

## TUTORIAL FOR THE EXAMPLE: COLLISION OF VCROSS UNIT IN 3D

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In this example a small collision problem was simulated to demonstrate the 3D FEMDEM code's capability of modelling arbitrary shaped bodies impacting with internal stress wave propagation, with application to coastal engineering and failure of impacting concrete armour units, see publications. The reader is invited to load the GID file from which the example below is generated and to view the animated result which is visible in the *MOVIES* folder.

The Vcross unit (see Figure 1a) was drawn using GID.

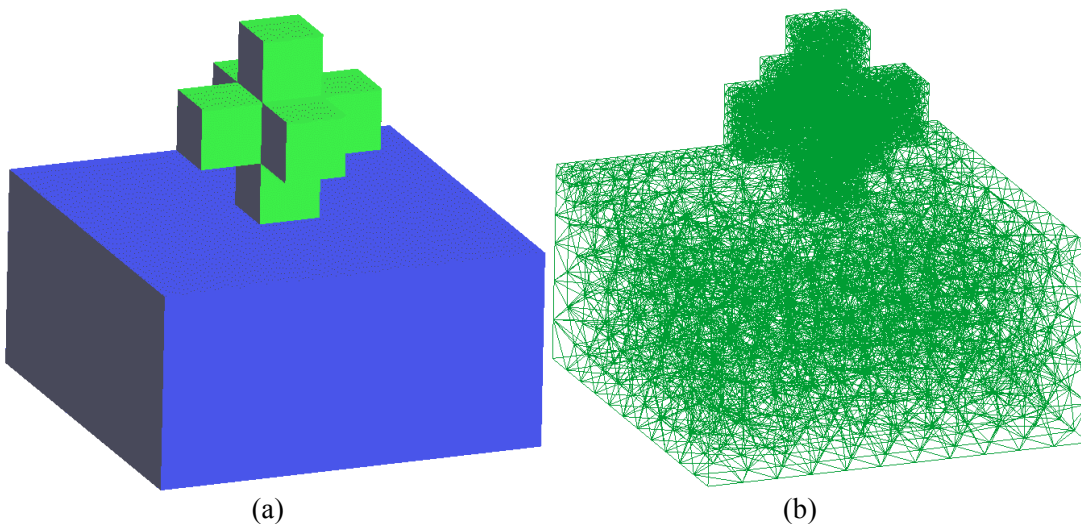


Figure 1 snapshot of Vcross from GID (a) geometry (b) elements

The purpose of this short tutorial is to show you the steps you will need to follow to create the input file .Y3D for the Y3D program (see \VGW\_QMULIC\DEV\Y3D).

1. Using GID, the Vcross unit and anvil were drawn
2. A generic template for collating all the input information (B3D.gid) has been set up to work along side GID to store all the assigned boundary conditions and material properties. At this stage, while working in th GID environment, you have chance to change material properties, particle centre initial positions, nodal initial velocity, etc through GID acting as a GUI (graphics user interface).
3. As Y3D has improved capability and handles quadratic tetrahedral meshes, we take advantage of GID's ability to generate quadratic tetrahedral elements.
4. After we obtain the quadratic elements, we can export correctly formatted meshes with the chosen property and boundary information by Clicking Files->Export->Calculation file. The exported completed template file ending in .B3D should have a file name chosen to convey the type of problem. In this case it is Vcross.B3D.
5. As there are a few settings that Y3D requires that could not be assigned from within GID, a translator program, GID\_gen, takes as input the .B3D file, requests the final problem definition information before outputting the .Y3D file needed for input to Y3D.

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6. By double clicking GenInputY3D.bat, the input file Vcross.Y3D will be produced