

Altair HVVH Tutorials 2019

HVVH-9000: Manufacturing Solution Tab - HyperXtrude

altairhyperworks.com

In this tutorial you will learn how to:

• Setup a model in Altair HyperXtrude and identify any problems during the Altair HyperXtrude interactive operation.

## Step 1: FE-Model Setup

 From Manufacturing Solution tab, select the HyperXtrude/HyperModel > FE Model tab > Model Setup tab.

See the Altair HyperXtrude/HyperModel <u>FE Model > Model Setup</u> for more information.

There is only a **Modify cmf script** option on this tab, not a Config file option.

| KHWH - HyperWorks Verification and Validation Harness (v2017) |                   | - O ×            |  |  |  |  |
|---|-------------------|------------------|--|--|--|--|
| File Edit Help  |                   |                  |  |  |  |  |
| Design CAD FE Model Solution Result Manufacturing solution    |                   |                  |  |  |  |  |
| Hyperform HyperXtrude/HyperMold                               |                   |                  |  |  |  |  |
| FE Model Solution Result                                      |                   |                  |  |  |  |  |
| Model Setup Basic ID Compare HX Versions                      |                   |                  |  |  |  |  |
| SolverType: Metal_Extrusion • HW Version: 2017                | Modify cmf script |                  |  |  |  |  |
| Models (Solver Deck / HM File)                                |                   |                  |  |  |  |  |
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|   |                   | -                |  |  |  |  |
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|   |                   |                  |  |  |  |  |
| Scripts / cmf Files   |                   |                  |  |  |  |  |
|   |                   | ^                |  |  |  |  |
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|   |                   |                  |  |  |  |  |
| Output directory :  |                   | <b>3</b>         |  |  |  |  |
|   |                   |                  |  |  |  |  |
|   |                   | Run              |  |  |  |  |
| Model Setup Info  |                   |                  |  |  |  |  |
| Output File Path  |                   | Status<br>Status |  |  |  |  |
|   |                   |                  |  |  |  |  |
| Hb  | ml Report         |                  |  |  |  |  |
| ll.   |                   |                  |  |  |  |  |
| 🖉 Messages 🥖  |                   |                  |  |  |  |  |
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### Step 2: Basic import and export.

Identify any loss of data during import and export Altair HyperXtrude operations.

1. From the **Manufacturing Solution** tab, select the **HyperXtrude/HyperModel** > **FE Model** tab > **Basic IO** tab.

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|------------------------|-----------------------------------|--------|----------------|----------------------------|----------------|---|--|-----|
| Edit Help              |                                   |        |                |                            |                |   |  |     |
| ign CAD FE Model Solu  | ution Result Manufacturing solu   | tion   |                |                            |                |   |  |     |
| yperform HyperXtrude/H | HyperMold                         |        |                |                            |                |   |  |     |
| E Model Solution Resu  | _                                 |        |                |                            |                |   |  |     |
|                        |                                   |        |                |                            |                |   |  |     |
| Model Setup Basic IO   | Compare HX Versions               |        |                |                            |                |   |  | _   |
| Solver type : Meta     | Extrusion • HW Version            | 2017 - | 1              |                            |                |   |  |     |
| Input deck(s)          |                                   |        | ·              |                            |                |   |  |     |
| input deck(s)          |                                   |        |                |                            |                |   |  |     |
|                        |                                   |        |                |                            |                |   |  |     |
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|                        |                                   |        |                |                            |                |   |  |     |
| Step 1                 |                                   |        |                |                            |                |   |  | _   |
| Step 1                 | Reference Model file              |        | Time to Import | Import Status<br>Status    | Time to Export | Export Status<br>Status                     | Import-Export<br>Diff  |     |
| Step 1                 | Reference Model file              |        | Time to import | Status<br>Status           | Time to Export | Status<br>Status                            | Diff   | 9 W |
| Step 1                 | Reference Model file              |        | Time to import | Status                     | Time to Export | Status                                      | Diff   | •   |
| Step 1                 | Reference Model file              |        | Time to import | Status<br>Status           | Time to Export | Status<br>Status                            | Diff   |     |
| Step 1                 | Reference Model file              |        | Time to Import | Status<br>Status           | Time to Export | Status<br>Status                            | Diff<br>Diff<br>Diff   |     |
| Check run              | Reference Model file              |        | Time to Import | Status<br>Status<br>Status | Time to Export | Status<br>Status                            | Diff<br>Diff<br>Diff<br>Import/Export  |     |
| Check run              |                                   |        |                | Status<br>Status<br>Status | Time to Export | Status<br>Status<br>Status<br>d3hsp<br>Diff | Diff<br>Diff<br>Diff<br>Import/Export<br>Import/Export<br>Output<br>Diff                 |     |
| Check run              |                                   |        |                | Status<br>Status<br>Status | Time to Export | Status<br>Status<br>Status<br>d3hsp         | Diff<br>Diff<br>Diff<br>Import/Export<br>output  |     |
| Check run              |                                   |        |                | Status<br>Status<br>Status | Time to Export | Status<br>Status<br>Status<br>d3hsp<br>Diff | Diff<br>Diff<br>Diff<br>Import/Export<br>Import/Export<br>Output<br>Diff                 |     |
| Check run              |                                   |        | Modified mod   | Status<br>Status<br>Status | Time to Export | Status<br>Status<br>Status<br>d3hsp<br>Diff | Diff<br>Diff<br>Diff<br>Diff<br>Import/Export<br>Import/Export<br>Output<br>Diff<br>Diff |     |
| Check run              |                                   |        |                | Status<br>Status<br>Status | Time to Export | Status<br>Status<br>Status<br>d3hsp<br>Diff | Diff<br>Diff<br>Diff<br>Diff<br>Import/Export<br>Import/Export<br>Output<br>Diff<br>Diff |     |
| Check run              |                                   |        | Modified mod   | Status<br>Status<br>Status | Time to Export | Status<br>Status<br>Status<br>d3hsp<br>Diff | Diff<br>Diff<br>Diff<br>Diff<br>Import/Export<br>Import/Export<br>Output<br>Diff<br>Diff |     |
| Check run<br>Re        |                                   |        | Modified mod   | Status<br>Status<br>Status | Time to Export | Status<br>Status<br>Status<br>d3hsp<br>Diff | Diff<br>Diff<br>Diff<br>Diff<br>Import/Export<br>Import/Export<br>Output<br>Diff<br>Diff |     |
| Check run              |                                   |        | Modified mod   | Status<br>Status<br>Status | Time to Export | Status<br>Status<br>Status<br>d3hsp<br>Diff | Diff<br>Diff<br>Diff<br>Diff<br>Import/Export<br>Import/Export<br>Output<br>Diff<br>Diff |     |

- 2. For Solver Type, select *Metal\_Extrusion*.
- 3. For HW Version, select 2017.
- 4. Under *Input decks*, use the file browser icon, in , or the add file icon, in , to select and open the 3D\_Die\_Benchmark\_2009.grf file, located in ...\tutorials\hvvh\Manufacturing-solution\HX\Tutorial-001-ME-SolidProfile.
- 5. For the **Output directory** field, use the open file icon, it is select an output directory.
- 6. Click *Import/Export*.



Step 1 shows the import and export details and status (pass or fail) of the reference model file (selected above).

The last column displays information on the ASCII differences between the imported file and the Altair HyperMesh exported file. If there are no differences, it is shown as **Pass**, otherwise it is displayed as **Fail**.

The original model and the Altair HyperXtrude exported models are run with the Altair Radioss solver and the OUT file blocks are compared as shown in the status.

7. In the **Messages** window, the run details are displayed along with the log file location.

| 🖒 HWH - HyperWorks Verification and Validation Harness (v2017)   |
|--|
| File Edit Help   |
| Design CAD FE Model Solution Result Manufacturing solution   |
| Hyperform HyperXtrude/HyperMold  |
| FE Model Solution Result   |
| Model Setup Basic IO Compare HX Versions   |
| Solver type : Metal_Extrusion  HW Version : 2017   |
| Input deck(s)  |
| C:/Altair/2017.0.0.14/demos/hvvh/Manufacturing-solution/HX/Tutorial-001-ME-SolidProfile/3D_Die_Benchmark_2009.grf  |
|  |
| Output directory : C:\//\/\/H\OutDir   |
| Step 1   |
| Reference Model file Time to Import Import Status Time to Export Export Status Import-Export   |
| /demos/hvvh/Manufacturing-solution/HX/Tutorial-001-ME-SolidProfile/3D_Die 21996 Pass 60243 Pass Fail   |
| Import/Export  |
| Check run  |
| Reference Model file Modified model file d3hsp output  wwh/Manufacturing-solution/H0/Tutorial-001-ME-SolidProfile/FE BasicIO 3/3D Die Benchmark 2009/Modified/3D Die Benchmark 2009/Modifi |
| wvh/Manufacturing-solution/HX/Tutorial-001-ME-SolidProfili/FE_BasicIO_3/3D_Die_Benchmark_2009/Modified/3D_Die_Be   |
| Check Run  |
| Html Report  |
|  |
|  |
| Messages   |
| Please refer logfile for status : C:/HVVH/OutDir/FE_BasicIO_3/logfile_BasicIO.txt  |
| Task completed.  |
|  |

8. Click HTML Report to open an HTML report.



| HyperWorks Verification and Validation Harness   |   |              |  |  |
|--|---|--------------|--|--|
| FE Model - Basic IO Report   |   |              |  |  |
| File Type : Metal_Extrusion HW Version : 2017  |   |              |  |  |
| Step 1 :   |   |              |  |  |
| Reference Model file   | Time to Import Import Status Time to Export Export Status Import-Export       |              |  |  |
| C/Altair 2017.0.0.14 demos hvvh Manufacturing-solution HX Tutorial-001-ME-SolidProfile 7D_Die_Benchmark_                 | 009.grf] 21996  |              |  |  |
| Check Run :  |   |              |  |  |
| Reference Model file   | Modified model file   | dNasp output |  |  |
| C:/Altair 2017.0.0.14/demos/hvvh Manufacturing-solution HX/Tutorial-001-ME-SolidProfile 3D_Die_Benchmark_2009.hx[C:/HVVI | CoutDir FE_BasicIO_3/3D_Die_Benchmark_2009 Modified/3D_Die_Benchmark_2009.htt | NA NA        |  |  |

## Step 3: Compare Altair HyperXtrude Versions.

Compare the analysis decks exported in different versions of Altair HyperXtrude.

 From the Manufacturing Solution tab, select the *HyperXtrude/HyperModel* > *FE Model* tab > *Compare HX Versions* tab.

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| subled rank          | Status                  | Export time  | Status  |
|                      | Status                  |  | Status  |
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| Import Time          |                         | Export Time  | Export Status   |
|                      | Status                  |  | Status  |
|                      |                         |  |   |
| Reference Ver        | sion                    |  | 0/11  |
|                      |                         |  | 0/7   |
|                      |                         |  | Import/Export   |
|                      |                         |  |   |
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|                      |                         |  |   |
|                      |                         |  |   |
|                      | Import Time             | Import Time Import Status<br>Status<br>Status<br>Import Time Import Status<br>Status | e File  Import Time Import Status Export Time Status Import Time Import Status Import Time Import Status Import Time Status Reference Version |

- 2. For File Type, select *Metal\_Extrusion*.
- 3. For Current Version, select 2017.
- 4. For Reference Version, select 14.0.0.130.



- 5. Under *Input decks*, use the file browser icon, in the add file icon, in the select and open the 3D\_Die\_Benchmark\_2009.grf file, located in ...\tutorials\hvvh\Manufacturing-solution\HX\Tutorial-001-ME-SolidProfile.
- 6. For the **Output directory** field, use the open file icon, it is select an output directory.
- 7. Click *Import/Export*.

The first table shows the import and export details and status (pass or fail) of the model file (selected above) in the current version.

The second table details the import and export time and status (pass or fail) of the model file (selected above) in the reference version.

The last column displays information on the ASCII differences between the exported files in the current and reference versions of Altair HyperMesh. If there is no difference, it is shown as **Pass**, otherwise it is displayed as **Fail**.

- 8. In the **Messages** window, the run details are displayed along with the log file location.
- 9. Click *HTML Report* to open an HTML report.

| VH - HyperWorks Verification and Validation Harness (v2017)  |                                |               |               |               |    |
|--|--------------------------------|---------------|---------------|---------------|----|
| idit Help  |                                |               |               |               |    |
| n CAD FE Model Solution Result Manufacturing solution  |                                |               |               |               |    |
| erform HyperXtrude/HyperMold   |                                |               |               |               |    |
|  |                                |               |               |               |    |
| Model Solution Result  |                                |               |               |               |    |
| Aodel Setup Basic IO Compare HX Versions   |                                |               |               |               |    |
| File type : Metal_Extrusion  Current Version : 2017  Reference Version : C Reference File type : C Ref |                                | • 0           |               |               |    |
| C:/Altair/2017.0.0.14/demos/hvvh/Manufacturing-solution/HX/Tutorial-001-ME-SolidProfile/3D_Die_  | Benchmark_2005                 | ).grf         |               |               |    |
|  |                                |               |               |               |    |
|  |                                |               |               |               | P. |
| *8   |                                |               |               |               | 10 |
| Output directory : C:\HVVH\OutDir  |                                |               |               |               | 9  |
| Current Version :  |                                |               |               |               |    |
| Current Version  | Import Time                    | Import Status | Export Time   | Export Status | A. |
| 2017.0.0.14/demos/hvvh/Manufacturing-solution/HX/Tutorial-001-ME-SolidProfile/3D_Die_Benchma   | rl 21471                       | Pass          | 59369         | Pass          |    |
| Reference Version :  |                                |               |               |               |    |
| Reference Version  | Import Time                    | Import Status | Export Time   | Export Status | â  |
| 3017.0.0.14/demos/hvvh/Manufacturing-solution/HK/Tutorial-001-ME-SolidProfile/3D_Die_Benchma   | rl 20470                       | Pass          | 46530         | Pass          |    |
| Compare versions :   |                                |               |               |               |    |
| Current Version<br>r/FE_CompareHXVersions/Current_3D_Die_Benchmark_2009/3D_Die_Benc/FE_CompareHXVersions/  | Reference Ve<br>Reference 3D F |               | 009/30 Die Be | Diff<br>Pass  | â  |
| hter compares a serie concerned on the construction of a construction of the construct | nerer en ce jab ja             |               |               |               |    |
|  |                                |               |               | Import/Export |    |
| Html Report  |                                |               |               |               |    |
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|  |                                |               |               |               |    |
|  |                                |               |               |               |    |
| issages 🖌  |                                |               |               |               |    |
|  |                                |               |               |               |    |
| refer logfile for status : C:/HVVH/OutDir/FE_CompareHXVersions/logfile_FE_CompareHXV<br>ompleted.  | ersions.txt                    |               |               |               |    |
|  |                                |               |               |               |    |

| HyperWorks Verification and Validation Harness   |   |  |  |  |  |  |
|--|---|--|--|--|--|--|
| FE - Compare HX Versions Report  |   |  |  |  |  |  |
| File Type : Metal_Extrusion Curren   | Version : 2017 Reference Version : 14.130           |  |  |  |  |  |
| Curr   | nt Version :  |  |  |  |  |  |
| Current Version  | Import Time Import Status Export Time Export Status |  |  |  |  |  |
| C:/Altair 2017.0.0.14 demos hvvh Manufacturing-solution HX Tutorial-001-ME-SolidPr   | ofile 3D_Die_Benchmark_2009.grf 21471 59369 Pass    |  |  |  |  |  |
| Reference File :   |   |  |  |  |  |  |
| Reference Version  | Import Time Import Status Export Time Export Status |  |  |  |  |  |
| C:/Altair 2017.0.0.14/demos/hvvh/Manufacturing-solution/HX/Tutorial-001-ME-SolidPr   | ofile/3D_Dis_Benchmark_2009.grf[ 20470 46530 Pass   |  |  |  |  |  |
| Compare Versions :   |   |  |  |  |  |  |
| Current Version  | Reference Version Diff                              |  |  |  |  |  |
| : HVVH OutDir FE_CompareHXVersions Current_JD_Die_Benchmark_2009 3D_Die_Benchmark_2009 grf C: HVVH OutDir FE_CompareHXVersions Reference_JD_Die_Benchmark_2009 3D_Die_Benchmark_2009 grf |   |  |  |  |  |  |



### Step 4: Solver check run for Altair HyperXtrude.

In this step, you will learn how to perform a check run on a solver deck (Altair HyperXtrude and tool deflection), and OUT files comparison of a solver written result file after the check run.

Three options are available for the solver check run:

- Two OUT files generated from the solver run can be compared.
- The current solver run OUT file can be compared with the reference OUT file.
- Two OUT files generated from the same solver deck using two different solver versions can be compared.
- From the Manufacturing Solution tab, select the HyperXtrude/HyperModel > Solution tab > Check run tab.
- See the Check Run section of the <u>Solution Tab</u> topic for more information on the tab's options.

# Step 5: Compare results from different solver versions (Altair HyperXtrude and tool\_deflection).

In this step, you will perform solver version result comparison for any given model's solver results. If the result files are not available, the solver run can be performed in the background, and the results generated are used in the result comparison.

- 1. From the **Manufacturing Solution** tab, select the **HyperXtrude/HyperModel >** Solution tab > Solver version result comparison tab.
- 2. See the **Solver version result comparison** section of the **Solution Tab** topic for more information on the tab's options.

# **Step 6: Compare results from an Altair HyperXtrude solver across different Altair HyperView versions.**

- 1. From the **Manufacturing Solution** tab, select the **HyperXtrude/HyperModel > Result** tab **> Solver result comparison HV versions** tab.
- See the Solver result comparison HV versions section of the <u>Result Tab</u> topic for more information on the tab's options.

