Moldex3D

What's New in R14

Moldex3D Italia –
Ing. Stefano Canali

MOLDING INNOVATION

Supported Platforms

- Support Windows 64-bit series in Microsoft's Mainstream
- Support SUSE Linux Enterprise Server and CentOS/RHEL (Red Hat Enterprise Linux)
- Moldex3D Mesh R14.0 for Rhino5 64-bit platform only

Platform	OS	Remark
Windows / x86-32	NOT Supported*	Support terminated since R14.0, except Moldex3D LM Server
Windows / x86-64	Windows 10 family* Windows 8 family Windows 7 family Windows Server 2008 Windows HPC Server 2008 Windows Server 2012	Moldex3D R14.0 is certified for Windows 10 Moldex3D Digimat-RP will support Windows 10 in the next release 
Linux / x86-64	CentOS 5 family CentOS 6 family RHEL 5 family RHEL 6 family SUSE Linux Enterprise Server 11 SP2	Linux platform is used for calculation resource only. Moldex3D LM, Pre-processor and post-processor do not support Linux platform

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Moldex3D R14.0 Key Features

> 1. Pre-Processor Enhancement (Designer BLM)
  - New generation of 3D mesh technology: BLM 2.0
  - New meshing user interface and workflow
  - Supporting non-matching mesh
> 2. New Module
  - Moldex3D Digimat-RP
  - Resin Transfer Molding (RTM)

Moldex3D R14.0 Key Features (con't)

- 3. Solver Enhancement (Kernel & Parameter)
- 4. Solver Enhancement (Solution Add-Ons)
- 5. Pre & Post (Usability)
- 6. Other
  - Online Help
  - Installation Wizard
  - Material database update

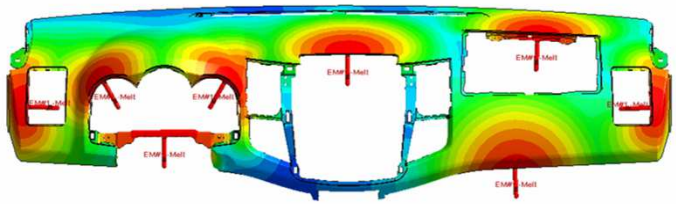
1. Designer BLM

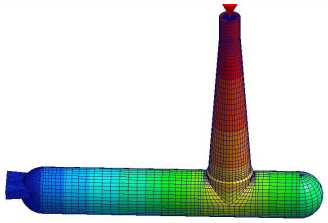
- New generation of 3D mesh technology
- Default meshing parameter change
- Less repair effort with intelligent mesh generator
- More robust solid mesh generator
- New meshing user interface
- Supporting non-matching mesh

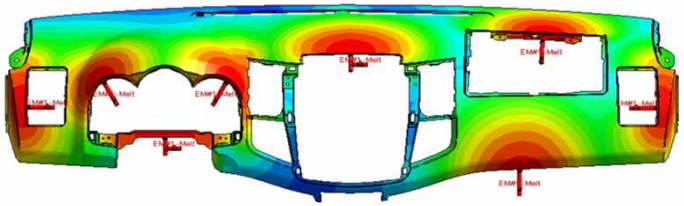
New Generation of 3D Mesh Technology

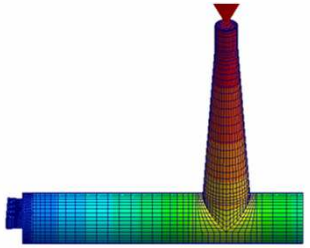
> BLM 2.0= Fast analysis + Good result

	Element Count		Filling Analysis Time
	Part	Runner	
R13.0	6,509,770	390,310	6.5HR
R14.0	**1,584,729**	**238,518**	**1.2HR**









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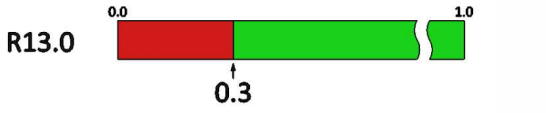
Less Repair Effort with Intelligent Mesh Generator

- **x6** Lower Quality Requirement for Surface Mesh
  - The poor element range of aspect ratio for surface mesh is reduced significantly from 0.3 to 0.05
- **Benefit**
  - Less human effort and to get good mesh quality



Surface Mesh Information

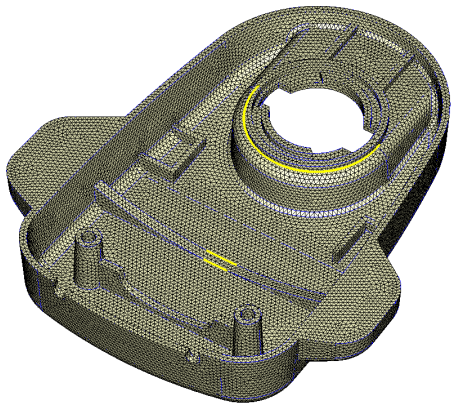
Recheck Zoom to Selection

Issue	Count
Free edge	0
T-connect edge	0
Overlap element	0
Aspect ratio (< 0.1)	126
Aspect ratio (0.1 ~ 0.3)	20
Trouble points	0

Surface Mesh Information

Recheck Zoom to Selection

Issue	Count
Free edge	0
T-connect edge	0
Overlap element	0
Aspect ratio (<0.01)	0
Aspect ratio (0.01 ~ 0.05)	0
Sharp angle (< 5.0°)	0



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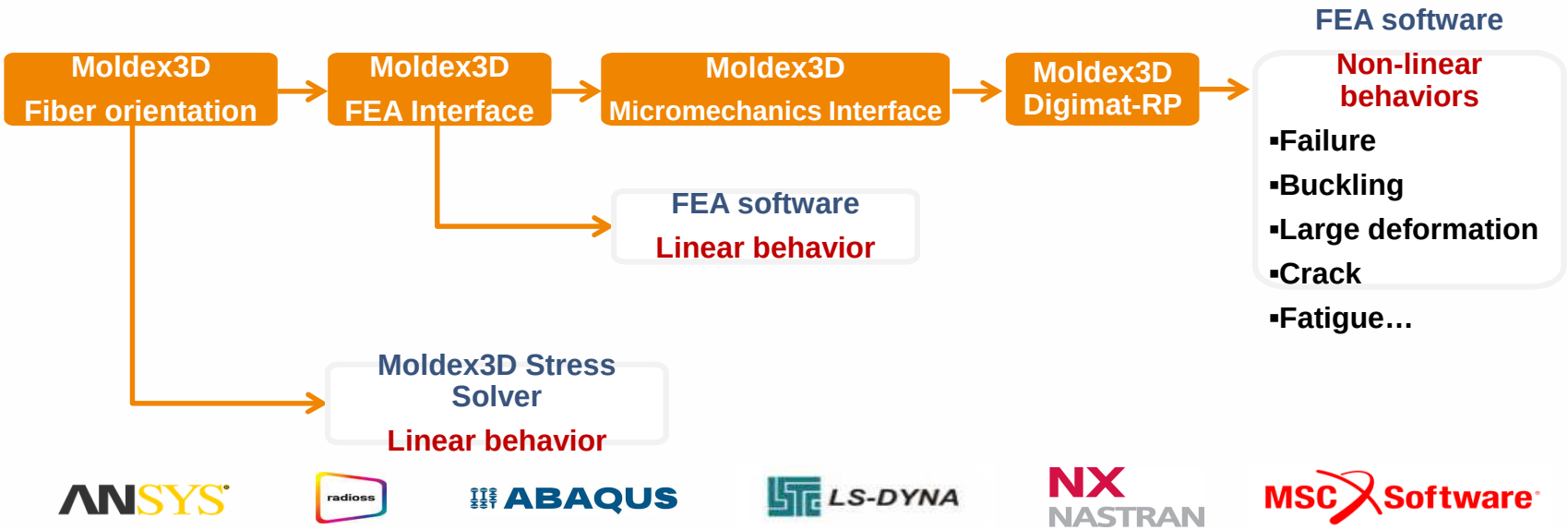
2. New Module

- Moldex3D Digimat-RP
- Resin Transfer Molding

Moldex3D Digimat-RP: New Module for Advanced Material Analysis

> CoreTech is pleased to announce that Moldex3D Digimat-RP (“Reinforced Plastics”) is now available from September 2015

> The two companies, e-Xstream engineering and Moldex3D are pleased to have joint force together to develop this joint product, **Moldex3D Digimat-RP**



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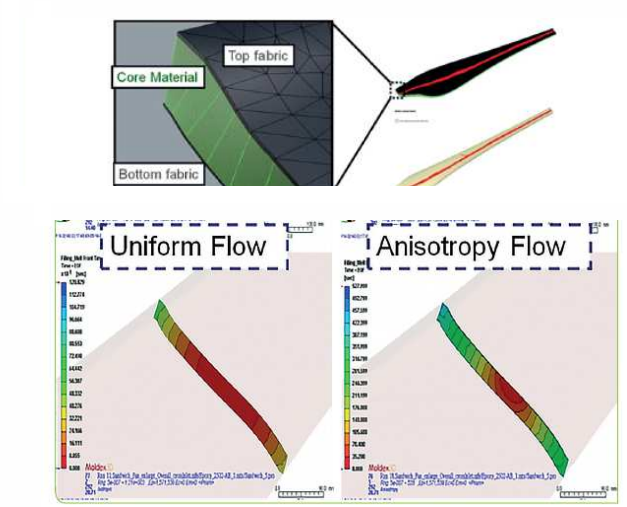
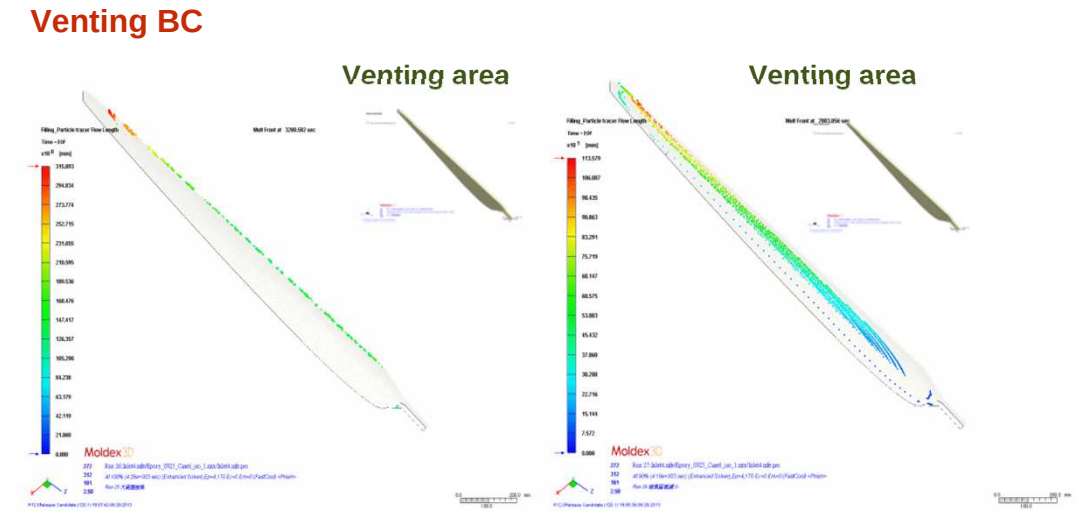
RTM: New Module for Special Molding

> Simulate the macro filling behavior for resin and composite with effect of fiber mat structure

> **Benefit**

- Detailed RTM filling behavior in the 3D structure
- Assist to evaluate and optimize design and process (inlet open time, venting location etc)





Ref : Hua-Zhan Chou, etc, "VISUALIZE RESIN TRANSFER MOLDING BEHAVIOR USING ADVANCED 3D CAE TECHNOLOGY", JEC Media, 2015

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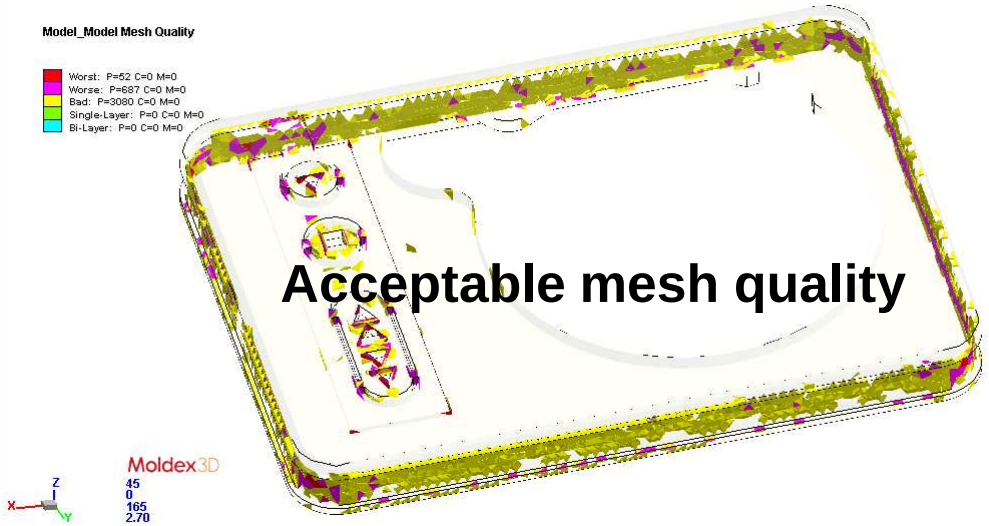
3. Solver Enhancement

Flow/Pack: More Independent to Mesh & HTC

- The enhanced solvers are robust to bear low quality mesh
- The analysis results are more independent to mesh resolution and HTC value as well
- **Benefit**
  - Less trial processing for mesh quality
  - Convergent and reliable prediction for different mesh quality and HTC valve



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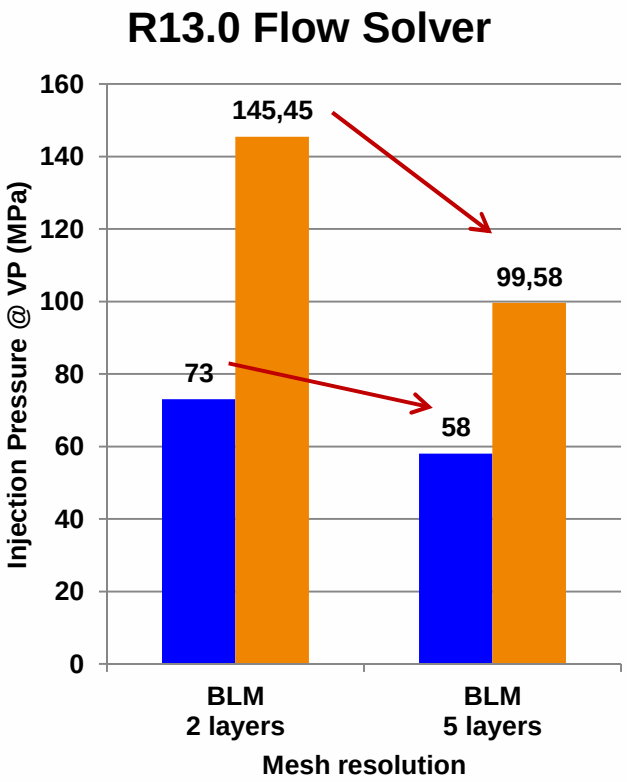
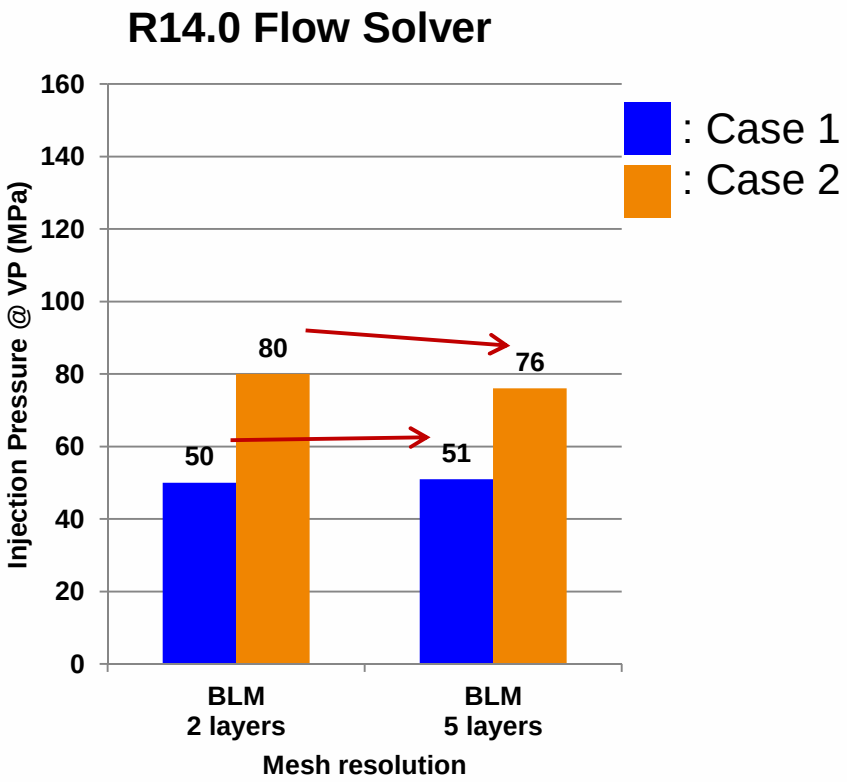
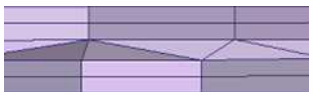
Flow/Pack: More Independent to Mesh & HTC (con't)

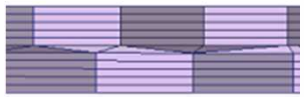
> R14.0's kernel is more independent to mesh







BLM 2 layers



BLM 5 layers

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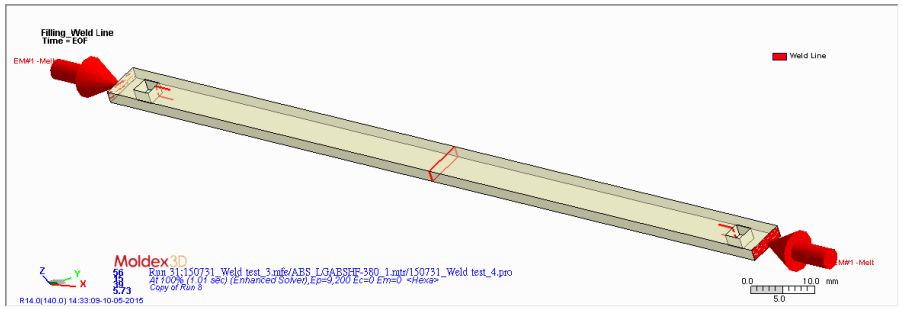
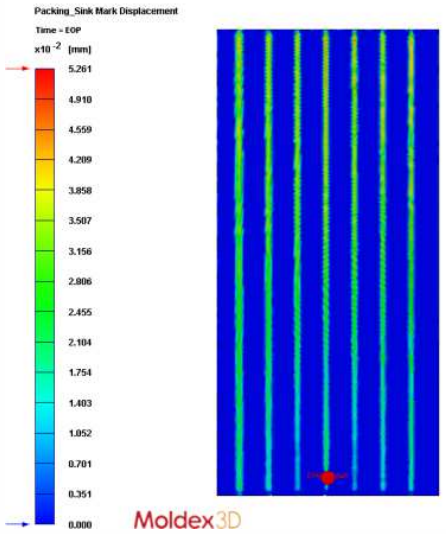
Flow/Pack: Enhanced Weld Line and Sink Mark Indicators

- Weld line
  - More robust to bad mesh quality
  - More independent for mesh resolution



- Sink mark
  - Improved prediction ability
  - More robust to bad mesh quality



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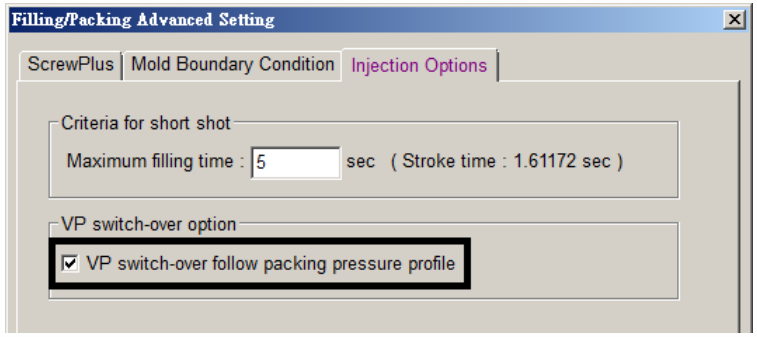
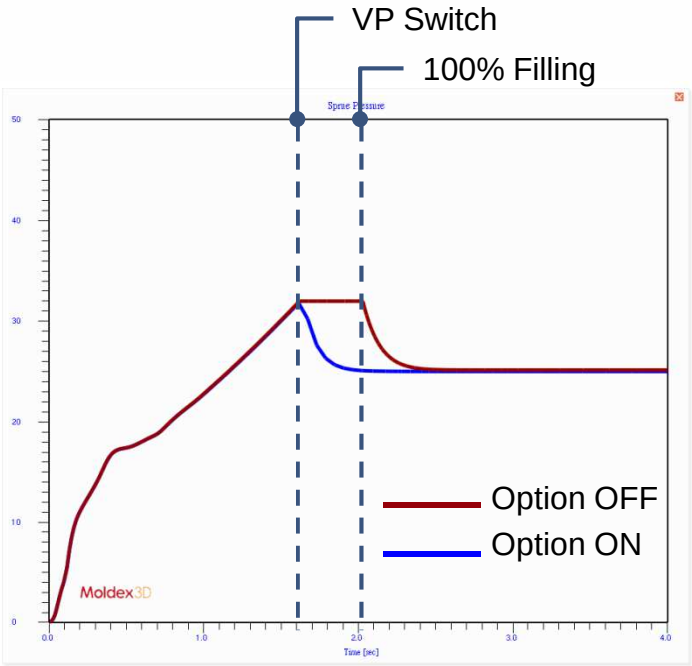
Flow/Pack: VP Switch with Pressure Following Packing Setting

- To have consistent packing behavior as actual injection machine in CAE mode during process setting
  - **Default: ON**
- **Benefit**
  - **Eliminate the difference between simulation and reality and avoid clamping force to be over predicted as well**



Option ON in machine mode as default



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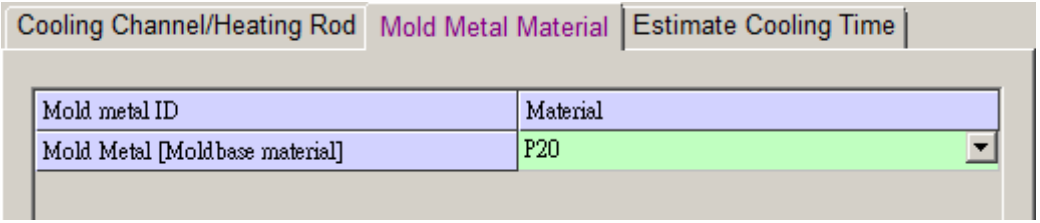
Cool: Renew to Default Computation Parameters

R13.0 default setting:	R14.0 default setting:
Moldbase material: P6 steel (not the most common mold steel)	**Moldbase material: P20 steel** (widely used mold steel) 
Moldbase mesh resolution: **Dense** with memory capacity (RAM) more than 32 GB	Moldbase mesh resolution: **Default** applied for fast cool model containing **hot runner metal** even with more than 32 GB memory

- **Benefit**
  - **Reasonable as compared to real application**
  - **Efficient memory usage for moldbase simulation**

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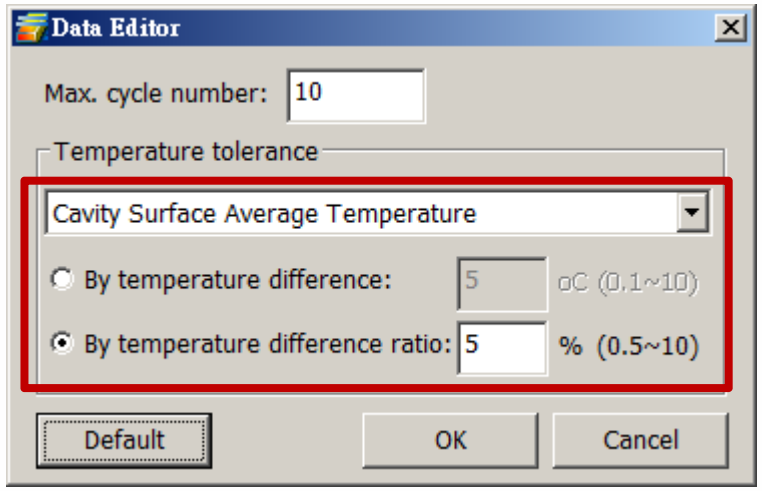
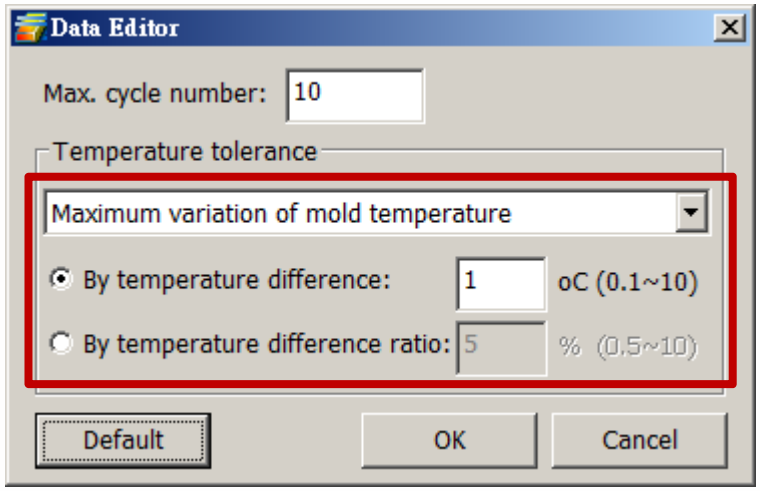
Cool: Renew to Default Computation Parameters (con't)

- Stricter convergence tolerance for transient cool
- **Benefit**
  - **Better in catching the heat accumulation in inner part**

R13.0 default setting:
Cavity Surface Average Temperature:
$|T_{Previous\ Cycle} - T_{Current\ Cycle}| / T_{Current\ Cycle} < 5\ \%$



R14.0 default setting:
Max. Variation of Mold Temperature:
$|T_{Previous\ Cycle} - T_{Current\ Cycle}| < 1℃$



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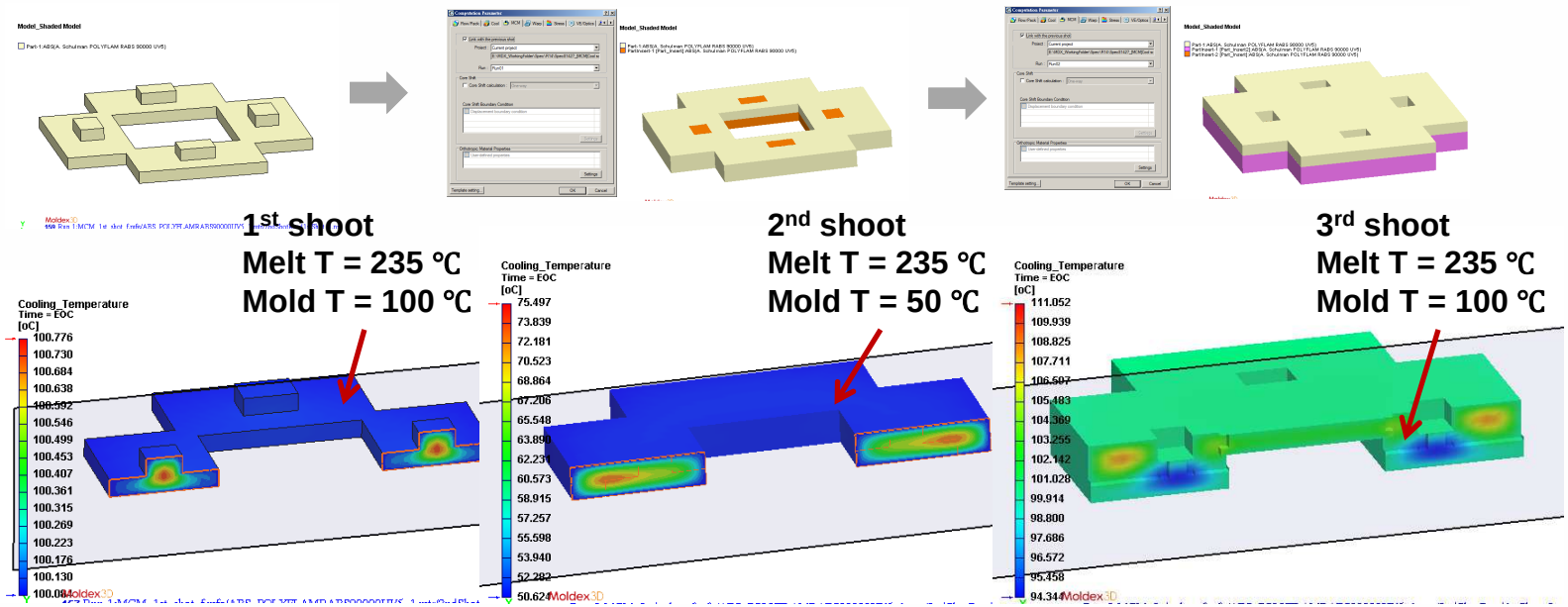
MCM: Full Consideration of Previous Shot Output

- Link of previous shot with all the effects in simulation
  - Residual temperature of all components
  - Other data like orthotropic material
- **Benefit**
  - More accurate results considering all components



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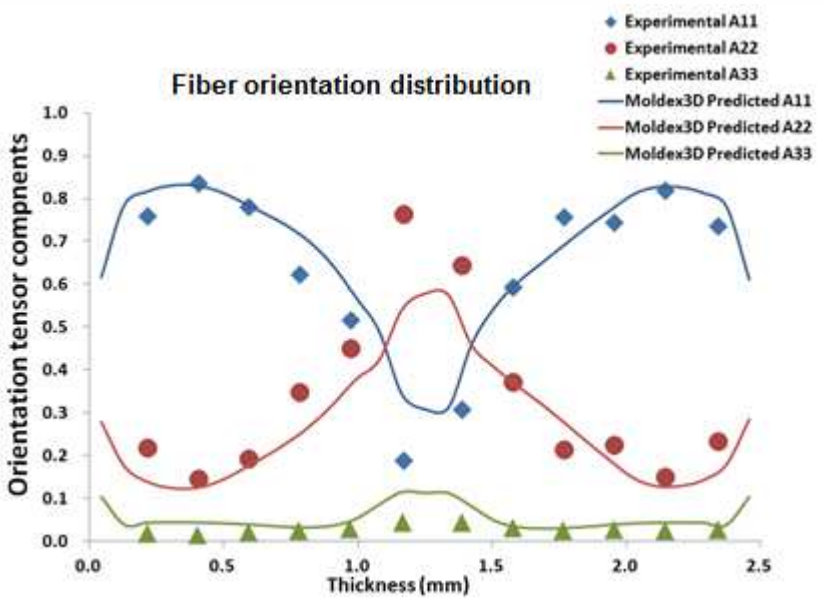
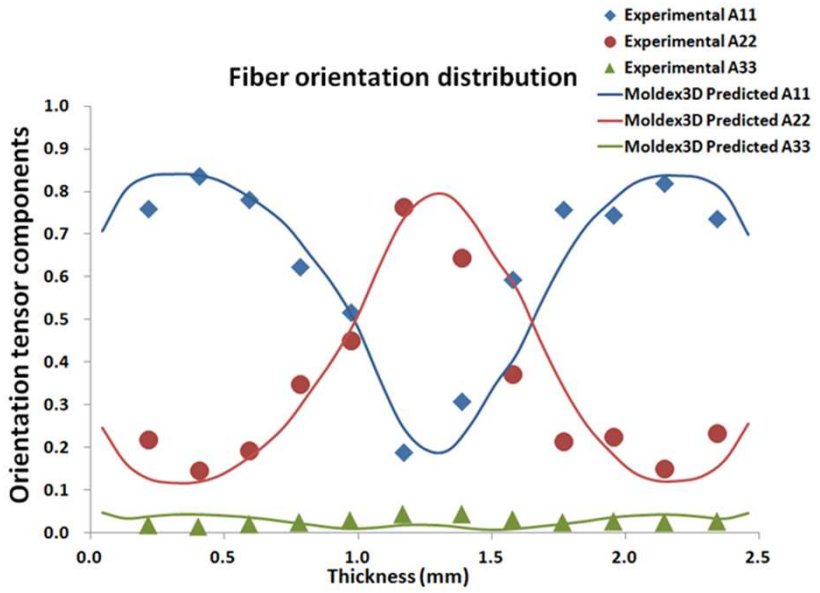
Fiber: New Moldex3D R14.0 Fiber Kernel

- Moldex3D R13.0 provides 70-80% accuracy on of fiber orientation prediction
- Moldex3D R14.0 further enhances the core region with an accuracy increment of at least 20%

Moldex3D R13.0
Fiber 1.0 (2013)



Moldex3D R14.0
Fiber 2.0 (2015)



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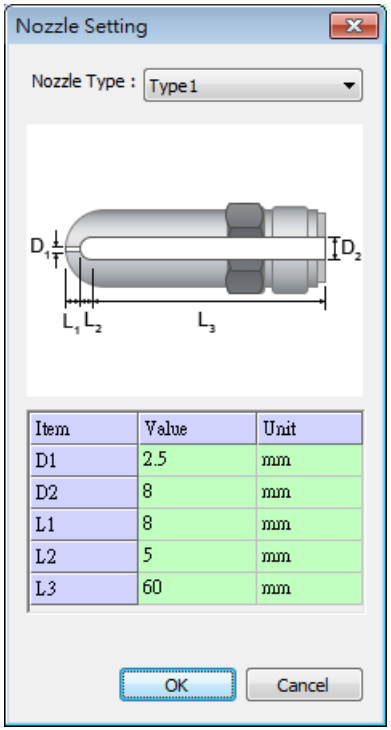
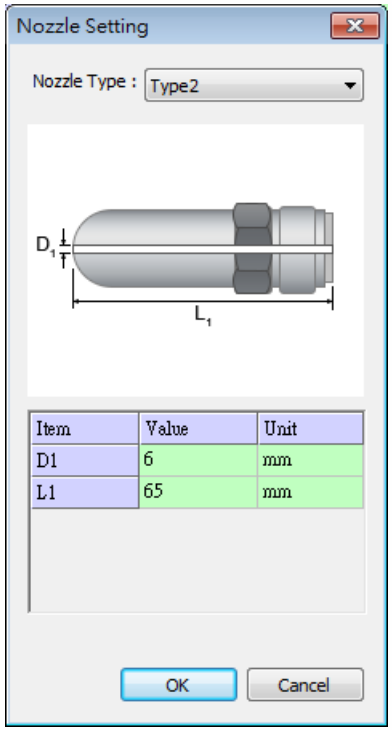
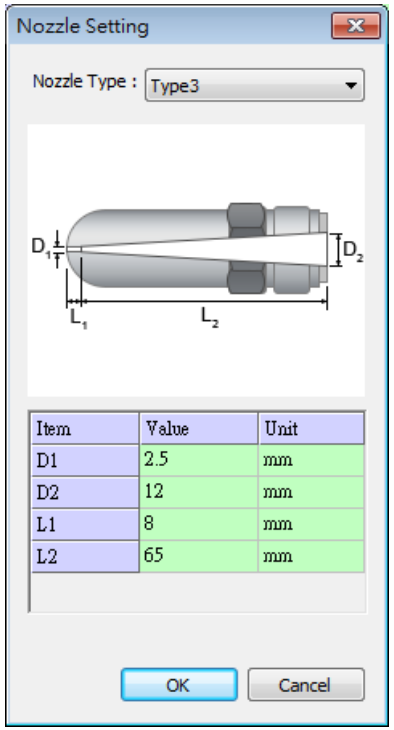
[Process] Enable Detailed Nozzle Type and Volume Setting

> Provide three nozzle types and corresponding parameter setting for machine in process wizard
  - Nozzle volume will be automatically calculated once nozzle types and dimension modified

> **Benefit**
  - Obtain nozzle volume in a more straight-forward way







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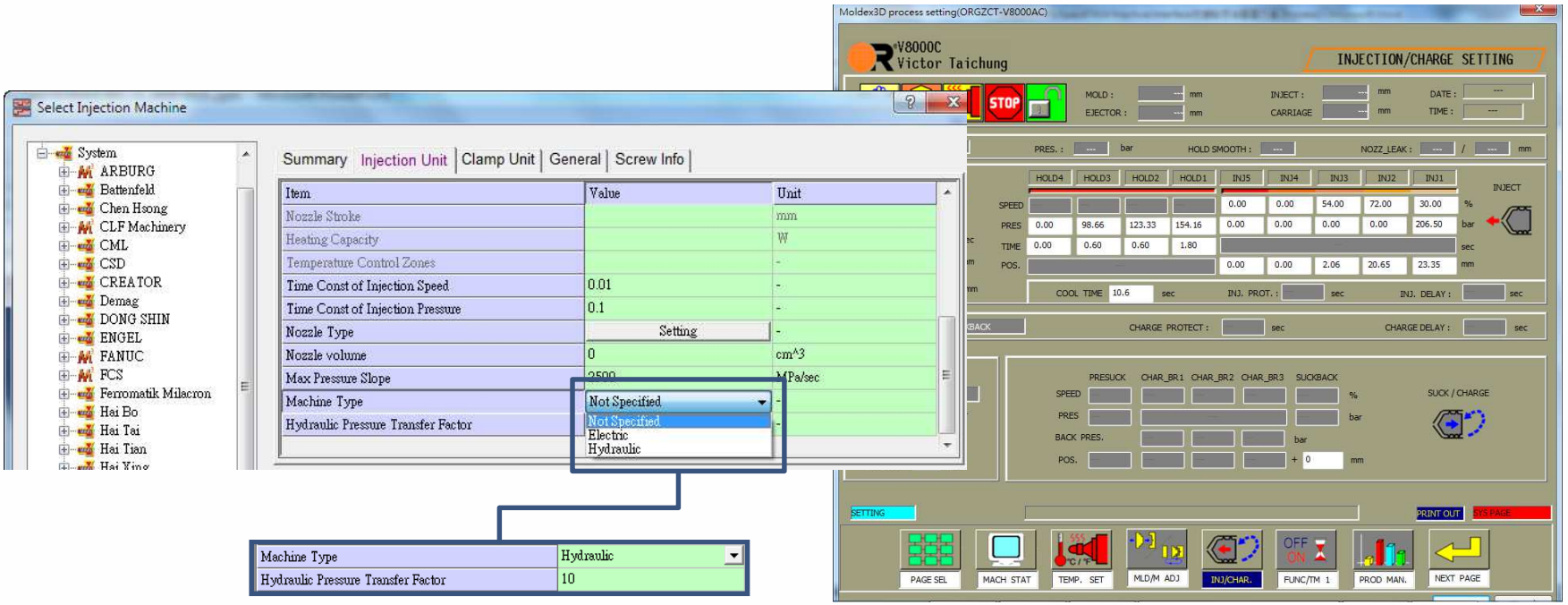
[Process] Adopt Hydraulic Pressure in Machine interface

- For hydraulic type machine, allow to control injection process with hydraulic pressure and its transfer factor
- **Benefit**
  - More realistic way of machine control with hydraulic (cylinder) pressure



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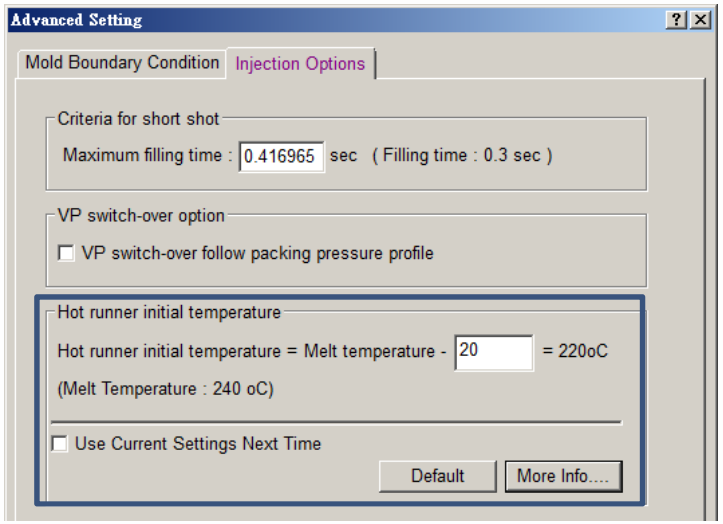
[Process] Enable Hot Runner Initial Temperature Setting

- This allows users to specify the hot runner initial temperature to consider imperfect insulation
  - The initial temperature within hot runner can be assigned with uniform temperature different to melt entrance temperature
  - This parameter will be disabled if applying Advanced Hot Runner model
- **Benefit**
  - Improve injection pressure prediction with more detailed consideration



Default setting is 20℃ in R14.0

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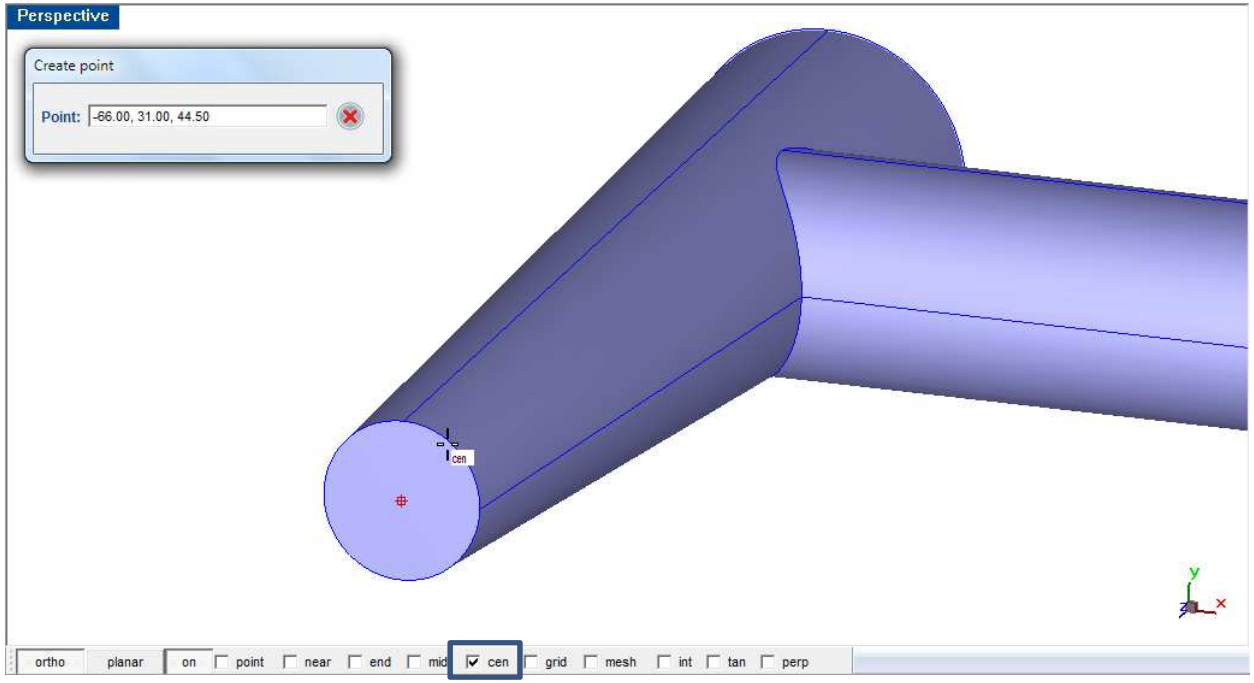
5. Usability Enhancement (Pre & Post)

[Designer] Support Snap with Center Option

- Cursor will be locked to center point when moving to a circular curve or surface edge if “cen” activated
- **Benefit**
  - Easy to locate the center point on existing object



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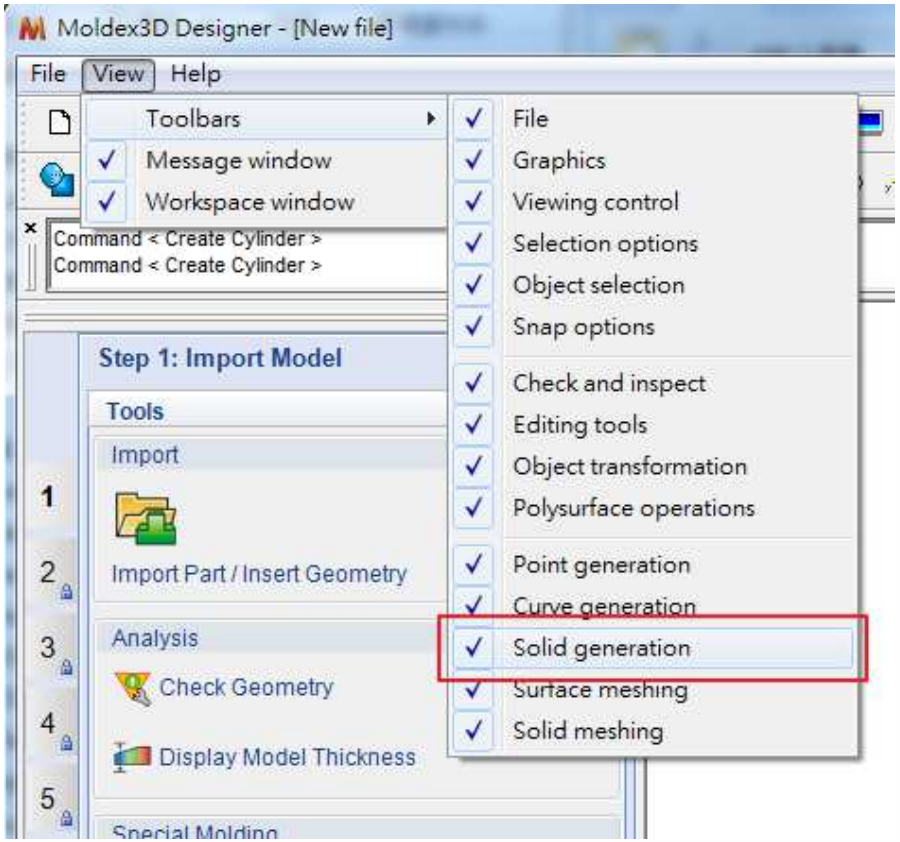
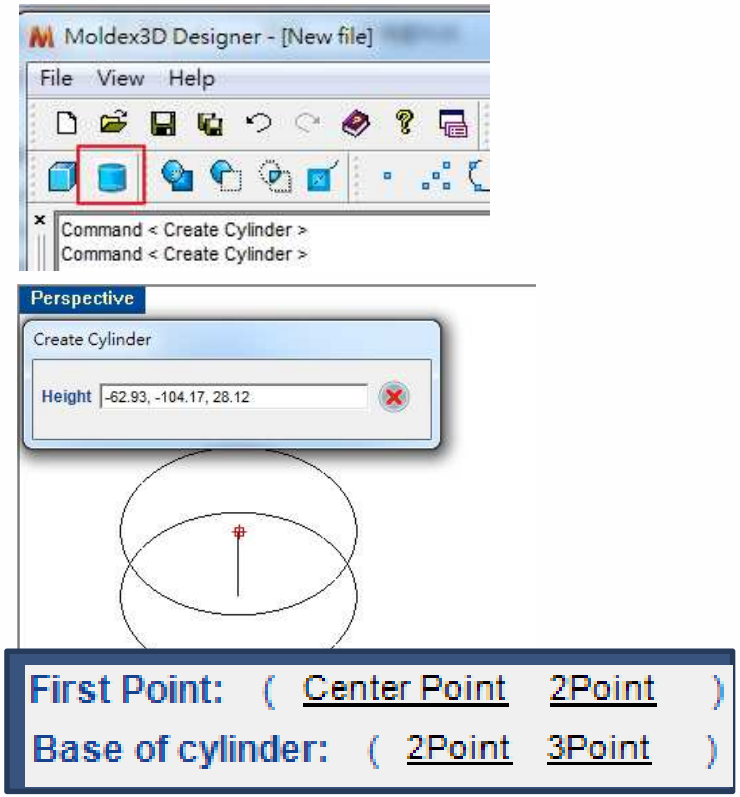
Designer: General Enhancement for Usability

> Add function to create cylinder geometry

> **Benefit**

– **For more variety in application**





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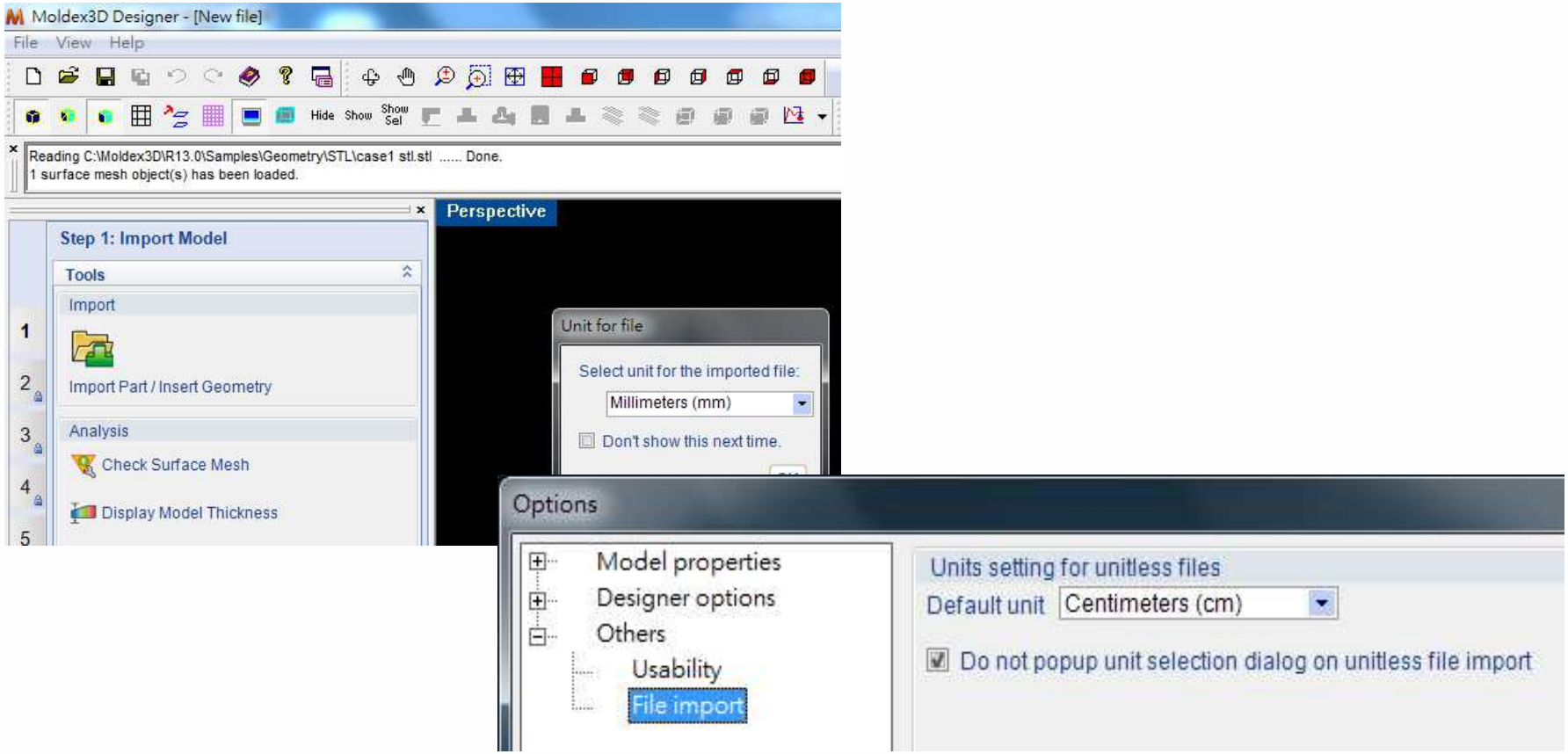
Designer: General Enhancement for Usability (con't)

- Allow to disable unit selection dialog popup next time
  - Check box "Don't show this next time" for default unit
  - Available both bellow the dialog and in Options



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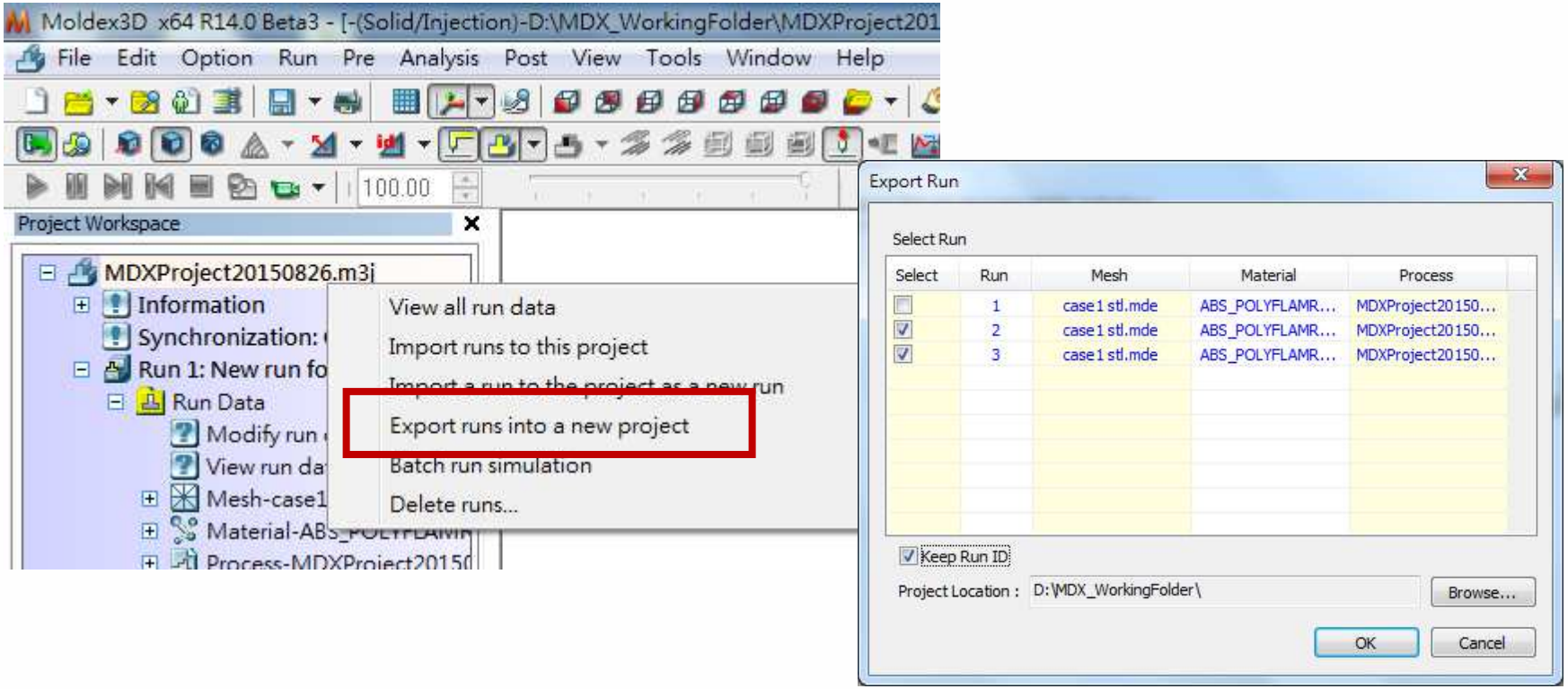
Project: Export and Import with Multiple Runs

- > Allow users to select multiple runs for exporting
- > Record original run ID and keep after export
- > Allow users to keep original run ID while importing runs
- > Linux users can easily export multiple runs



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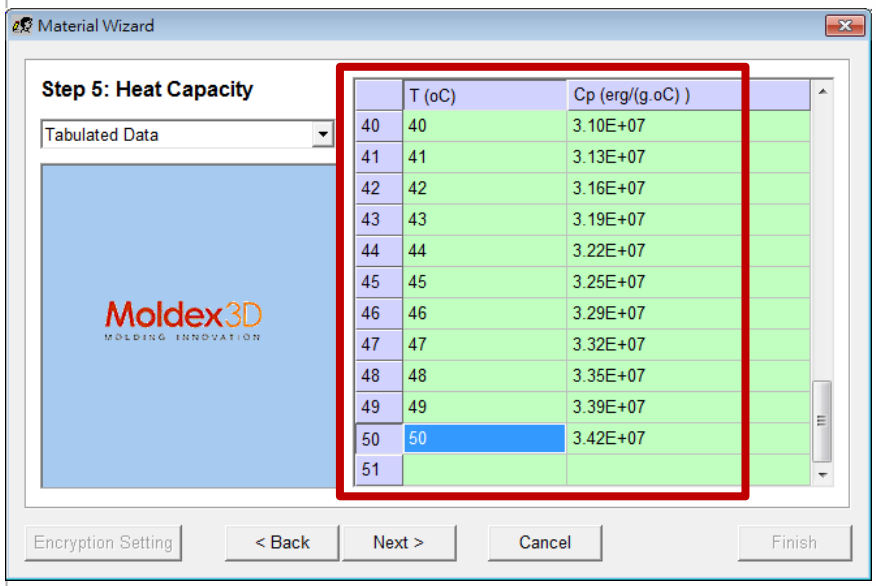
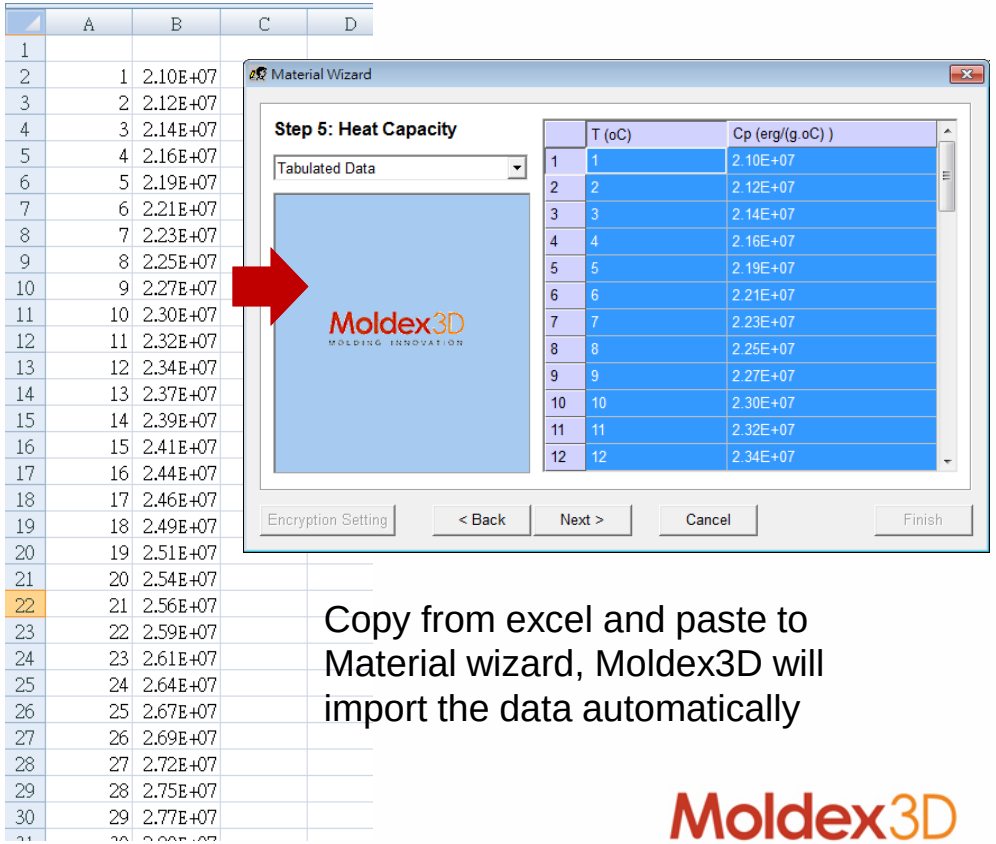
Material: New Functions

> Tabulated Data Setting to enhance Usability
  - Unlimited data number instead limit of 25
  - Support to directly copy the data from excel to wizard



The limit of setting data will not limit to 25



Copy from excel and paste to Material wizard, Moldex3D will import the data automatically

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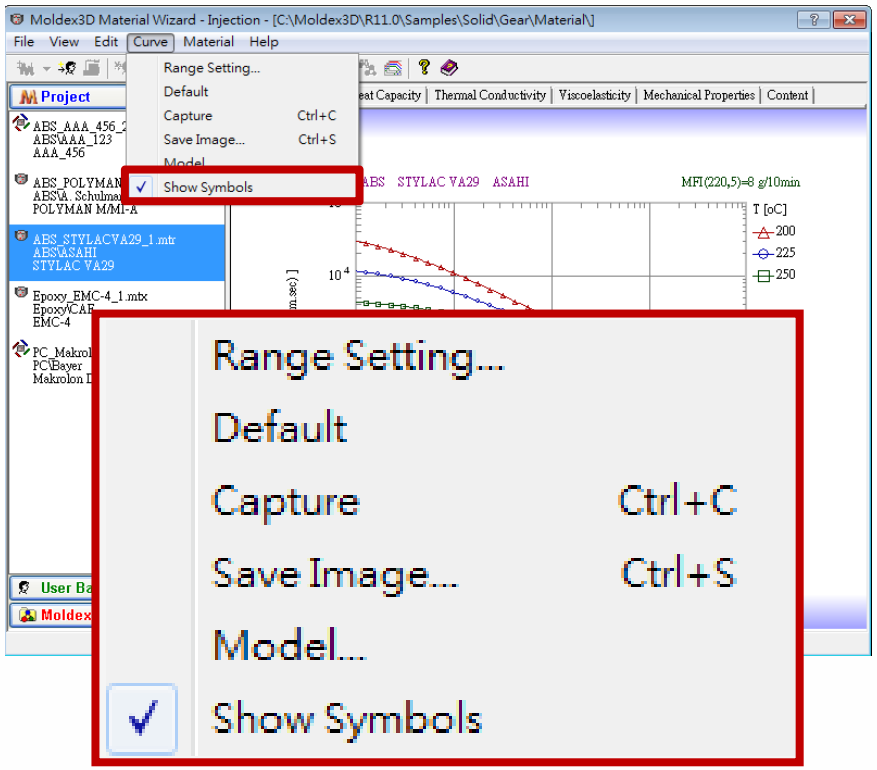
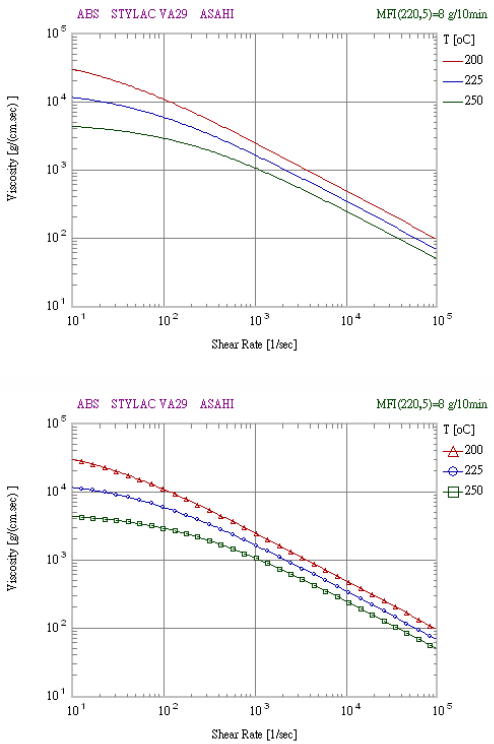
Material: New Functions

> Add option to show/hide the symbol on the curves

- **“Show Symbols” option will be enable automatically while comparing materials**
- **The setting will be applied for report generation**





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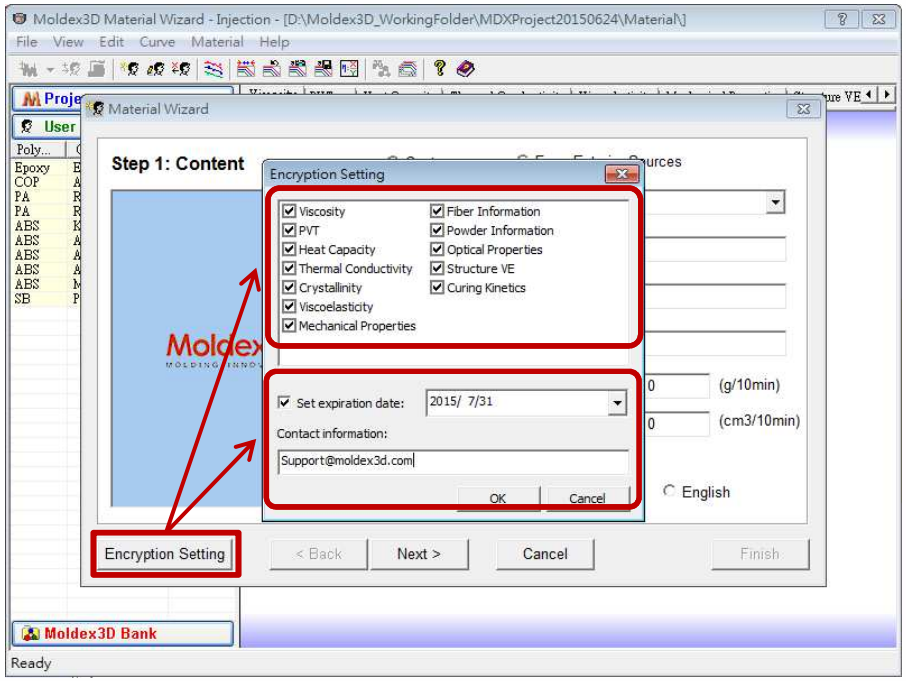
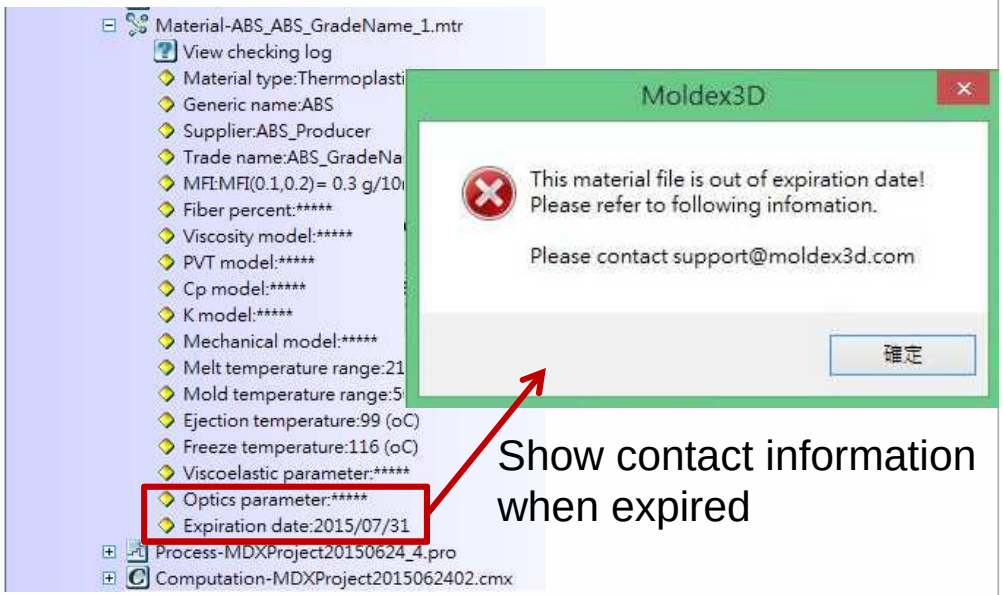
Material: Encryption of Material Data

- Set encryption when creating new material
  - Specify encryption options and expiration date
  - Show expiration date but hide material information
  - Notify for expired material with contact information



Encryption options expiration date



Show expiration date
in Moldex3D Project

Show contact information
when expired

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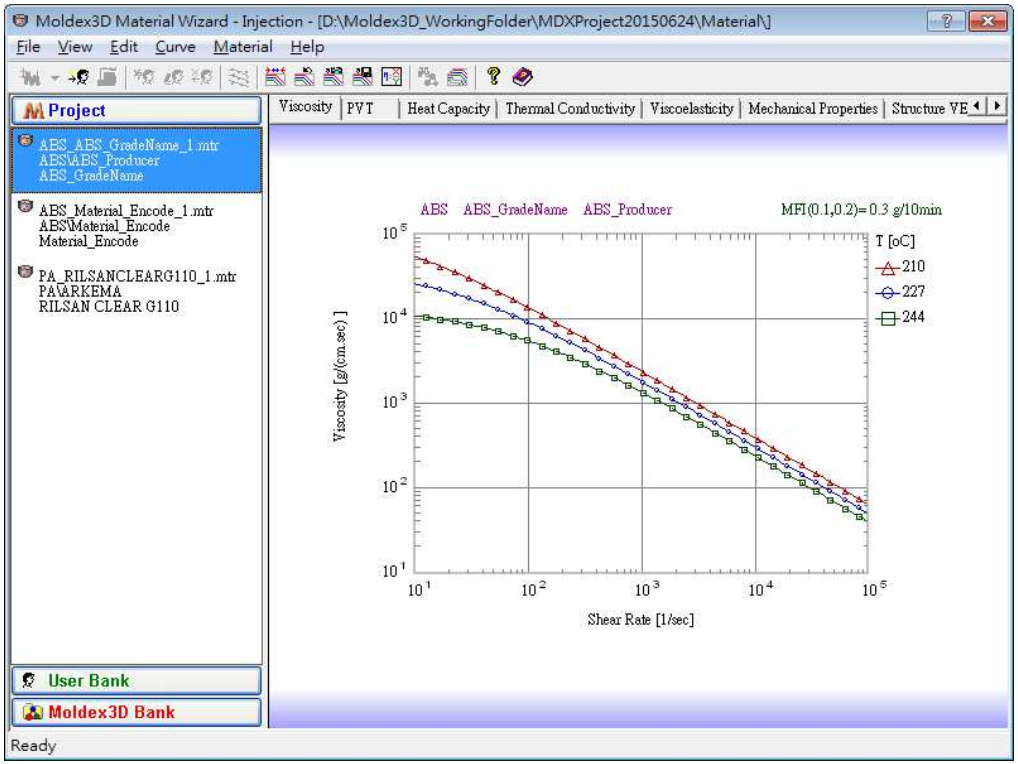
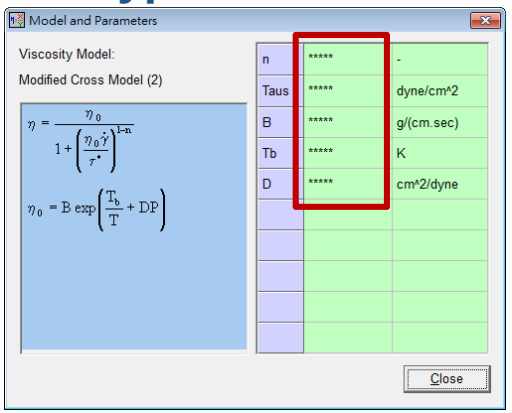
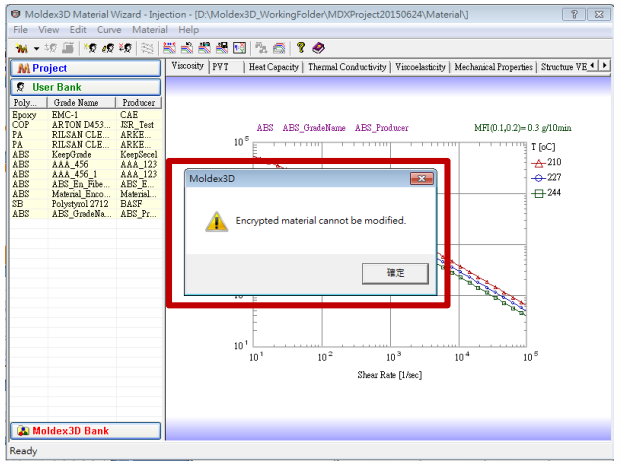
Material: Encryption of Material Data (con't)

> For encrypted material, the parameters information and modification is hidden in Material wizard

– Hide fiber data in computation parameter if encrypted







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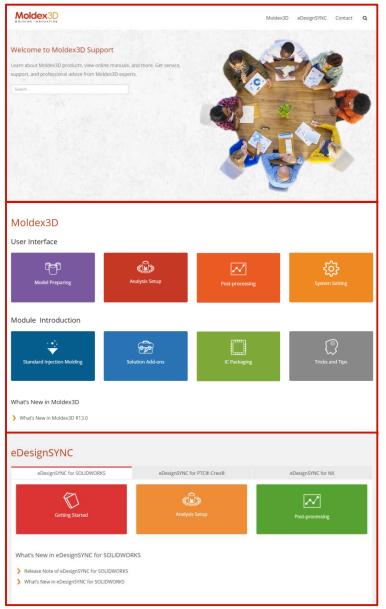
6. Other

Moldex3D Online Help

- Web version of Help
  - Go to: http://support.moldex3d.com/
  - Support both Moldex3D and eDesignSYNC help
- Timely product support
  - Users can get to a solution anytime and anywhere by themselves
  - Reduce support cost by online resource
  - Up-to-date maintained Information
  - Convenient search engine and UI
- Support also offline version
  - For users without internet connected
  - Content matches user's version
  - Alternative: F1 button



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Material Database Update

- **235** thermoplastic materials are newly added
  - ABS(11), ASA(2), LCP(1), PA(58), PBT(21), PC(6) , PC+ABS(13), PE(1), PEI(13), PET(1), PMMA(1), POLYBLEND(10), POM(5), PP(53), PPS(1), SEBS(2), SPECIAL(6), TPE(2), TPO(2), TPU(22), TPV(2), Other(2)

- **2** thermo-set materials are newly added
  - LSR(2)

- **153** material information is updated for properties including viscosity, PVT, Cp and K

Material Database Update SP1

- **29** thermoplastic materials are newly added
  - PA(11), PBT(4), PC(2) , POLYESTER(3), POM(2), PP(4), SPECIAL(3)

- **52** material information is updated for properties including viscosity, PVT, Cp and K
  - LCP(1), PA(47), POLYESTER(3), PP(1)

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