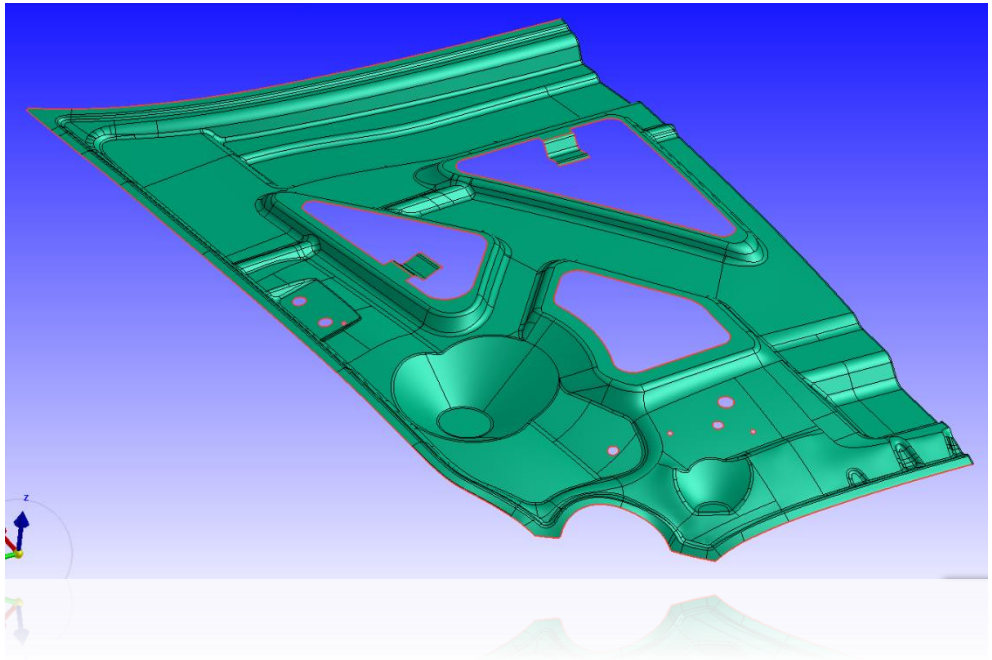
Hoodframe

Getting started in 22 videos step by step with iterations
From Die Face Design with VISUAL DIEMAKER 10.8 including DIESTARTER
To simulation with PAM-STAMP 2015.0



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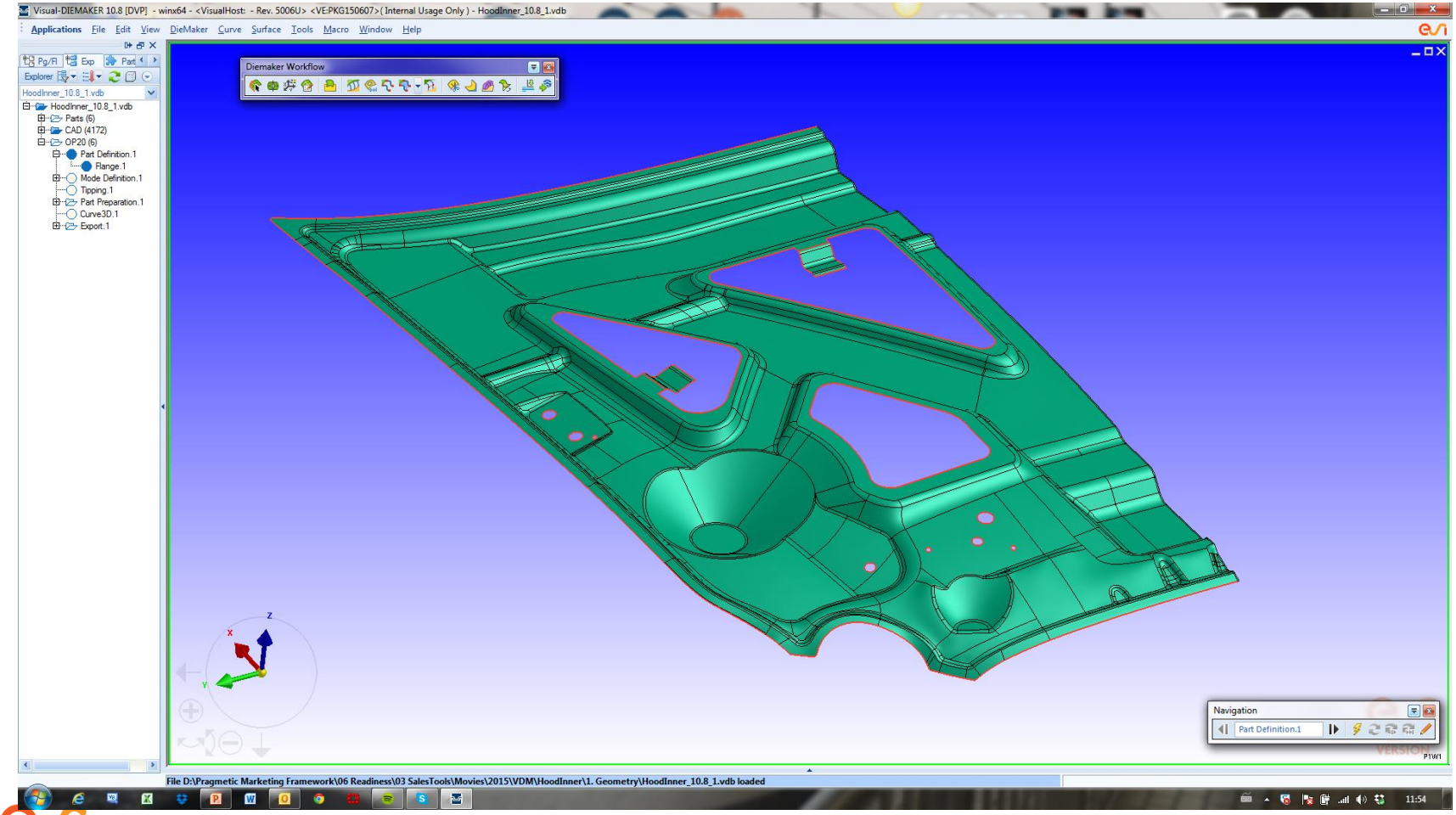
Hoodinner Example



Videos

- Hoodinner_videos_1_Import and clean.wmv
- Hoodinner_videos_2_Part definition.wmv
- Hoodinner_videos_3_Part preparation.wmv
- Hoodinner_videos_4_Diestarter definition.wmv
- Hoodinner_videos_5_Diestarter export.wmv
- Hoodinner_videos_6_PS setup diestarter.wmv
- Hoodinner_videos_7_VDM Export modifications.wmv
- Hoodinner_videos_8_PS new run.wmv
- Hoodinner_videos_9_VDM Profile endpoint surface.wmv
- Hoodinner_videos_10_VDM Addendum profiles.wmv
- Hoodinner_videos_11_VDM Dol.wmv
- Hoodinner_videos_12_VDM addendum surface.wmv
- Hoodinner_videos_13_VDM Control curve.wmv
- Hoodinner_videos_14_VDM Binder fitting.wmv
- Hoodinner_videos_15_VDM Fillet.wmv
- Hoodinner_videos_16_VDM Export.wmv
- Hoodinner_videos_17_PS new run.wmv
- Hoodinner_videos_18_VDM Part replace.wmv
- Hoodinner_videos_19_VDM Export.wmv
- Hoodinner_videos_20_PS new run.wmv
- Hoodinner_videos_21_VDM trimlines flanges and export.wmv
- Hoodinner_videos_22_PS final run.wmv

(Note: VDM=Visual Diemaker, PS=Pamstamp)

Step-by-Step Instructions

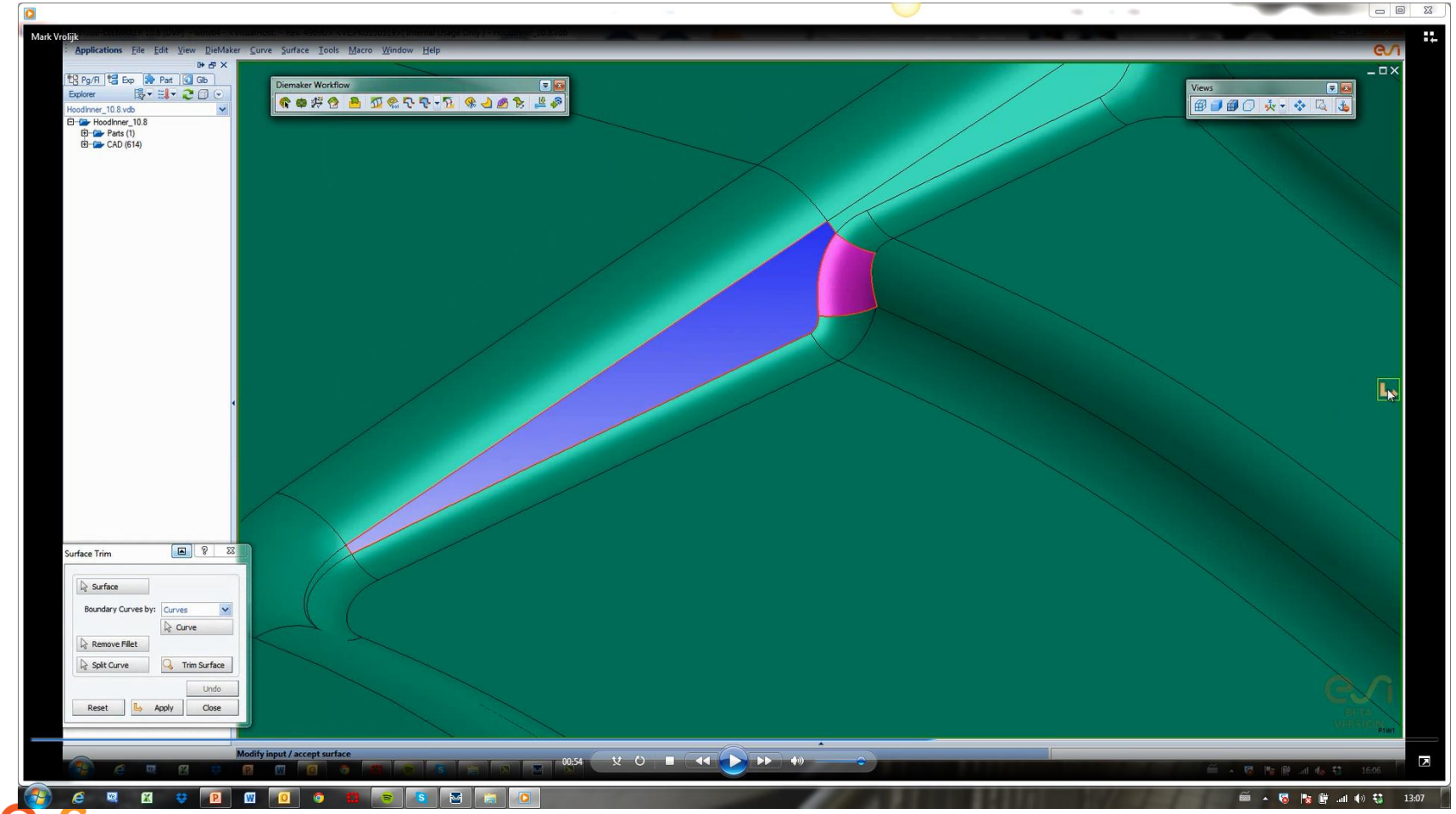
Video based

Step 1 : Hoodinner_videos_1_Import and clean

Play the video with any media player on another device and practice in parallel

- Import the model
- Check for possible problems in the part
  - Use surface repair/construction tools to repair the surfaces
    - This will avoid meshing and offset problems at a later stage which are much more time-consuming to repair

Result

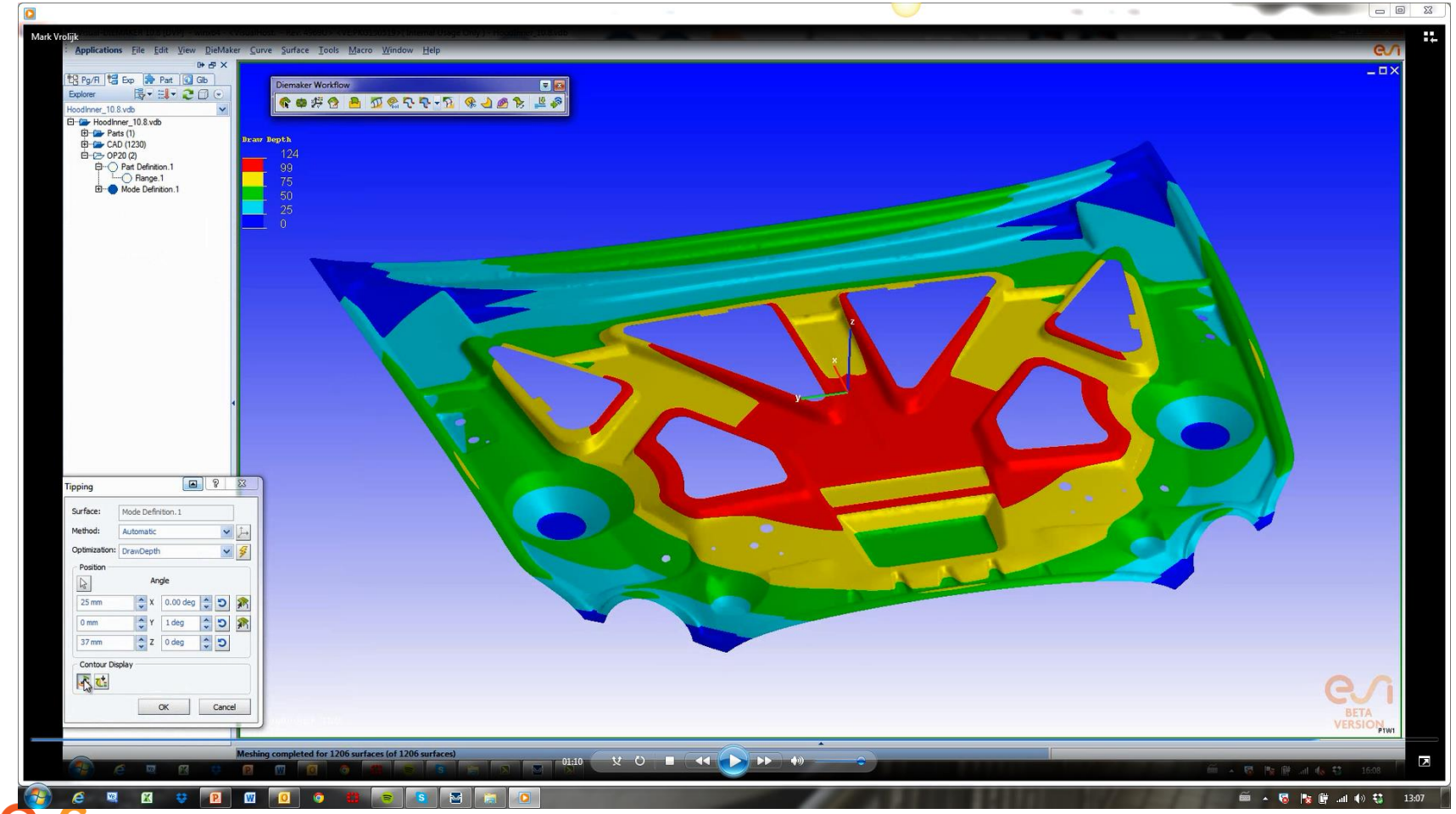


Step 2 : Hoodinner_videos_2_Part definition

Play the video with any media player on another device and practice in parallel

- Part definition
  - Hide flanges which will be formed in following operations
- Mode definition
  - Create the symmetrical side by selecting the symmetry edge
- Tipping
  - Perform tipping based on minimizing drawdepth
  - Check that no undercut exists

Result

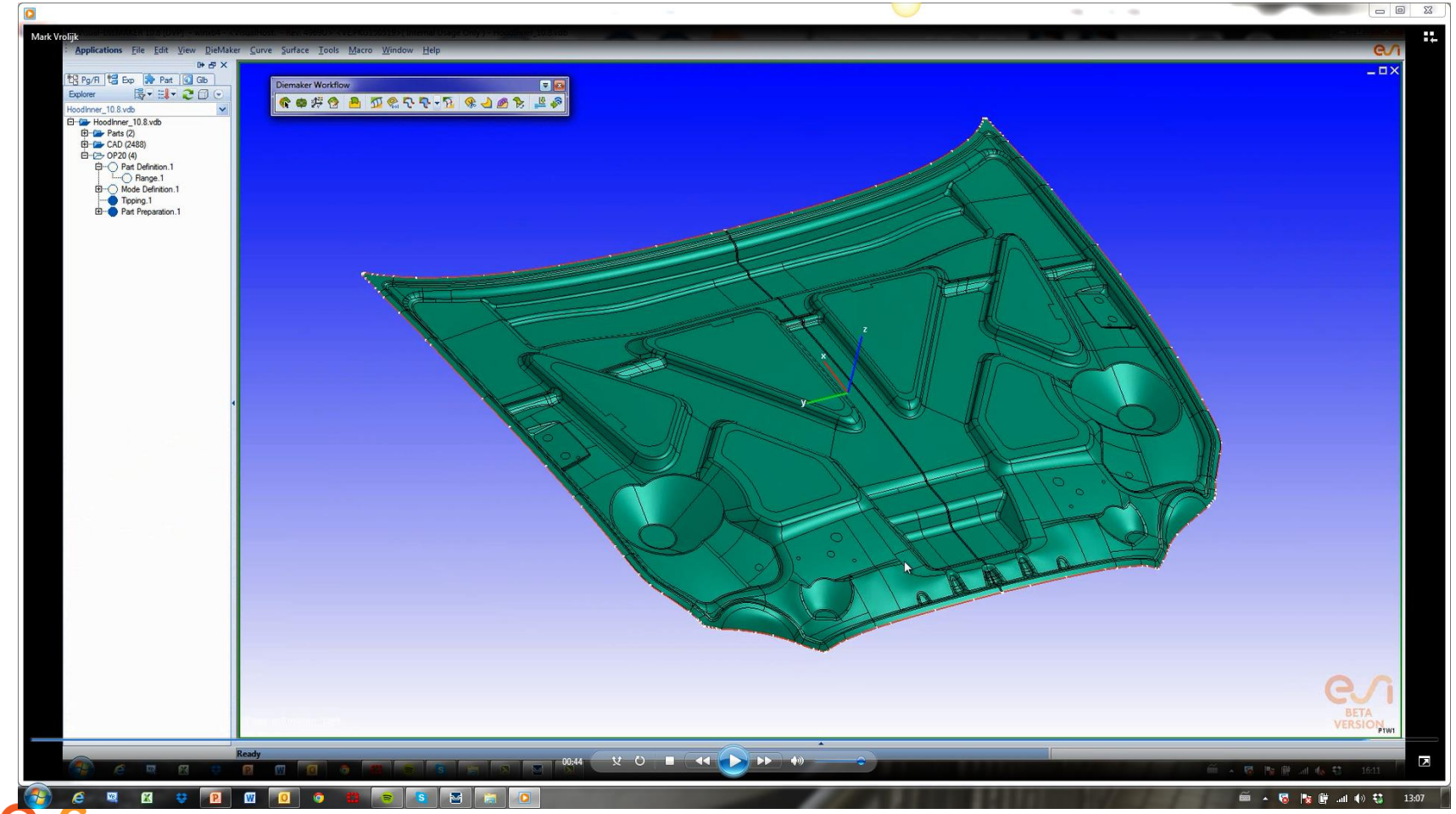


Step 3 : Hoodinner_videos_3_Part preparation

Play the video with any media player on another device and practice in parallel

- Part preparation
  - Select all the holes in the model and fill them
  - One good practice is to have a very smooth part outline. This will avoid quality problems in the addendum later
    - Use the automatic rolling cylinder to smooth the outline
      - 300 mm rolling radius
      - Fill the 2 symmetrical surfaces

Result

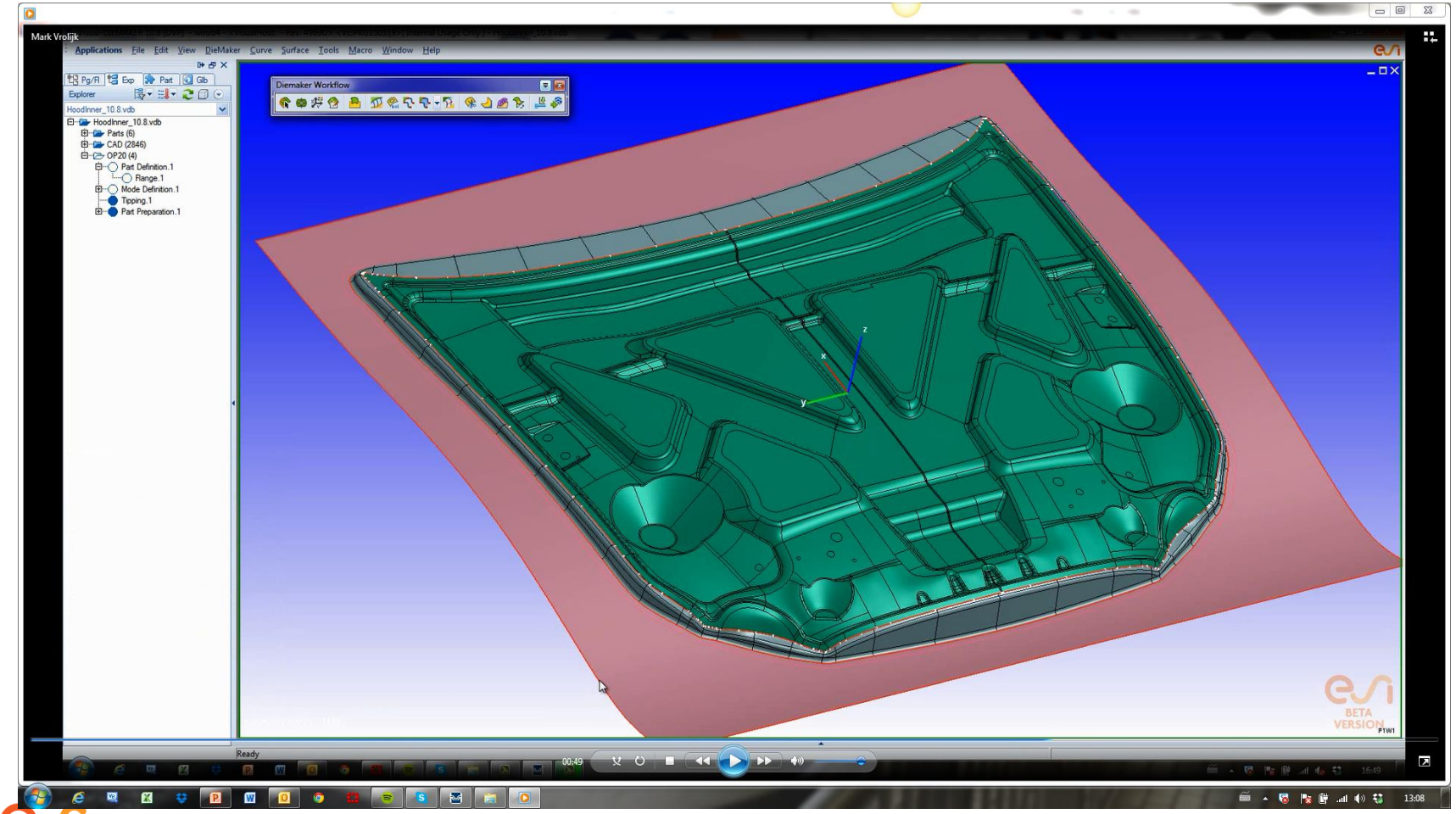


Step 4 : Hoodinner_videos_4_Diestarter definition

Play the video with any media player on another device and practice in parallel

- Diestarter will give very fast and fully automated an idea of how the final die face could look like
  - It should be considered as a step in the right direction (starting point), which will bring the user closer to a feasible die face design in shorter time.
  - Define the material data, use the default settings and create the die face design

Result

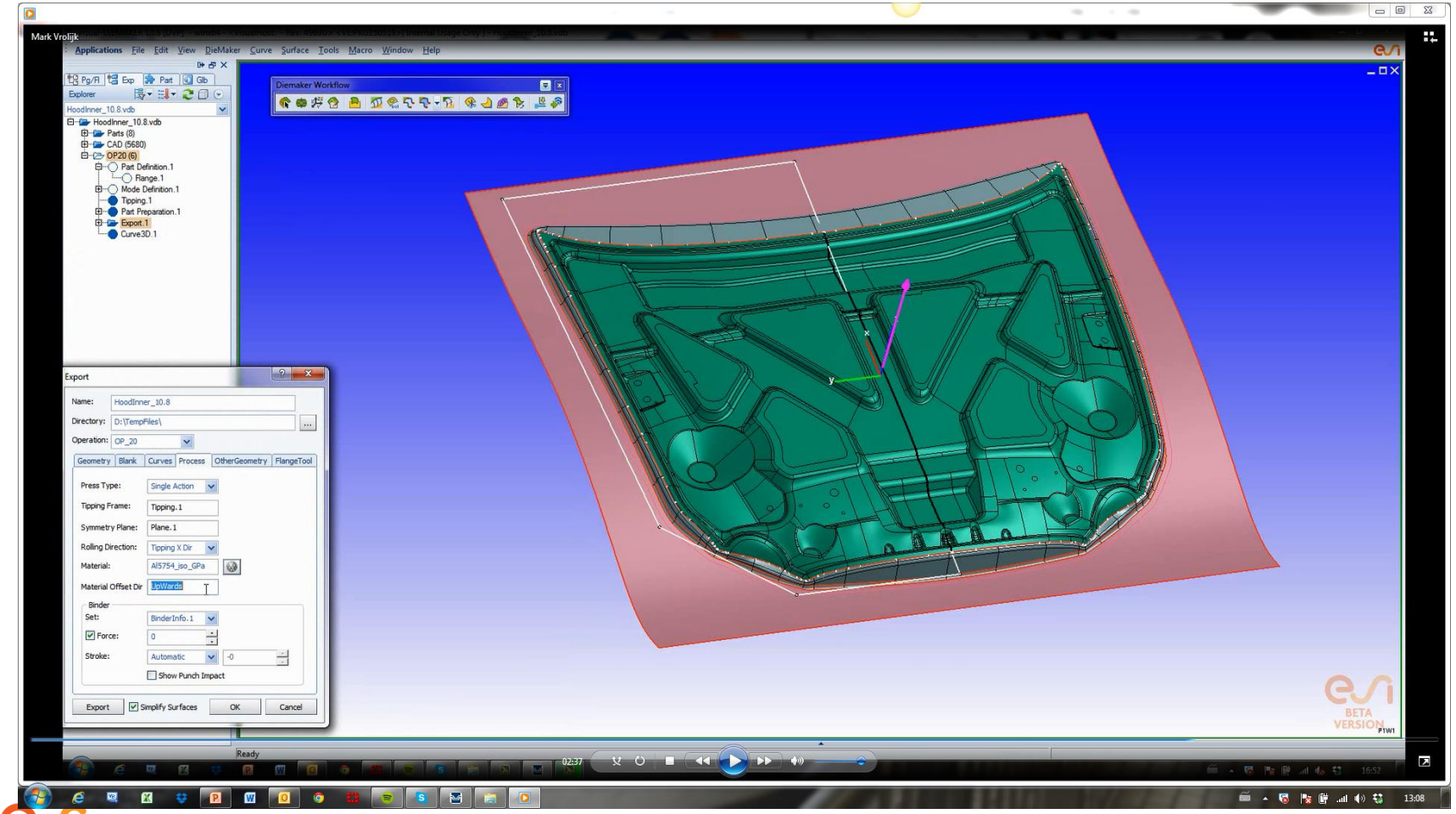


Step 5 : Hoodinner_videos_5_Diestarter export

Play the video with any media player on another device and practice in parallel

- Define the process setup and export the data and geometry to PAM-STAMP
  - Select the full die and divide the model into different regions via propagation of the die entry radius
  - Define the geometries for the punch and binder regions
  - Create the symmetrical blank
    - Blank only needs to be created on 1 side for symmetrical models
  - Define the process parameters
    - Material offset direction
    - Aluminium material parameters from the database
    - Single action process
    - Binder force
    - Binder stroke
  - Press export to create the export files
    - Igs for geometry
    - Xml for process data

Result

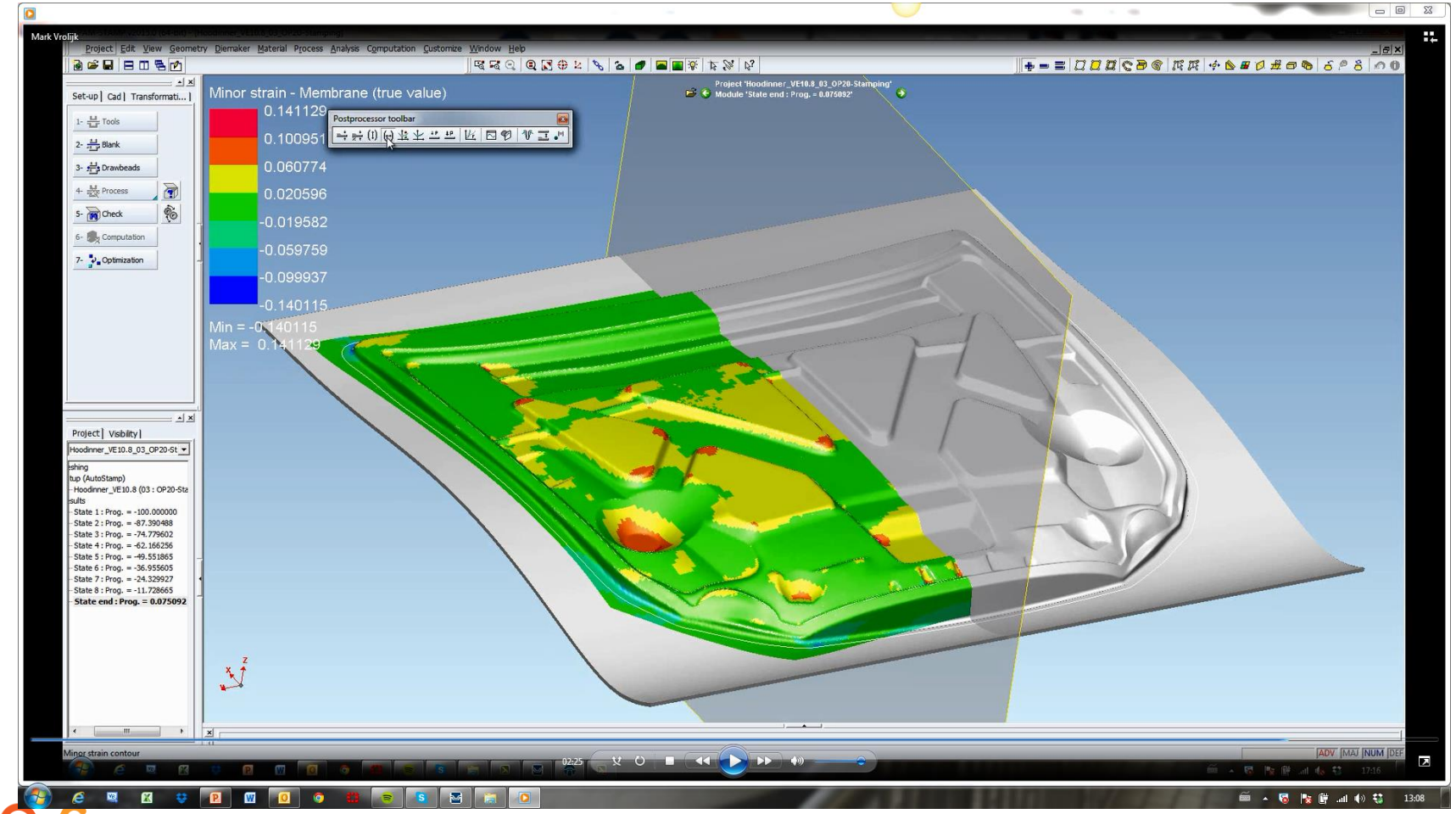


Step 6 : Hoodinner_videos_6_PS setup diestarter

Play the video with any media player on another device and practice in parallel

- Import the diemaker files by selecting the .xml file
  - Offset and tool creation for punch and blankholder will be automatically applied
  - Material data will be automatically set
- Open the process macro and select the feasibility single action macro
  - All process data and objects will be automatically retrieved from the xml file
  - Only minimum tool radius should be set
    - 6 mm
- Start the solver
- Analyze the results with the dedicated post-processing toolbar

Result

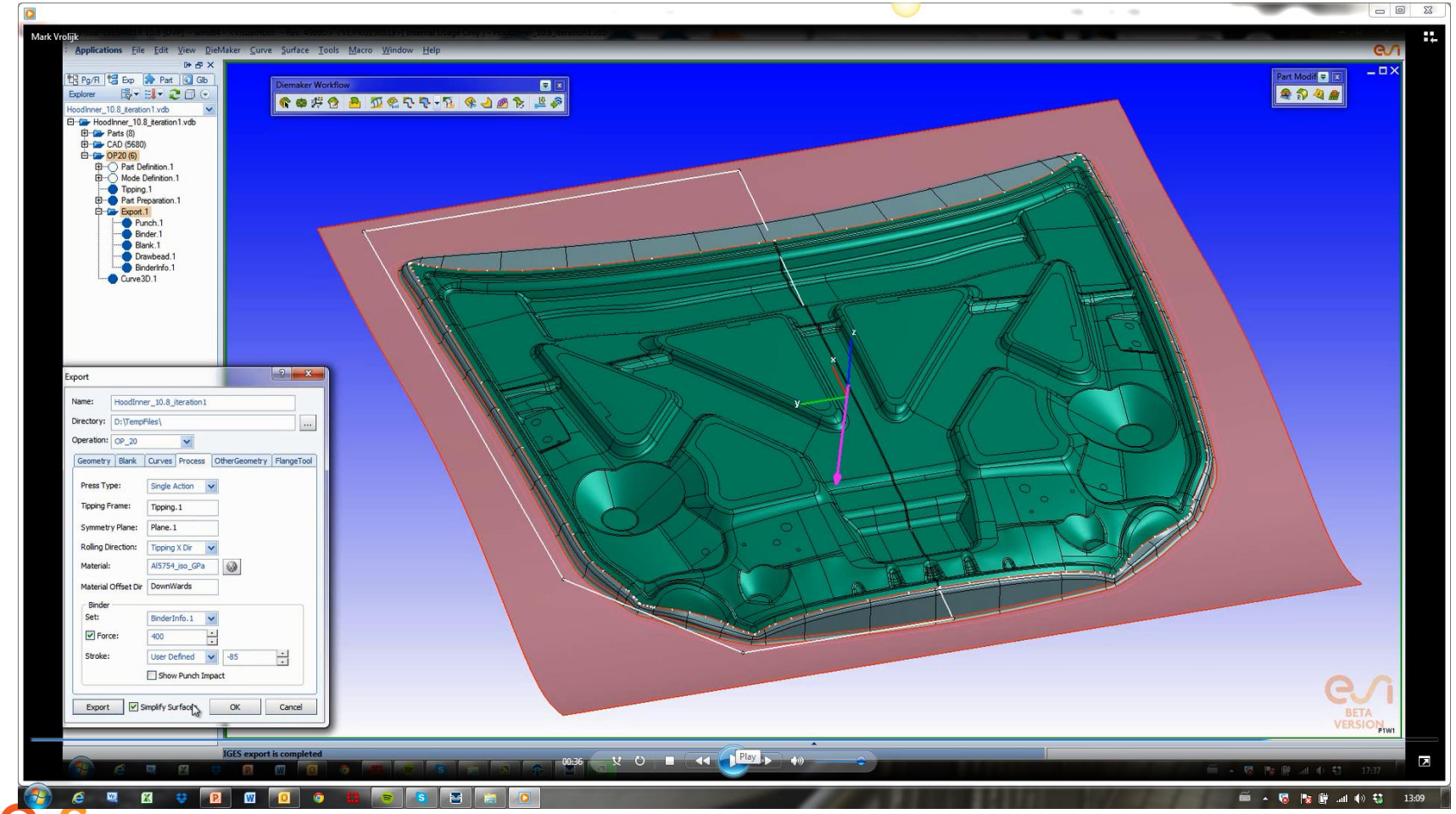


Step 7 : Hoodinner_videos_7_VDM Export modifications

Play the video with any media player on another device and practice in parallel

- Redefine the export inside VDM
  - Adjust the blank size according to the obtained draw in
    - Reduce width if too much material consumed
  - Adjust process parameters
    - Increase or decrease the binder force
    - Increase or decrease the stroke value
  - Export the new files
    - Either overwrite or give them a new name

Result

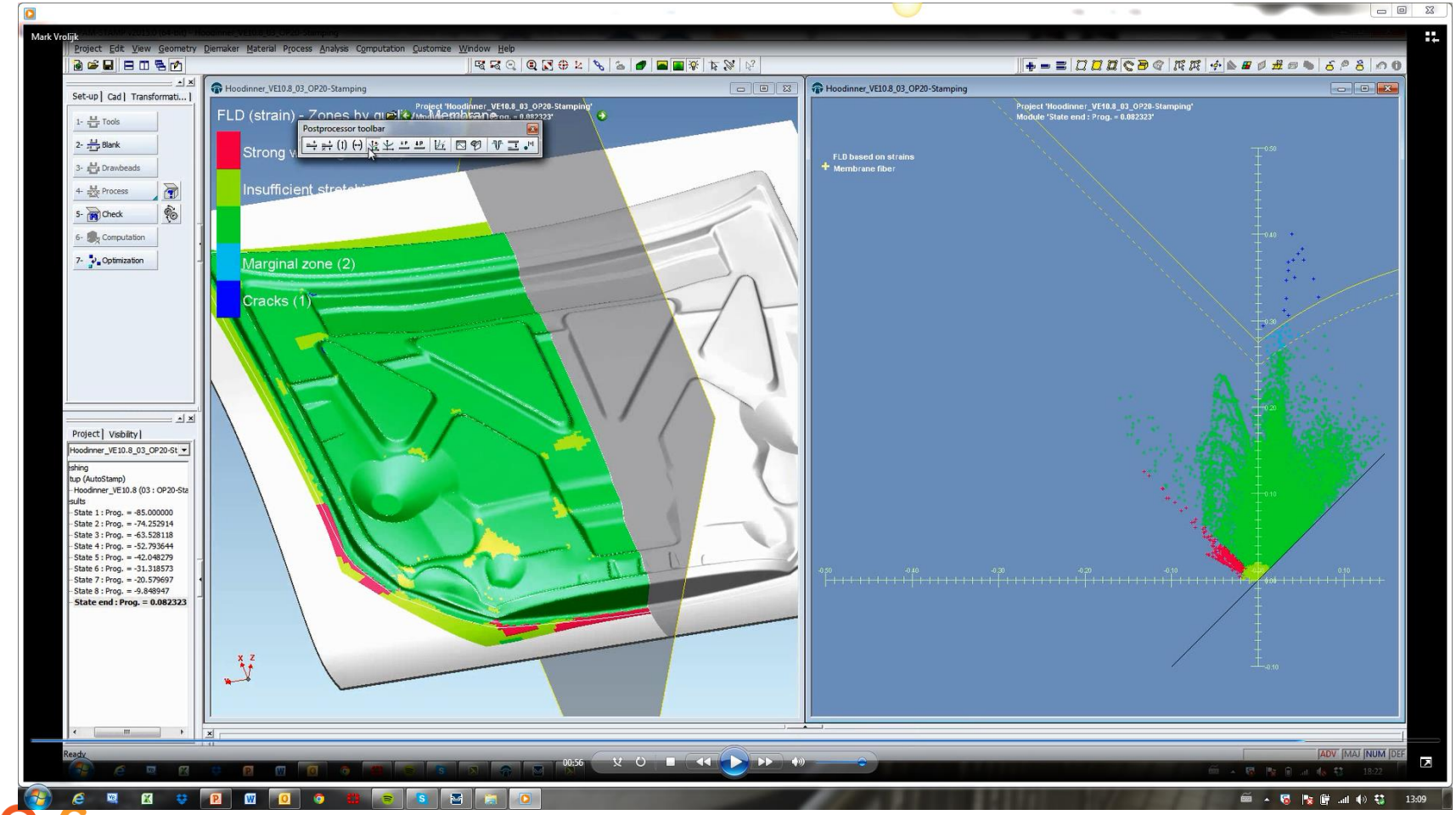


Step 8 : Hoodinner_videos_8_PS new run

Play the video with any media player on another device and practice in parallel

- Save the simulation under a different name
- Perform a new import and overwrite the existing definitions
  - No geometry modifications have been performed but the geometry would have automatically been updated according to the latest changes
  - Open the process macro and apply the new settings
- Run the solver again
- Analyze the results using the post-processing toolbar

Result

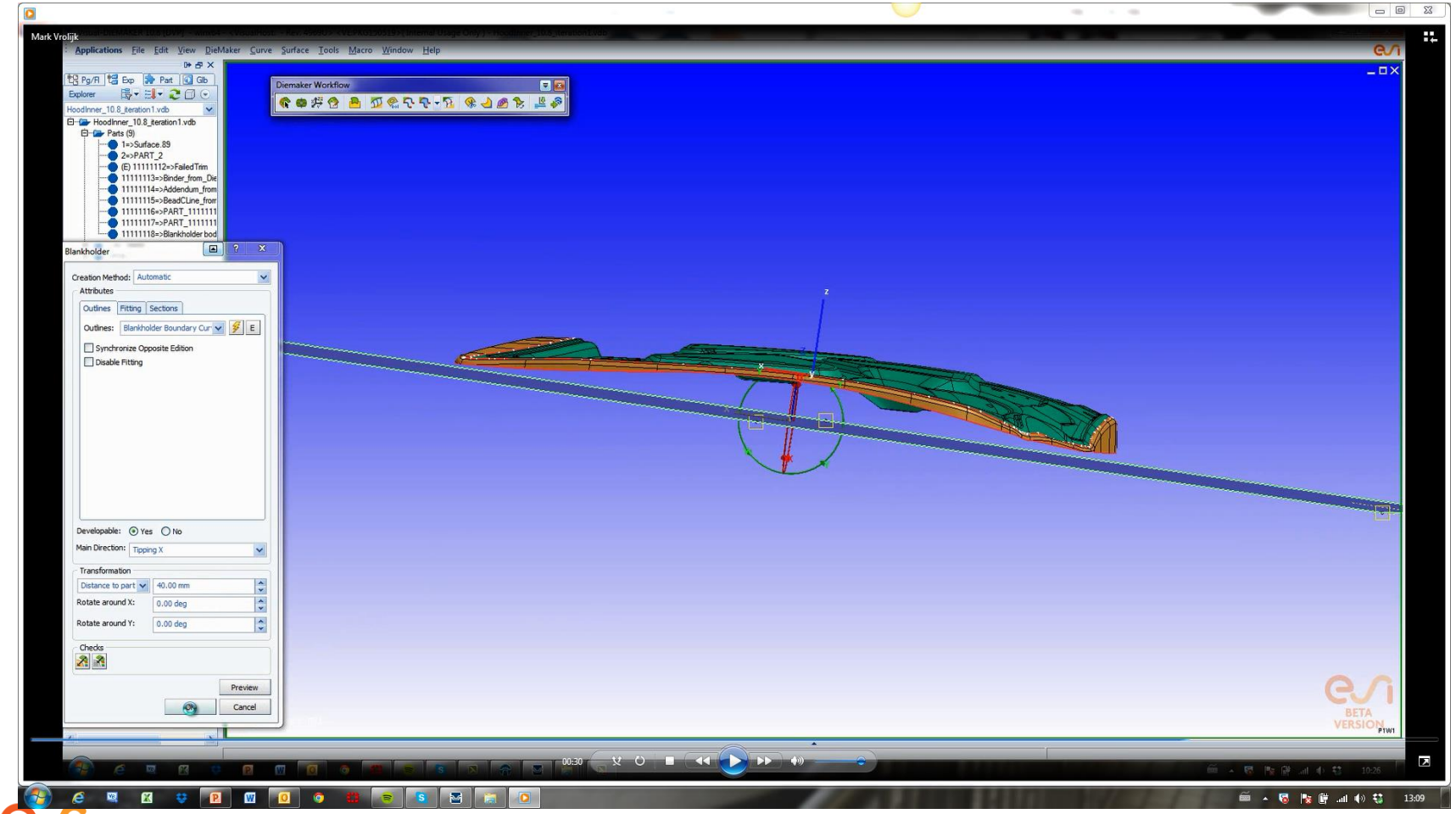


Step 9 : Hoodinner_videos_9_VDM Profile endpoint surface

Play the video with any media player on another device and practice in parallel

- To improve the die face model a parametric die face will be build by using the diestarter results as reference
  - Build first a surface which will serve as profile endpoint support. Use the binder functionality to achieve the surface and position it with a sufficient distance from the part
    - This approach has the following advantages:
      - user can iterate on either one of them without influencing/updating the other
      - If binder needs to be moved up or down the topology of the addendum is fully maintained
      - Binder can be constructed afterwards by using the addendum geometry (e.g. Creating a fitting curve over the surface)
      - Very easy to model the case when punch radius and die entry radius blend into each other
  - Note
    - Optionally the user can also directly create the ‘real’ binder and skip this step

Result

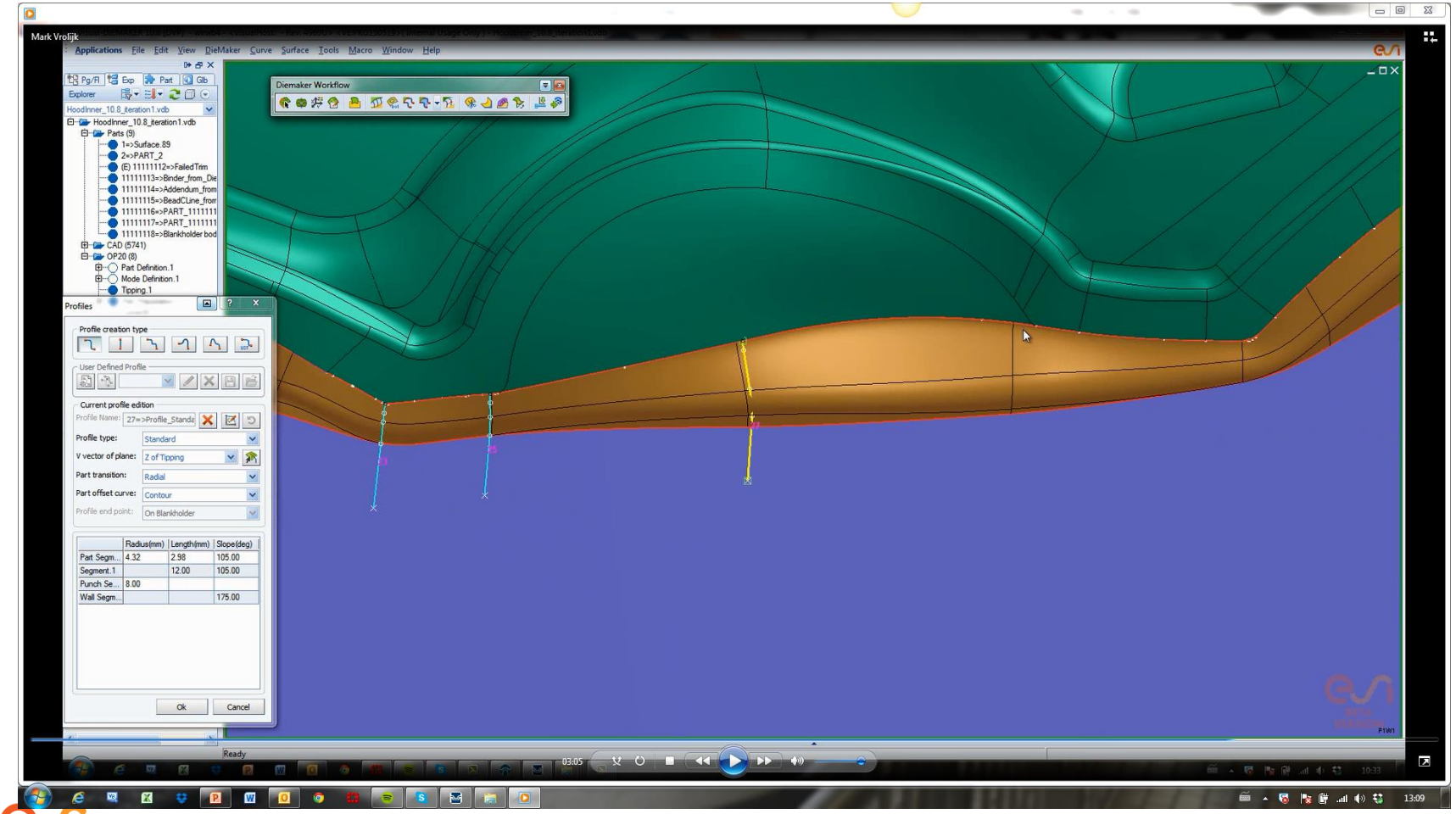


Step 10 : Hoodinner_videos_10_VDM Addendum profiles

Play the video with any media player on another device and practice in parallel

- Define an addendum frame
  - Combination between outline and surface
  - Used to define open / closed addendum
  - Used to distinct inner and outer addendum
- Create parametric profiles approximating the diestarter reference geometry
  - Use standard profiles and adjust their shapes
    - Tangent / radial
    - Length segments
    - Punch radius
- Note
  - Try to keep line segments longer than 1 mm
  - Only place profiles where transitions in outline or addendum shape occur or if distances between subsequent profiles become quite large

Result

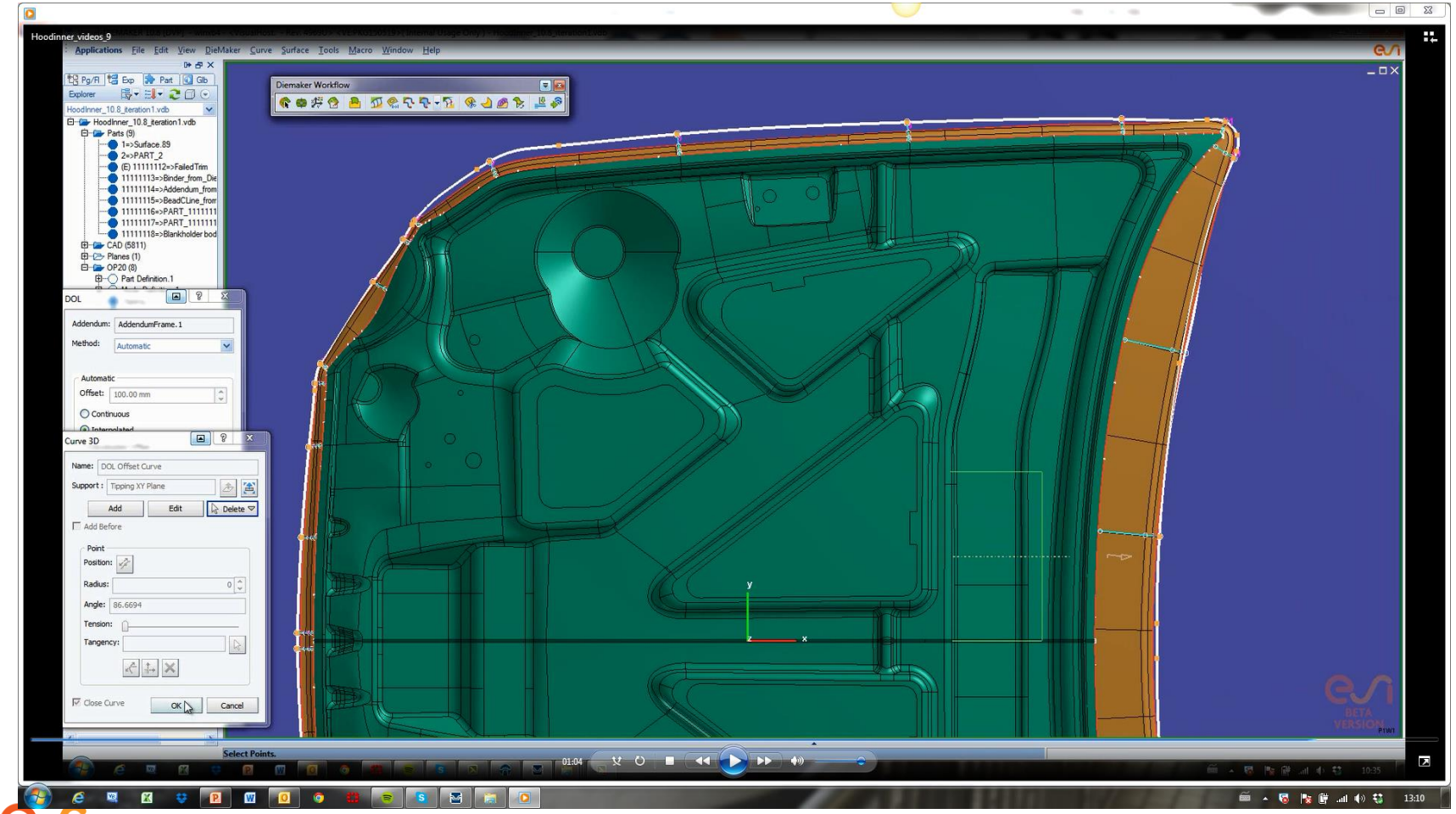


Step 11 : Hoodinner_videos_11_VDM Dol

Play the video with any media player on another device and practice in parallel

- Create the connecting line through the endpoints of the profiles by using the die opening line functionality
  - Keep the die opening line (dol) as master
    - That means that the dol is the reference for the profiles. If dol is changed the profiles will be autoamtically adjusted to keep their endpoint on this curve
    - In case the user will play with the profile shape afterwards the endpoints will stick to the curve
  - Press create dol
    - This will create a default dol
    - Press the ‘edit’ button and adjust the initial curve shape as required in order to get a very smooth connecting curve shape
      - Change line segments from spline to line
      - Add/remove/edit points on curves

Result

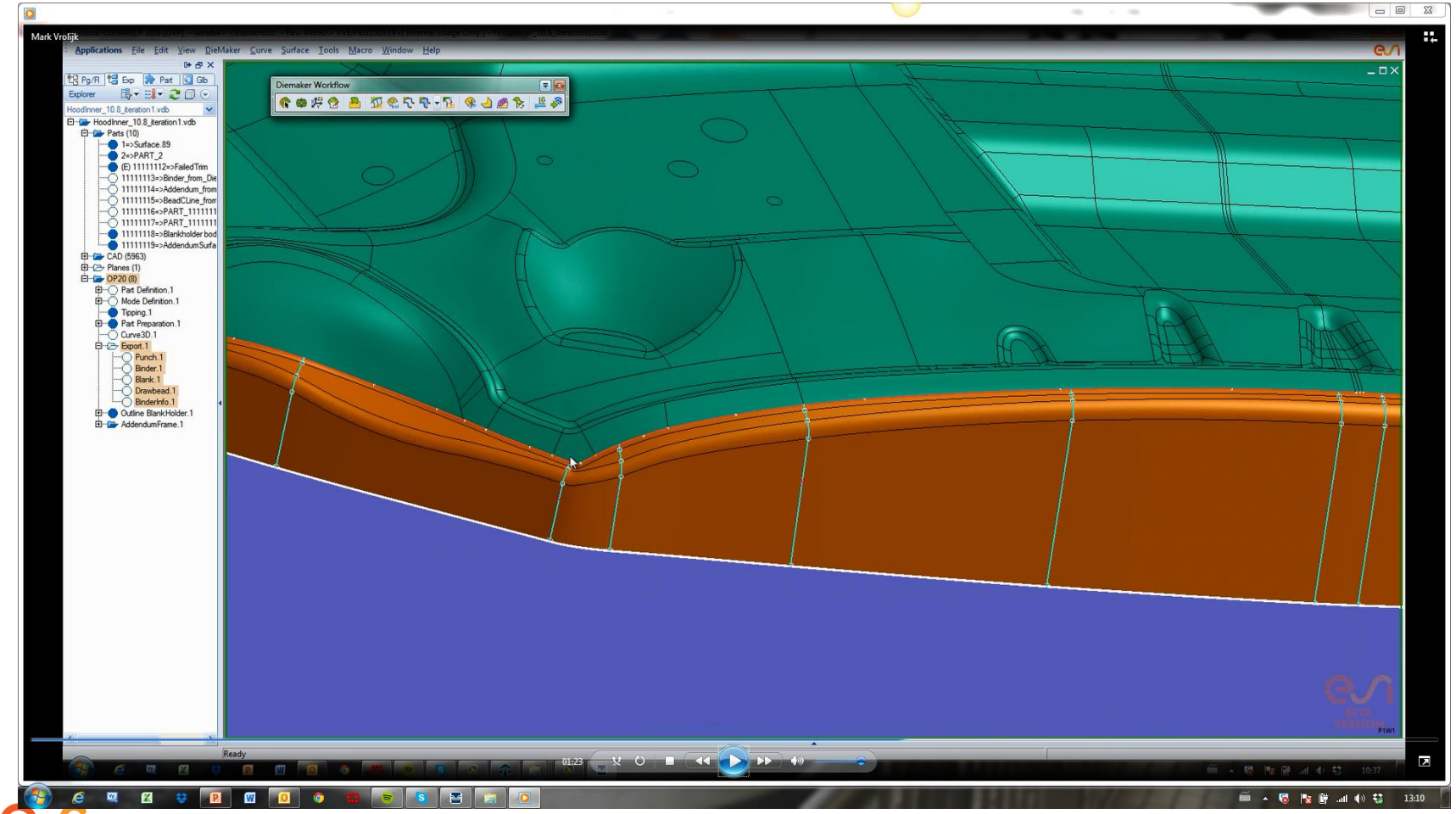


Step 12 : Hoodinner_videos_12_VDM addendum surface

Play the video with any media player on another device and practice in parallel

- Create the addendum surface
  - Usually after creation of the addendum surface the iterations will start: connecting curve can be modified and profiles can be deleted/added/modified
    - Use the above mentioned functionalities to get a smooth addendum surface

Result

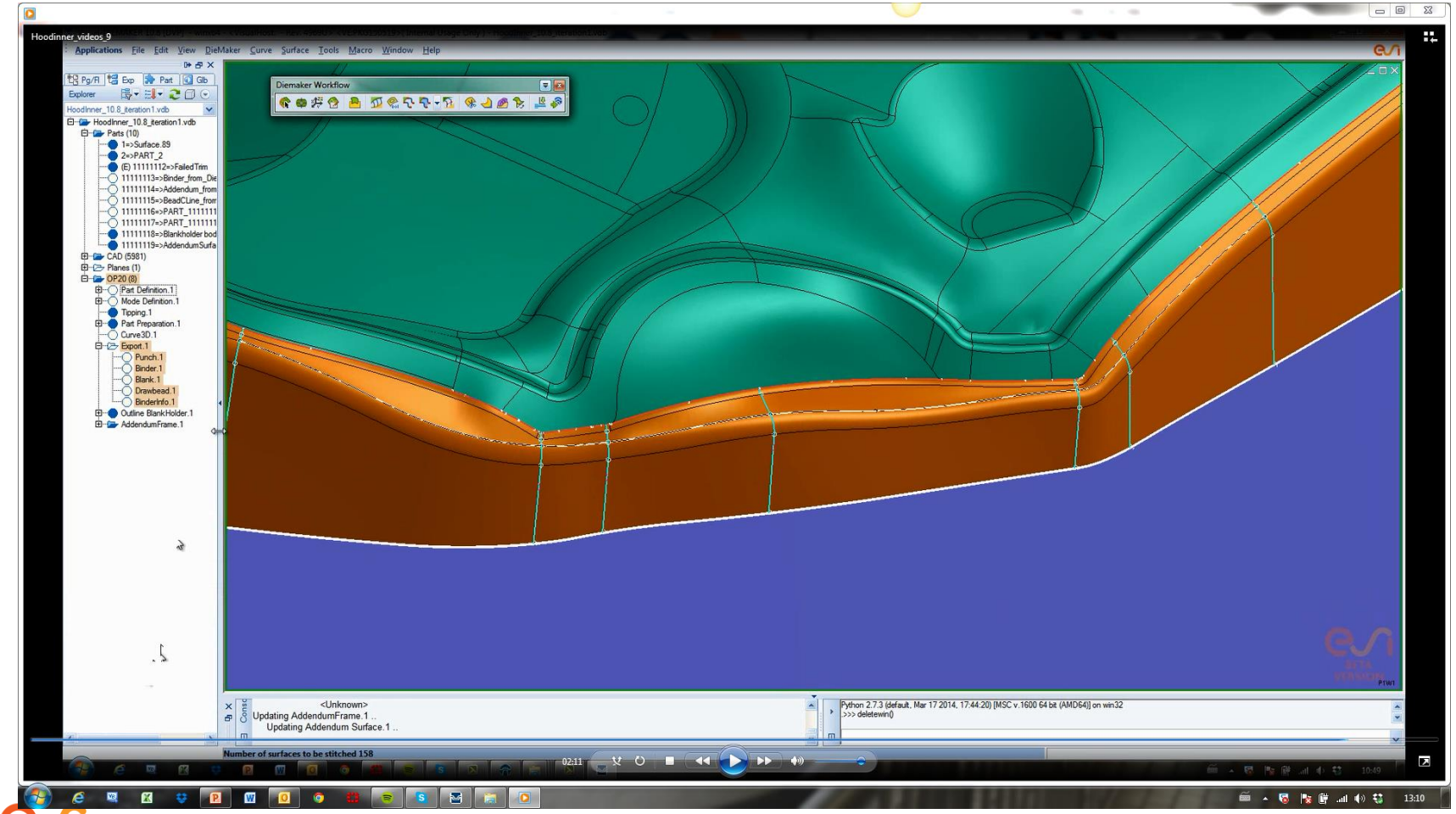


Step 13 : Hoodinner_videos_13_VDM Control curve

Play the video with any media player on another device and practice in parallel

- To control the surface flow in between profiles control curves can be created
  - Click the start and endprofile between which the control curve needs to be generated
  - The initial curve will try to follow the already created addendum surface but can be modified
    - Press edit option in the dialog and delete/add/modify points
    - Define tangencies on the endings by e.g. selecting the part edge directions at those locations

Result

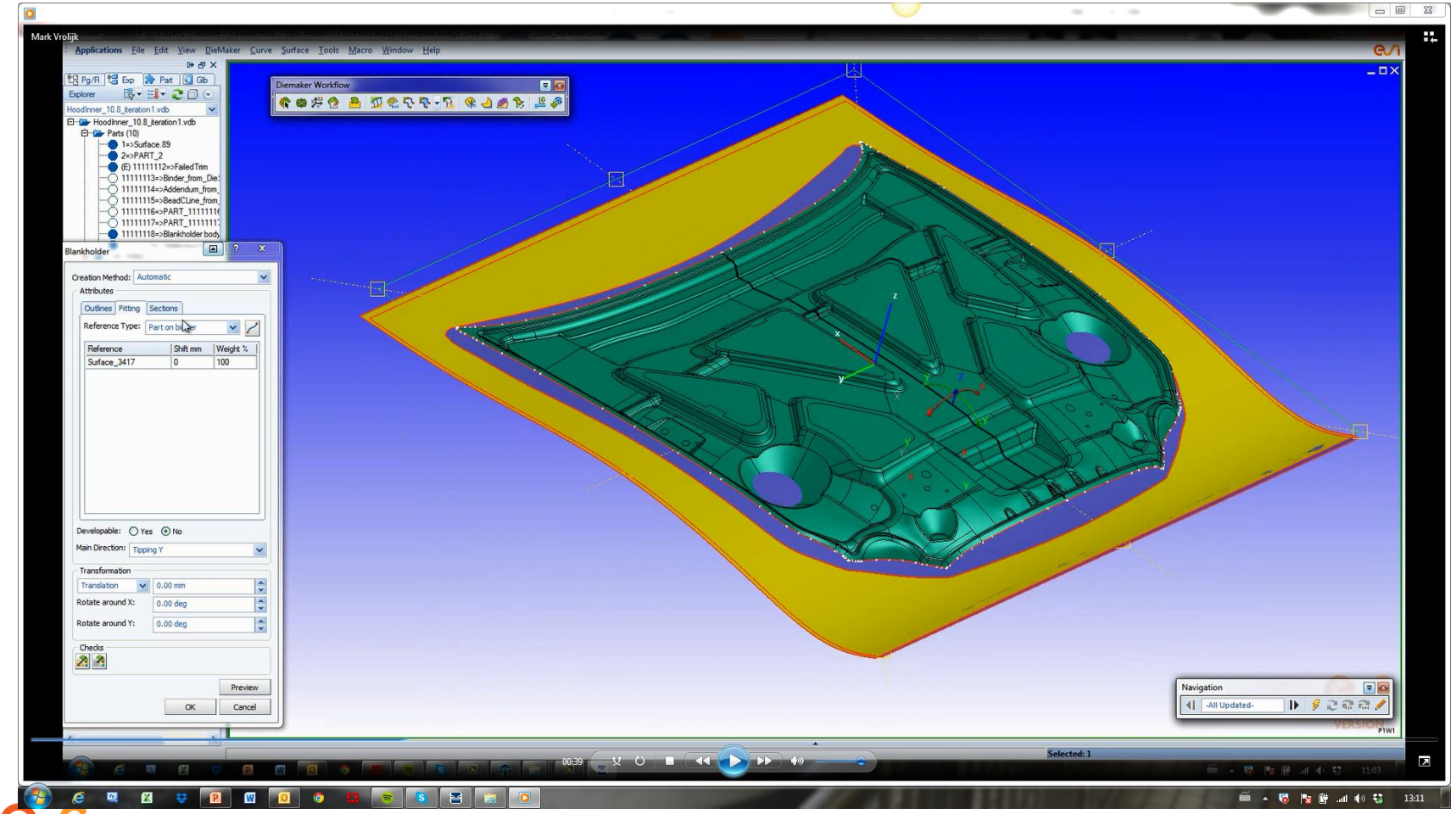


Step 14 : Hoodinner_videos_14_VDM Binder fitting

Play the video with any media player on another device and practice in parallel

- Approximate the binder surface from diestarter
  - Use the blankholder functionality
  - Use part on binder option and select the diestarter binder
    - Set the algorithm to non-developable
  - Resize the resulting binder to fit with the edges of the diestarter binder
  - Create the outlines
    - Simplify them afterwards by deleting internal points and set curve segments to line or spline
  - Activate ‘disable fitting’ option
    - This will ignore the selected entities in the fitting tab page. Otherwise the binder will try to fit through the selected diestarter surface and the newly created outlines. If they do not exactly match it will result in disturbed binder surface flow

Result

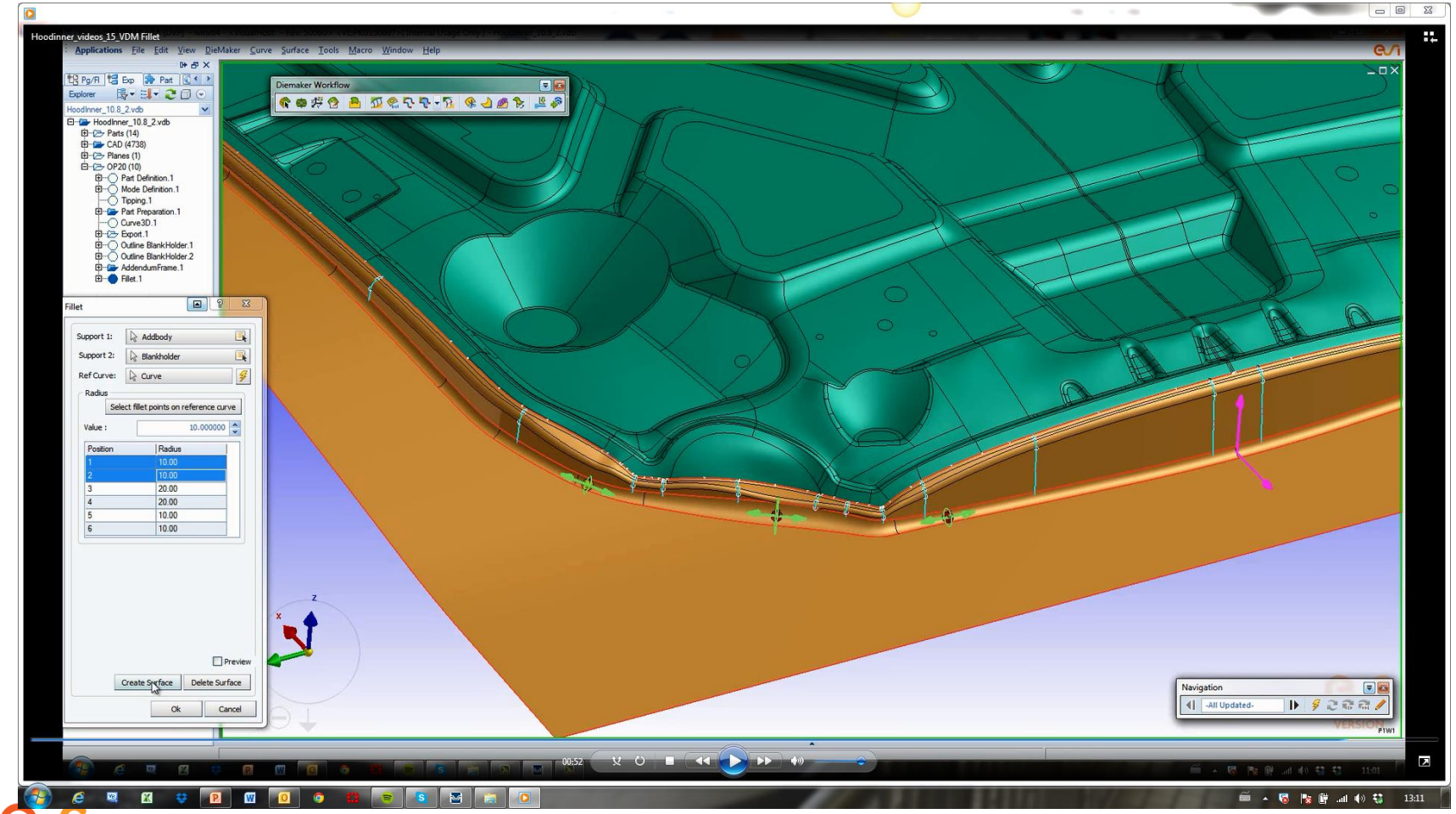


Step 15 : Hoodinner_videos_15_VDM Fillet

Play the video with any media player on another device and practice in parallel

- Create the final die entry radius
  - Use the diemaker fillet functionality
    - Addendum surface will be preselected
    - Last created binder will be preselected
    - Create the intersection curve
    - Then define directly a constant fillet of 10 mm or add points on the reference curve to create a variable fillet

Result



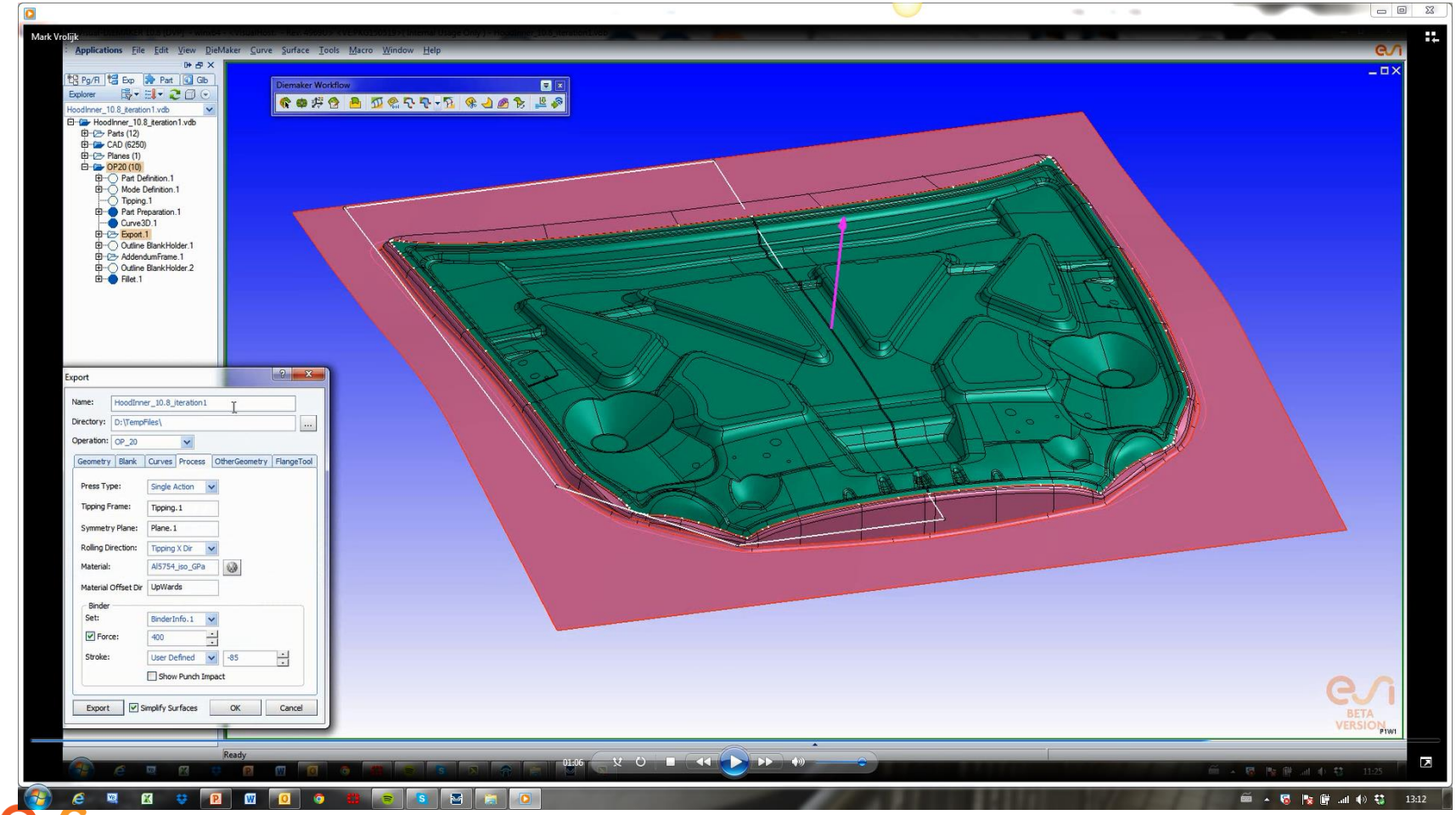
Step 16 : Hoodinner_videos_16_VDM Export

Play the video with any media player on another device and practice in parallel

- Redefine the export
  - As we no longer use the full die face design from diestarter, the geometries need to be updated to represent the latest diemaker design
    - Delete the existing objects
    - Redefine the full die geometry and select the new die entry fillet
      - Deselect already selected entities by pressing control-D
    - Redefine the punch and binder definitions
  - Export the new files

- Note:
  - Make sure the offset direction is pointing in the correct direction!

Result

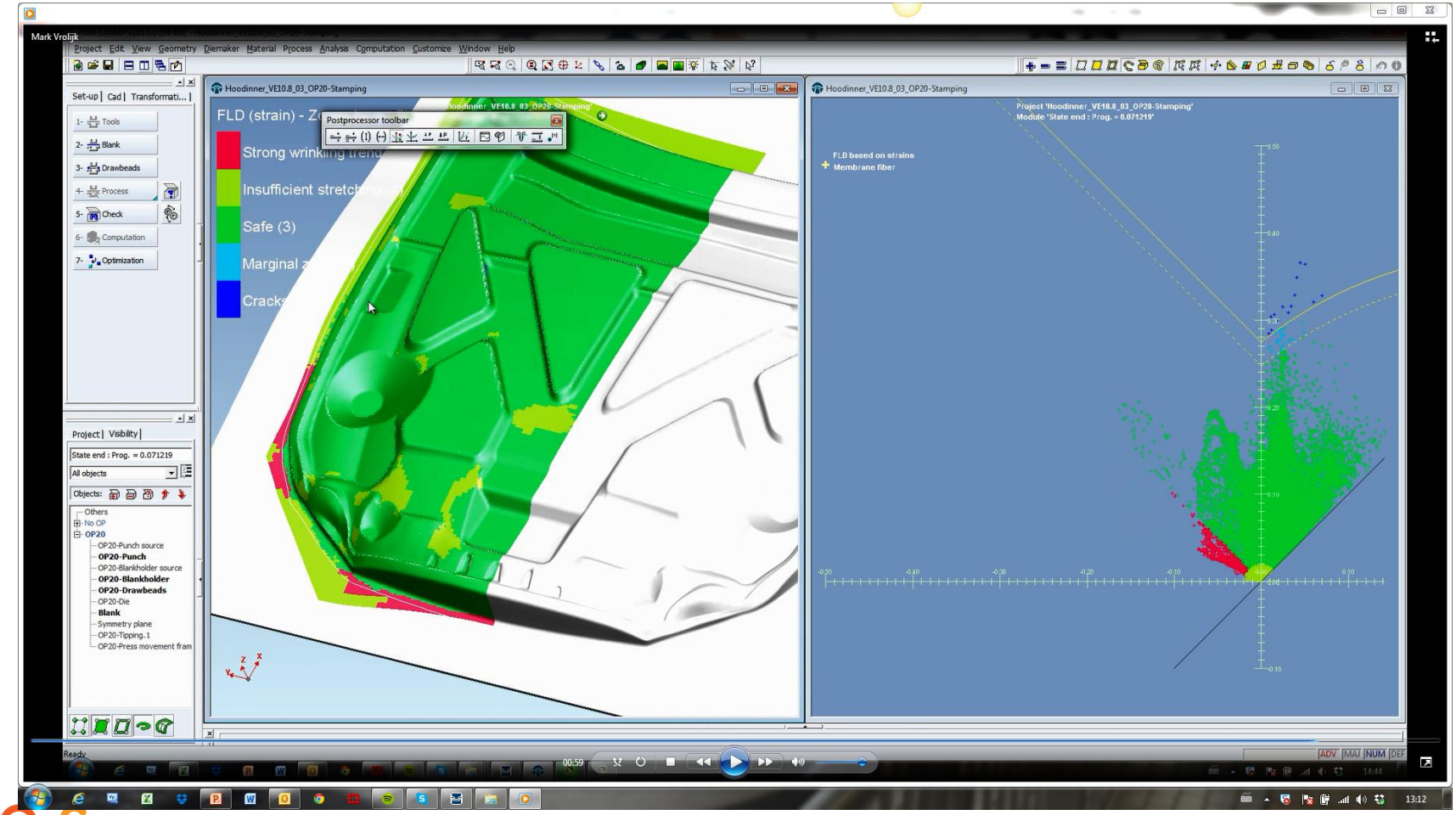


Step 17 : Hoodinner_videos_17_PS new run

Play the video with any media player on another device and practice in parallel

- Save the current simulation file under a different name
- Import the new geometries using the same procedure as with previous imports
  - Geometries will be automatically updated inclucing the punch and the blankholder
- Start a new solver run
- Analyze the results by using the dedicated post-process toolbar

Result

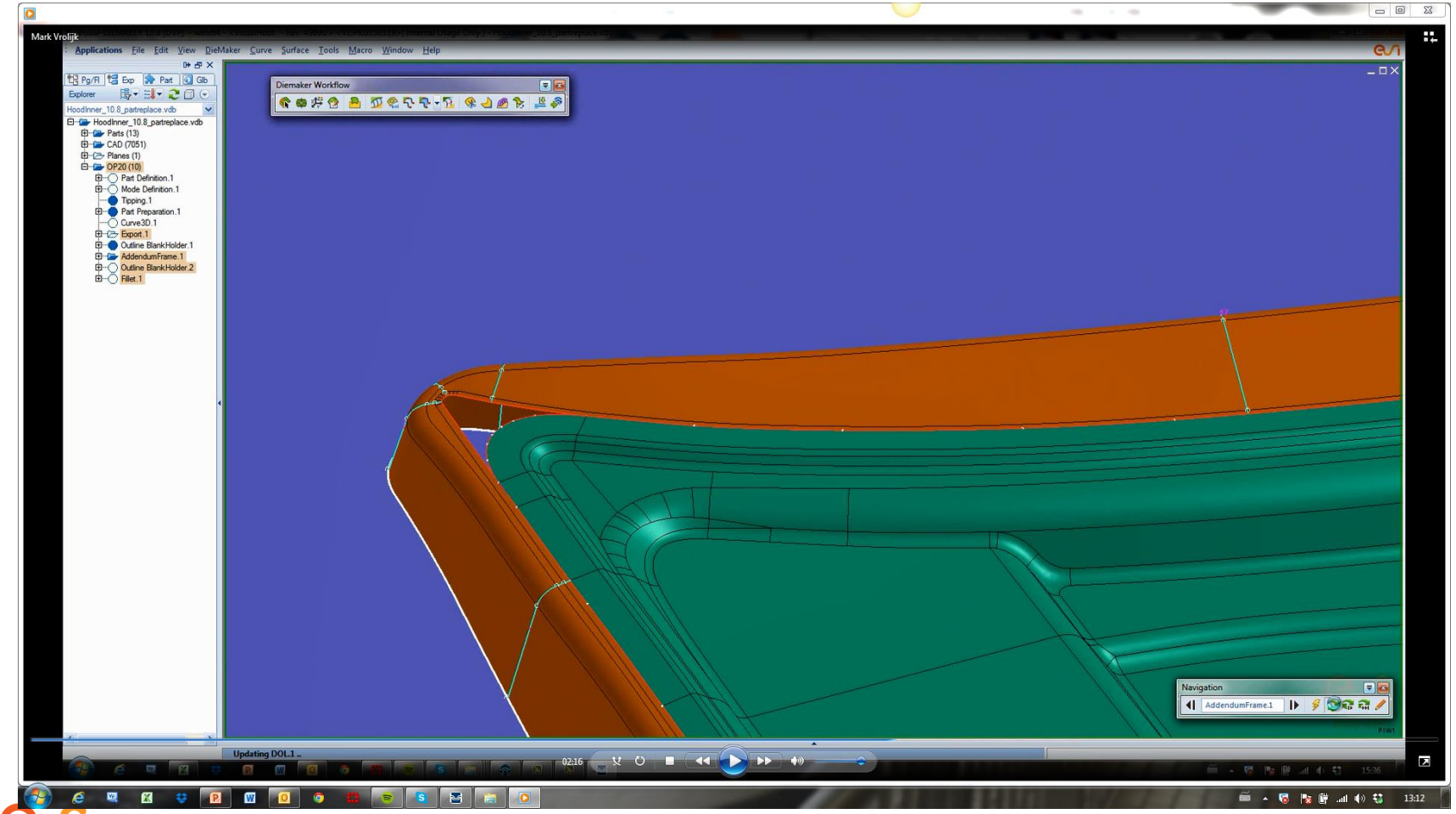


Step 18 : Hoodinner_videos_18_VDM Part replace

Play the video with any media player on another device and practice in parallel

- Return to the die face design module and import a new part geometry
- Use part definition – replace part
  - Show old and new part and check the differences
  - Flanges will be automatically set again as they are identical to the previous part
  - Use the navigation toolbar to ‘walk’ through the workflow and update the features step by step
    - In part preparation it is required to edit the content of the feature:
      - The existing rolling cylinders should be removed as the headlight area is alreday filled and the new cut outs at the frontside should be smoothened
      - In addendum frame some of the profiles will probably need to be repositioned
      - Control curve will need modification as well due to the new surface at the headlight region

Intermediate Result

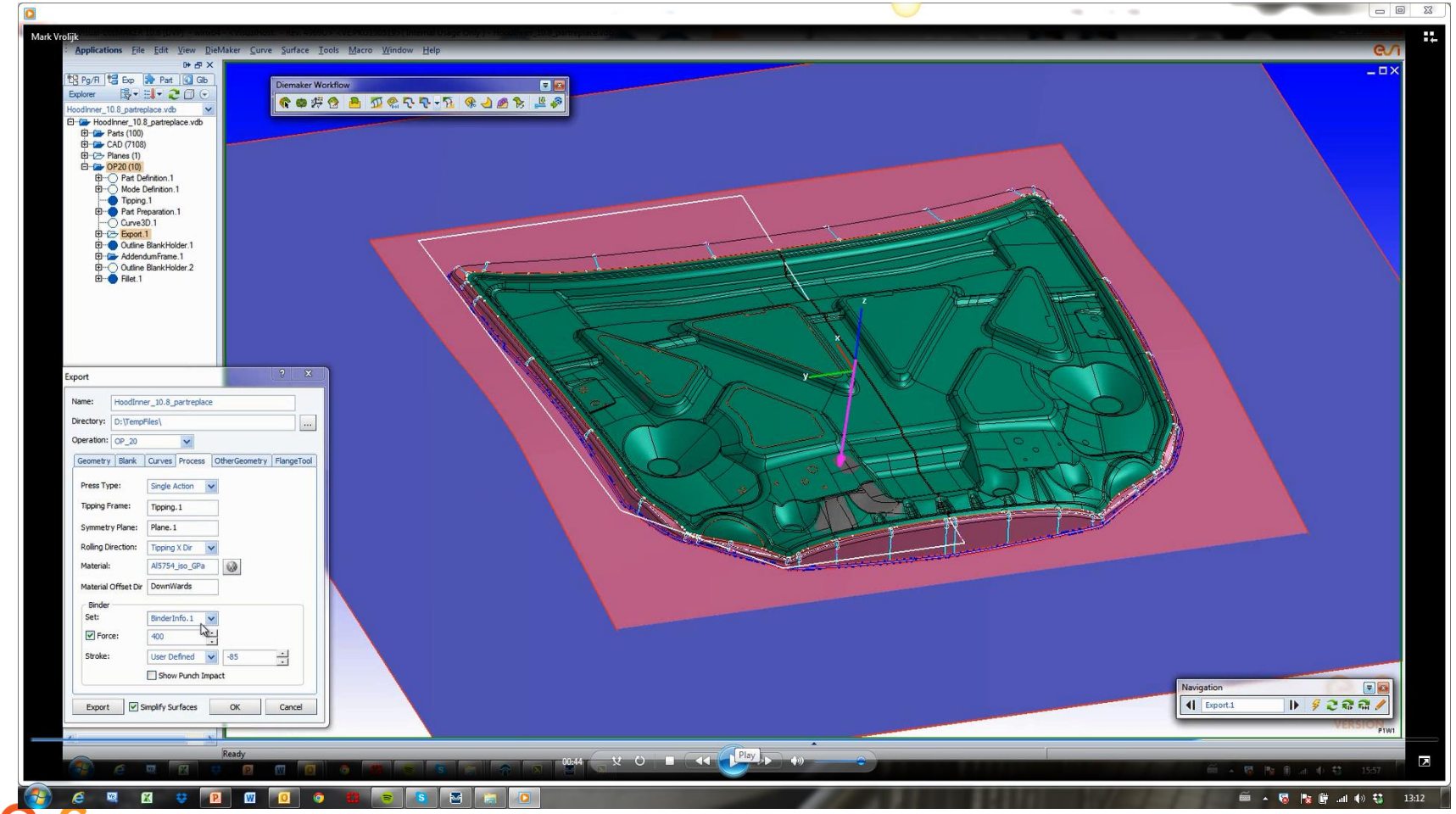


Step 19 : Hoodinner_videos_19_VDM Export

Play the video with any media player on another device and practice in parallel

- Redefine the export definitions
  - Redefine the full die
    - De-select the existing surfaces by pressing control-D
    - Select the new full die face geometry
      - Split this full die into different regions by selecting the die entry radius
        - The existing punch and binder definitions will be updated accordingly
  - Export the new geometry

Result

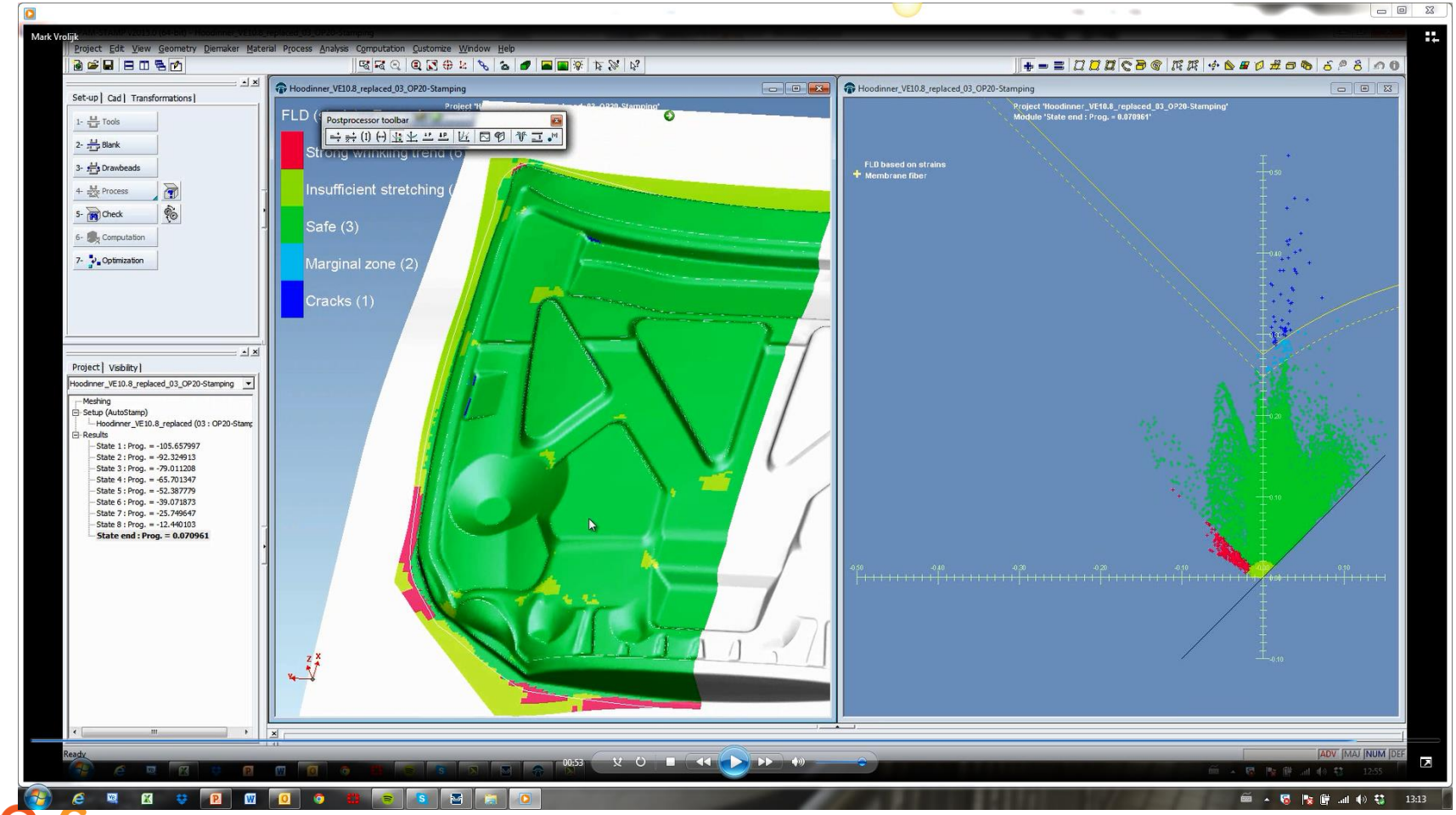


Step 20 : Hoodinner_videos_20_PS new run

Play the video with any media player on another device and practice in parallel

- Save the current simulation file under a different name
- Import the new geometries using the same procedure as with previous imports
  - Geometries will be automatically updated inclucing the punch and the blankholder
- Start a new solver run
- Analyze the results by using the dedicated post-process toolbar

Result

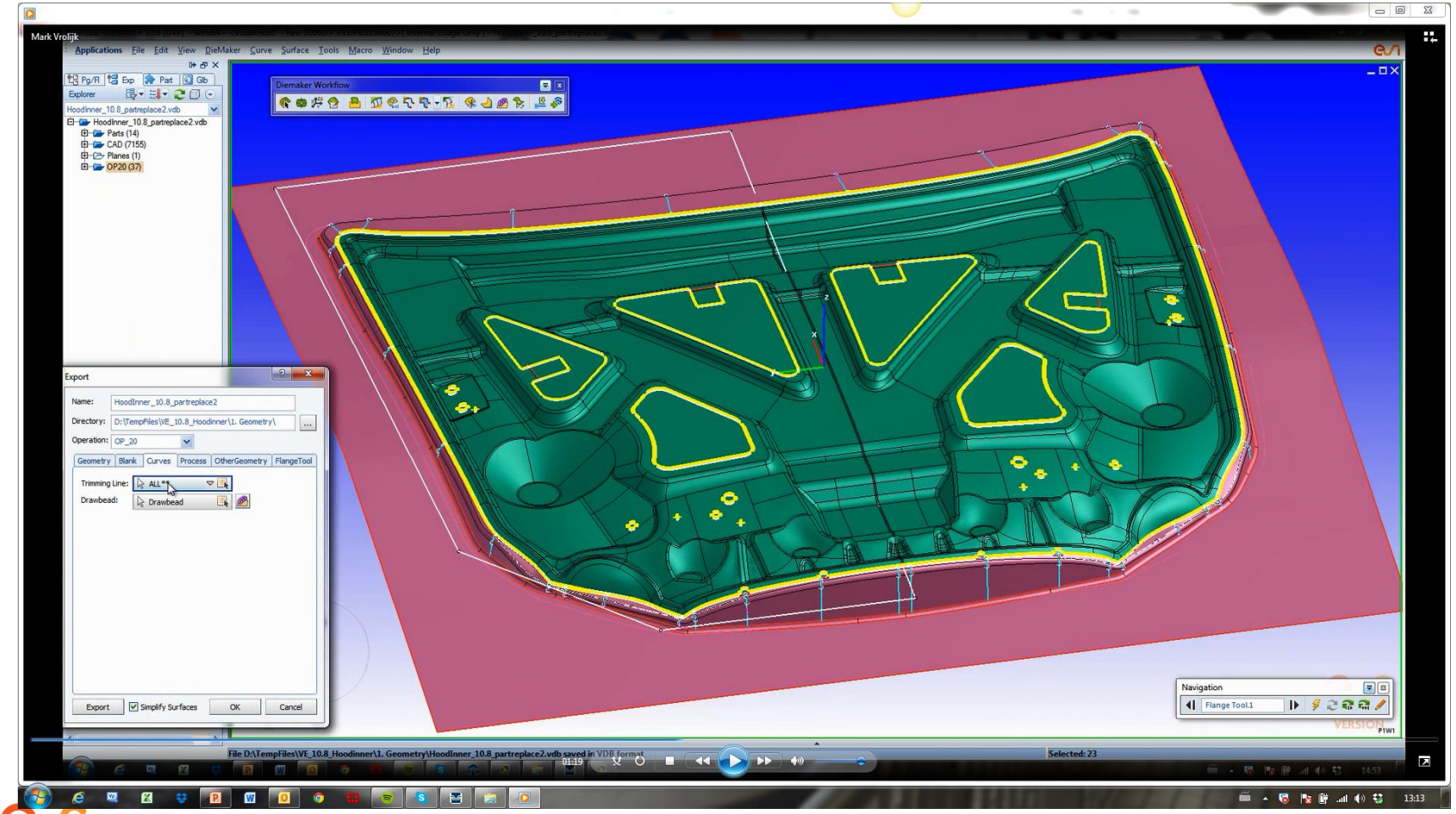


Step 21 : Hoodinner_videos_21_VDM trimlines flanges and export

Play the video with any media player on another device and practice in parallel

- Return to the die face design module
  - Develop the flanges onto the created draw die
    - Use accurate development which will run an inverse solver for projection
  - Create the flanging tools for the hidden flange regions
    - De-activate the bottom surface as these flanges only require extensions
    - Set the OP to OP40 for the flanging
  - Update the export
    - Check that trimming curves are selected
    - Add the OP40 flanges to the definition in the ‘flange tool’ tab page
      - Create the support from the full die minus the filled holes and wall extensions of the flanging tools
      - Create the pad by selecting the surrounding surfaces
  - Create the export files

Result

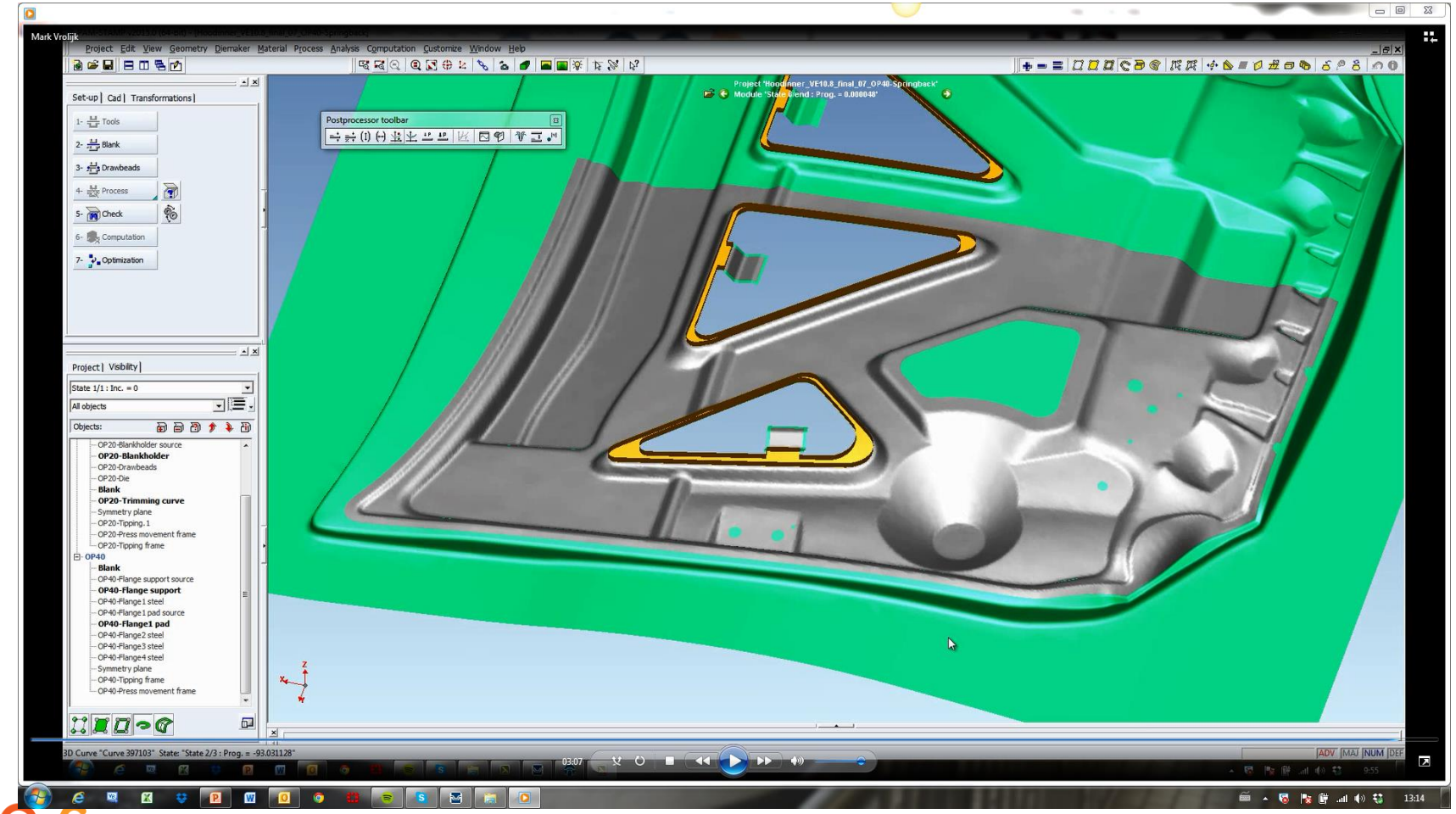


Step 22 : Hoodinner_videos_22_PS final run

Play the video with any media player on another device and practice in parallel

- Save the current simulation file under a different name
- Import the new geometries using the same procedure as with previous imports
  - Geometries will be automatically updated inclucing the punch and the blankholder
  - Now also OP40 geometries will be imported
    - Check the new entities
  - Add a trimming (blanking) stage in the process macro by selecting the trimming curves object
    - Define a point on the part that remains
  - Add the flanging macro from the validation directory
    - CHECK: that the flanging tools on the blank side are selected and NOT the ones on the other side of the symmetry plane
    - Correct if required
    - Define the flanging radius and the pad force
- Start a new solver run
- Analyze the results by using the dedicated post-process toolbar

Result



THANK YOU