

generating construction drawings

The geometry is imported into the commercial CAD-Software “Rhinoceros”. 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 “frame”, 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–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