

POINTWISE POINTER

A USER TIP FROM THE SUPPORT DESK
SPRING 2004

New Database Constrained Boundary Condition for Extrusions

This issue of the Pointer will highlight a capability recently added to Version 15. A new boundary condition (BC) has been added to both the hyperbolic (**Type Hyp**) and normal (**Type Nrm1**) extrusion methods. This new BC allows you to extrude a domain into a block, or a connector into a domain, while constraining one or more boundaries to lie on a database surface or surfaces. A common example and perfect application for this new addition is seen in turbo-machinery type applications where a blade spans the gap between hub and shroud surfaces. A generalized example including a simulated "hub" surface is shown in Figure 1.

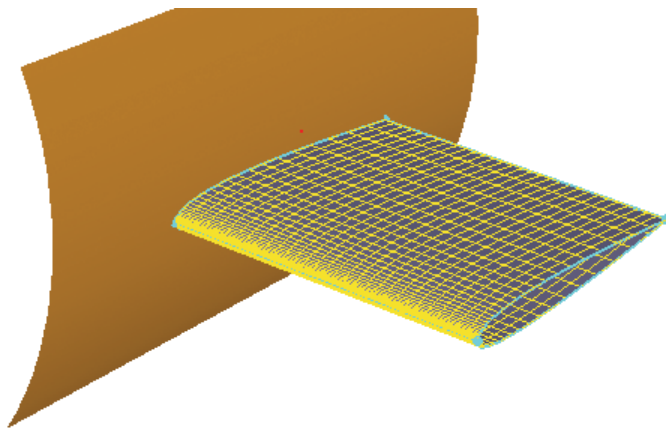


Figure 1

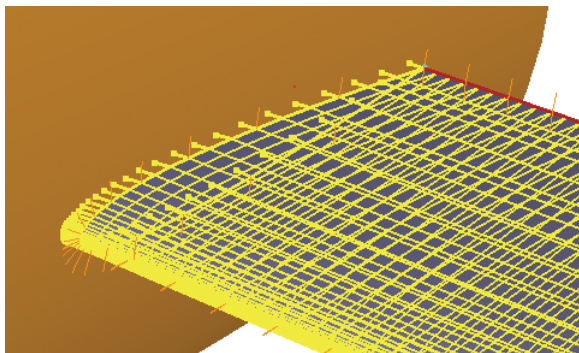
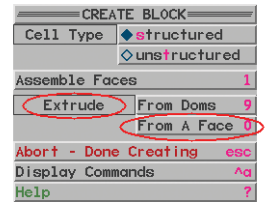
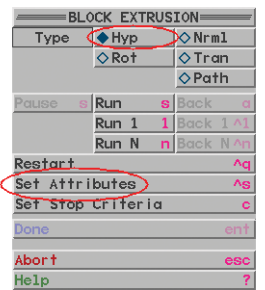


Figure 2

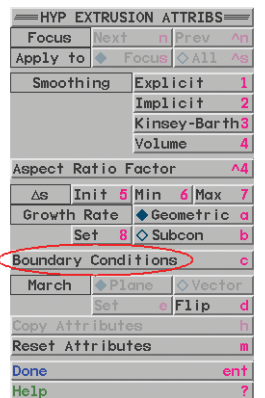
For both extrusion types, proceed as usual to the CREATE BLOCK menu. In this example, **Extrude From A Face** was chosen as shown in Menu 1. After choosing the hyperbolic method, proceed to **Set Attributes** (see Menu 2). Then select **Boundary Conditions**, where you will find the subject of this issue (see Menu 3). After selecting the appropriate boundary edge, you will enter the BC selection menu, shown in Menu 4. Now, simply select **DB Constrained** to enter the database entity browser and choose the surface or surfaces to which the edge should be constrained. Afterward, in Figure 2 you can see by the addition of phantom nodes extending from that boundary that the yellow edge now has a BC applied.



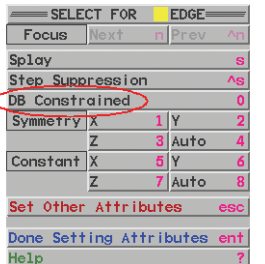
Menu 1



Menu 2



Menu 3



Menu 4

Return to the BLOCK EXTRUSION menu (see Menu 2) and set the extrusion to run 25 steps and pause using **Run N**. The paused state of the extrusion is shown below in Figure 3. Note the final front and the nodes representing the **DB Constrained** BC are all rendered in black. A chordwise view (see Figure 4) looking down along the root of the blade shows how the BC is holding the boundary to the “hub” surface.

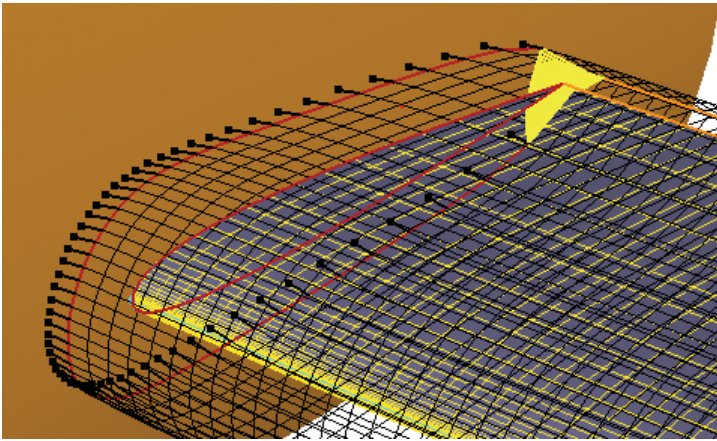


Figure 3

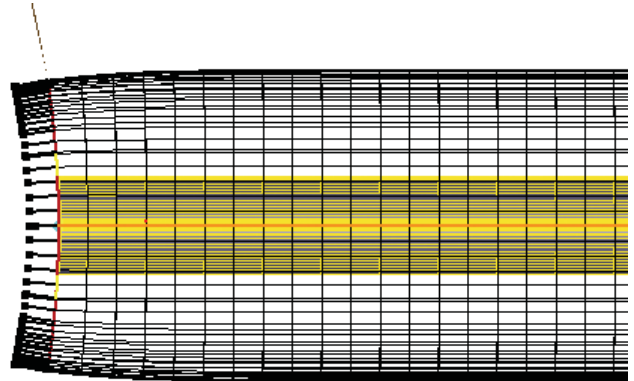


Figure 4

Finally, after saving the new extruded block, see Figure 5 for a view of the block rendered in **Hidden Lines Removed** style. Figure 6 shows the high quality surface-fitted domain on the hub created by the **DB Constrained** BC.

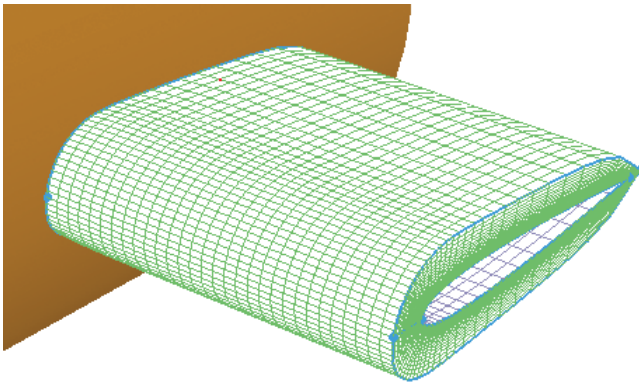


Figure 5

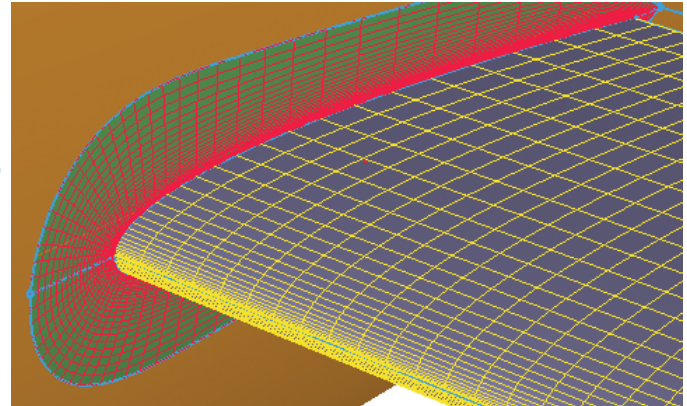


Figure 6



213 South Jennings Avenue
Fort Worth, Texas 76104-1107
888-GRIDGEN (toll free)
(817) 377-2807
(817) 377-2799 (fax)
support@pointwise.com
www.pointwise.com