Moldex3D

Non-matching Technology & Pin Movement Simulation

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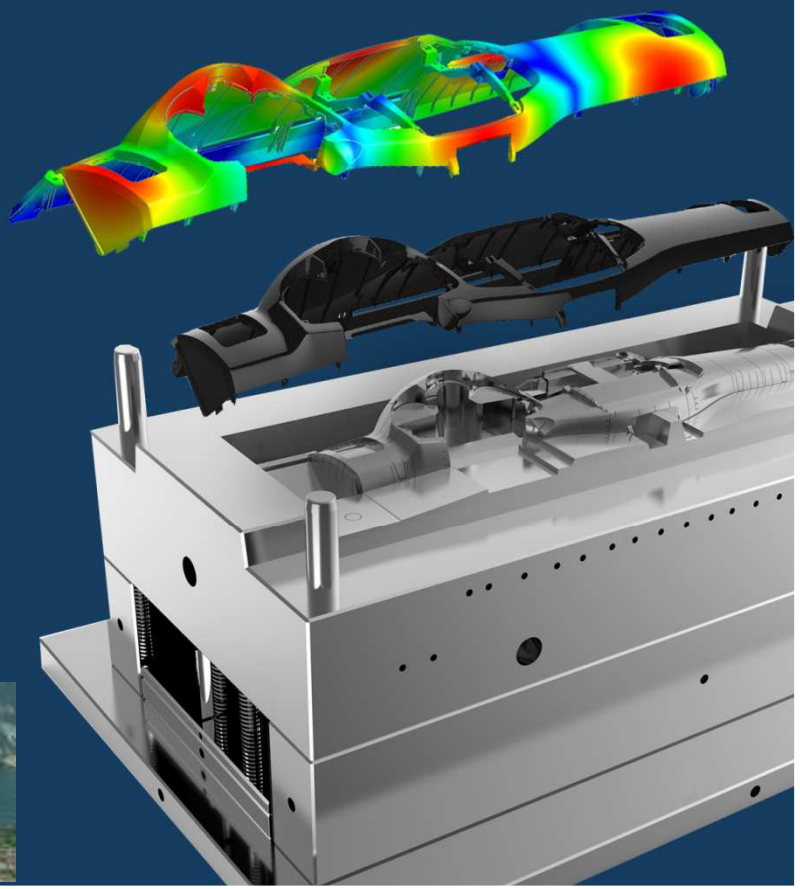

Non-Matching Technology

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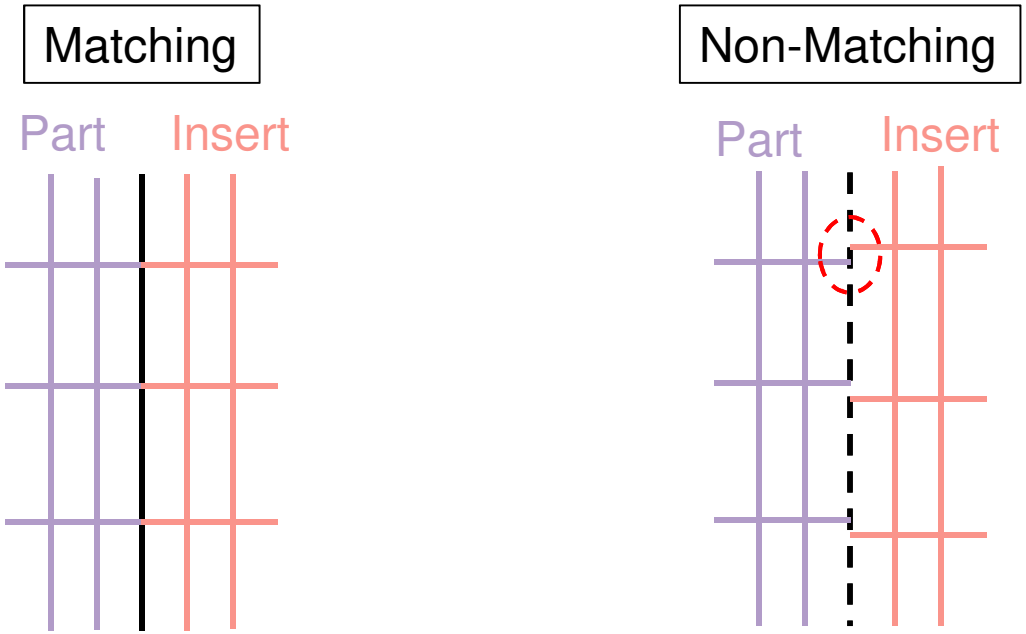

> **Non-Matching surface mesh**
  - **Shorter the pre-process time**
  - **Smoother mesh generation process**

Non-Matching Technology in Meshing

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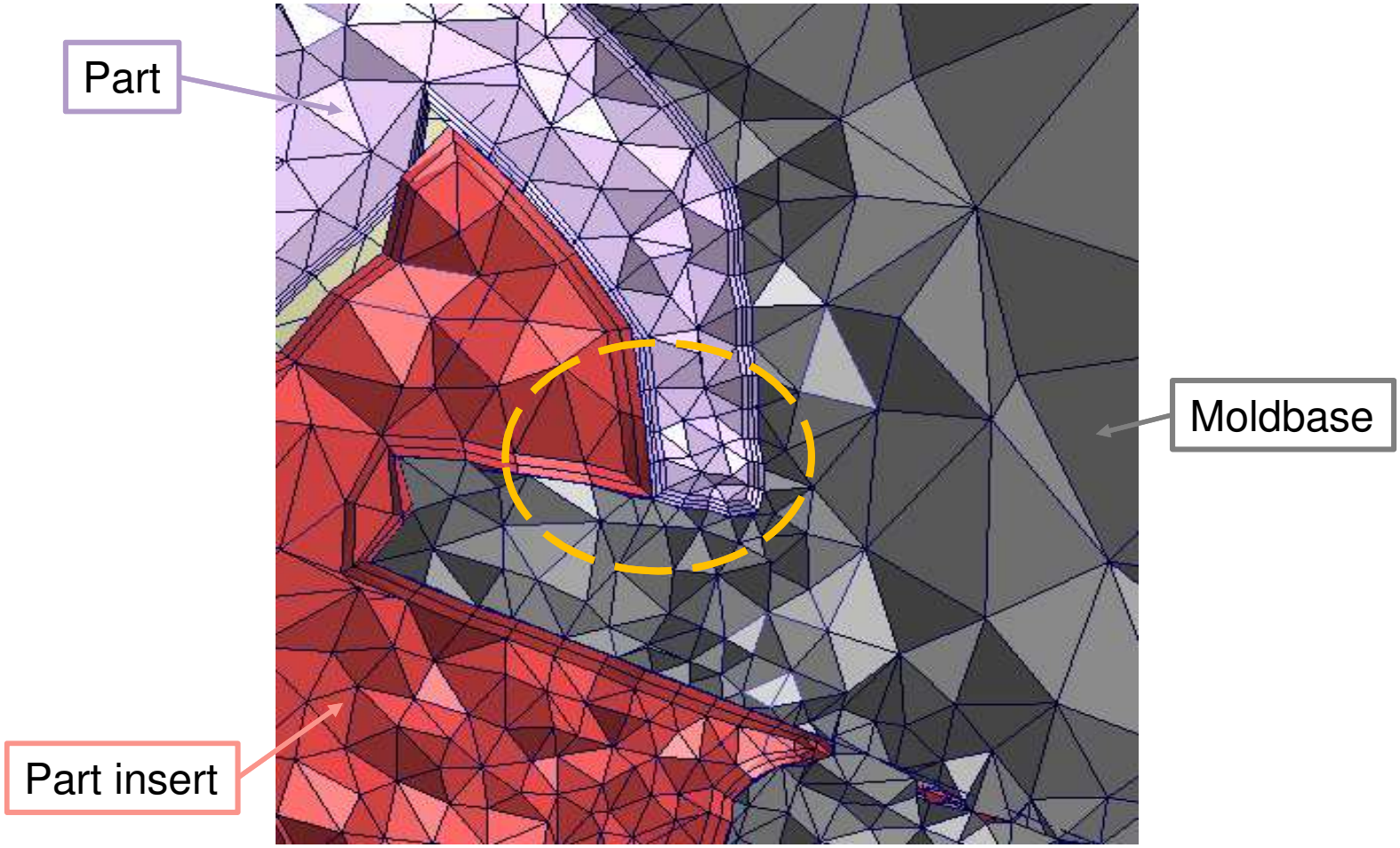

Non-matching technology in R16

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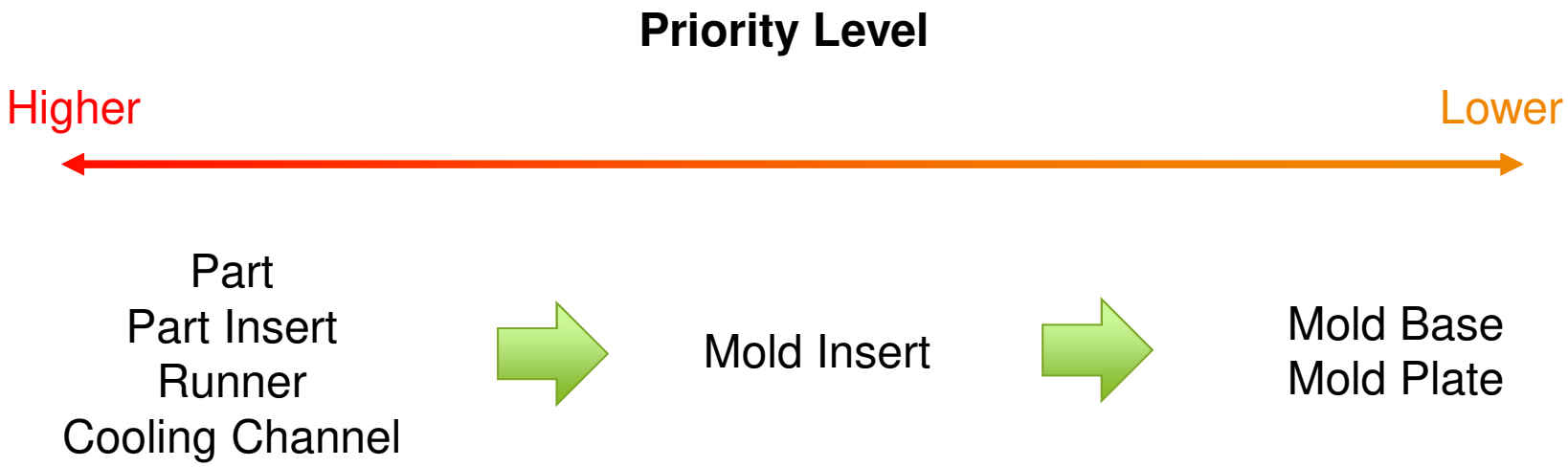
> Advantages
  - Support most of mesh types
  - New mesh kernel and tools

> Limitations
  - Do not support mold deformation
  - Do not support following mesh type:
    - Overflow
    - Compression Zone
    - Pin Movement

Quick Seeding

The node seeding at higher priority level will be brought to the lower priority level. It could make sure the surface mesh size is close to each other at the contact surface.



Tips to do non-matching mesh

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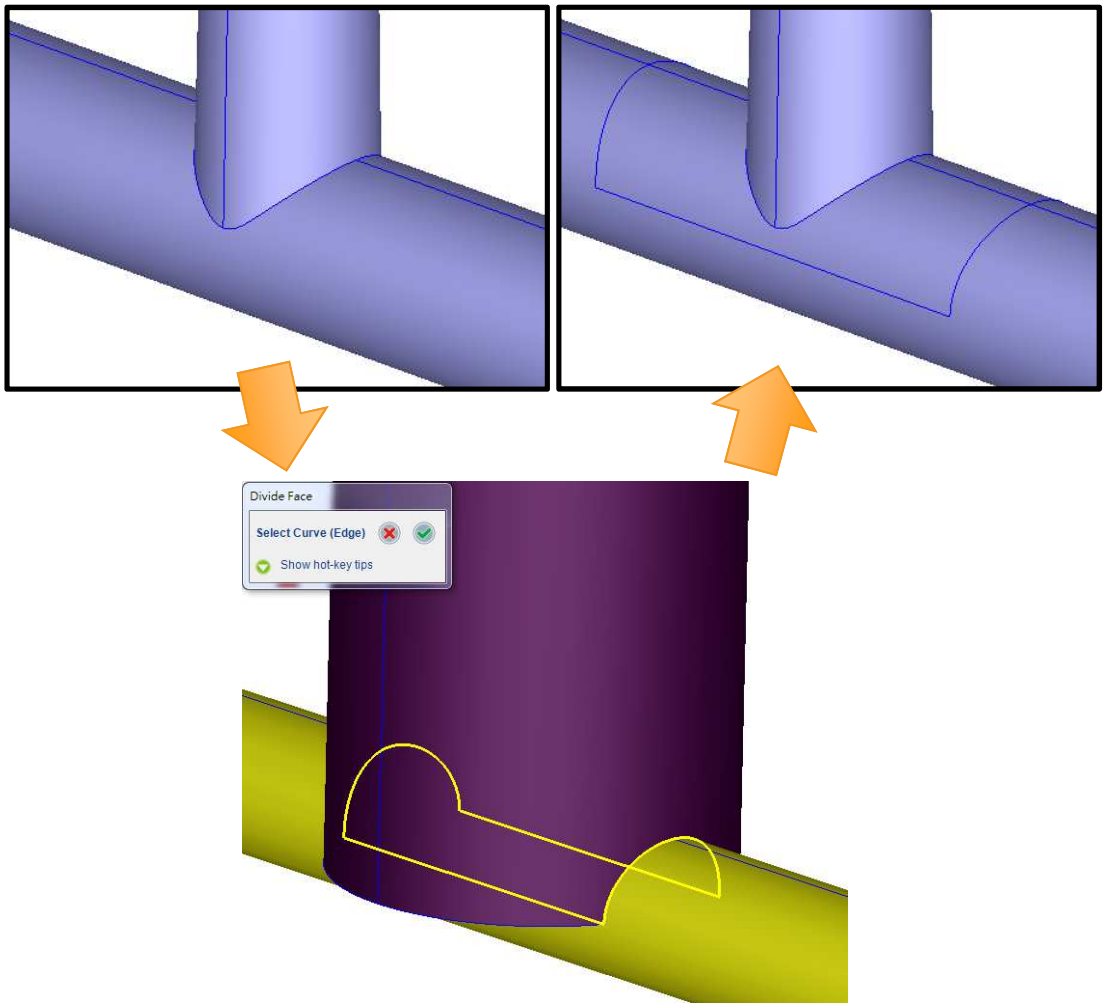
> Manual seeding
  - Node seeding match in all the contact region
  - The difference in node seeding should be under 1.7 times

> Node Seeding Sequence
  - Set the node seeding from higher priority to lower priority
    - part/part insert > mold insert > mold base/mold plate

> Matched CAD file
  - The non-matched CAD file would lead to intersection, the problem could only be fixed from CAD file now
  - Using divide face function or draw the feature line in CAD file can decrease the numerical noise

Divide Face

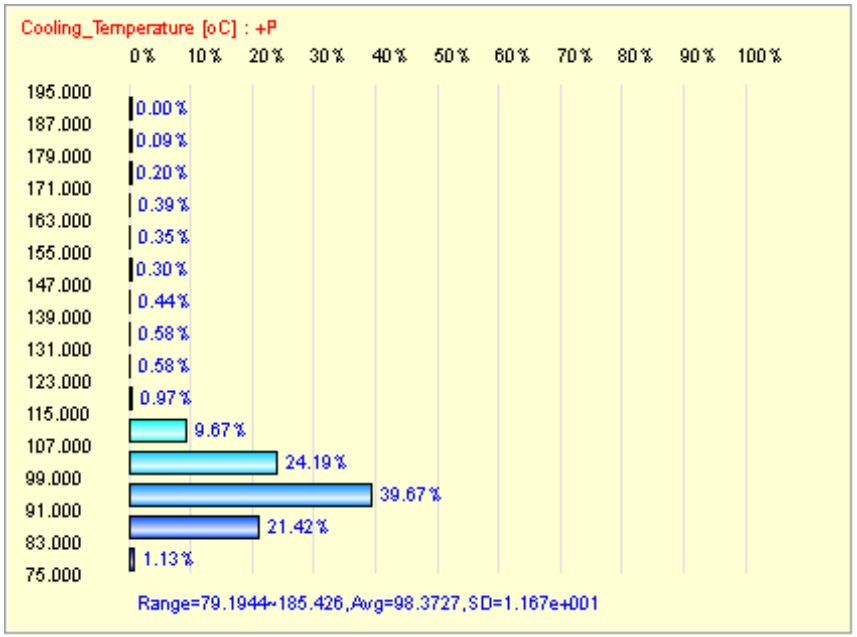
Create the feature line with another geometry's boundary



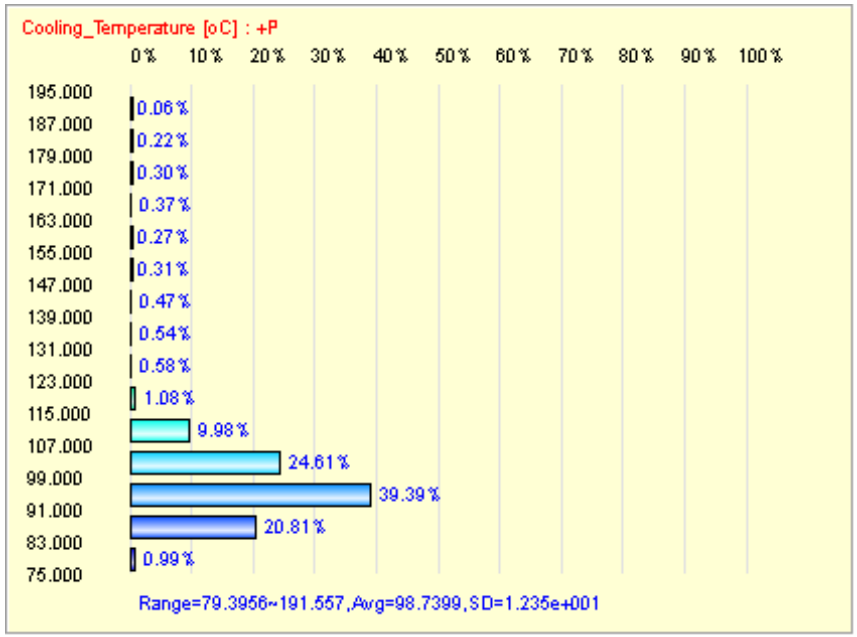
Result Comparison (1)

> Time takes for meshing
  - 10 mins vs 5 hours

> Part temperature results



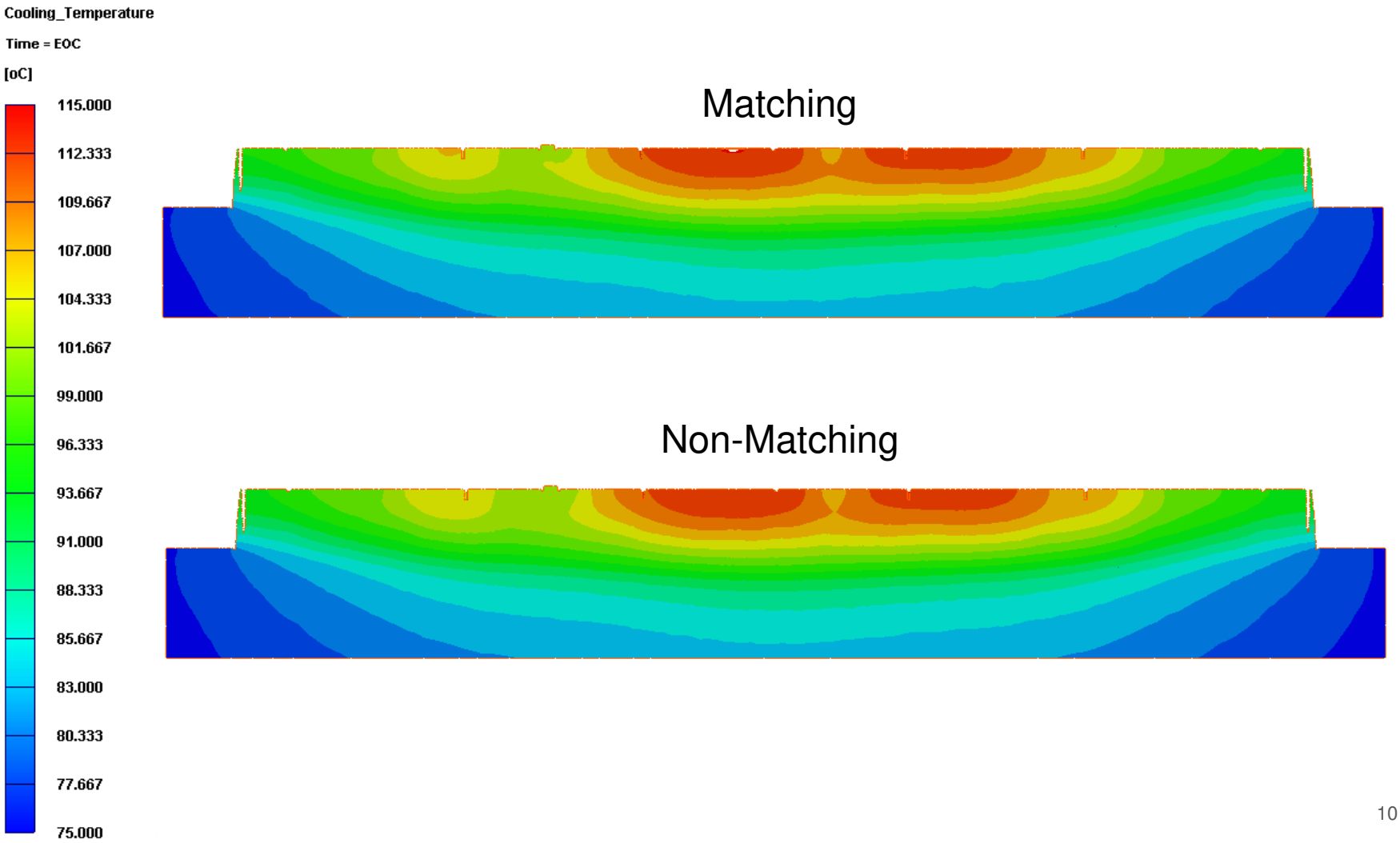
Matching
Average temperature 98.37 ˚C



Non-Matching
Average temperature 98.74 ˚C

Result Comparison (2)

> **Mold insert temperature**



Benefit from Non-matching technology

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- Easier to establish solid mesh model
- Synchronized result with matching mesh model
- Possible for complete mold base analysis

Pin Movement

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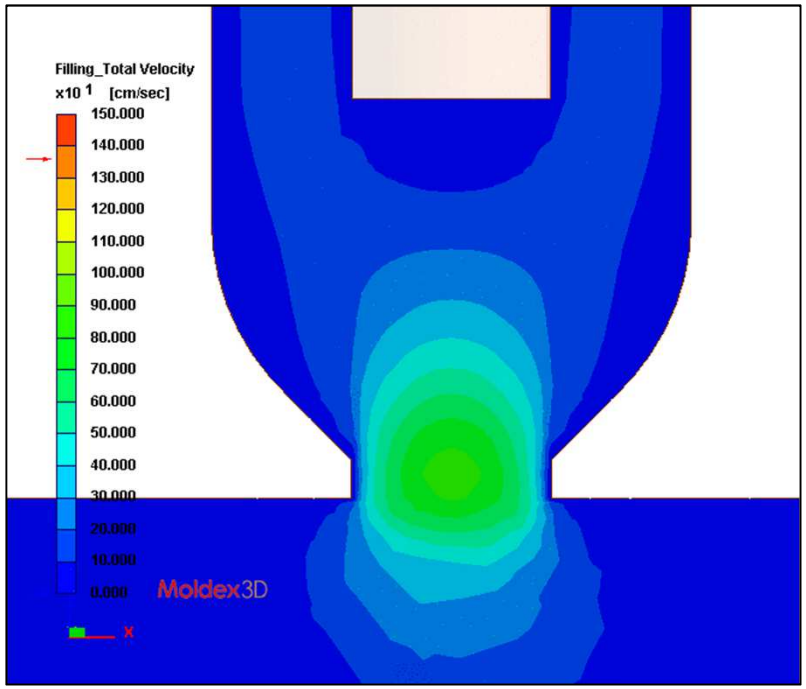
Hot Runner now days

Source: https://www.hrsflow.com/eng/soluzioni/flexflow-servo-driven-valve-gate-system.php

Source: http://www.synventive.com/products/active-gate-control.aspx

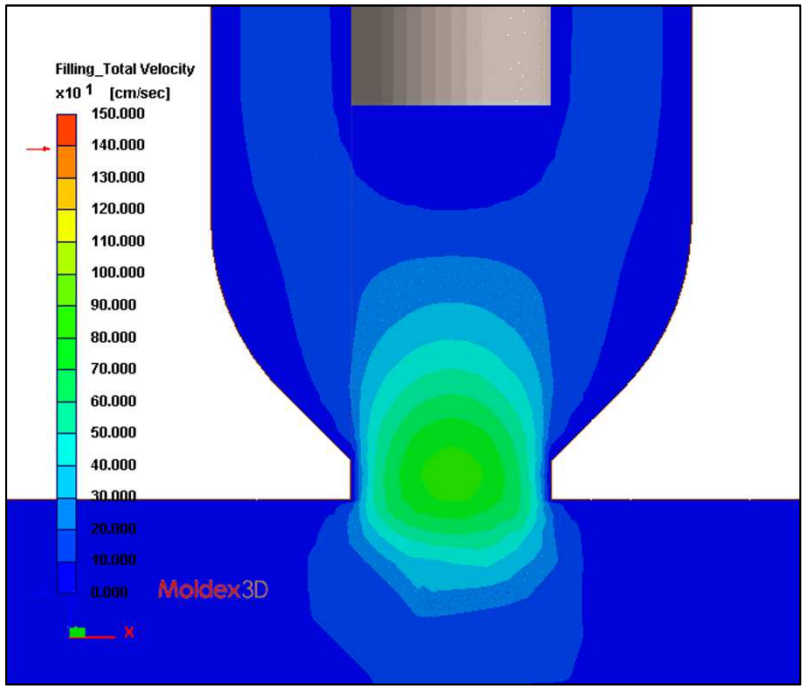
Why Pin Movement should be considered?

Conventional Valve Gate



Only go and stop in the gate region

AHR Pin Movement



The flow velocity is decided by pin movement

Stress Mark

Problems caused by residual stress in plastic part. Generally fall into some of the following categories:

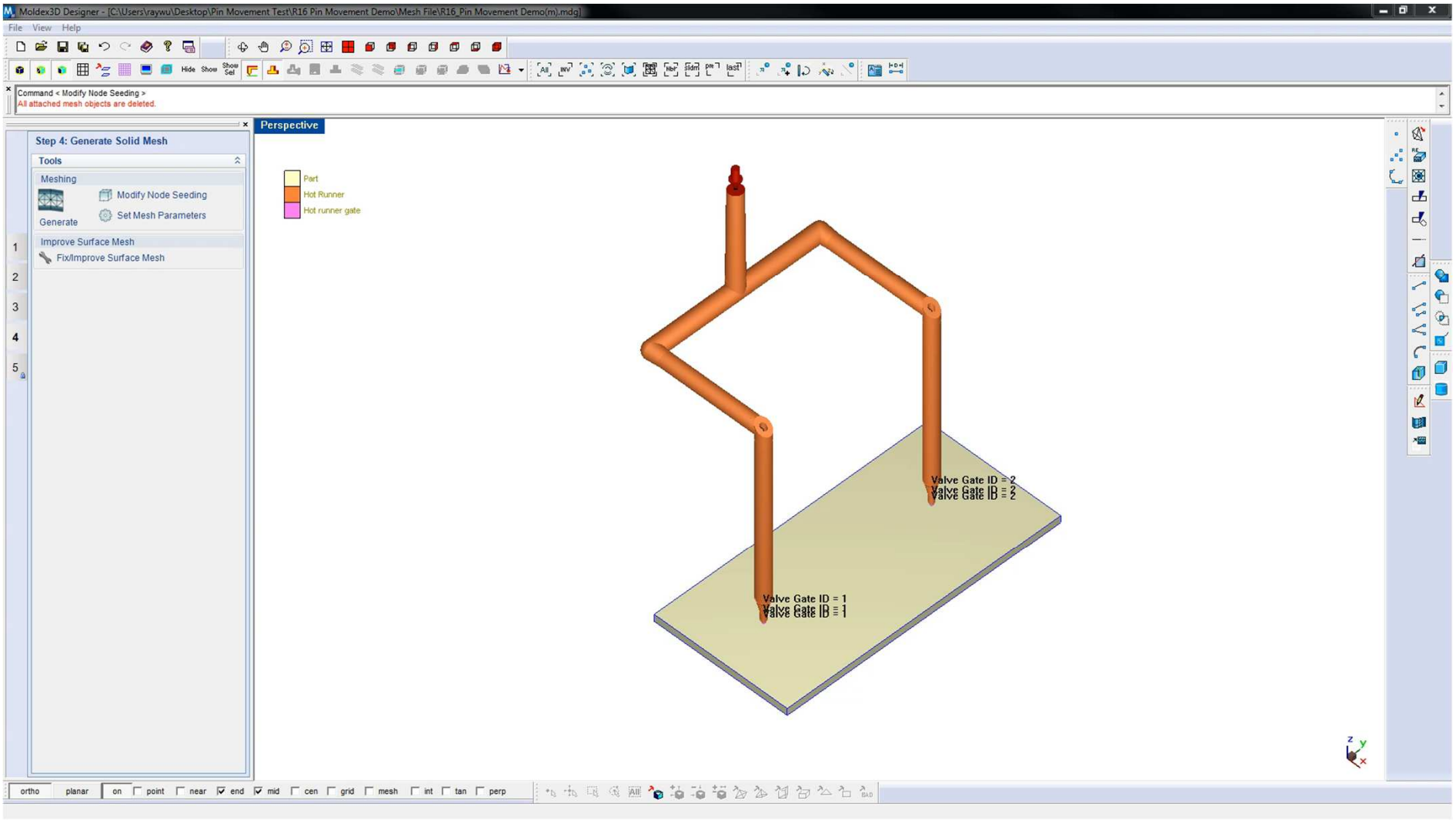
- **Cracking**
- **Distortion**
- **Aggravation of optical properties:**

Source: https://www.apporo-cnc.com/news_detail.php?menu_s=400&sn=39&page=

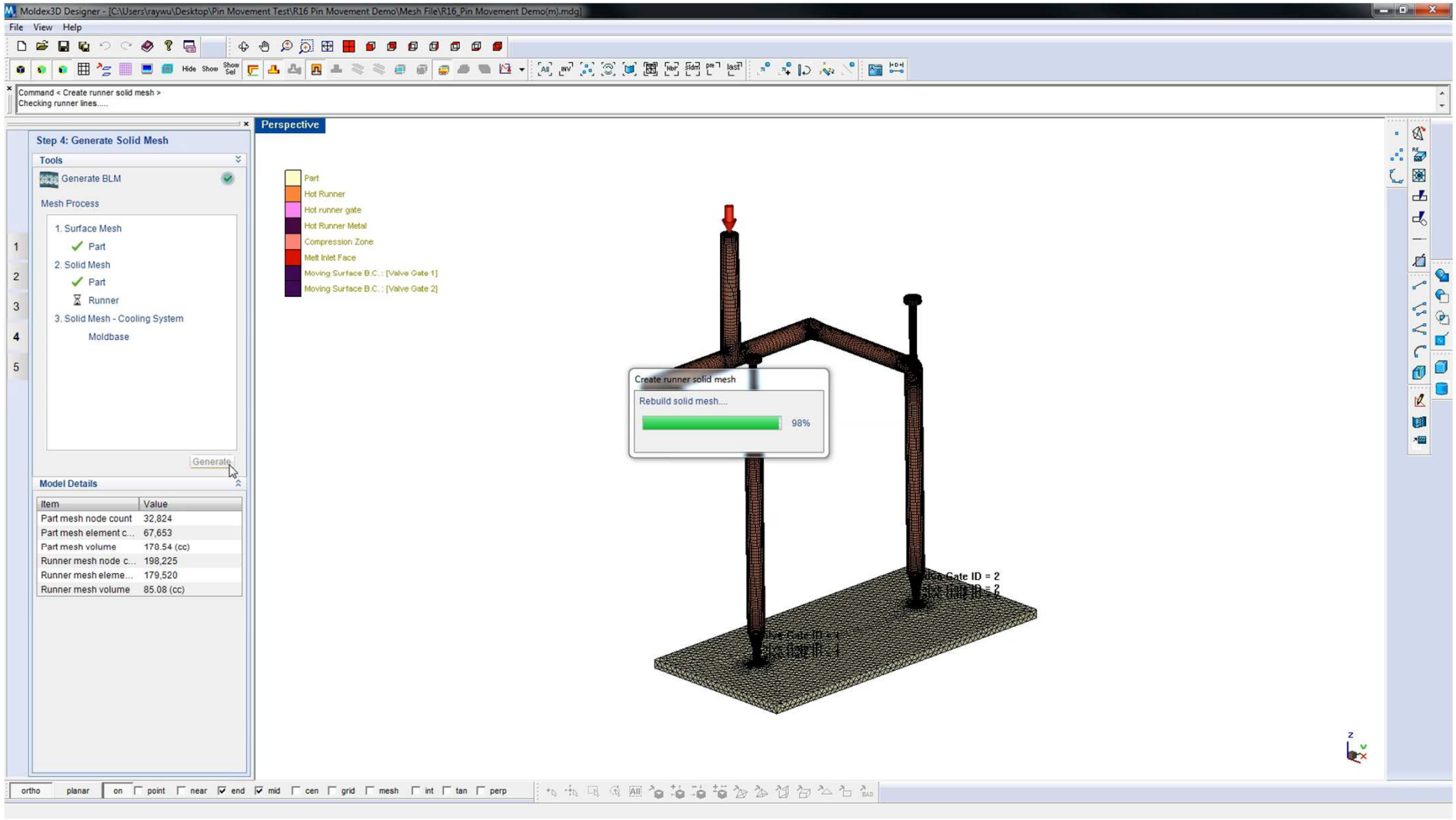
Pin Movement in R16

- Mesh
  - Automatic solid mesh generation in Designer BLM
- Necessary Modules
  - Designer BLM
  - Advanced Hot Runner
  - Pin Movement
- Pin Movement Control method
  - Velocity to Position
  - Position to Time
- Results
  - Synchronized pin movement animation

Pin Movement Meshing Demo



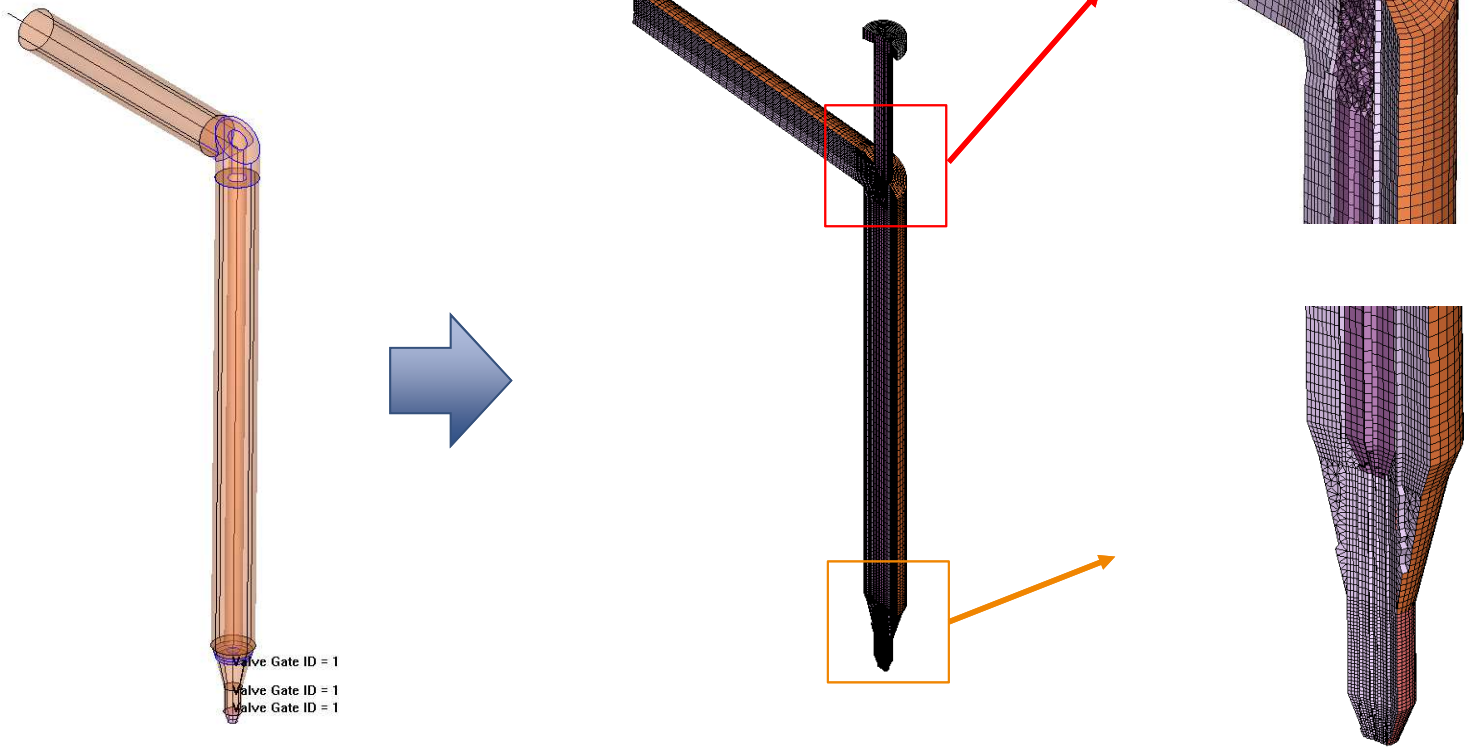
Pin Movement Meshing Demo



Pin Movement in R16 - Mesh

> **Mesh**

- ~~Rhino Mesh only in R15~~
- **Automatic runner generation in R16**



Pin Movement in R16 – Control Method

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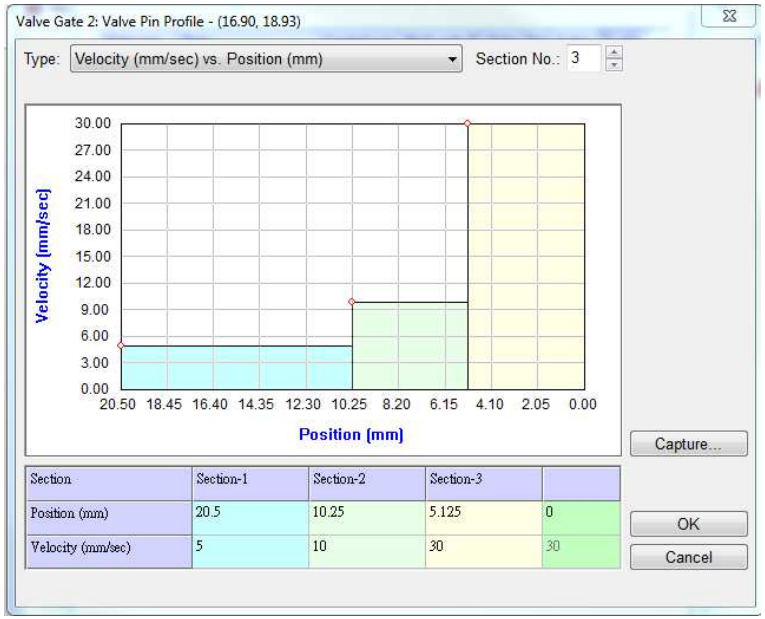
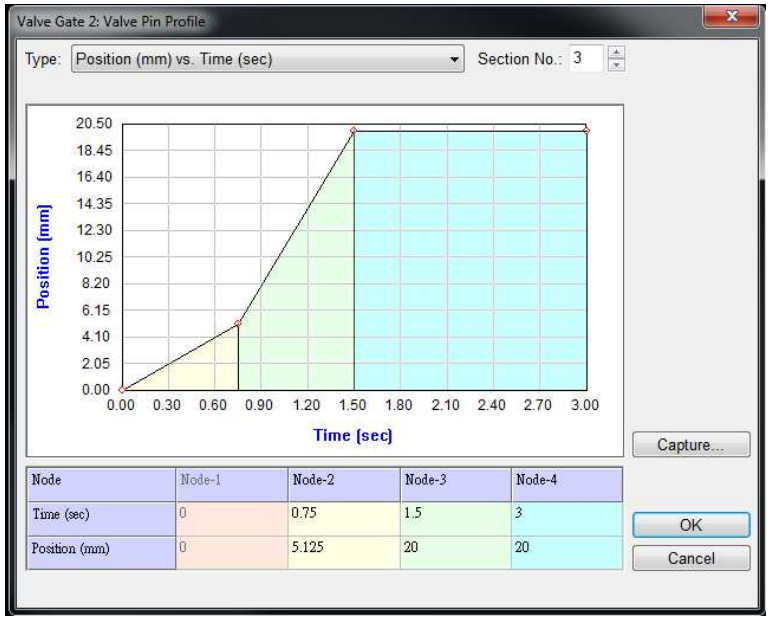
> **Pin Movement Control method**
  - ~~Velocity to Time~~
  - **Velocity to Position**
  - **Position to Time**





Thank You

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