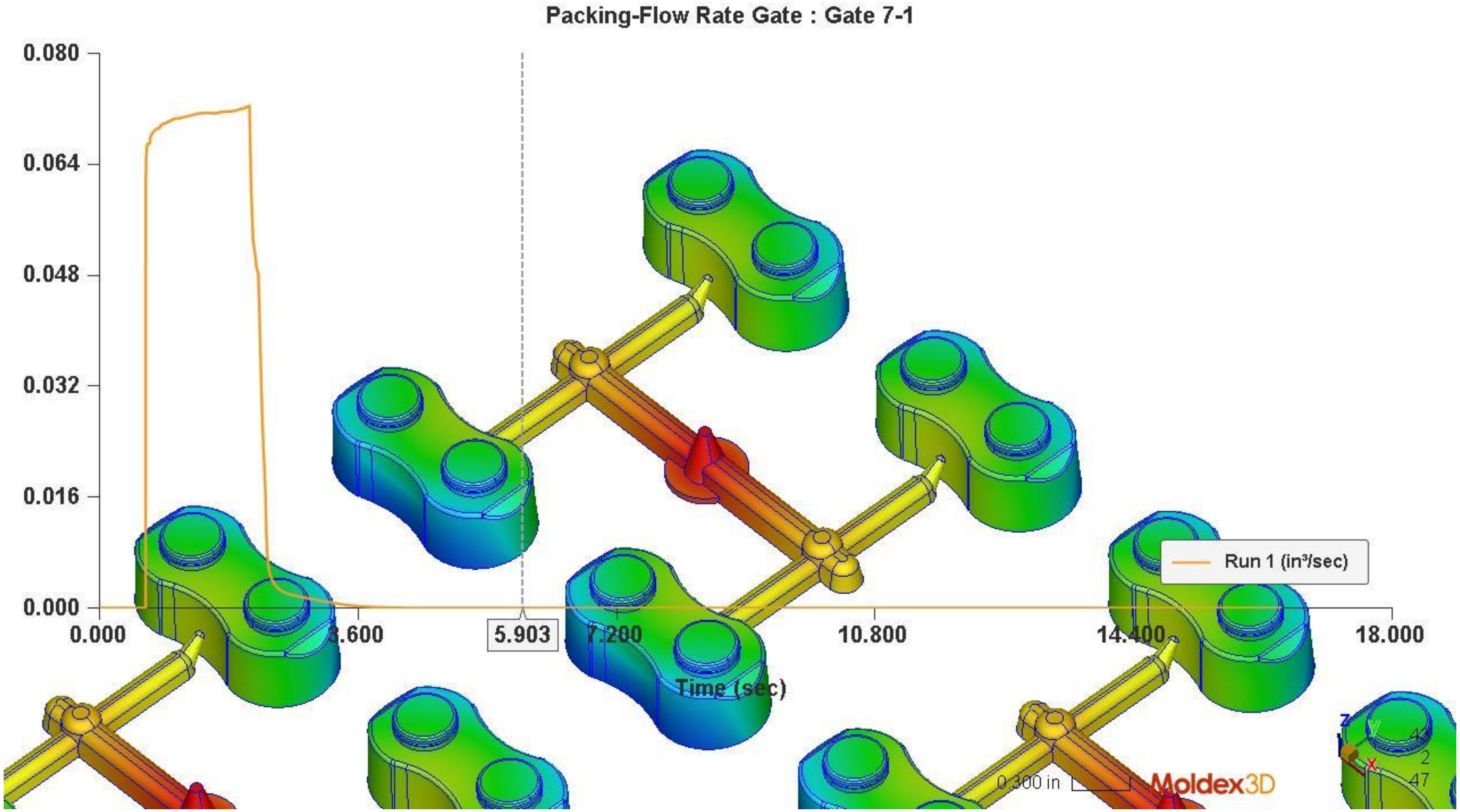
Packing_XY_Flow Rate Gate - Gate 6-1



Max	Unit
0.085	in³/sec

Moldex3D

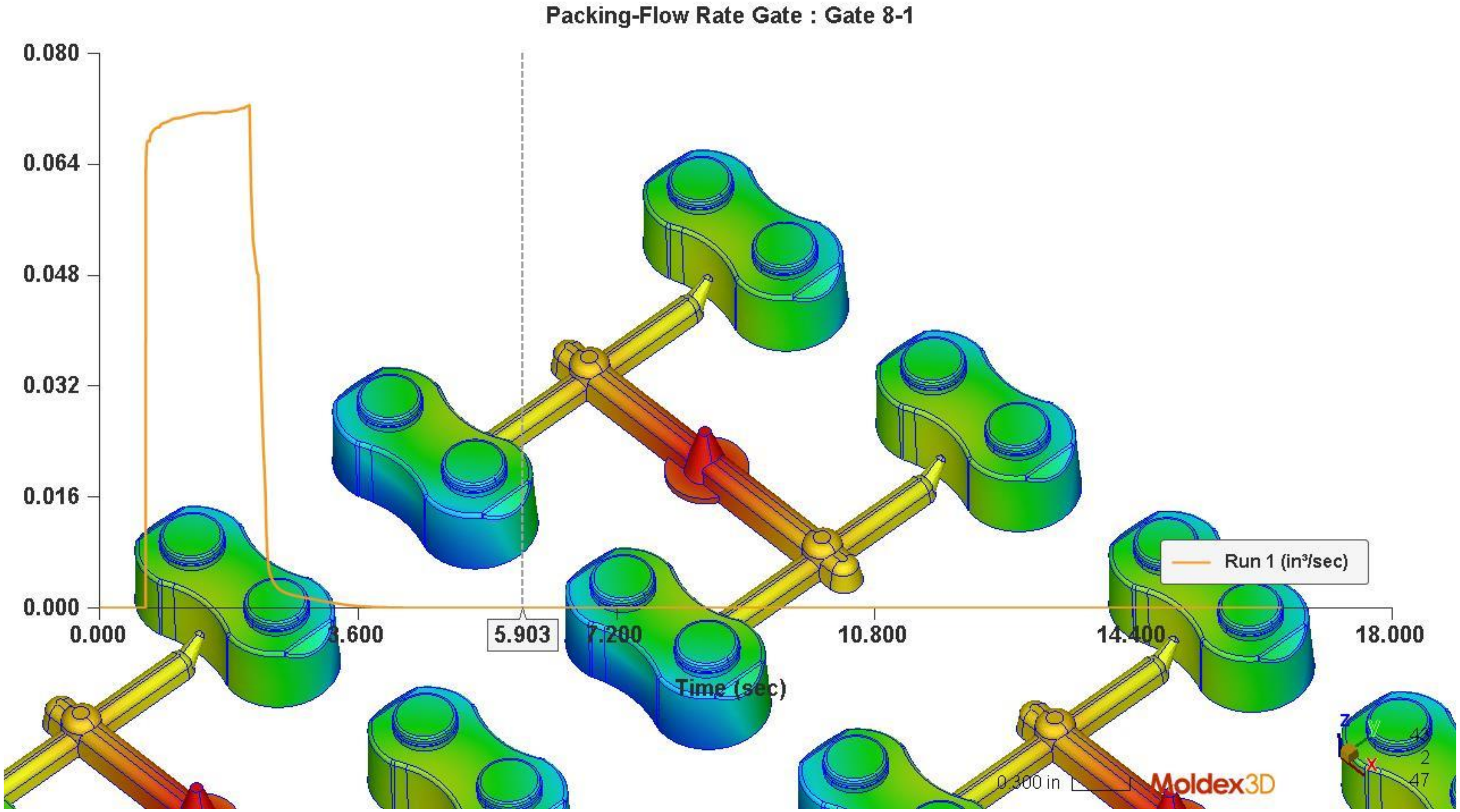
Packing_XY_Flow Rate Gate - Gate 7-1



Max	Unit
0.072	in³/sec

Moldex3D

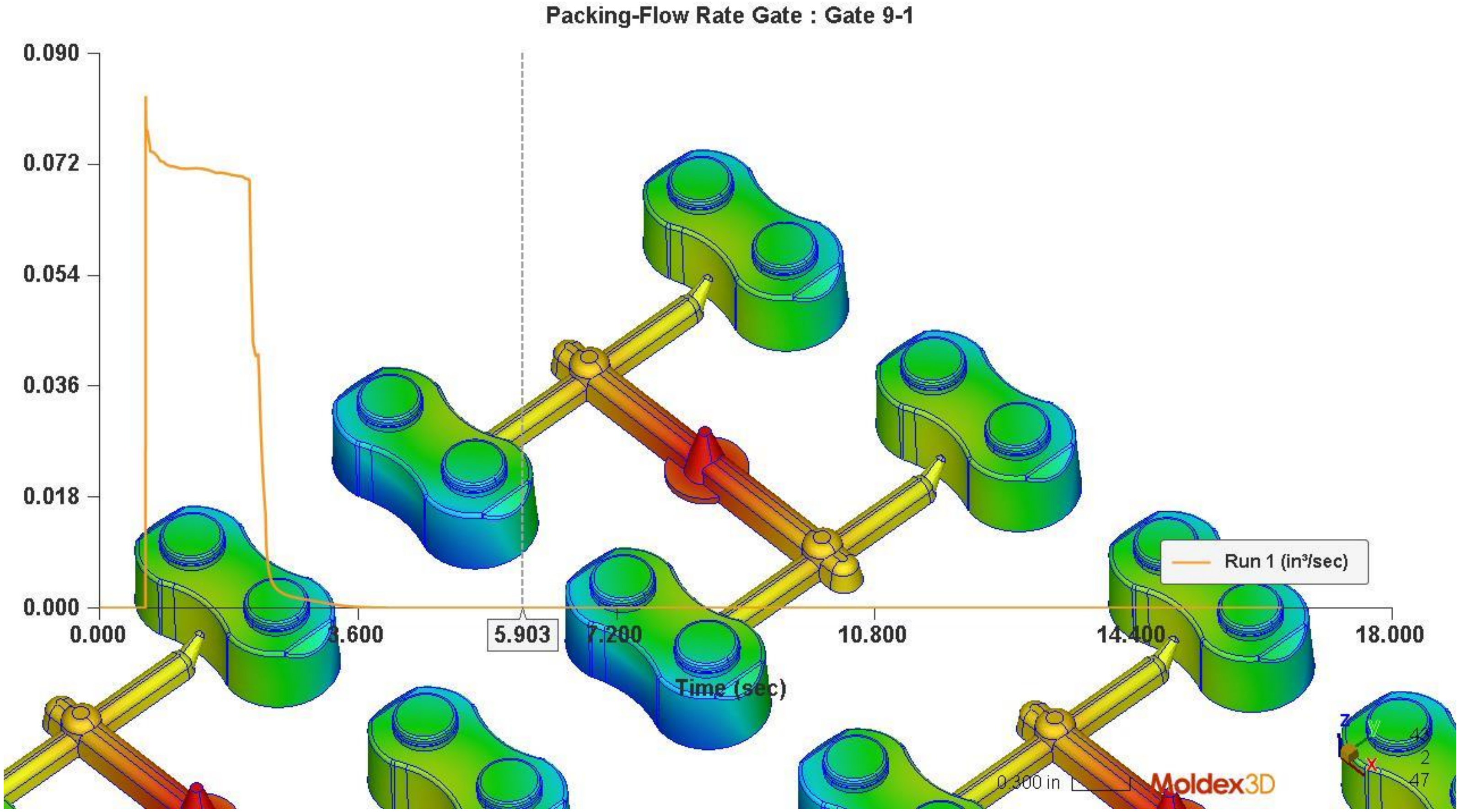
Packing_XY_Flow Rate Gate - Gate 8-1



Max	Unit
0.073	in^3/sec

Moldex3D

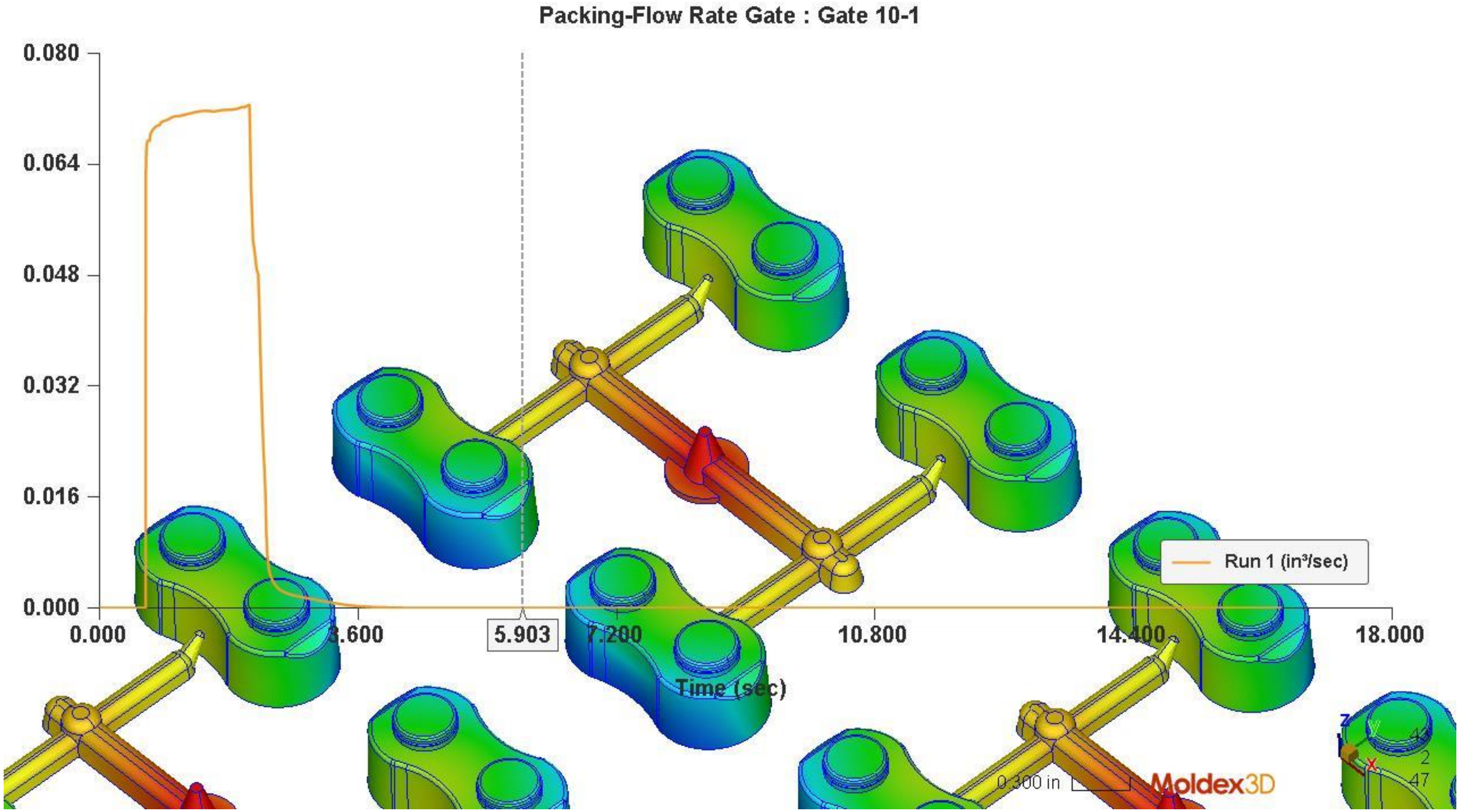
Packing_XY_Flow Rate Gate - Gate 9-1



Max	Unit
0.083	in³/sec

Moldex3D

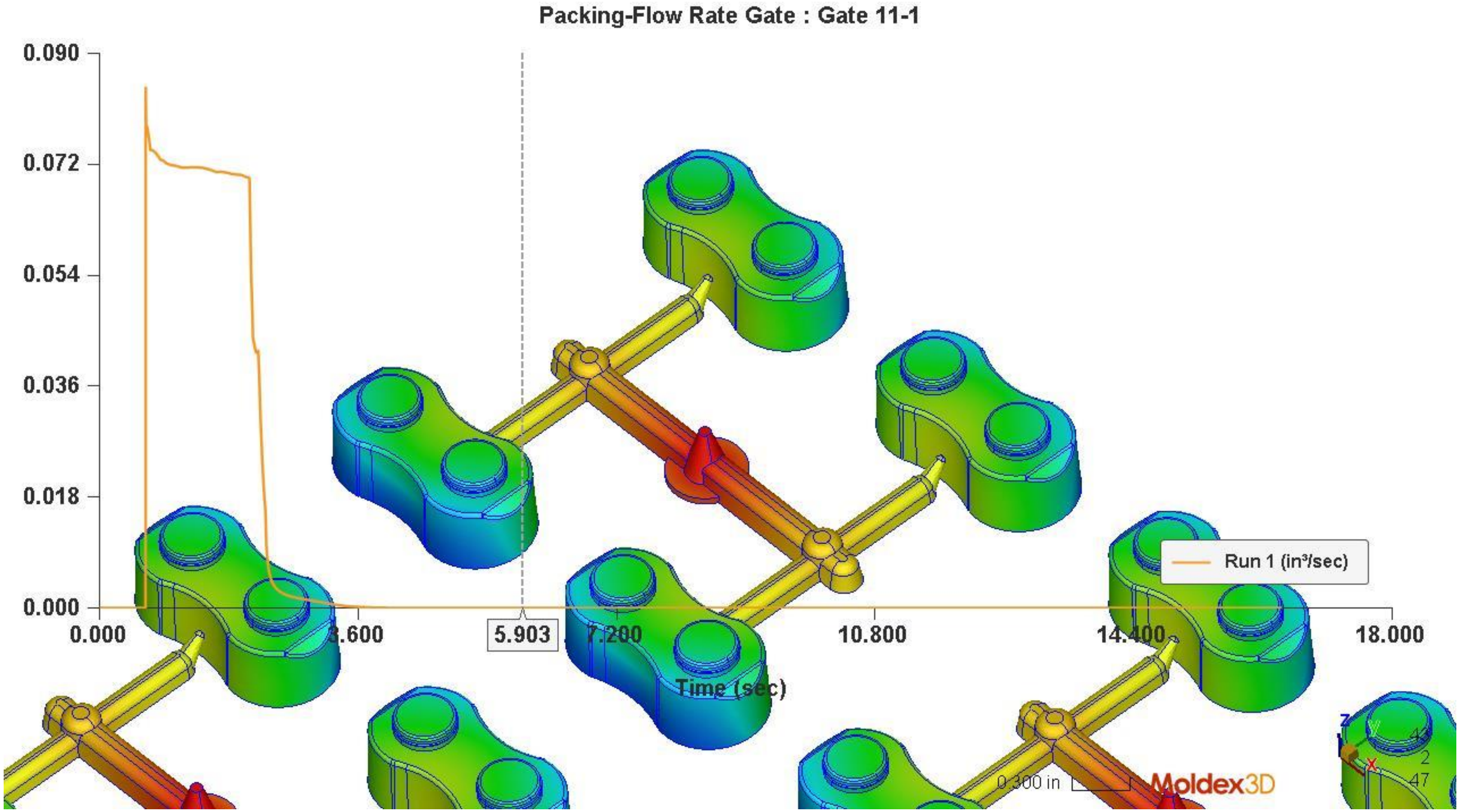
Packing_XY_Flow Rate Gate - Gate 10-1



Max	Unit
0.073	in³/sec

Moldex3D

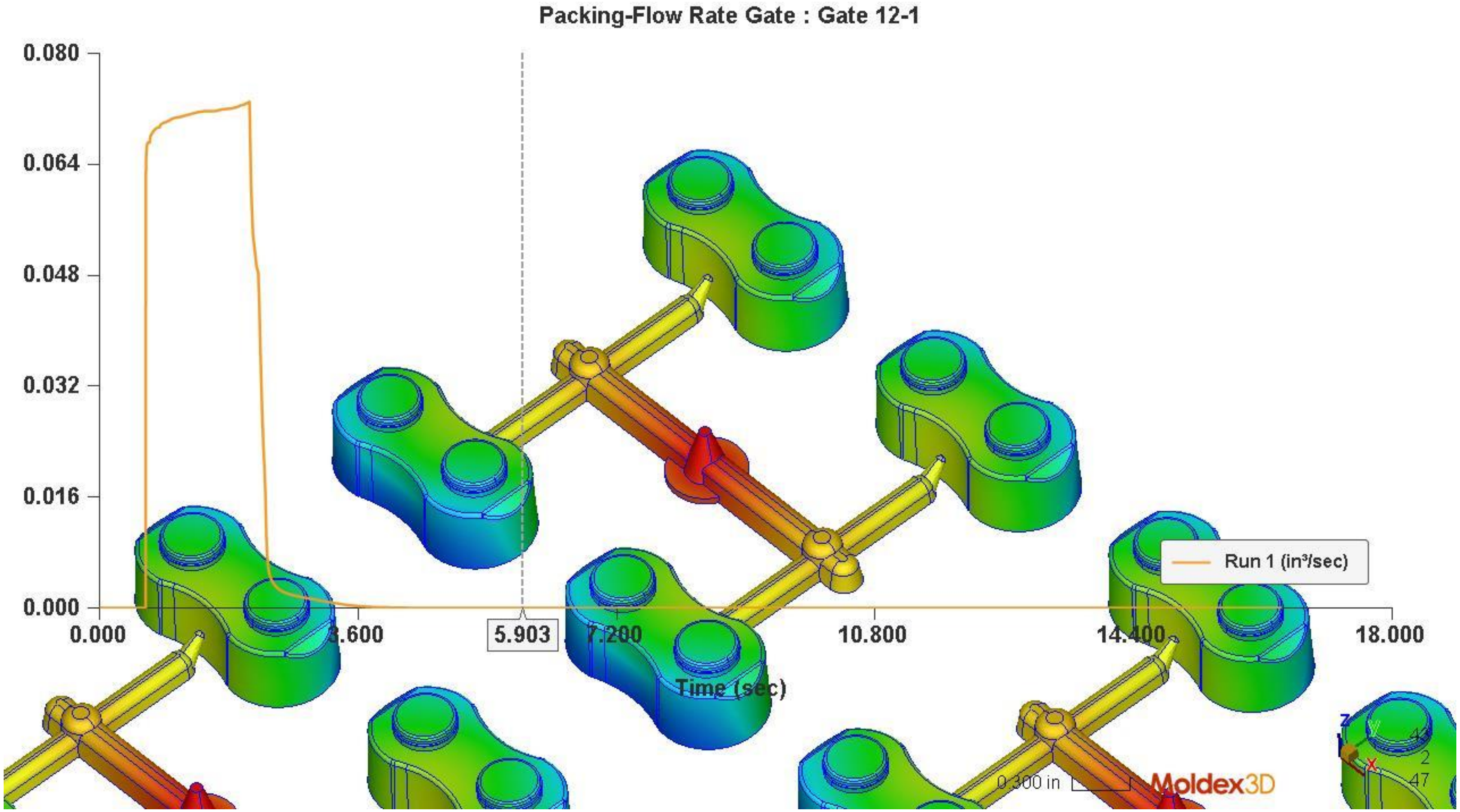
Packing_XY_Flow Rate Gate - Gate 11-1



Max	Unit
0.084	in³/sec

Moldex3D

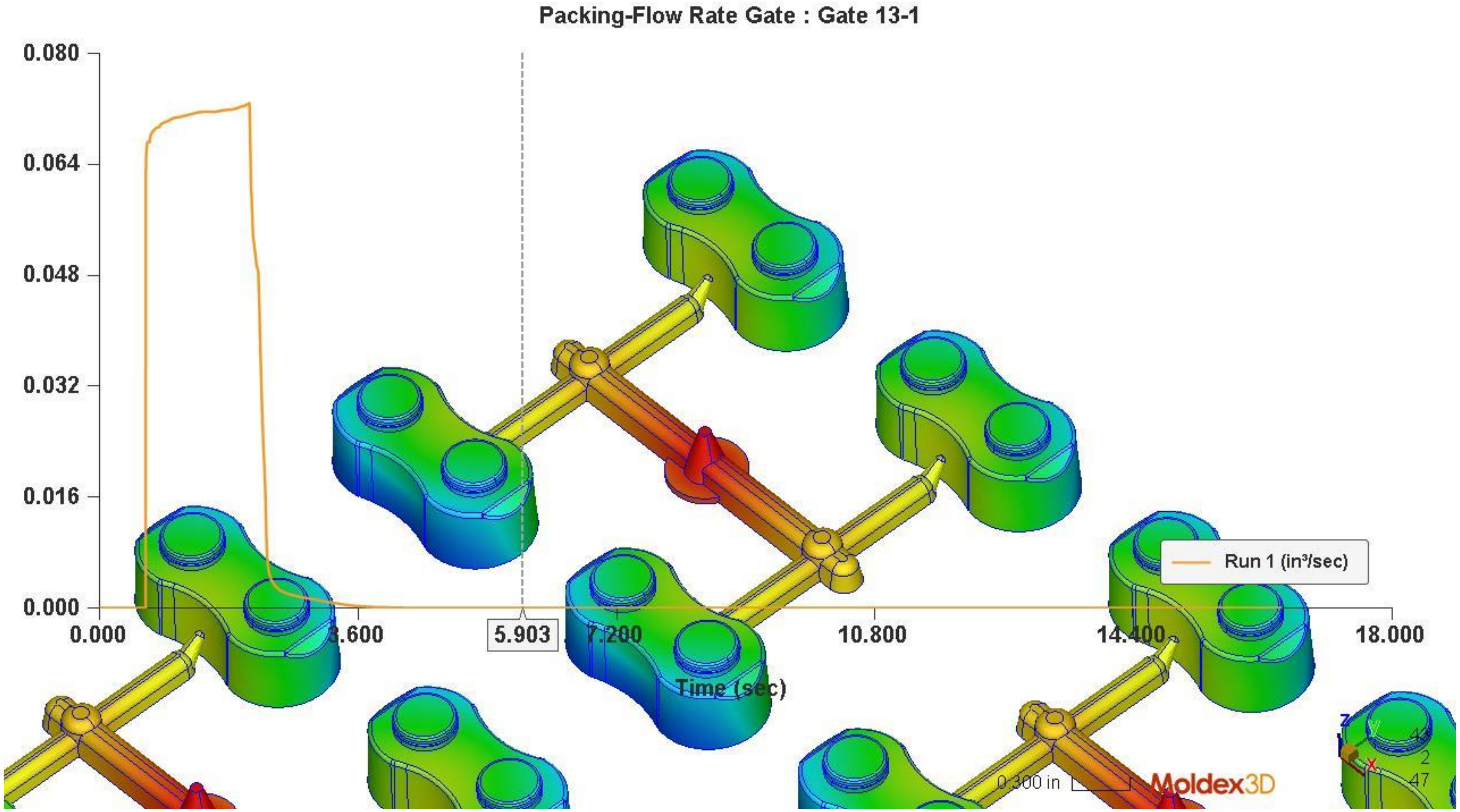
Packing_XY_Flow Rate Gate - Gate 12-1



Max	Unit
0.073	in^3/sec

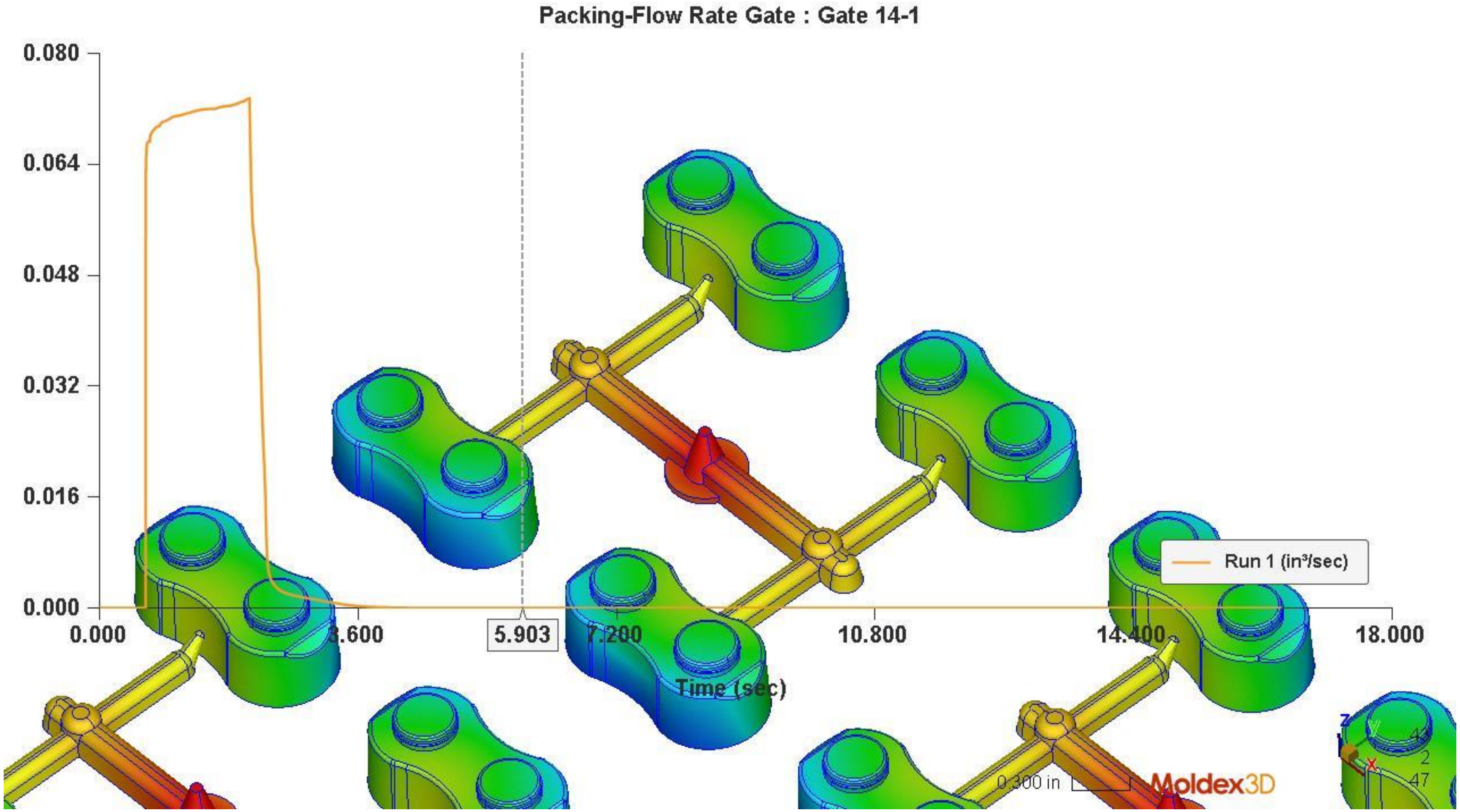
Moldex3D

Packing_XY_Flow Rate Gate - Gate 13-1



Max	Unit
0.073	in³/sec

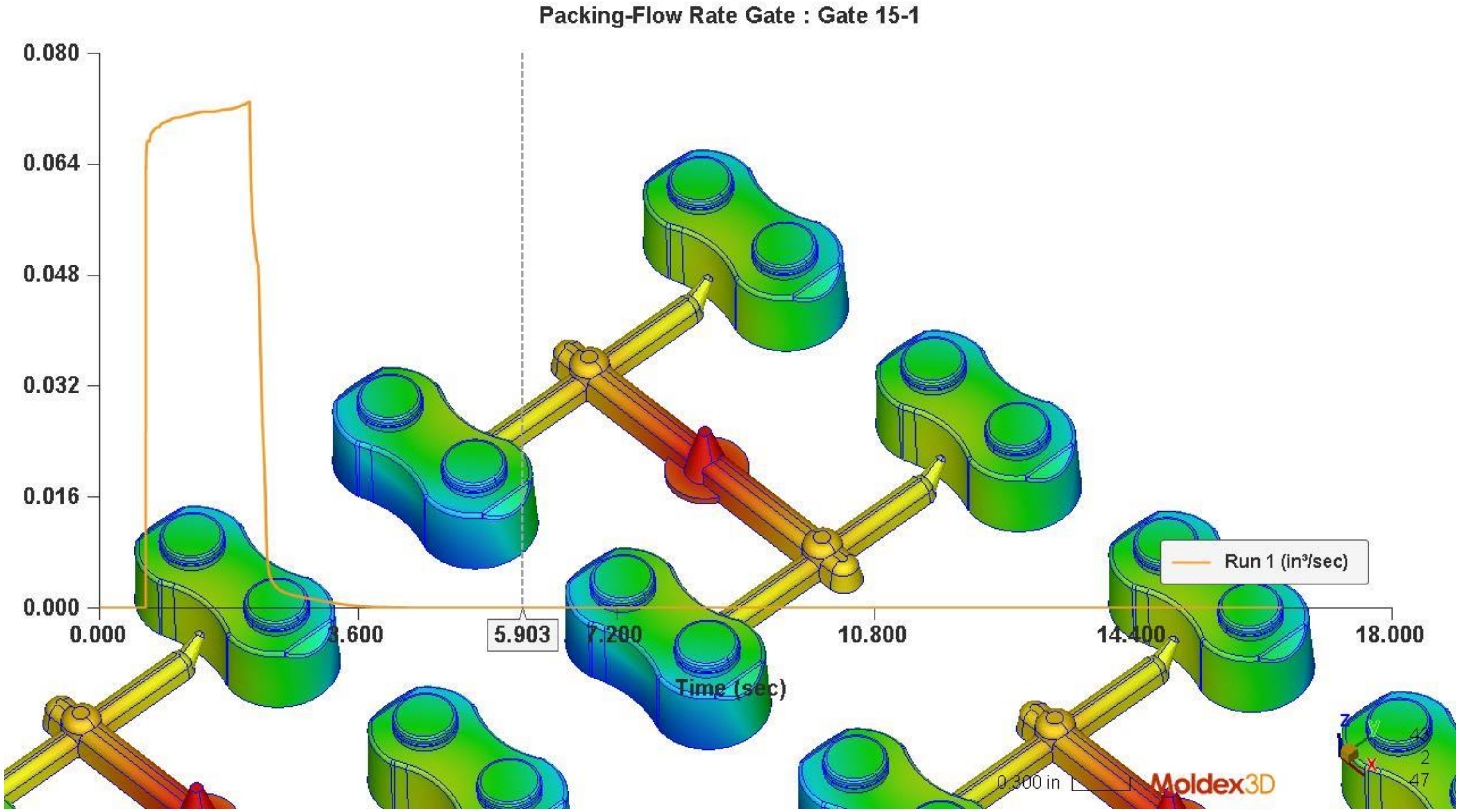
Packing_XY_Flow Rate Gate - Gate 14-1



Max	Unit
0.074	in^3/sec

Moldex3D

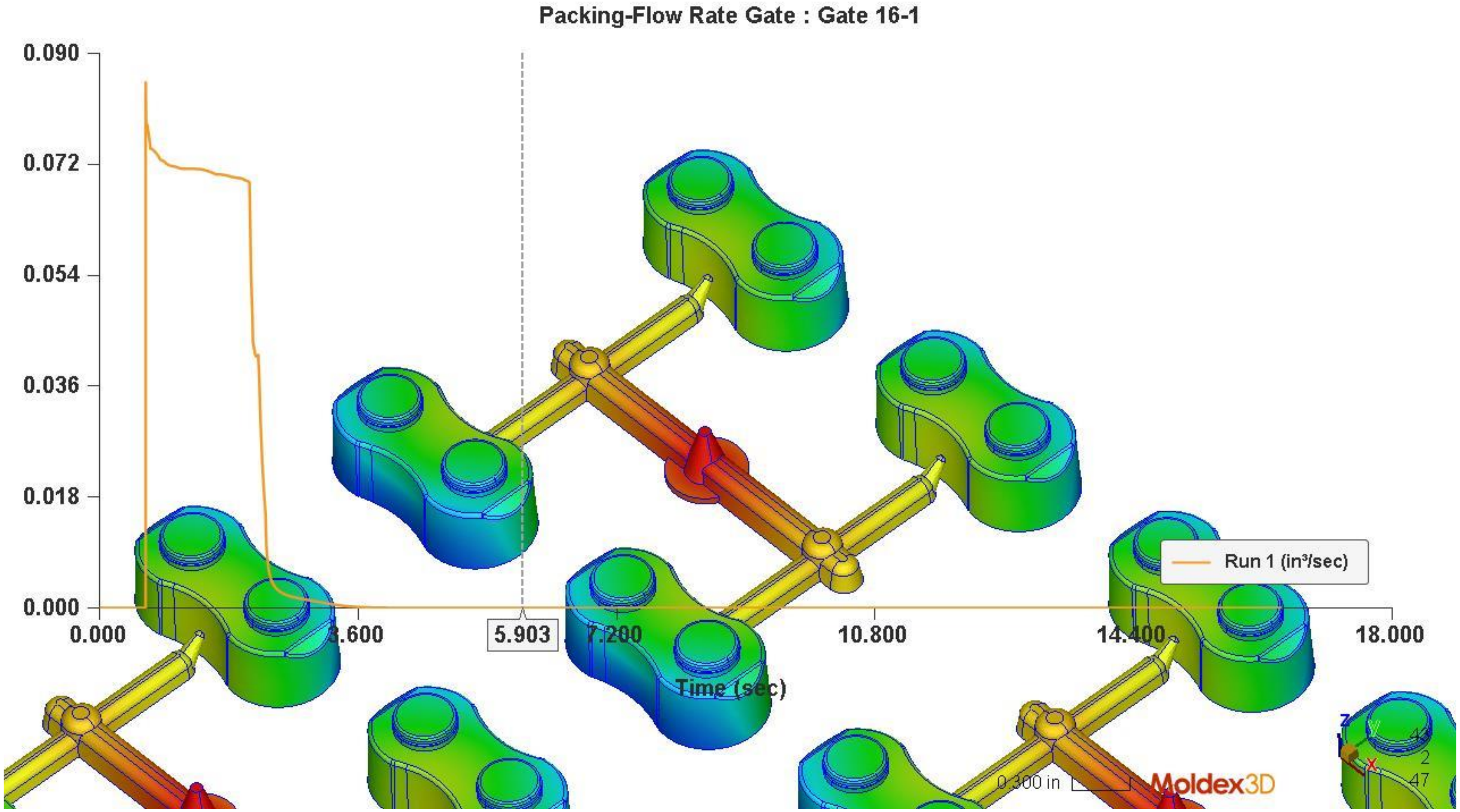
Packing_XY_Flow Rate Gate - Gate 15-1



Max	Unit
0.073	in³/sec

Moldex3D

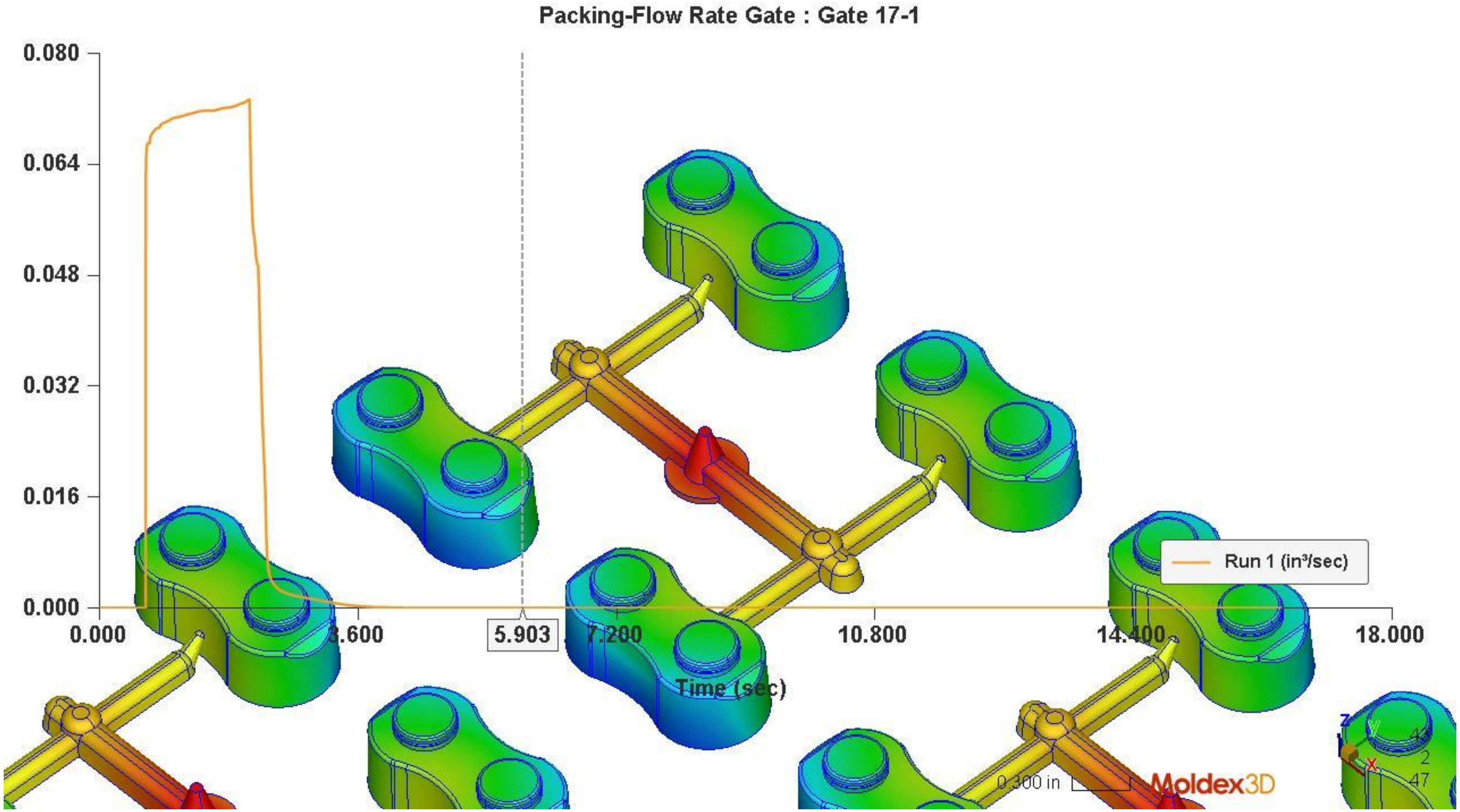
Packing_XY_Flow Rate Gate - Gate 16-1



Max	Unit
0.085	in³/sec

Moldex3D

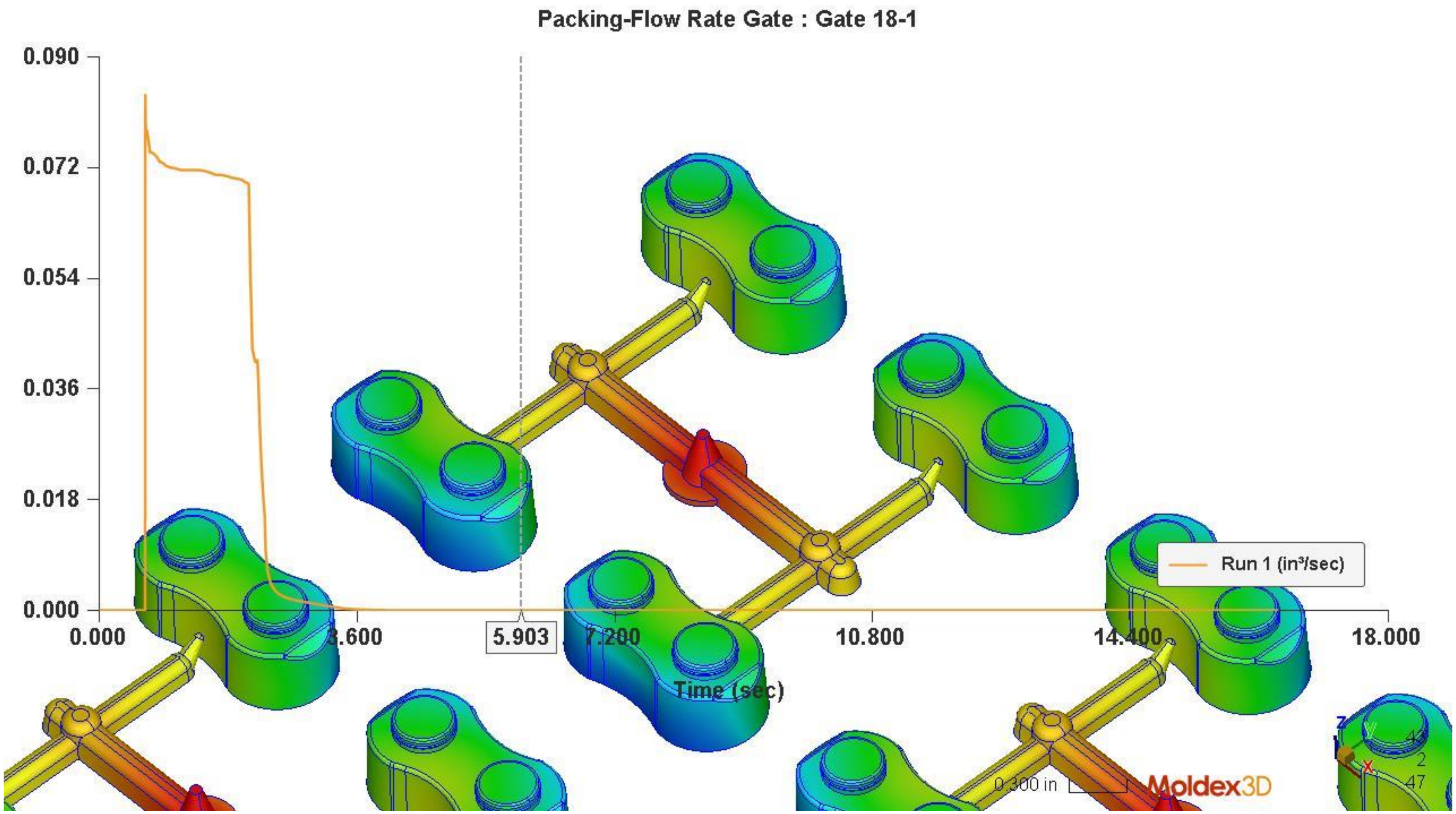
Packing_XY_Flow Rate Gate - Gate 17-1



Max	Unit
0.073	in^3/sec

Moldex3D

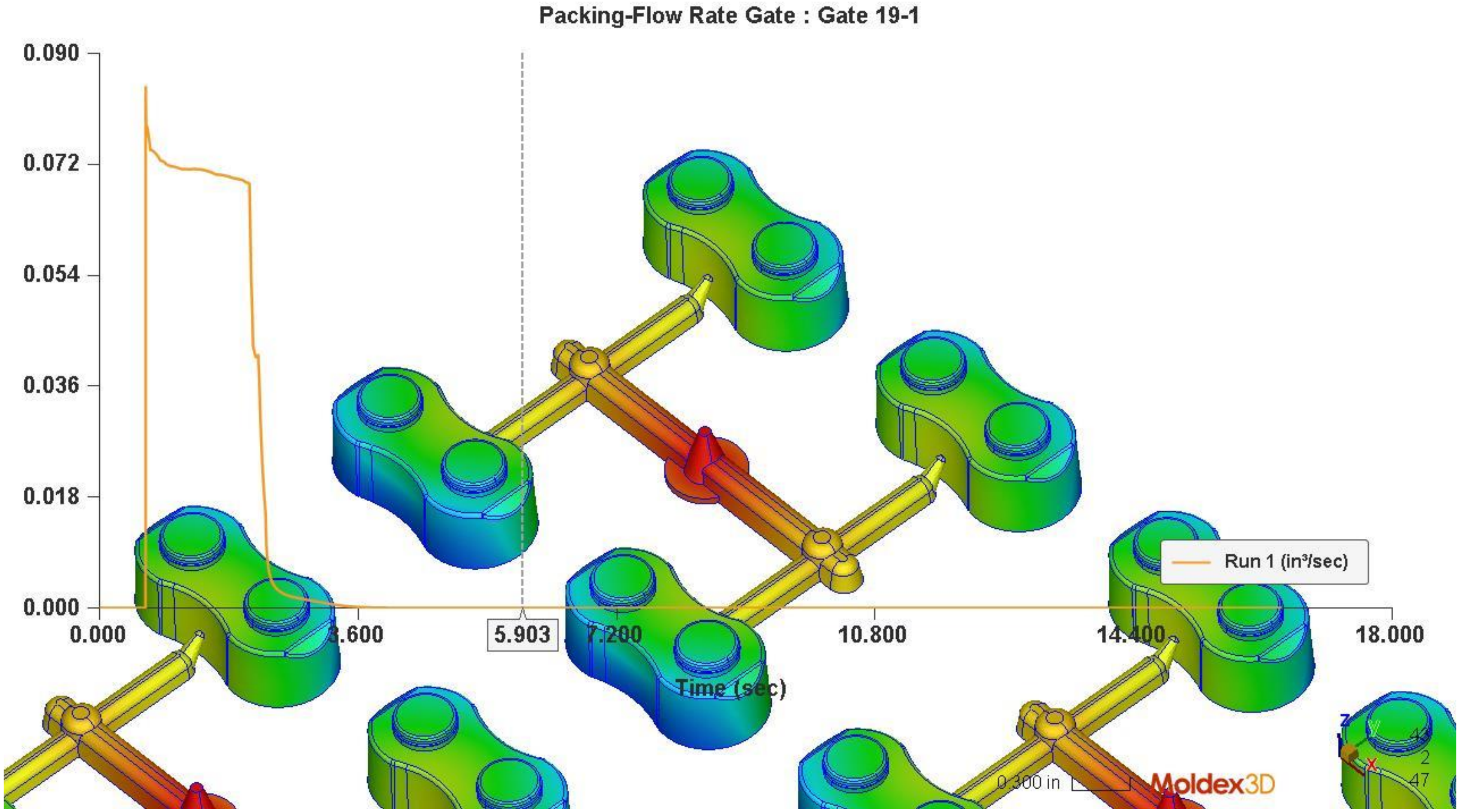
Packing_XY_Flow Rate Gate - Gate 18-1



Max	Unit
0.084	in³/sec

Moldex3D

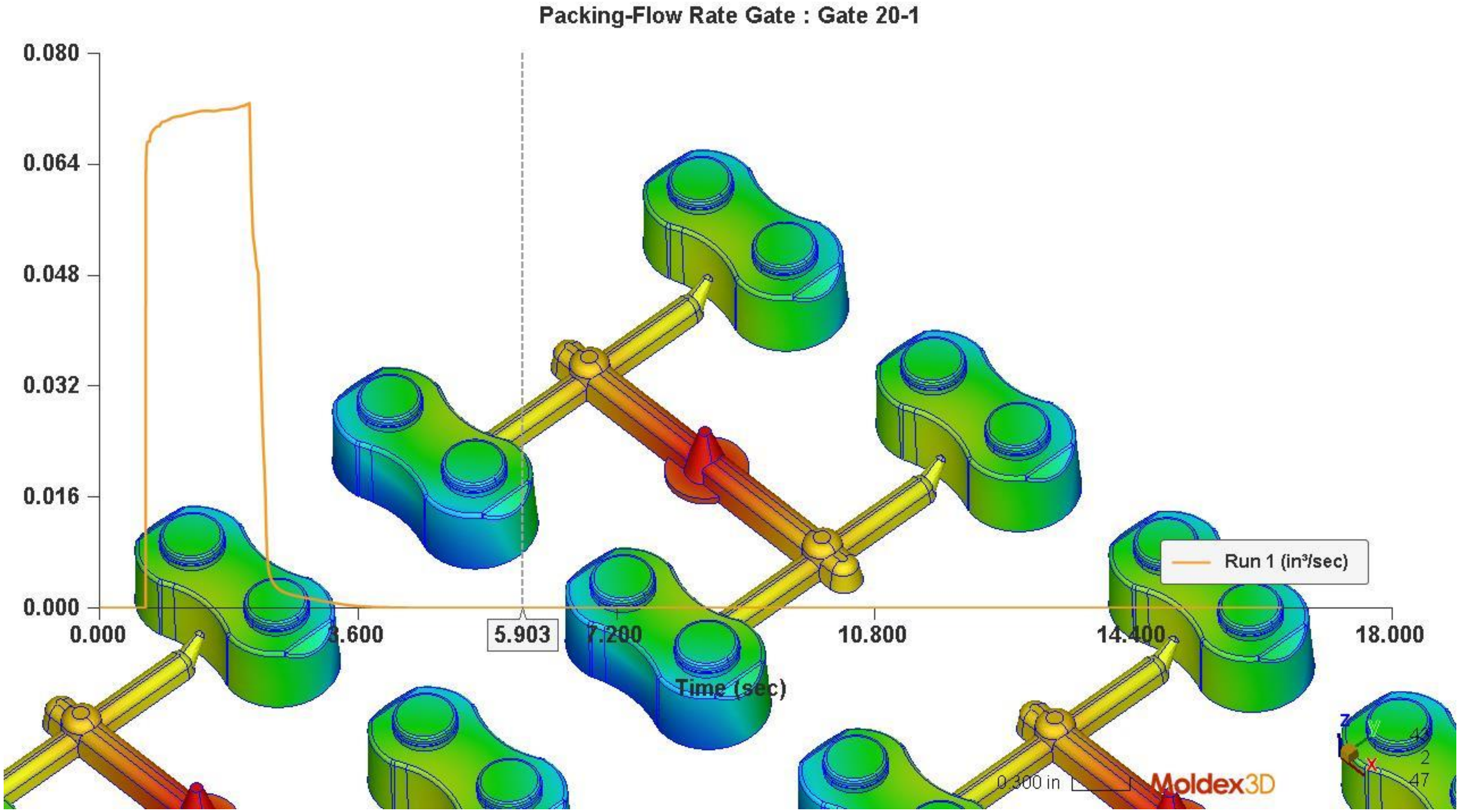
Packing_XY_Flow Rate Gate - Gate 19-1



Max	Unit
0.085	in³/sec

Moldex3D

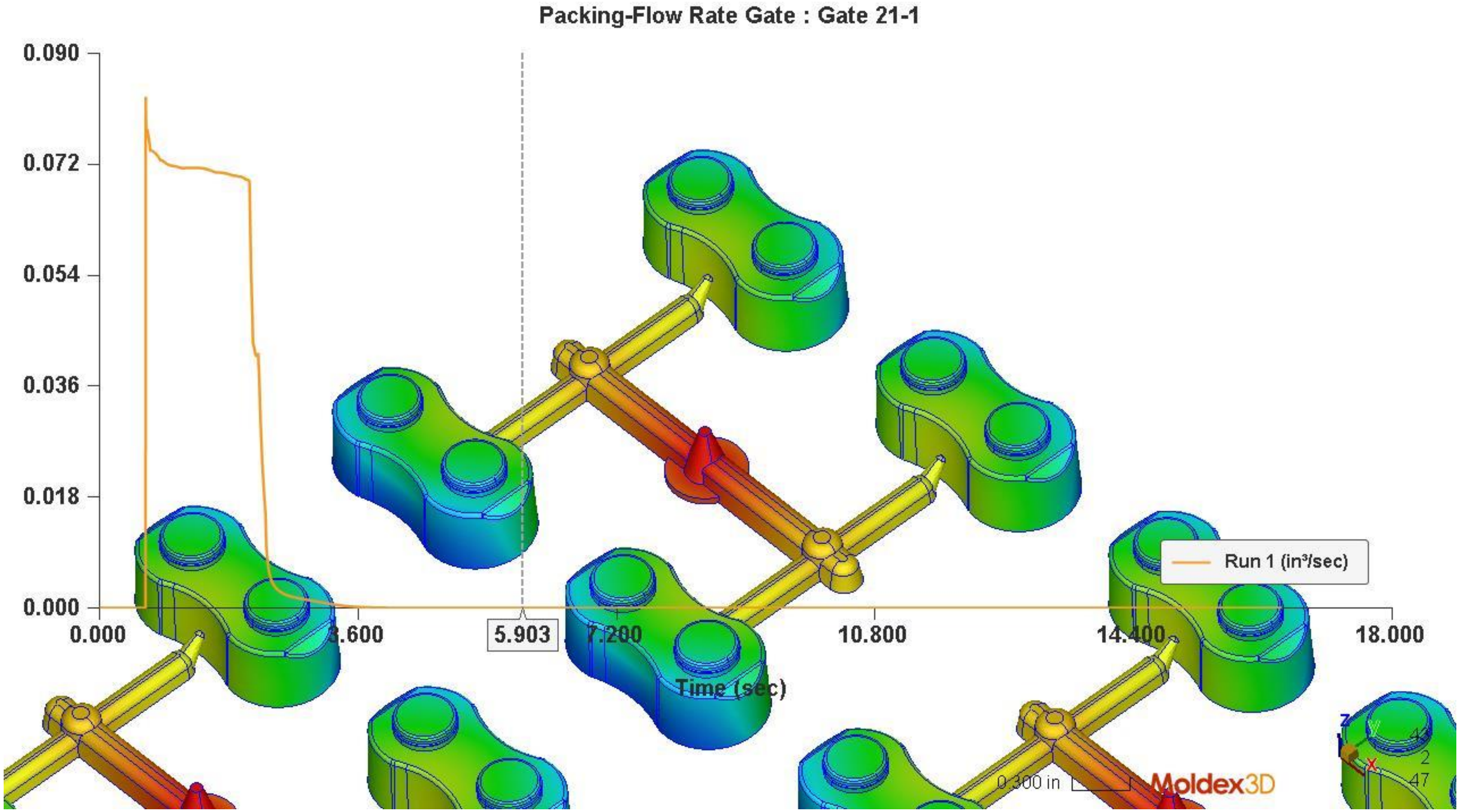
Packing_XY_Flow Rate Gate - Gate 20-1



Max	Unit
0.073	in³/sec

Moldex3D

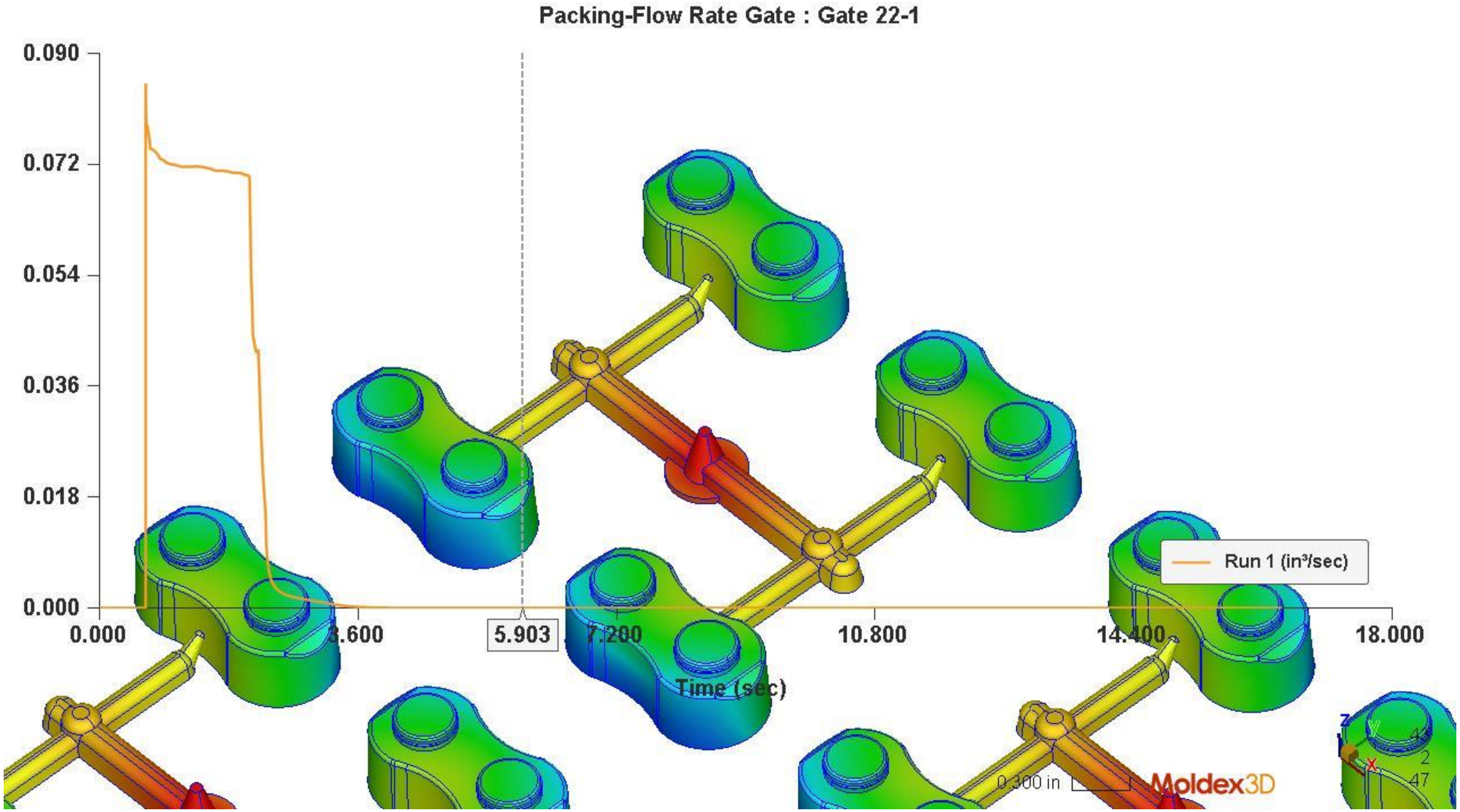
Packing_XY_Flow Rate Gate - Gate 21-1



Max	Unit
0.083	in³/sec

Moldex3D

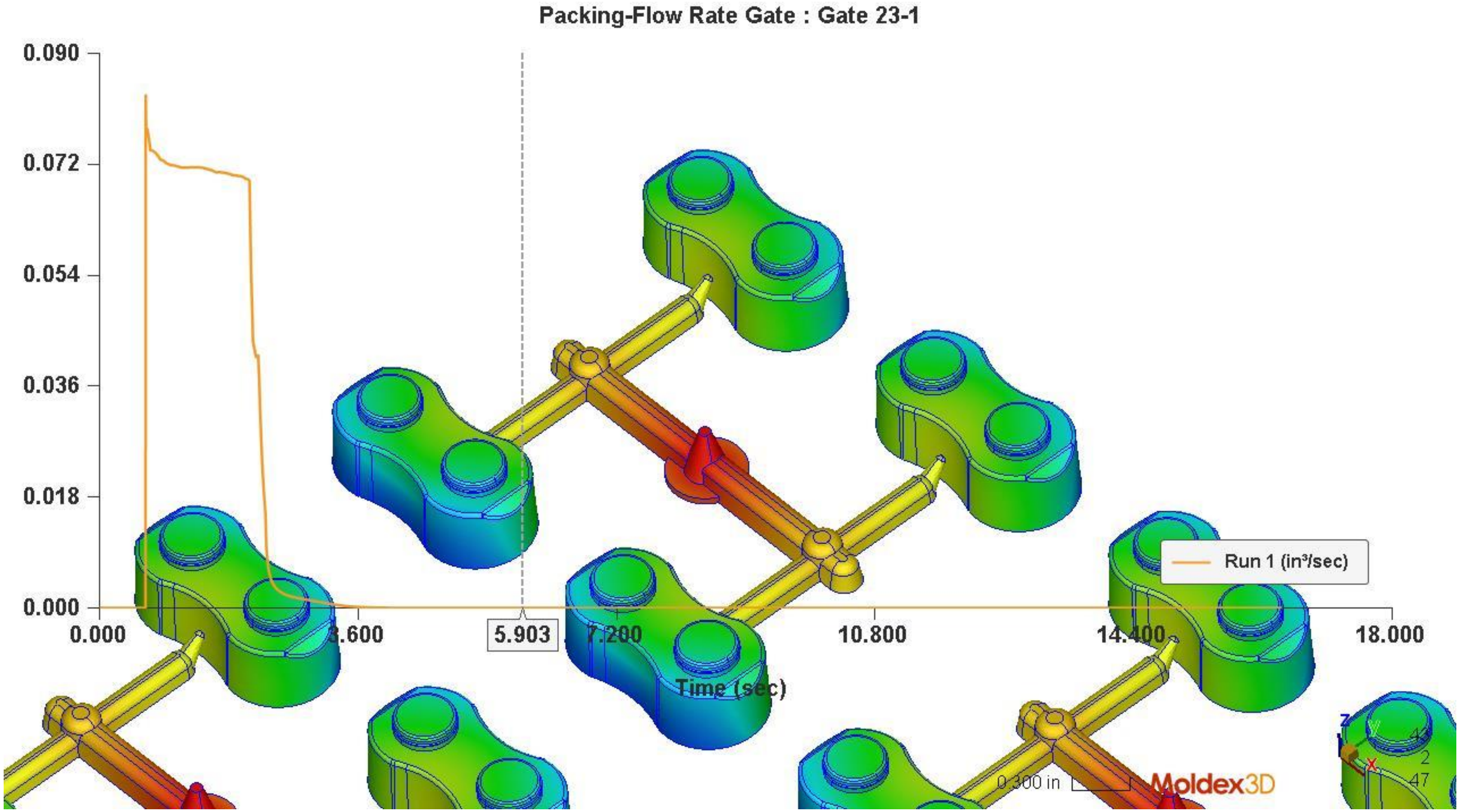
Packing_XY_Flow Rate Gate - Gate 22-1



Max	Unit
0.085	in³/sec

Moldex3D

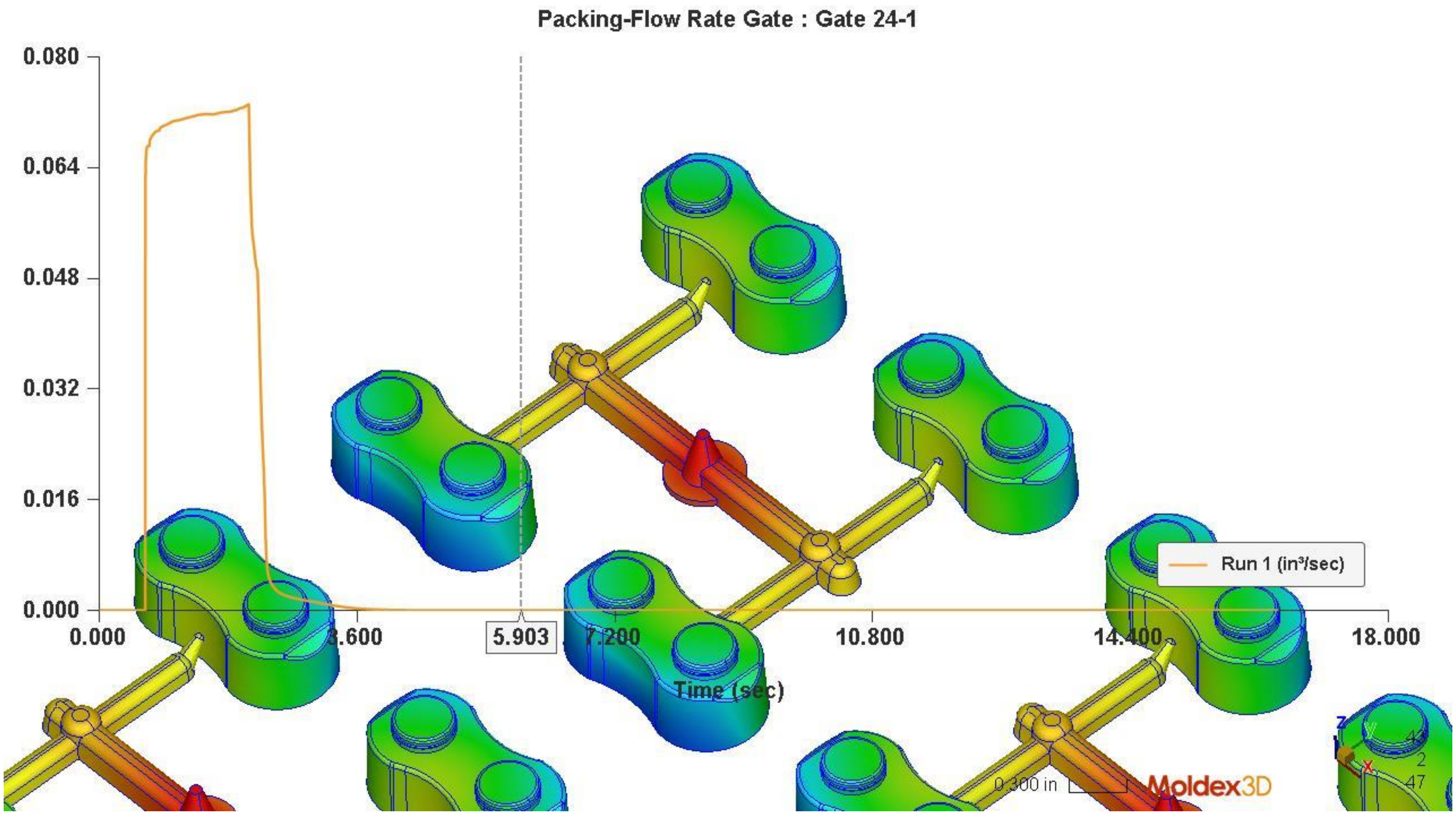
Packing_XY_Flow Rate Gate - Gate 23-1



Max	Unit
0.083	in³/sec

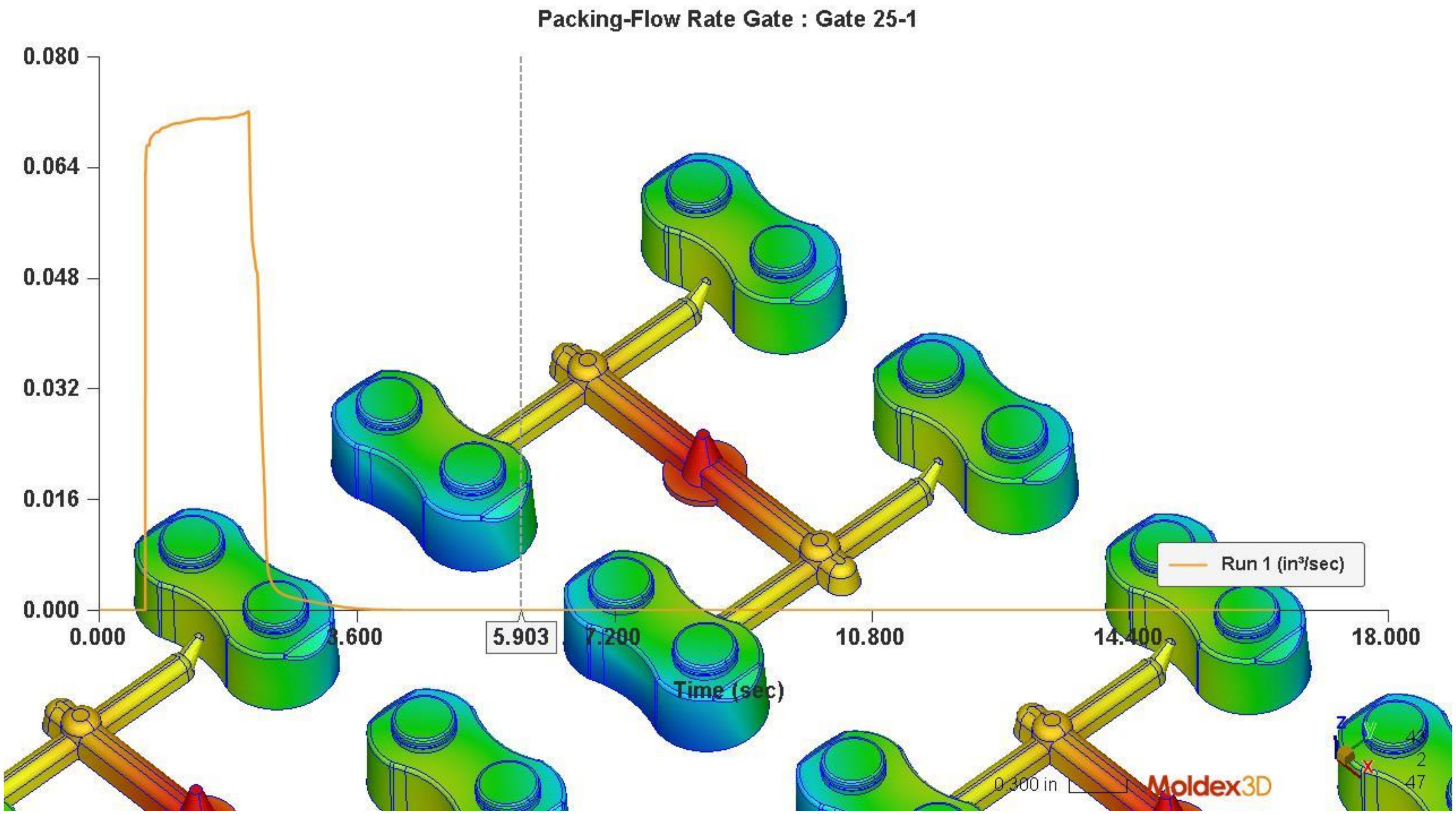
Moldex3D

Packing_XY_Flow Rate Gate - Gate 24-1



Max	Unit
0.073	in³/sec

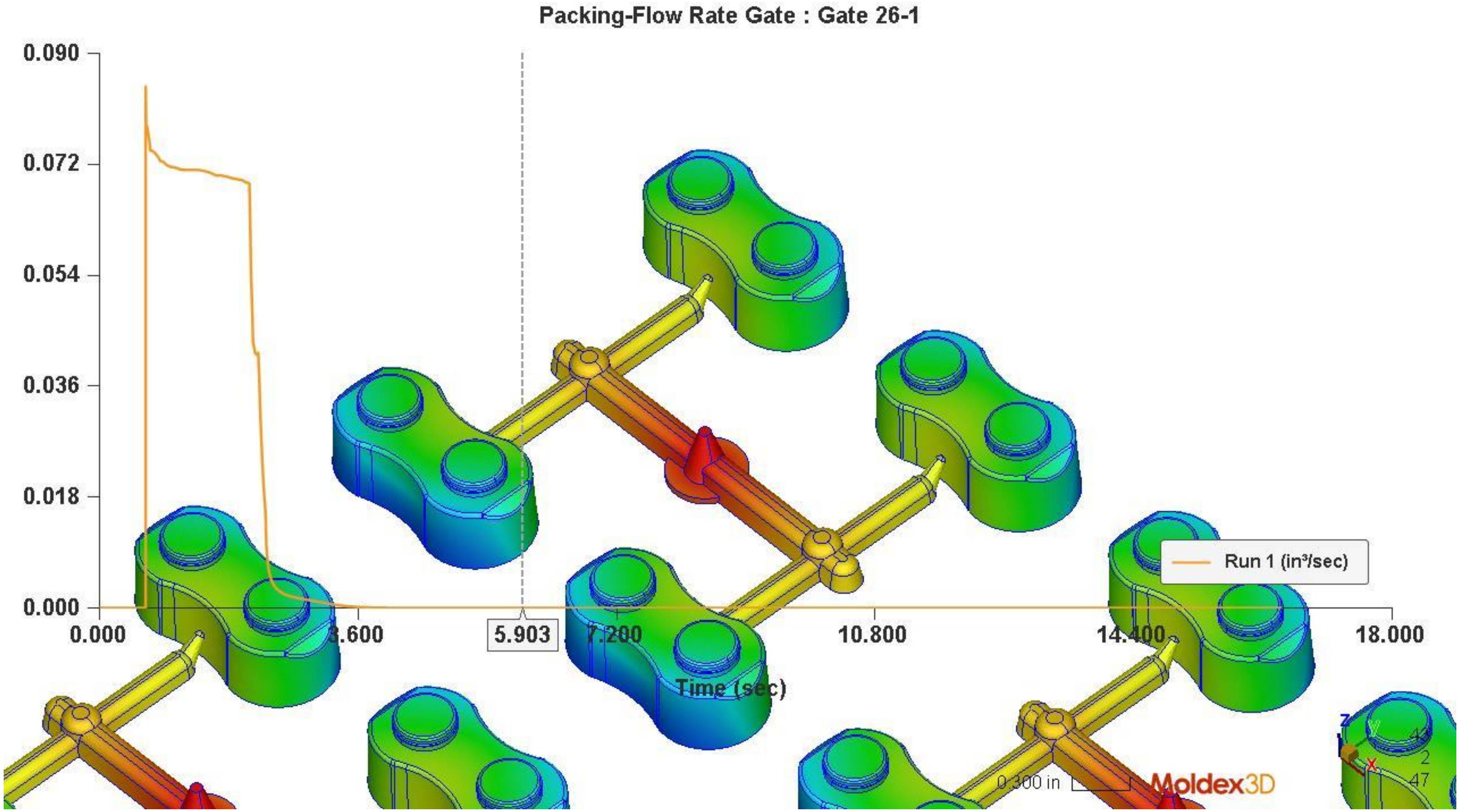
Packing_XY_Flow Rate Gate - Gate 25-1



Max	Unit
0.072	in³/sec

Moldex3D

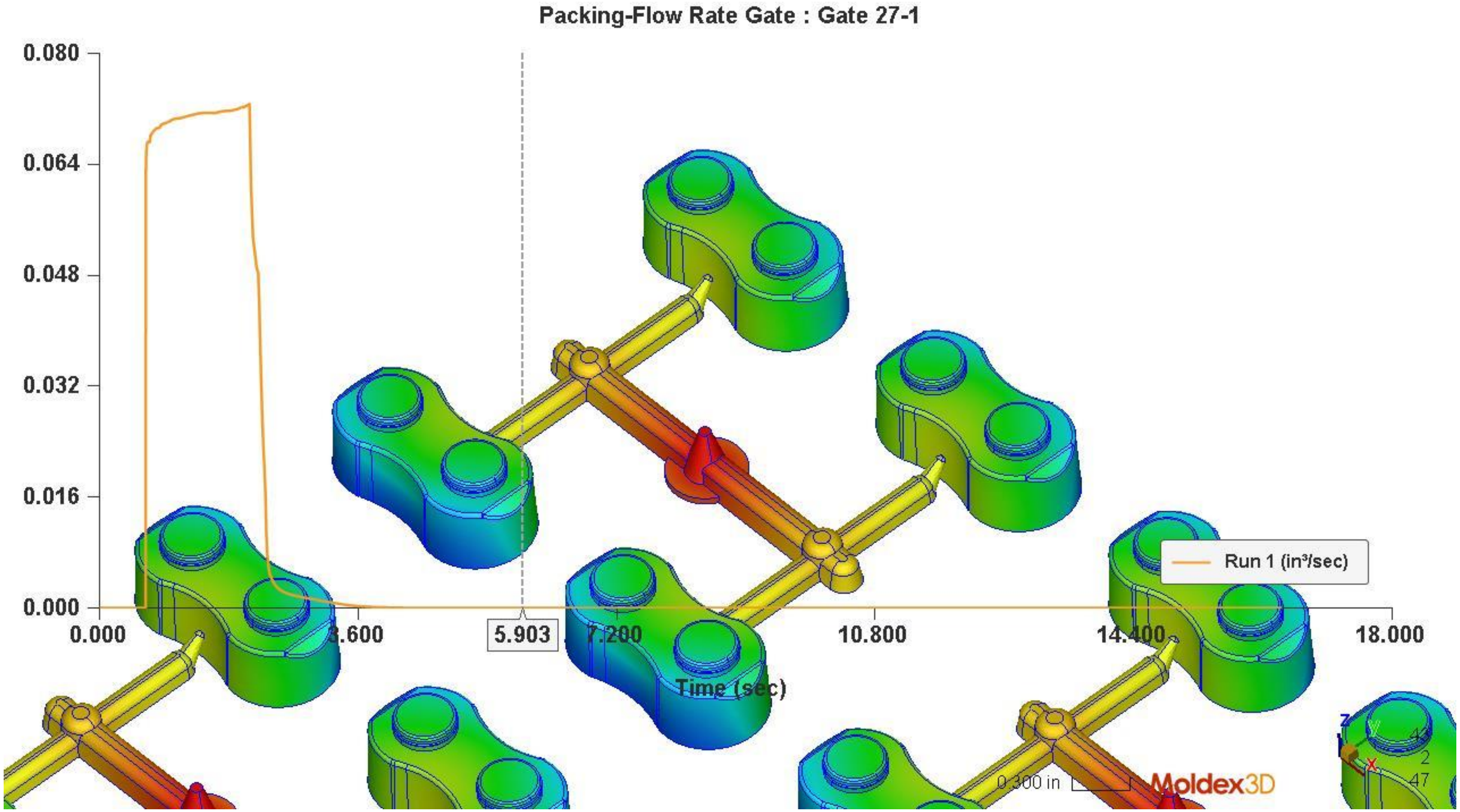
Packing_XY_Flow Rate Gate - Gate 26-1



Max	Unit
0.085	in³/sec

Moldex3D

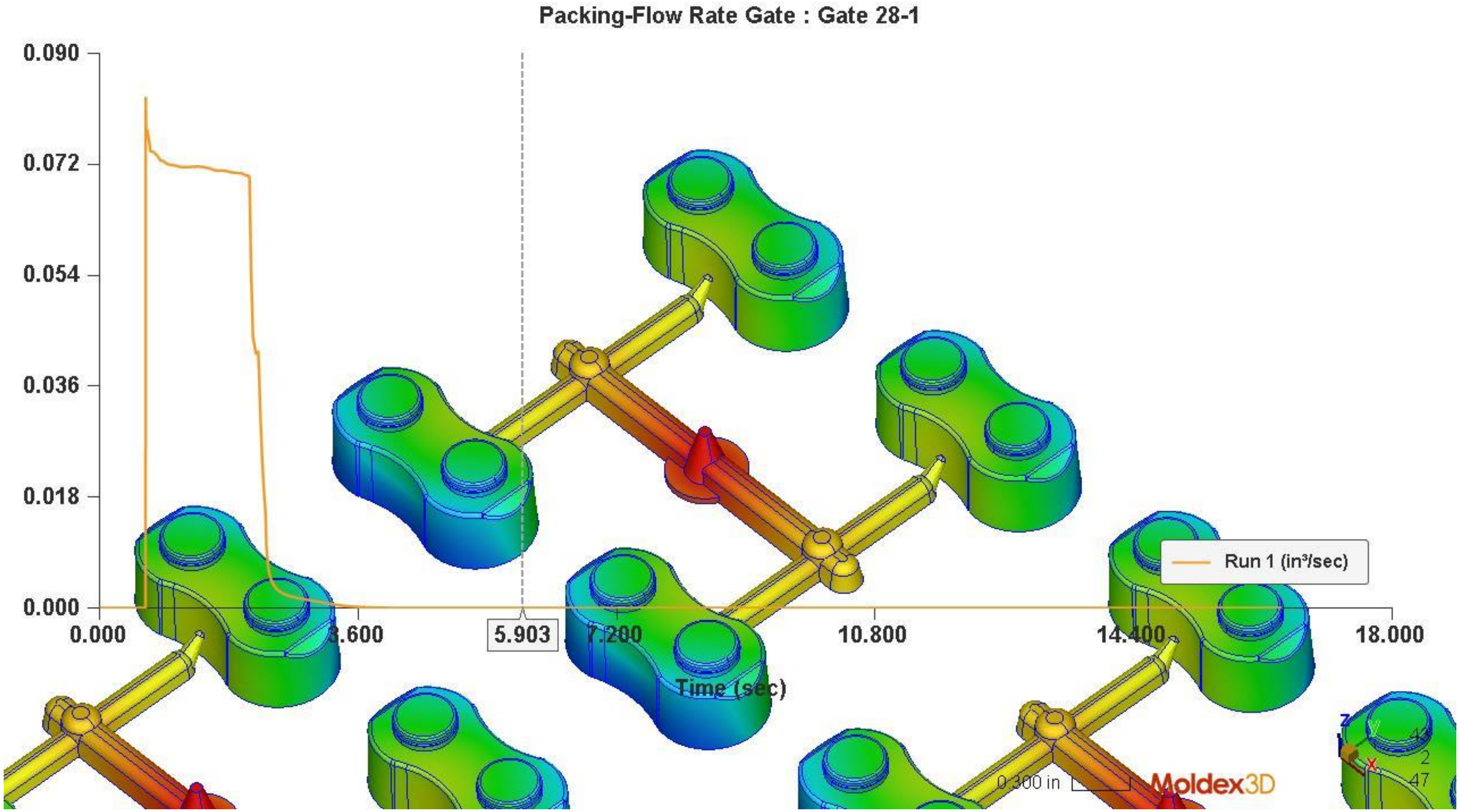
Packing_XY_Flow Rate Gate - Gate 27-1



Max	Unit
0.073	in³/sec

Moldex3D

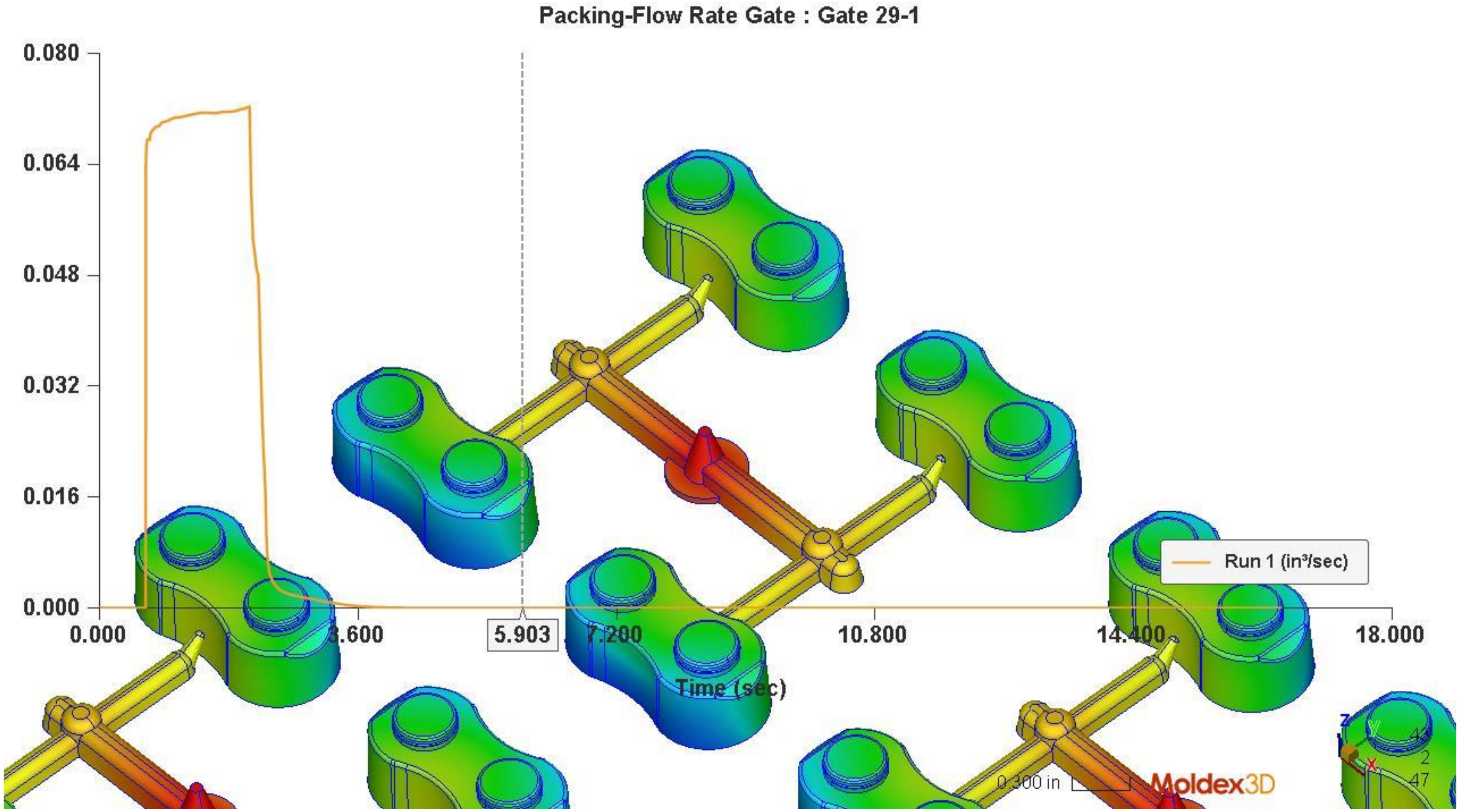
Packing_XY_Flow Rate Gate - Gate 28-1



Max	Unit
0.083	in³/sec

Moldex3D

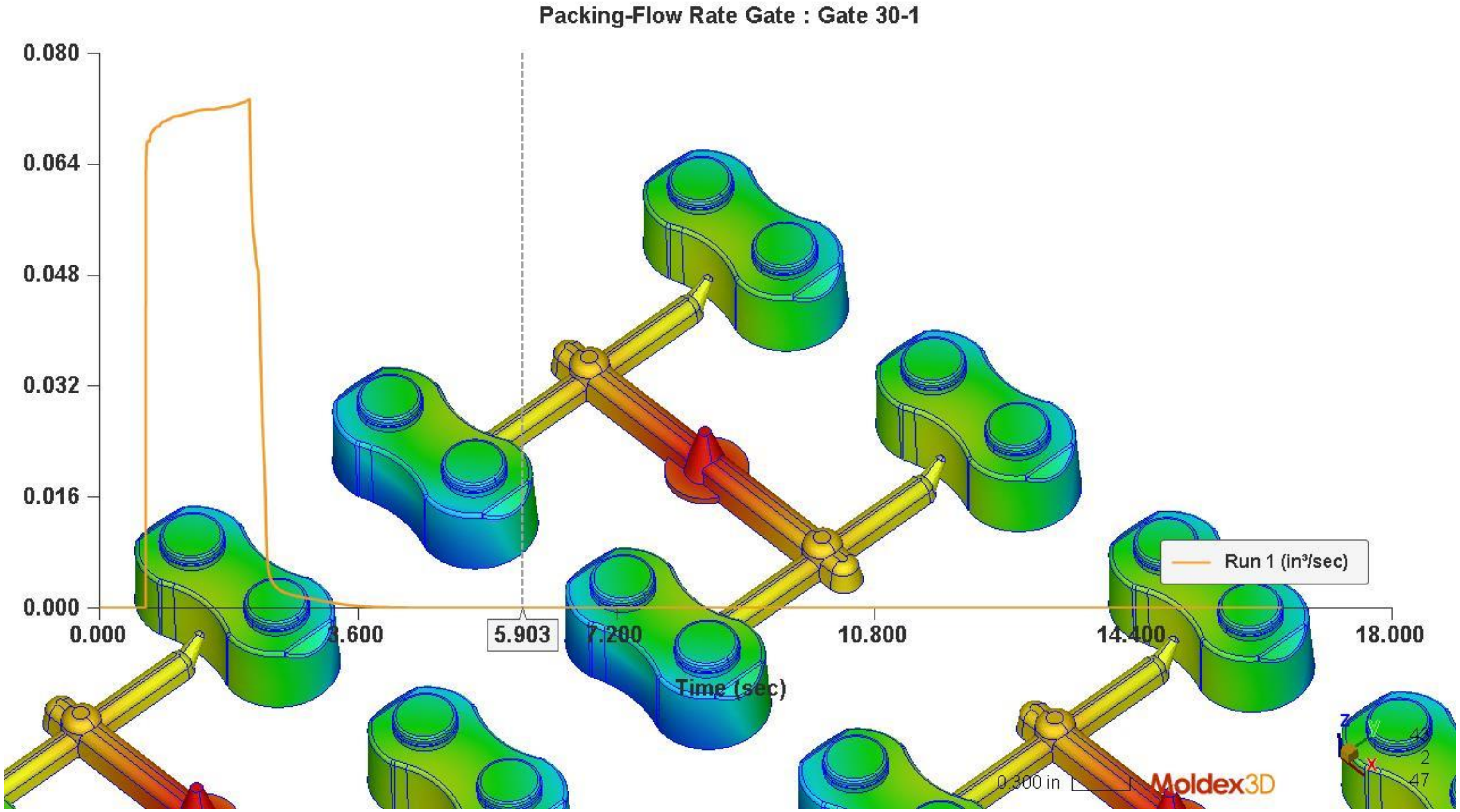
Packing_XY_Flow Rate Gate - Gate 29-1



Max	Unit
0.072	in³/sec

Moldex3D

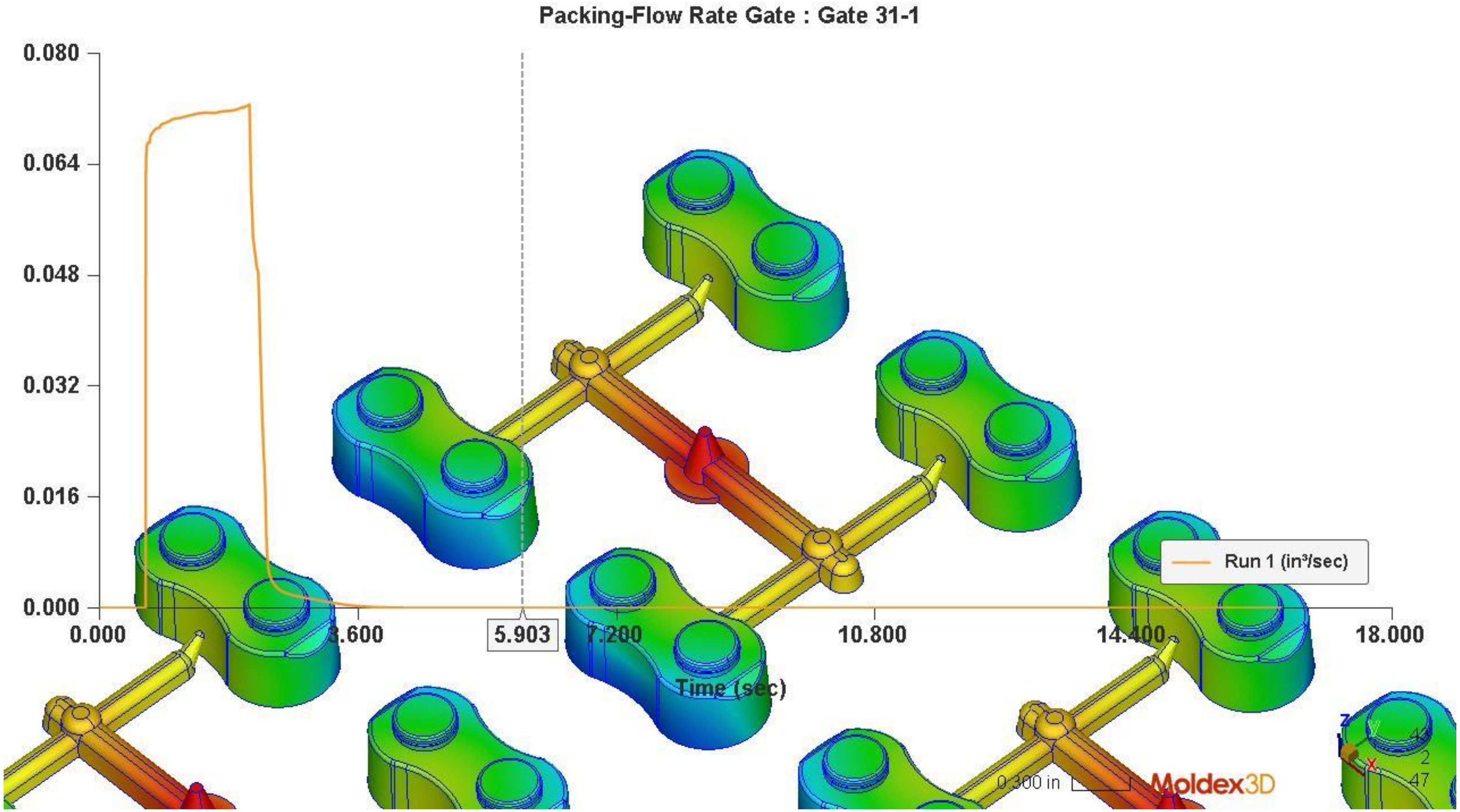
Packing_XY_Flow Rate Gate - Gate 30-1



Max	Unit
0.073	in³/sec

Moldex3D

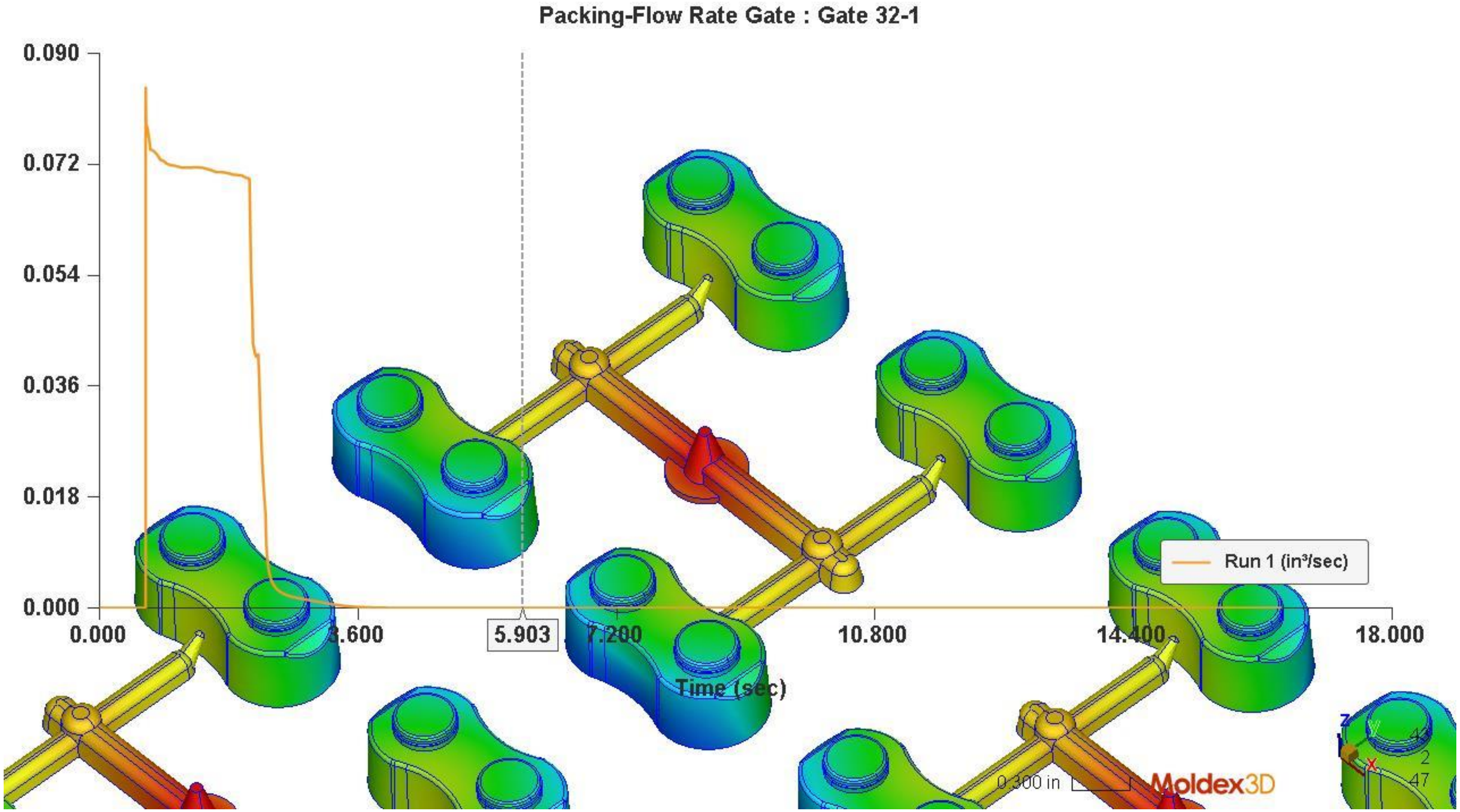
Packing_XY_Flow Rate Gate - Gate 31-1



Max	Unit
0.073	in³/sec

Moldex3D

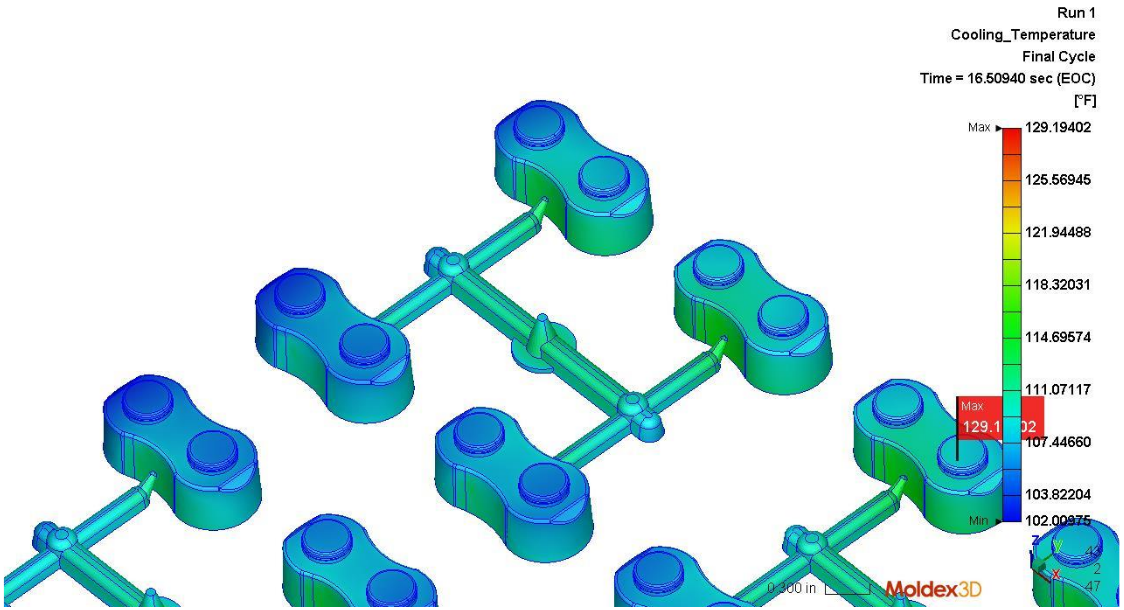
Packing_XY_Flow Rate Gate - Gate 32-1



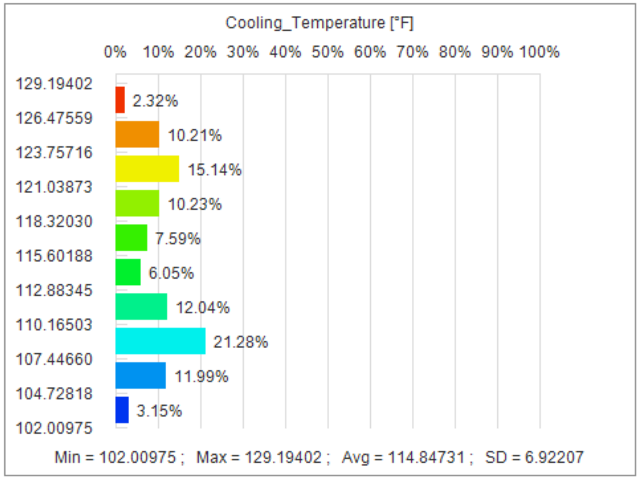
Max	Unit
0.084	in³/sec

Moldex3D

Cooling_Temperature



Histogram

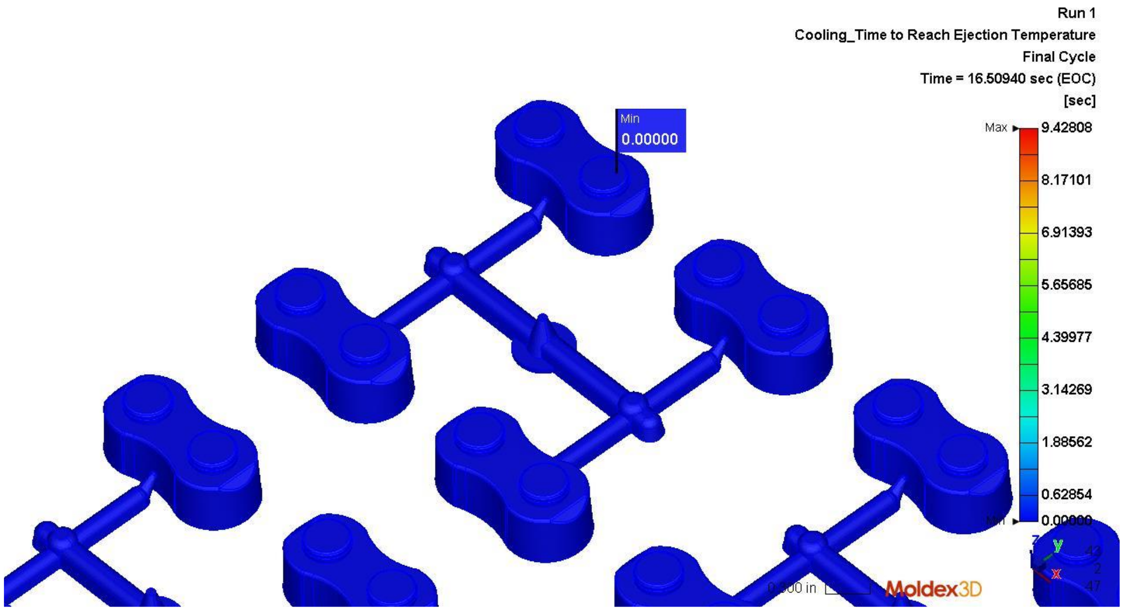


Max	Min
129.19402	102.00975

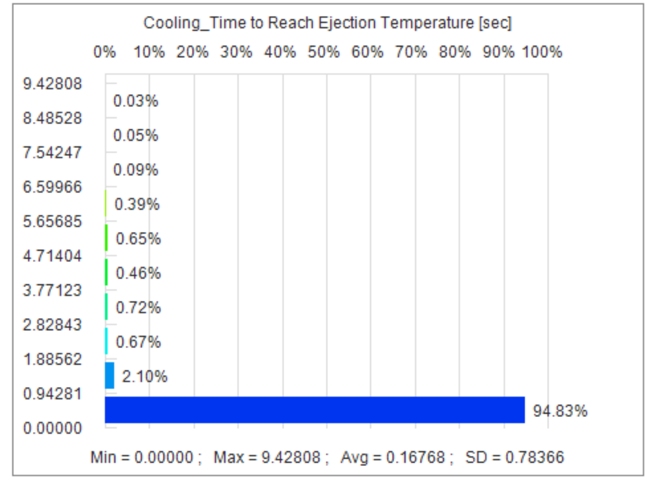
Avg	SD
114.84731	6.92207

Temperature result shows the 3D temperature distribution throughout the result display domain at current time step.
From Temperature result interpretation, one can determine heat accumulation inside the part or if cooling/heating performance meets the design and setting.
Note: For Temperature result in Cooling stage, the Max/Min values on the color bar refer to the result on surface only, instead of considering the whole model (back to the regular display when using Inspect tool).

Cooling_Time to Reach Ejection Temperature



Histogram



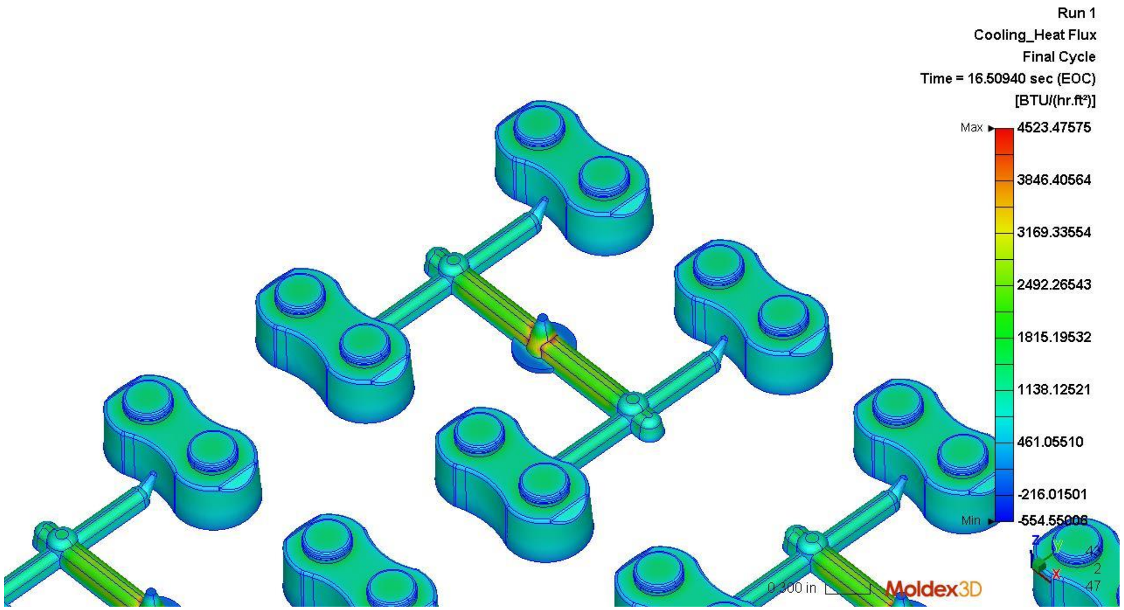
Max	Min
9.42808	0.00000

Avg	SD
0.16768	0.78366

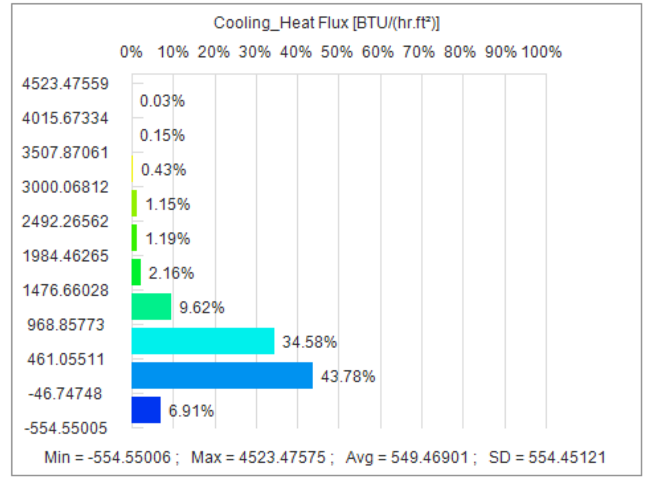
This is the time estimated from end of packing results for the computed mold cavity surface temperature and the estimated center temperature of the plastic part to be cooled enough to be ejected. This value can be used as an indicator of hot spot and cycle-time-restriction location.Use [Slicing] or [Clipping] function to view interior distribution.

Moldex3D

Cooling_Heat Flux



Histogram



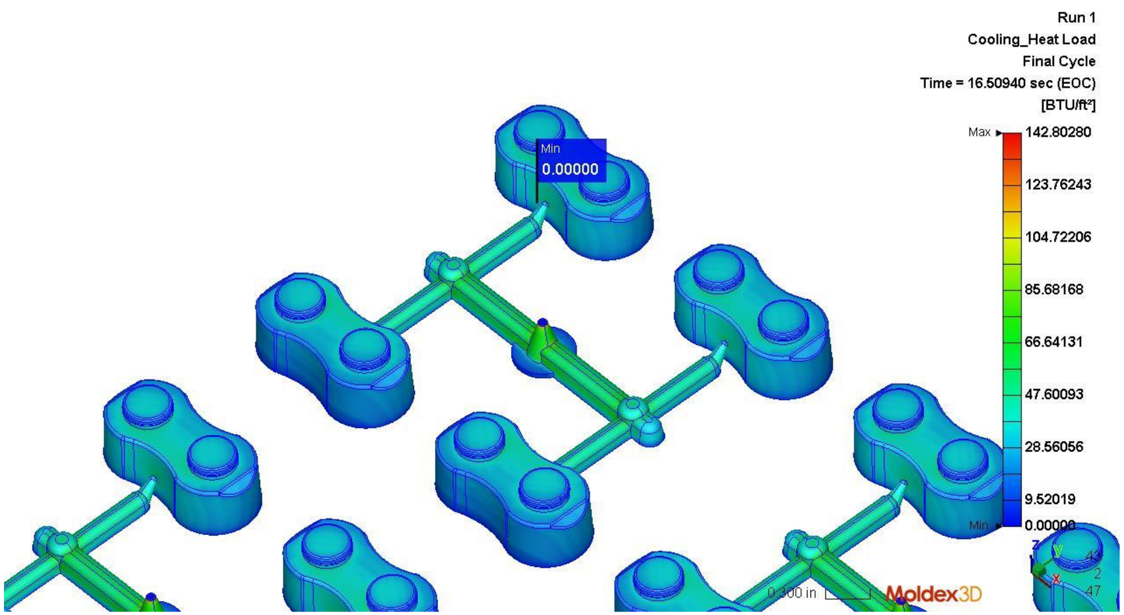
Max	Min
4523.47575	-554.55006

Avg	SD
549.46901	554.45121

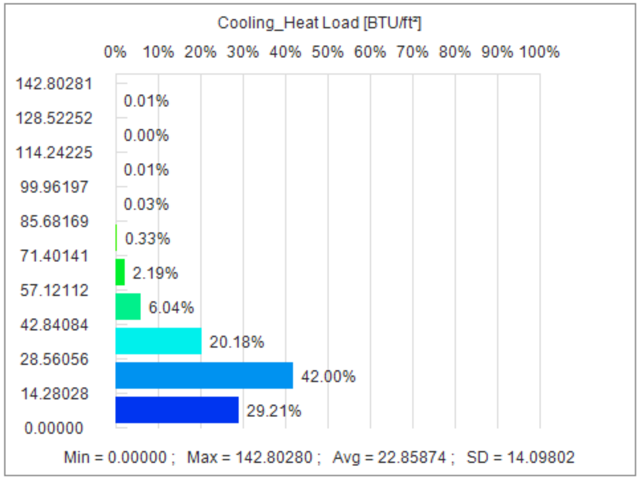
This is the heat flux of the part/mold surface. This value means the heat-dissipation rate per unit area (flux) of part-mold interface. In Cycle average Analysis, it shows the average heat flux during the cycle time. In Transient Analysis, it shows the heat flux in this instant, A higher heat flux value indicates better cooling efficiency.

Moldex3D

Cooling_Heat Load



Histogram



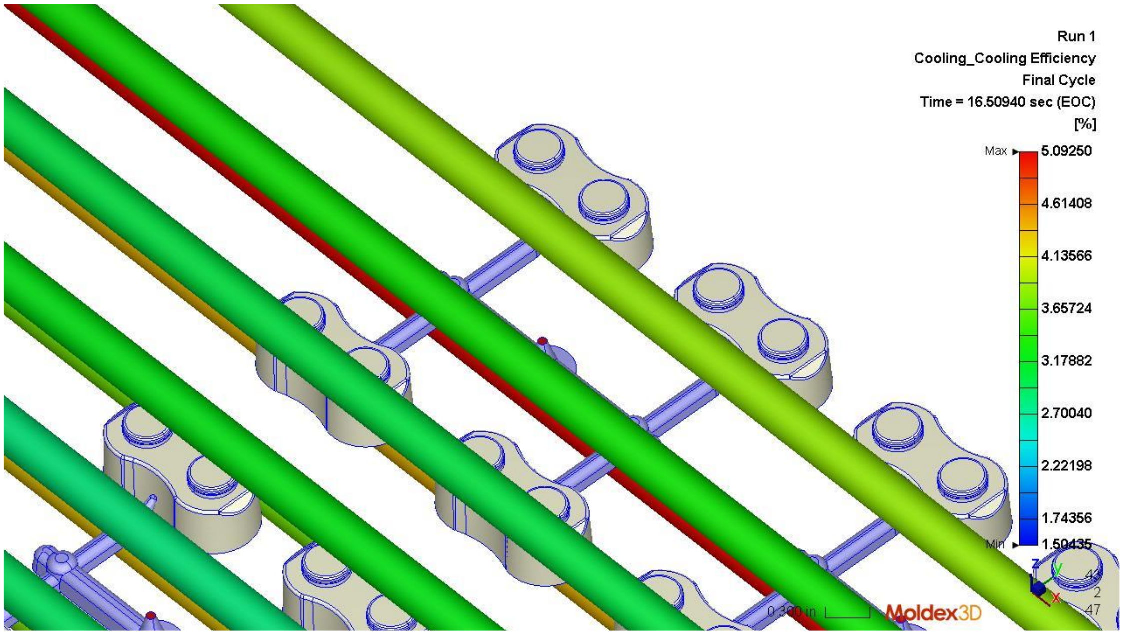
Max	Min
142.80280	0.00000

Avg	SD
22.85874	14.09802

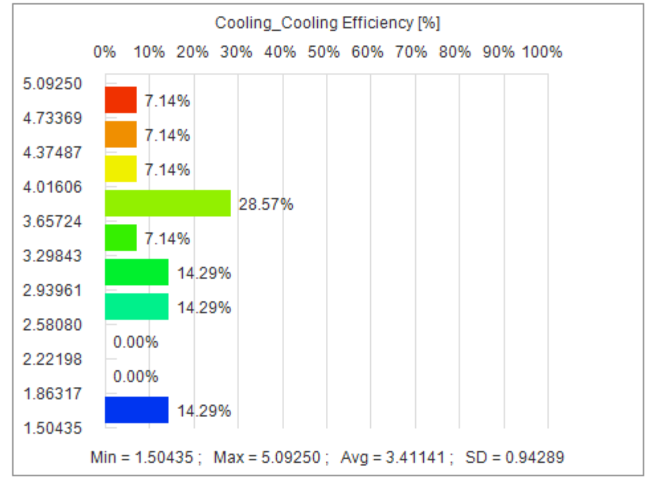
This is the heat load of the interface of the part/moldbase/cooling channel. This value means the heat-released accumulation of the part via the part-mold interface.

Moldex3D

Cooling_Cooling Efficiency



Histogram



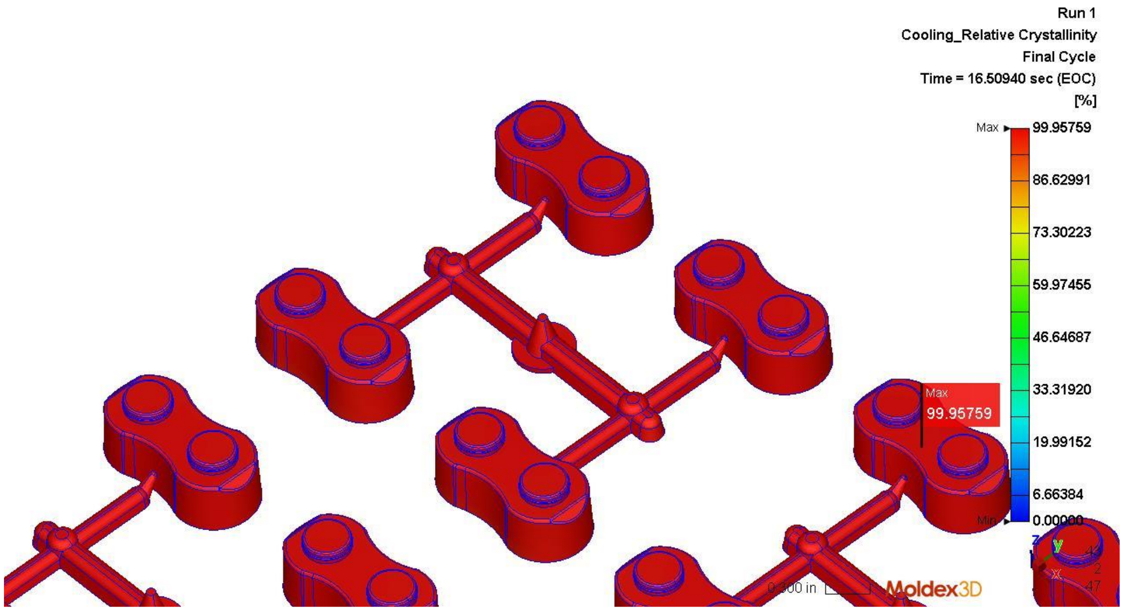
Max	Min
5.09250	1.50435

Avg	SD
3.41141	0.94289

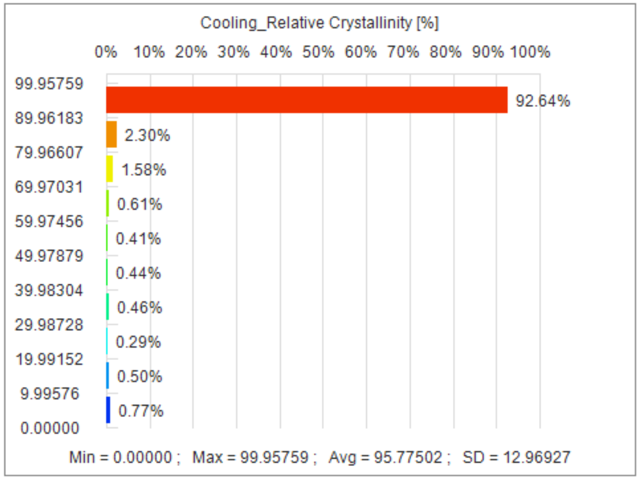
This result shows the cooling efficiency of each cooling channel. It shows the percentage of heat withdrawn by the cooling channel.
If Qi is the total heat flows into the i-th cooling channel surface.
When Qi is positive, it means that the total heat is absorbed from its surface and the cooling efficiency is defined as the following equation
Cooling efficiency =Qi/Qa+Qma *100%
where Qa is the total absorbed heat through cooling channel surface., and Qma is the total absorbed heat through mold surface via surroundings.
When Qi is negative, it means that the total heat is released from its surface and the cooling efficiency is defined as the following equation
Cooling efficiency =Qi/Qr+Qmr *100%

Moldex3D

Cooling_Relative Crystallinity



Histogram



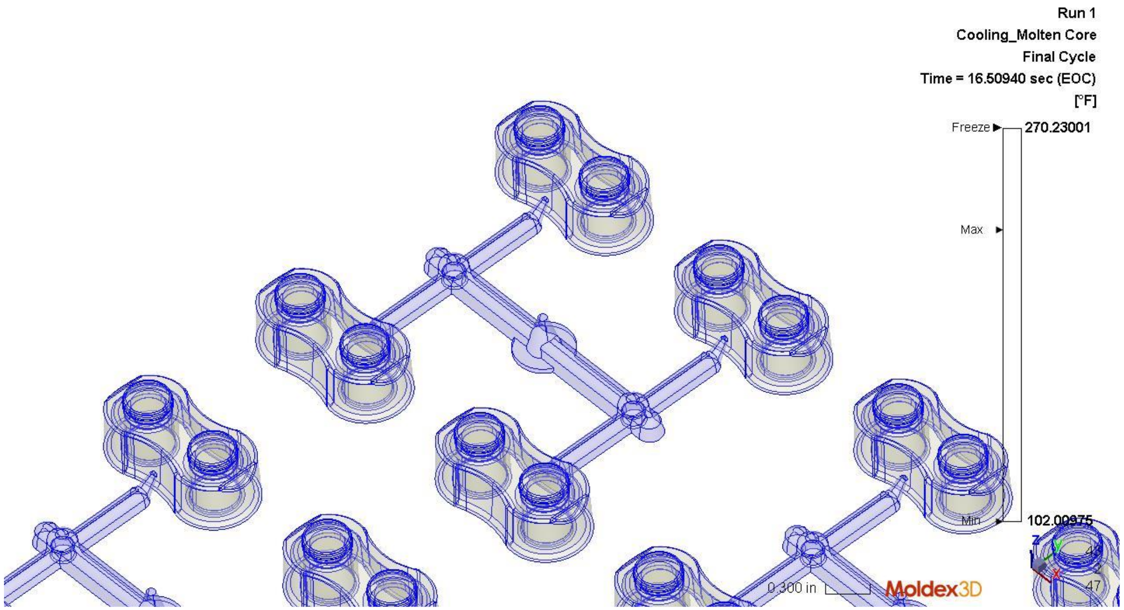
Max	Min
99.95759	0.00000

Avg	SD
95.77502	12.96927

Show three dimensional relative crystallinity distribution with the cavity at current instant.

Moldex3D

Cooling_Molten Core



This shows isosurface of plastic melt-zone. Region enclosed by the isosurface has temperature higher than freeze temperature specified in the process condition. This data can be used to check frozen layer thickness (region outside the molten core).

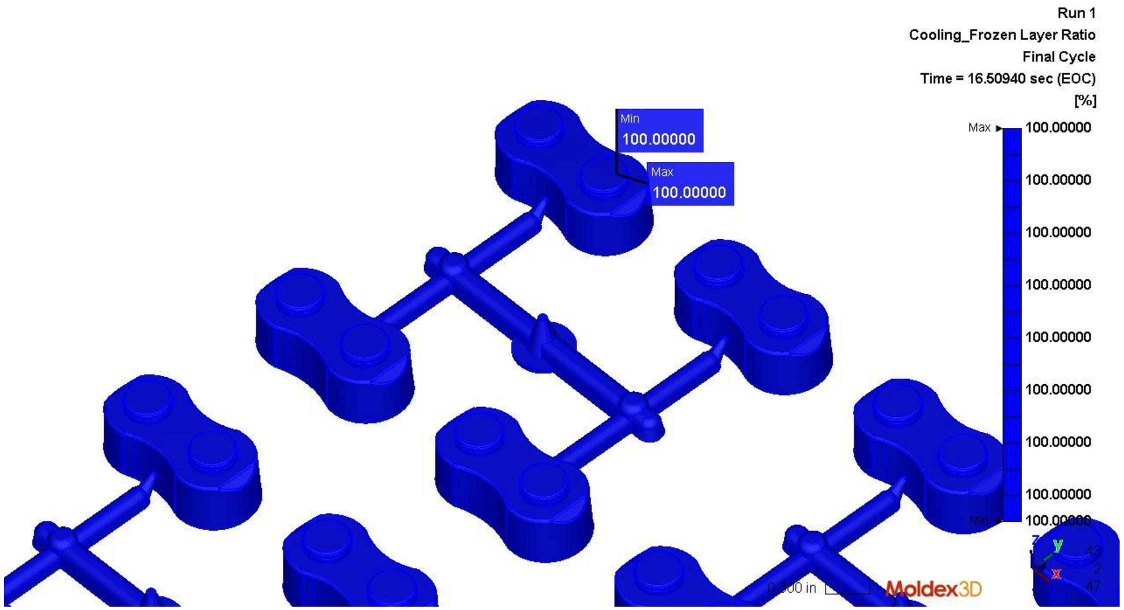
Histogram
N/A

Max	Min
N/A	N/A

Avg	SD
N/A	N/A

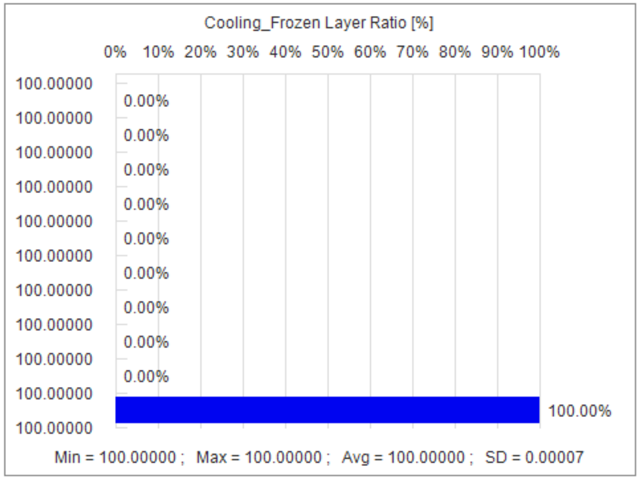
Moldex3D

Cooling_Frozen Layer Ratio



Solidification caused by cooling results in the forming of frozen layer near the cavity surface. With the increasing of time, the frozen ratio increases. The increase of frozen ratio not only reduces the cross-section along the flow path, but also increases the flow resistance and sprue pressure. Furthermore, the residual stress and flow-induced orientation will be affected.

Histogram

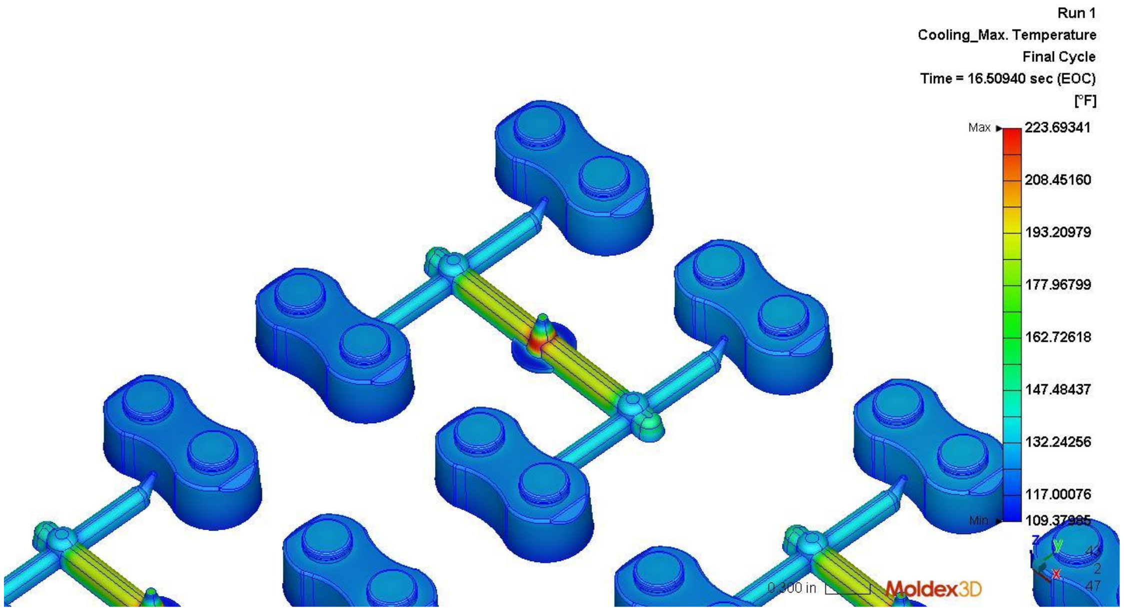


Max	Min
100.00000	100.00000

Avg	SD
100.00000	0.00007

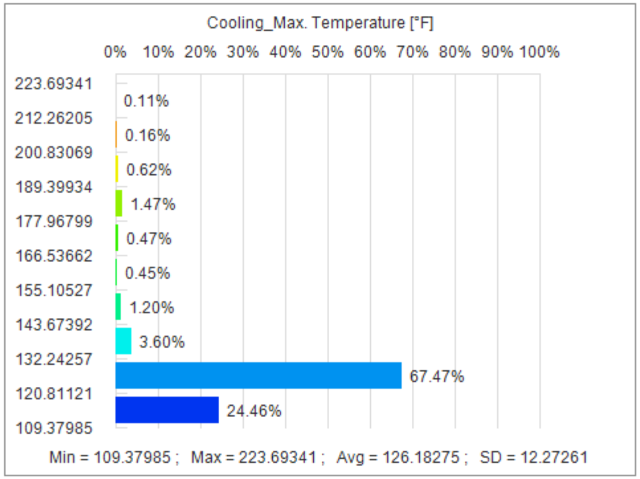
Moldex3D

Cooling_Max. Temperature



Shows the maximum temperature in the thickness direction of the part.

Histogram

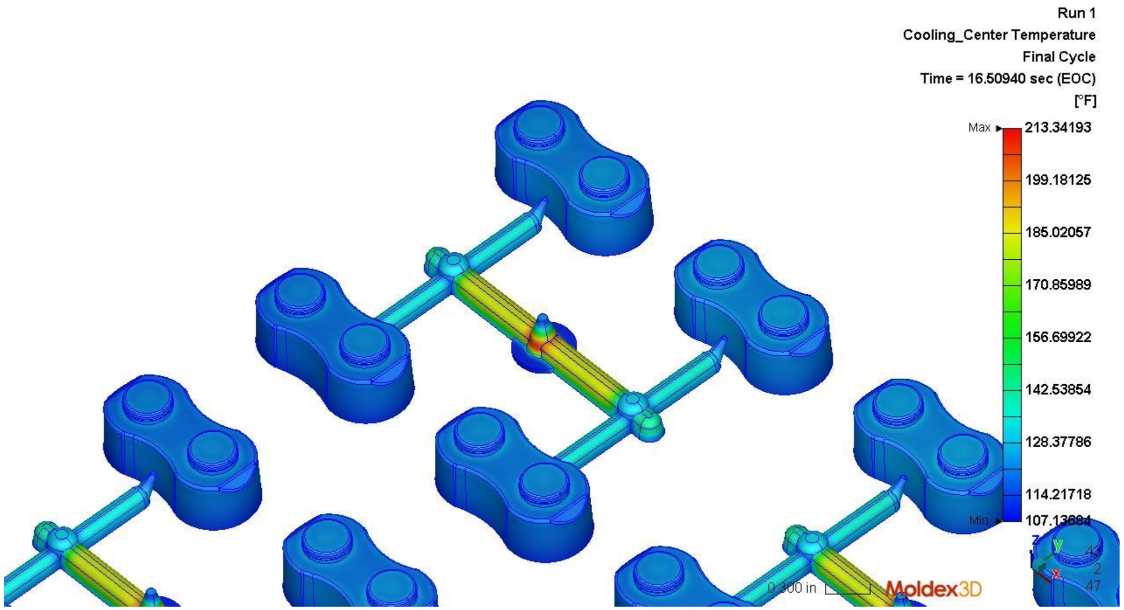


Max	Min
223.69341	109.37985

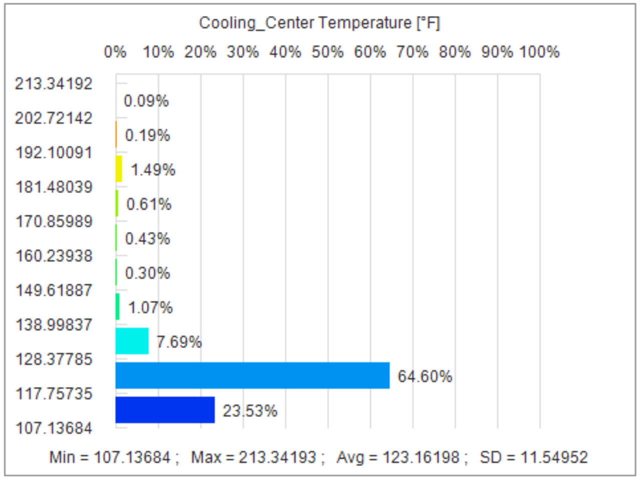
Avg	SD
126.18275	12.27261

Moldex3D

Cooling_Center Temperature



Histogram

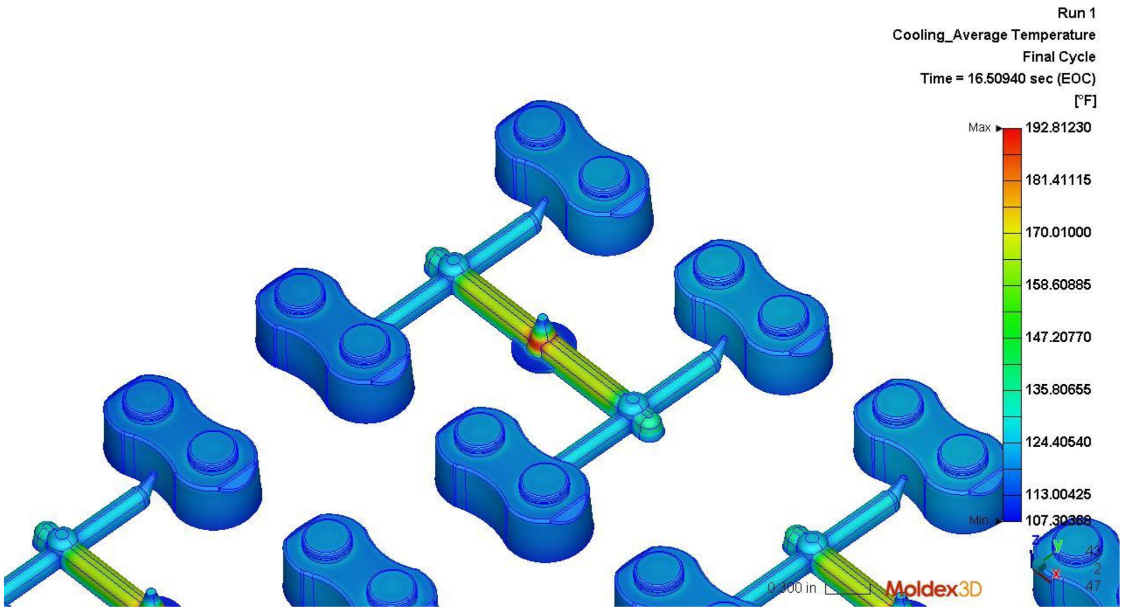


Max	Min
213.34193	107.13684

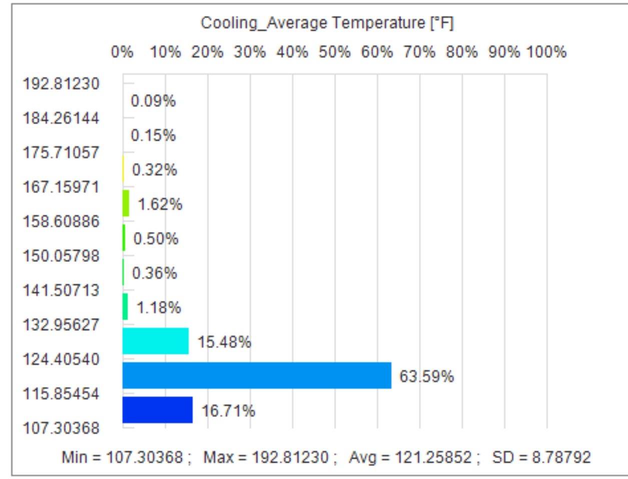
Avg	SD
123.16198	11.54952

Center temperature is the melt temperature of the middle layer (part line) in the thickness direction at current instant. Center temperature is an indicator of thermal energy supply of the fresh hot melt. In general, the center temperature is an indicator of incomplete filling (short shot). If the center temperature is too low, flow hesitation happens and there will be a short shot problem.

Cooling_Average Temperature



Histogram



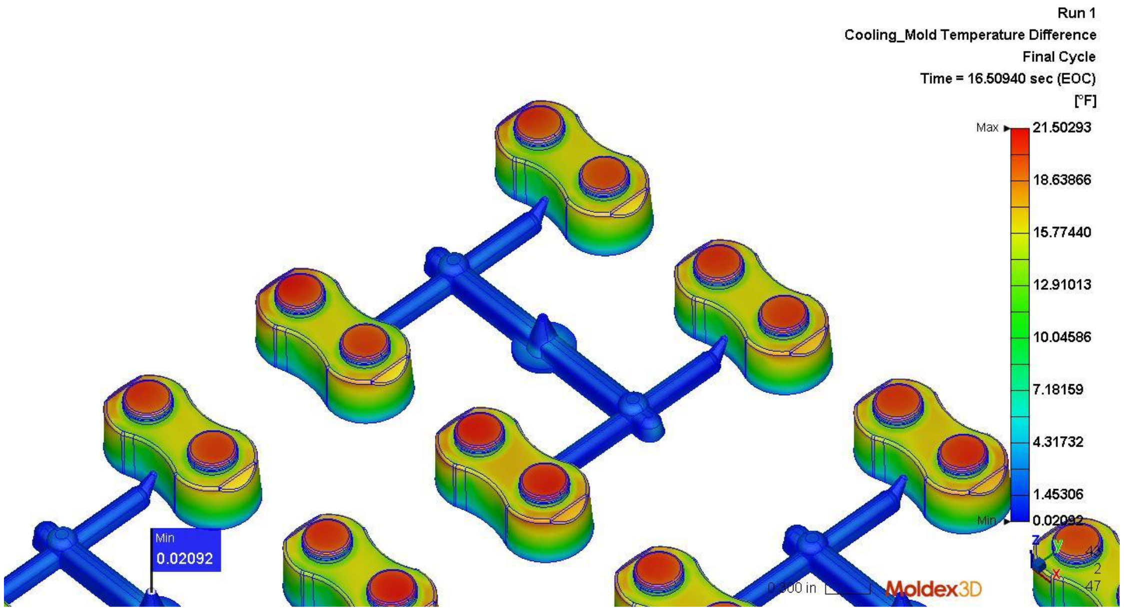
Max	Min
192.81230	107.30368

Avg	SD
121.25852	8.78792

Average temperature is the averaged temperature across the part thickness at current instant. It considers the effect of mold cooling and viscous heating of melt. Therefore, average temperature is representative for the part temperature. This data can be used to check the combined effect of viscous heating of polymer melt and mold cooling. One should examine if there is any hot spot that will cause burning problem and the possibility of short shot due to flow hesitation and excess mold cooling.

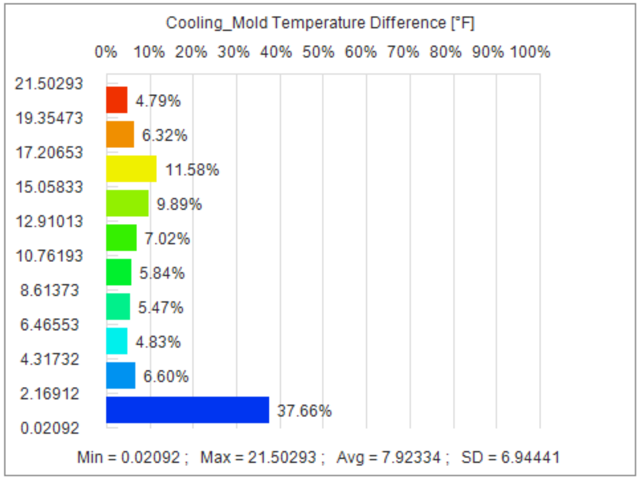
Moldex3D

Cooling_Mold Temperature Difference



Shows the temperature difference between the upper cavity wall and lower.

Histogram

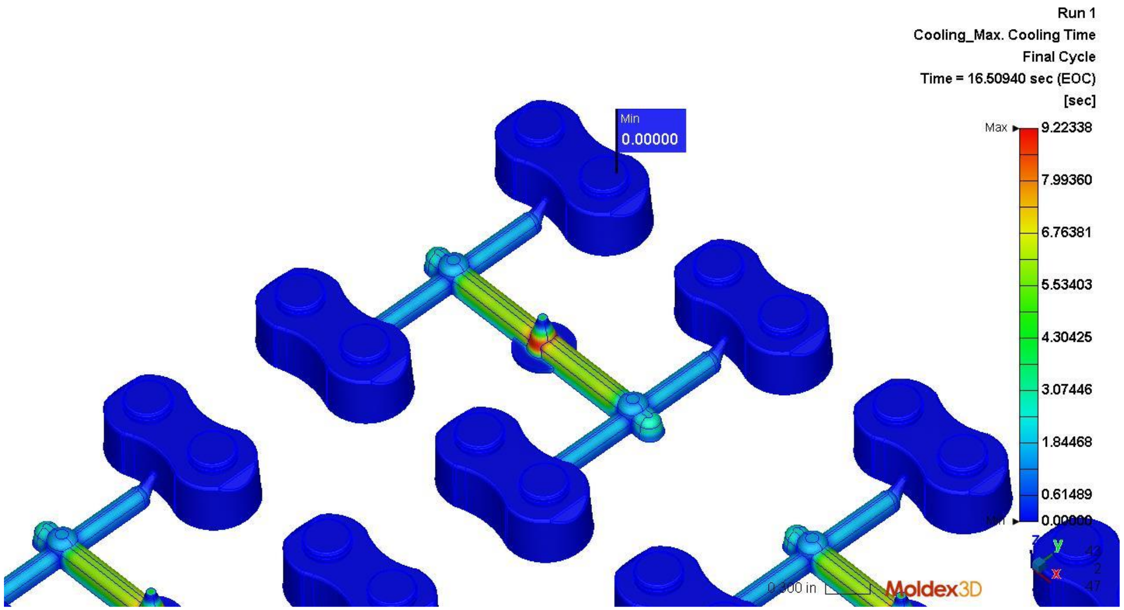


Max	Min
21.50293	0.02092

Avg	SD
7.92334	6.94441

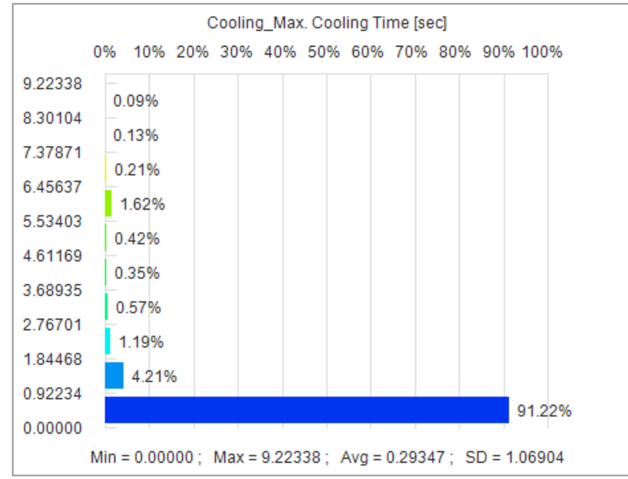
Moldex3D

Cooling_Max. Cooling Time



Shows the maximum cooling time in the thickness direction of the part.

Histogram

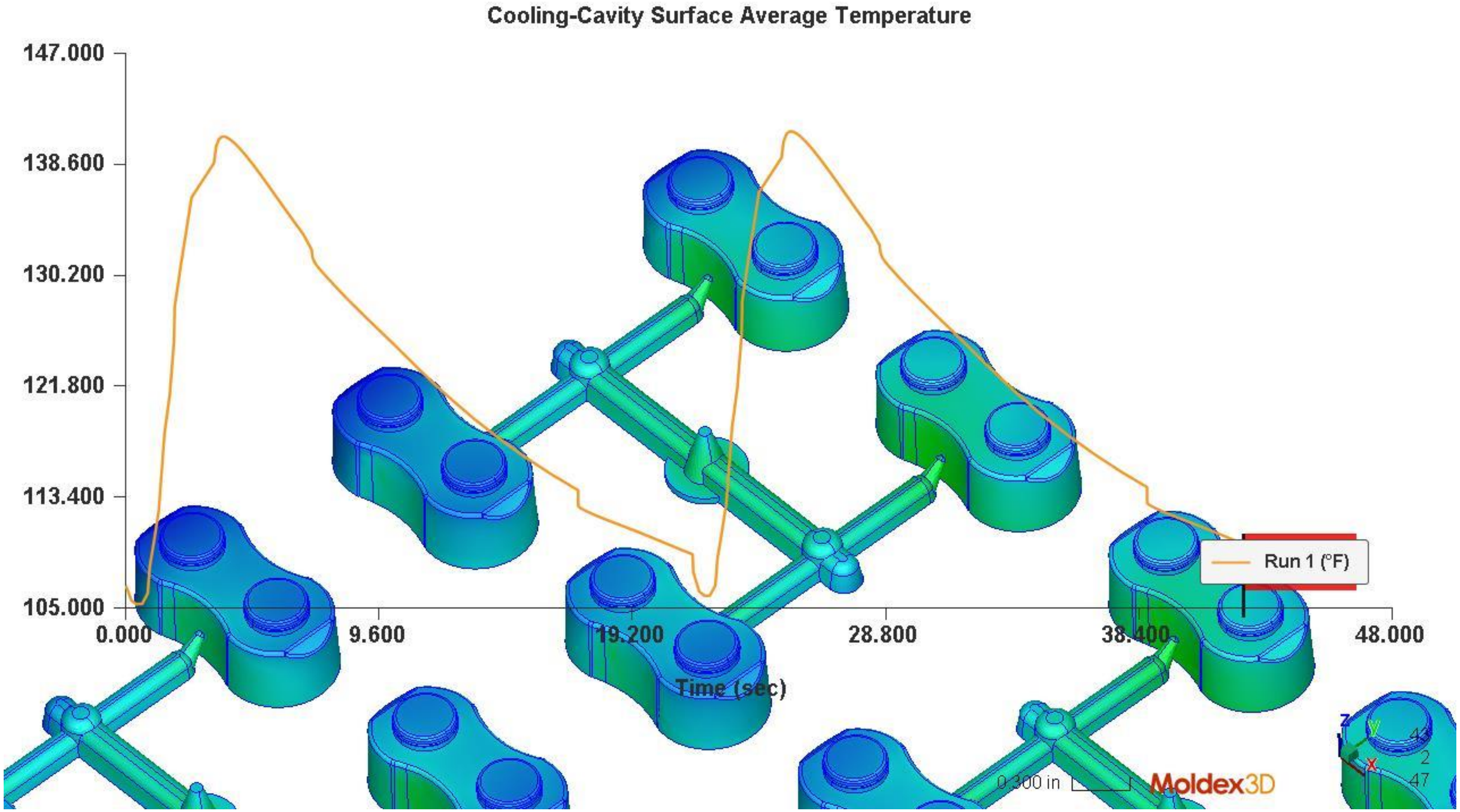


Max	Min
9.22338	0.00000

Avg	SD
0.29347	1.06904

Moldex3D

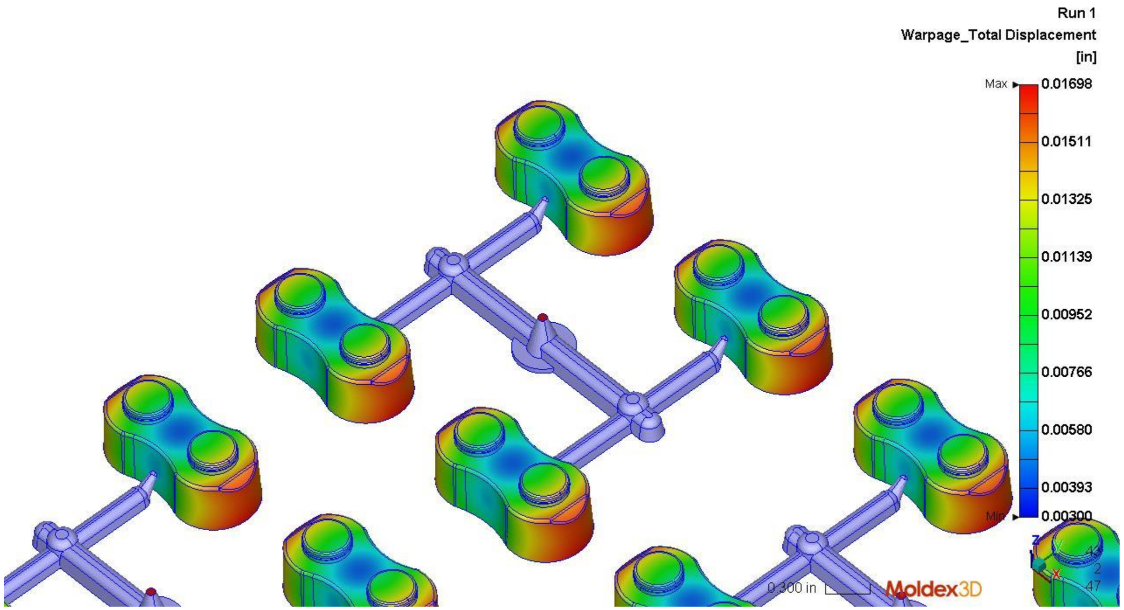
Cooling_XY_Cavity Surface Average Temperature



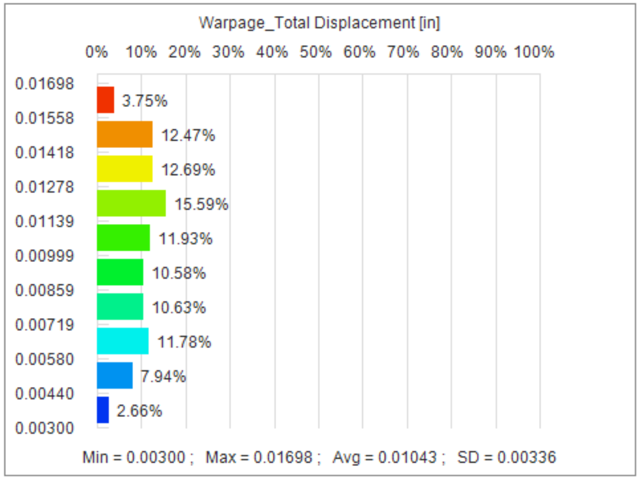
Max	Unit
141.105	°F

Moldex3D

Warpage_Total Displacement



Histogram

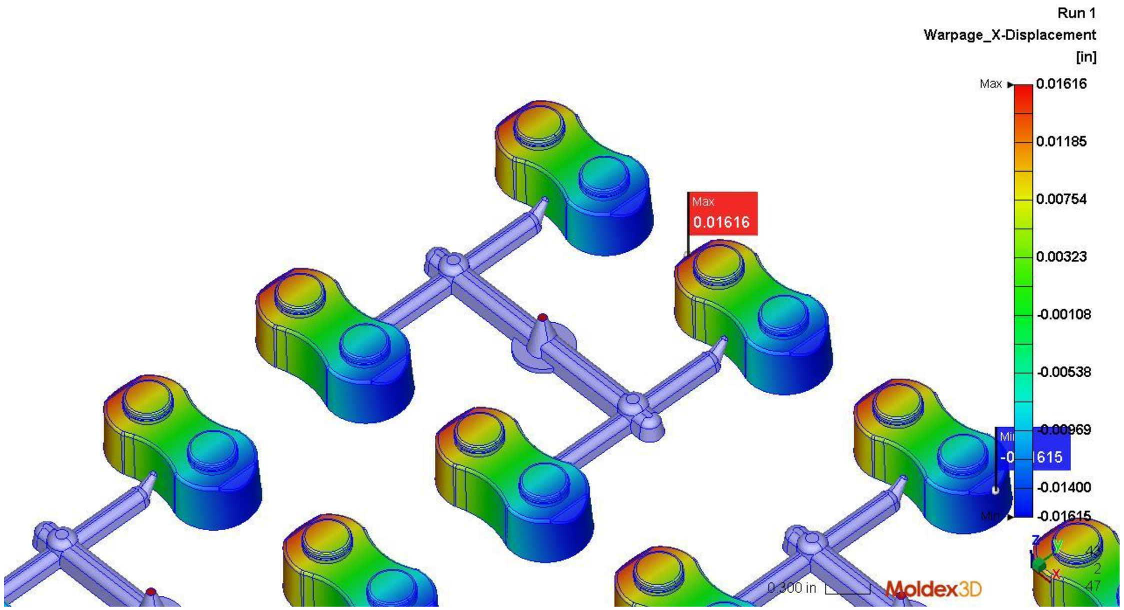


Max	Min
0.01698	0.00300

Avg	SD
0.01043	0.00336

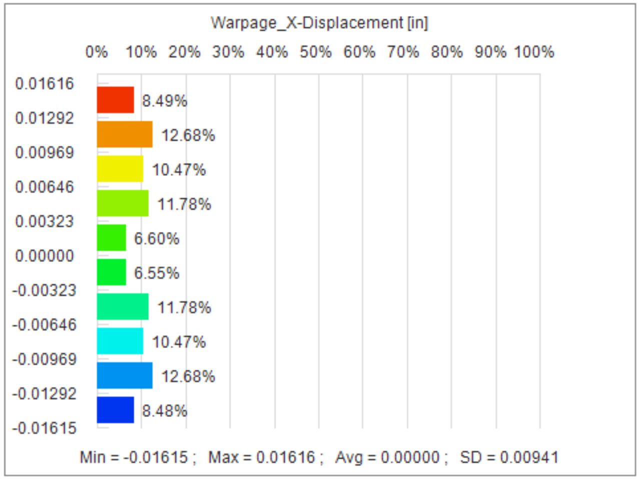
Shows the length of the total displacement vector (All effects are considered) after the part is ejected and cooled down to room temperature. The value is relative to the model coordinate.

Warpage_X-Displacement



Shows the X-component of the total displacement (All effects are considered) after the part is ejected and cooled down to room temperature. The value is relative to the model coordinate.

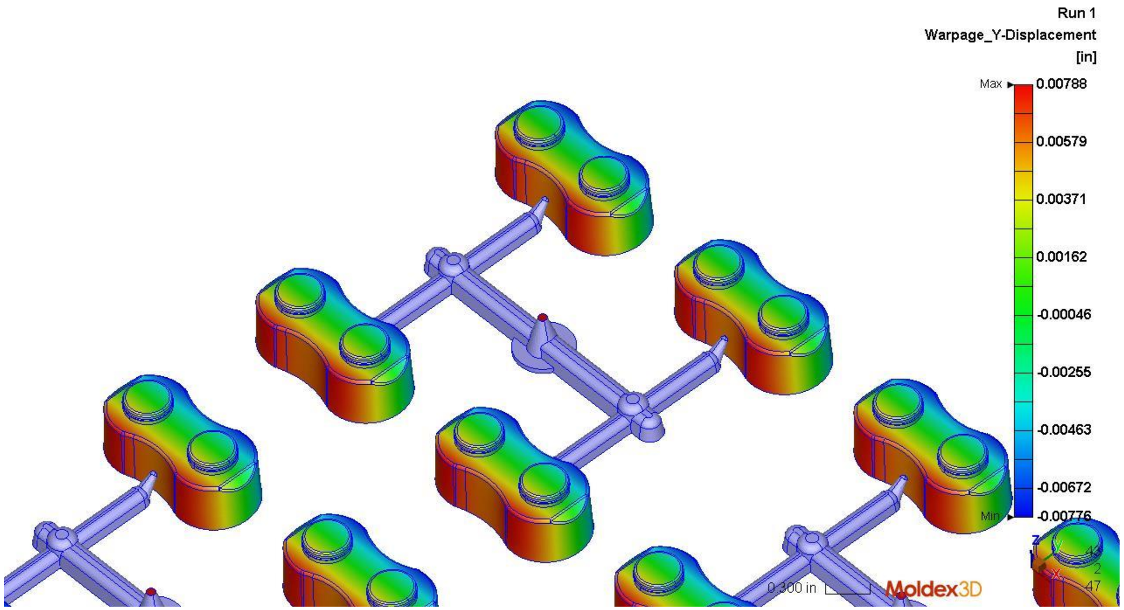
Histogram



Max	Min
0.01616	-0.01615

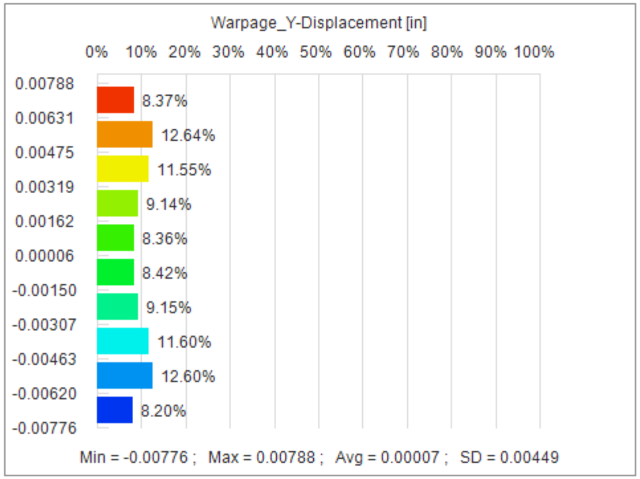
Avg	SD
0.00000	0.00941

Warpage_Y-Displacement



Shows the Y-component of the total displacement (All effects are considered) after the part is ejected and cooled down to room temperature. The value is relative to the model coordinate.

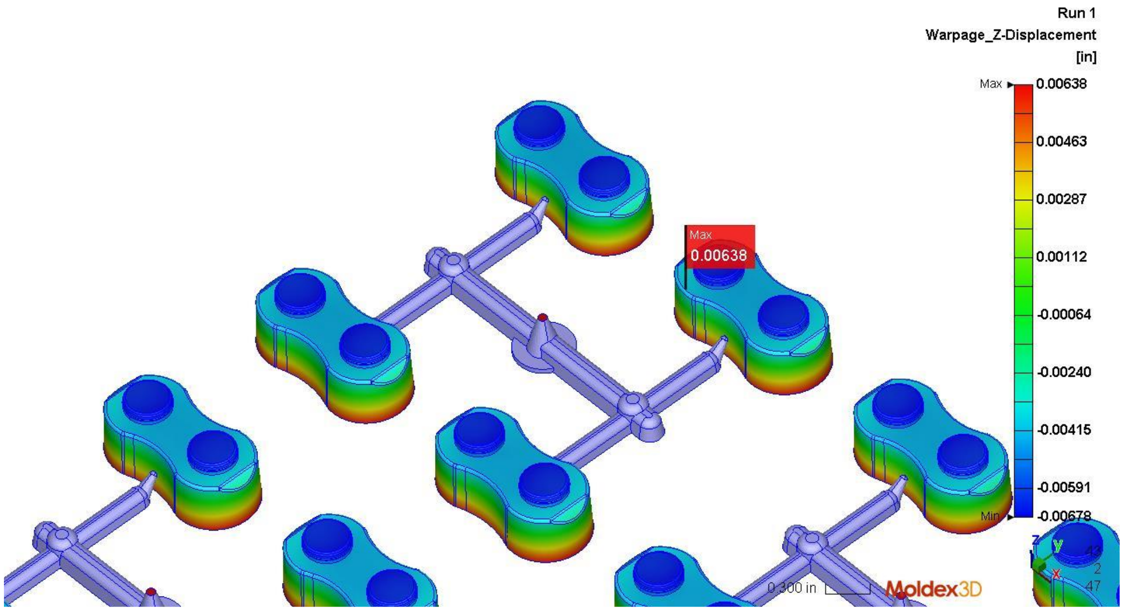
Histogram



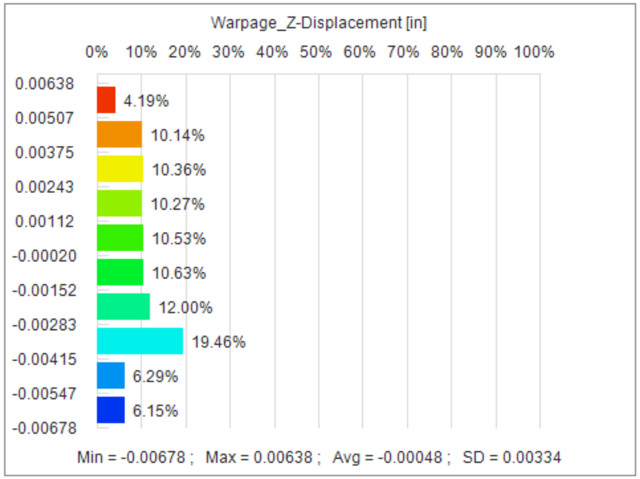
Max	Min
0.00788	-0.00776

Avg	SD
0.00007	0.00449

Warpage_Z-Displacement



Histogram



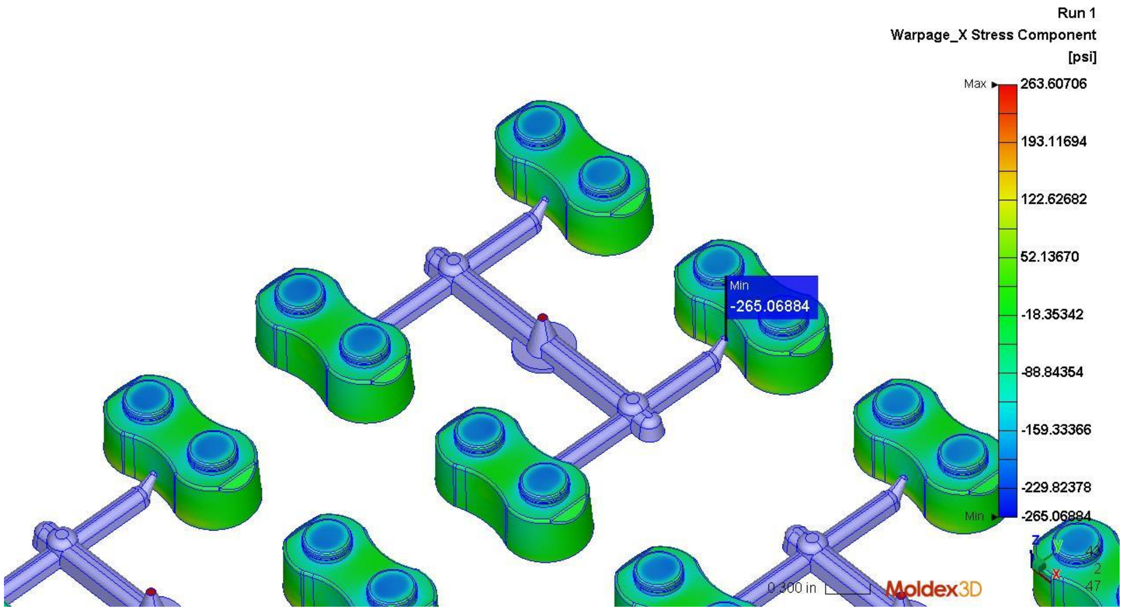
Max	Min
0.00638	-0.00678

Avg	SD
-0.00048	0.00334

Shows the Z-component of the total displacement (All effects are considered) after the part is ejected and cooled down to room temperature. The value is relative to the model coordinate.

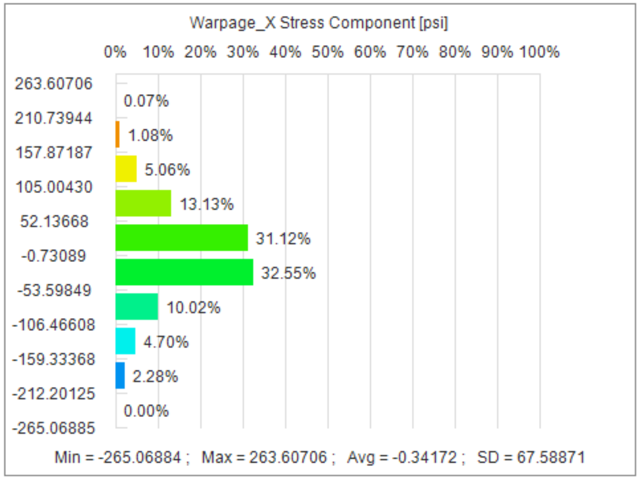
Moldex3D

Warpage_X Stress Component



XX-component of the thermal residual stress tensor of the ejected part.

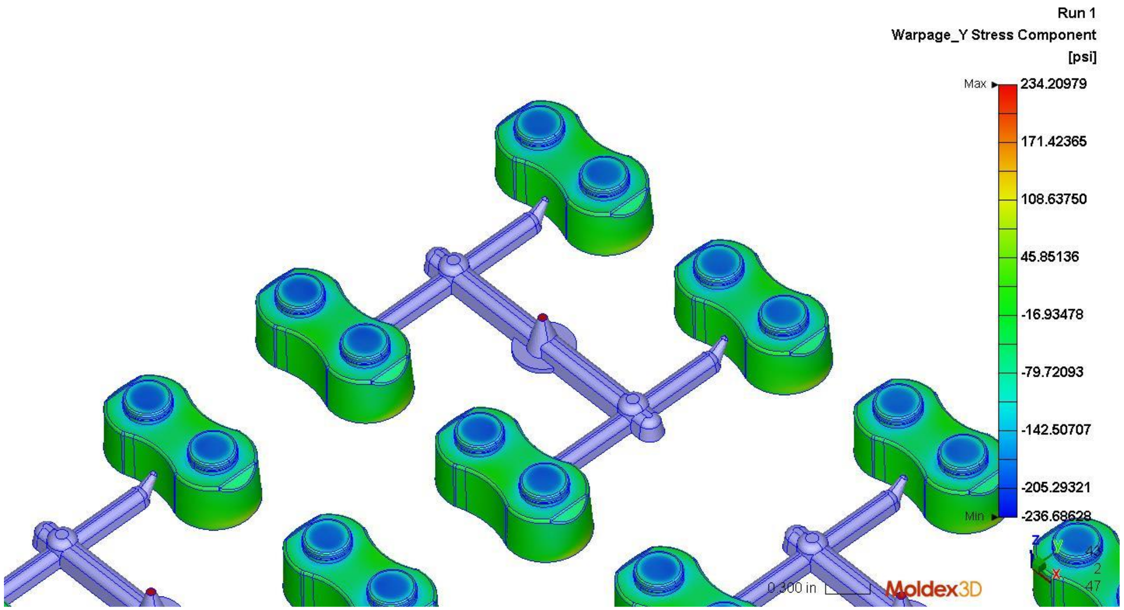
Histogram



Max	Min
263.60706	-265.06884

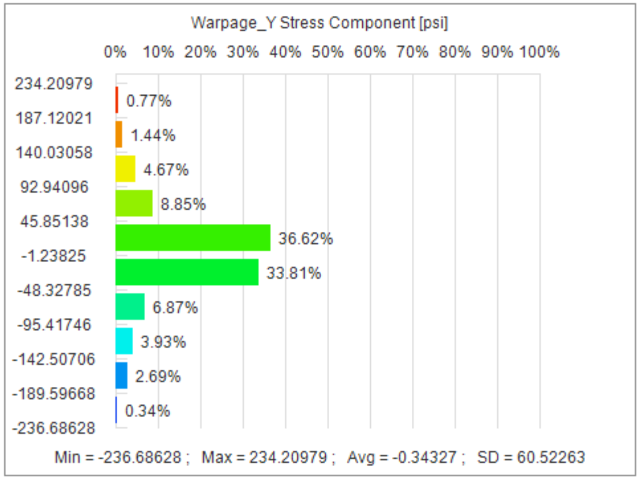
Avg	SD
-0.34172	67.58871

Warpage_Y Stress Component



YY-component of the thermal residual stress tensor of the ejected part.

Histogram

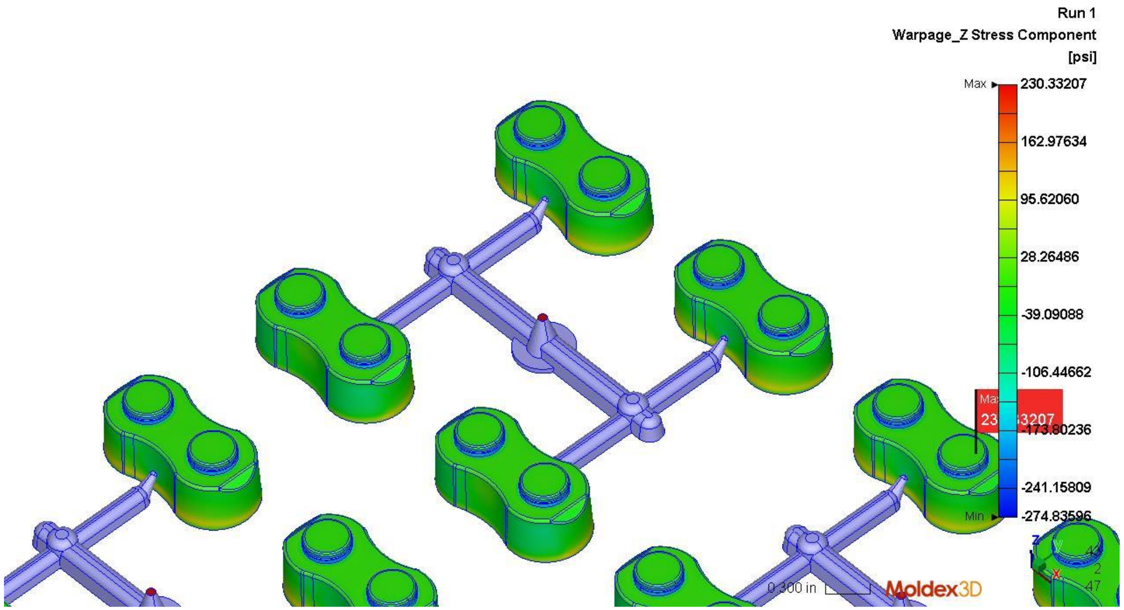


Max	Min
234.20979	-236.68628

Avg	SD
-0.34327	60.52263

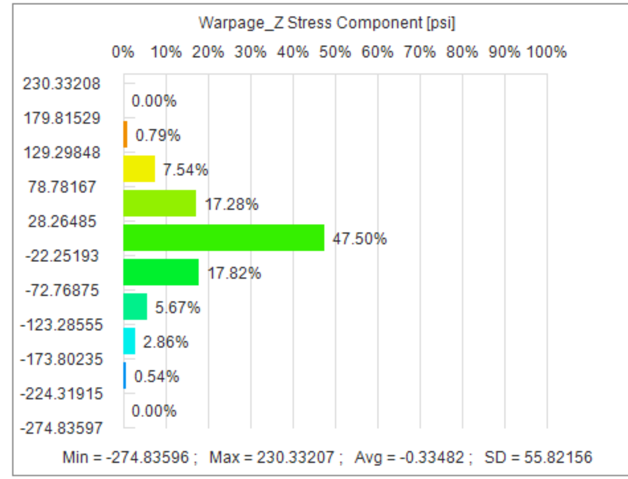
Moldex3D

Warpage_Z Stress Component



ZZ-component of the thermal residual stress tensor of the ejected part.

Histogram

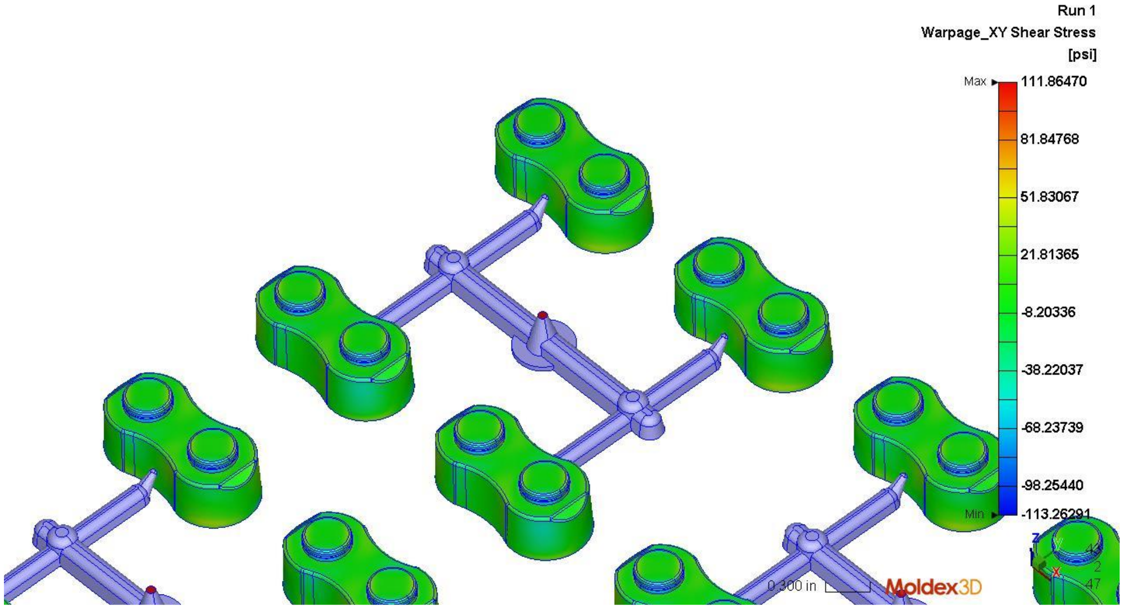


Max	Min
230.33207	-274.83596

Avg	SD
-0.33482	55.82156

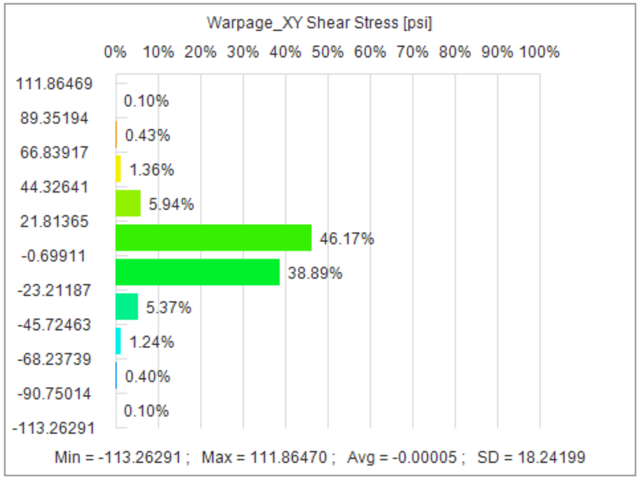
Moldex3D

Warpage_XY Shear Stress



XY-component of the thermal residual stress tensor of the ejected part.

Histogram

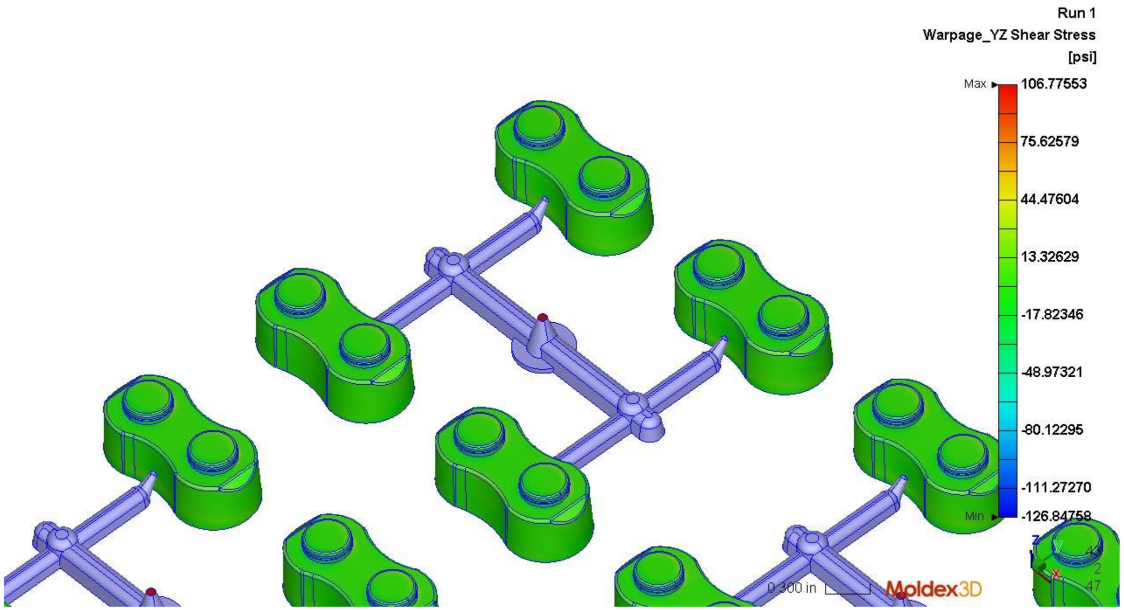


Max	Min
111.86470	-113.26291

Avg	SD
-0.00005	18.24199

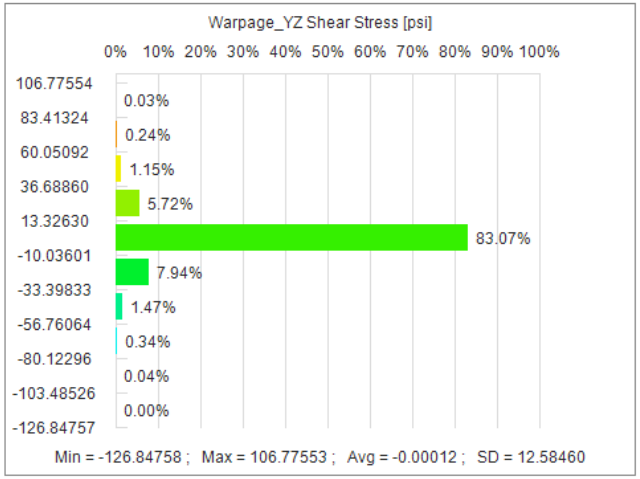
Moldex3D

Warpage_YZ Shear Stress



YZ-component of the thermal residual stress tensor of the ejected part.

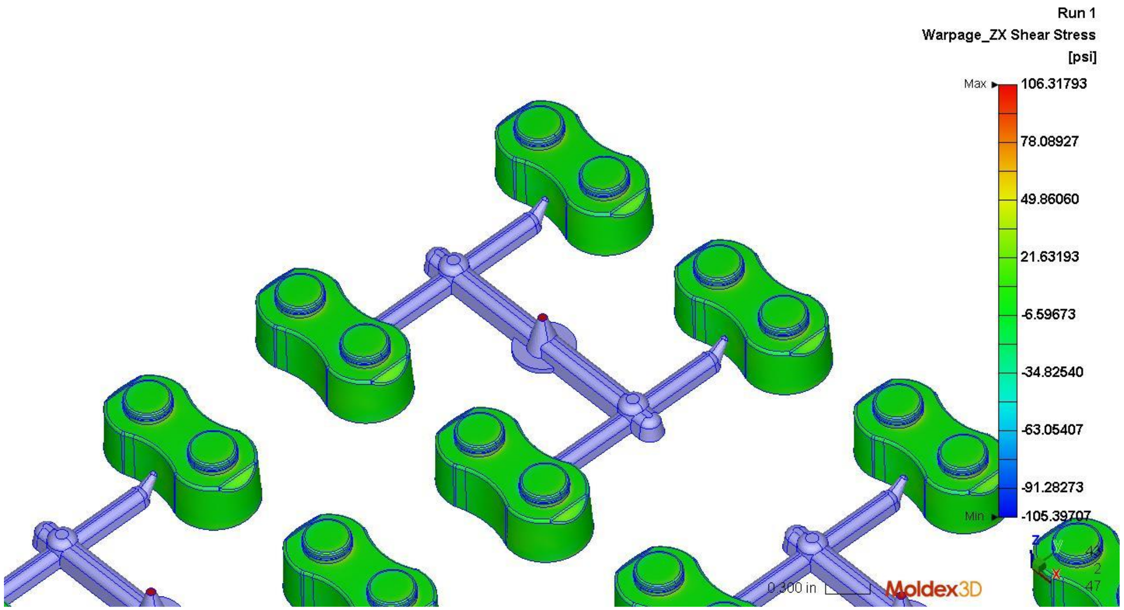
Histogram



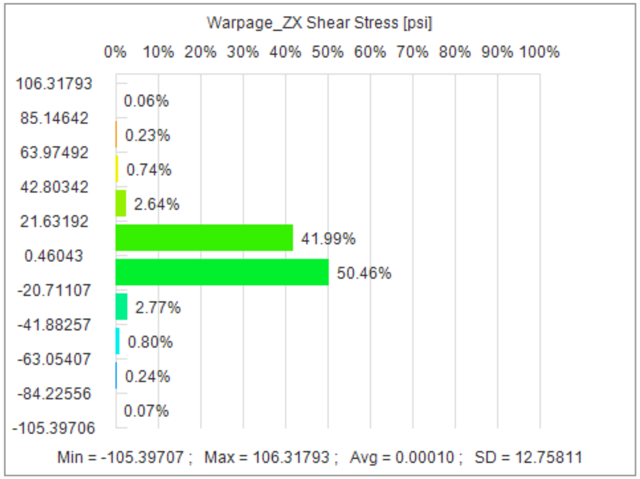
Max	Min
106.77553	-126.84758

Avg	SD
-0.00012	12.58460

Warpage_ZX Shear Stress



Histogram



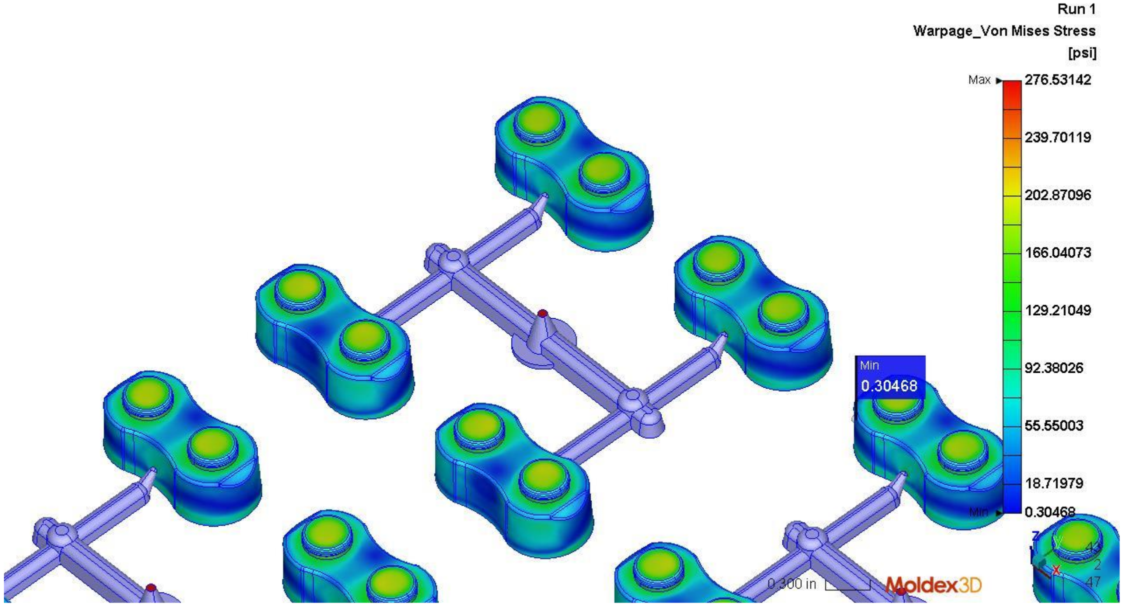
Max	Min
106.31793	-105.39707

Avg	SD
0.00010	12.75811

ZX-component of the thermal residual stress tensor of the ejected part.

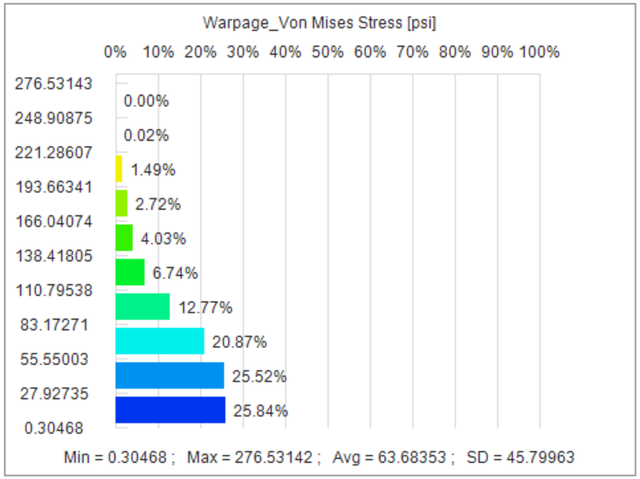
Moldex3D

Warpage_Von Mises Stress



Von-Mises thermal residual stress of the ejected part.

Histogram

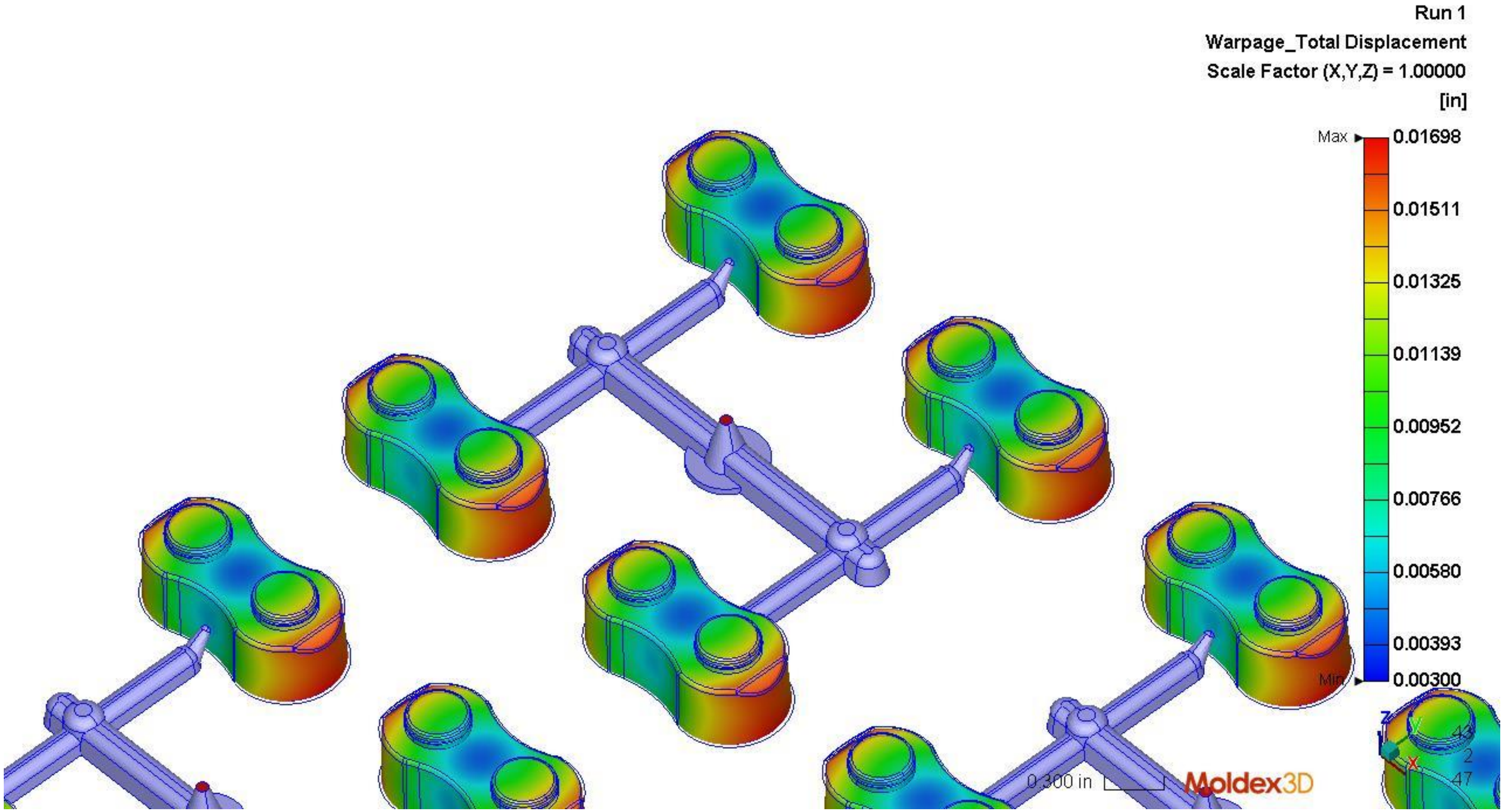


Max	Min
276.53142	0.30468

Avg	SD
63.68353	45.79963

Moldex3D

Warpage_Total Displacement (Deformation)



Deformation Factor	Max Displacement	Unit
1	0.01698	in

Moldex3D