

## generating construction drawings

The geometry is imported into the commercial CAD-Software &ldquo;Rhinoceros&rdquo;. An especially programmed parser interprets the data of the model now closer defined by the set of construction parameters and creates the physical elements to be produced. First, the geometric data is rebuilt, following, the actual construction data is calculated and visualized. The polygonal cell elements are offsets of the cell edges, customized by selecting inner and outer radii as well as edge curvature.

The scripts automatically create and arrange the necessary cutting plans for the machines. Each polygonal element, a so called &ldquo;frame&rdquo;, is rotated into an even plane, necessary milling offsets for the machine paths are automatically calculated and added. A second procedure builds up the geometry for the frame connectors. It also generates the cutting plans needed for the production of the several hundred individual frame connectors, each one shaped in an individual angle derived by the geometry of the overall structure.

left image variant 1, right image variant n

{mosimage ch=180 popup=1 popupTyp=script} {mosimage ch=180 popup=1 popupTyp=script}

rhino : step cd 1 > generate construction model

{mosimage ch=180 popup=1 popupTyp=script} {mosimage ch=180 popup=1 popupTyp=script}

rhino : step cd 2 > rotate shapes into even plane

{mosimage ch=180 popup=1 popupTyp=script} {mosimage ch=180 popup=1 popupTyp=script}

rhino : step cd 3 > generate connectorsrotate shapes into even plane

igs export

10,0,13H050927.225412; G 12  
314 1 0 0 0 0 0 000000200D 1  
314 0 2 1 0 0 0 COLOR 0D 2  
314 2 0 0 0 0 0 000000200D 3  
314 0 1 1 0 0 0 COLOR 0D 4  
314 3 0 0 0 0 0 000000200D 5  
314 0 4 1 0 0 0 COLOR 0D 6  
406 4 0 0 2 0 0 000000300D 7  
406 0 -1 1 3 0 0 LEVELDEF 0D 8  
406 5 0 0 3 0 0 000000300D 9  
406 0 -1 1 3 0 0 LEVELDEF 0D 10  
406 6 0 0 4 0 0 000000300D 11  
406 0 -3 1 3 0 0 LEVELDEF 0D 12  
406 7 0 0 5 0 0 000000300D 13  
406 0 -5 1 3 0 0 LEVELDEF 0D 14  
126 8 0 0 4 0 0 000000000D 15  
126 0 -3 8 0 0 03d BsCrv 0D 16  
126 16 0 0 4 0 0 000000000D 17  
126 0 -3 6 0 0 03d BsCrv 0D 18  
110 22 0 0 4 0 0 000000000D 19  
110 0 -3 3 0 0 0 3d Line 0D 20  
126 25 0 0 4 0 0 000000000D 21  
126 0 -3 8 0 0 03d BsCrv 0D 22  
126 33 0 0 4 0 0 000000000D 23  
126 0 -3 8 0 0 03d BsCrv 0D 24  
126 41 0 0 4 0 0 000000000D 25  
126 0 -3 8 0 0 03d BsCrv 0D 26  
126 49 0 0 4 0 0 000000000D 27  
126 0 -3 11 0 0 03d BsCrv 0D 28  
110 60 0 0 4 0 0 000000000D 29  
110 0 -3 3 0 0 0 3d Line 0D 30  
126 63 0 0 4 0 0 000000000D 31  
126 0 -3 8 0 0 03d BsCrv 0D 32  
126 71 0 0 4 0 0 000000000D 33  
126 0 -3 11 0 0 03d BsCrv 0D 34  
110 82 0 0 4 0 0 000000000D 35  
110 0 -3 3 0 0 0 3d Line 0D 36  
126 85 0 0 4 0 0 000000000D 37  
126 0 -3 6 0 0 03d BsCrv 0D 38  
126 91 0 0 4 0 0 000000000D 39  
126 0 -3 8 0 0 03d BsCrv 0D 40  
110 99 0 0 2 0 0 000000000D 41  
110 0 -1 3 0 0 0 3d Line 0D 42  
124 102 0 0 0 0 0 000000000D 43  
124 0 0 4 0 0 0 0D 44  
100 106 0 0 2 0 43 000000000D 45  
100 0 -1 2 0 0 0 3d Arc 0D 46  
110 108 0 0 2 0 0 000000000D 47  
110 0 -1 3 0 0 0 3d Line 0D 48

110 111 0 0 3 0 0 000000000D 49  
110 0 -1 3 0 0 0 3d Line 0D 50  
124 114 0 0 0 0 0 000000000D 51  
124 0 0 4 0 0 0 0D 52  
100 118 0 0 3 0 51 000000000D 53  
100 0 -1 2 0 0 0 3d Arc 0D 54  
110 120 0 0 3 0 0 000000000D 55

import to SurfCam

{mosimage ch=180 popup=1 popupTyp=script} {mosimage ch=90 popup=1 popupTyp=script}

transfer to cnc&ndash;machines

CAM cutting plans

material frames: 49.73sqm  
material connectors: 4,80sqm  
number of frames: 111  
number of connectors: 1368

average milling  
time for one frame: 8-9 minutes

average laser cutting  
time for one connector: 70-80 seconds

total milling time: 34 hours  
hours of assembly: 16 hours