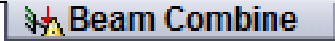



# Beam Double Combine ANALYSIS

## A. Update Beam Combine Study.

Step 1. If necessary, open your **Beam Double** part file.

Step 2. Click **Beam Joints Study** tab  at the bottom left of the graphics area.

## B. Run.

Step 1. Click **Run**  on the Simulation toolbar.

Step 2. Note the **Yield strength**:  
**13.979 mega pascals**, Fig. 1  
yours might be slightly different.

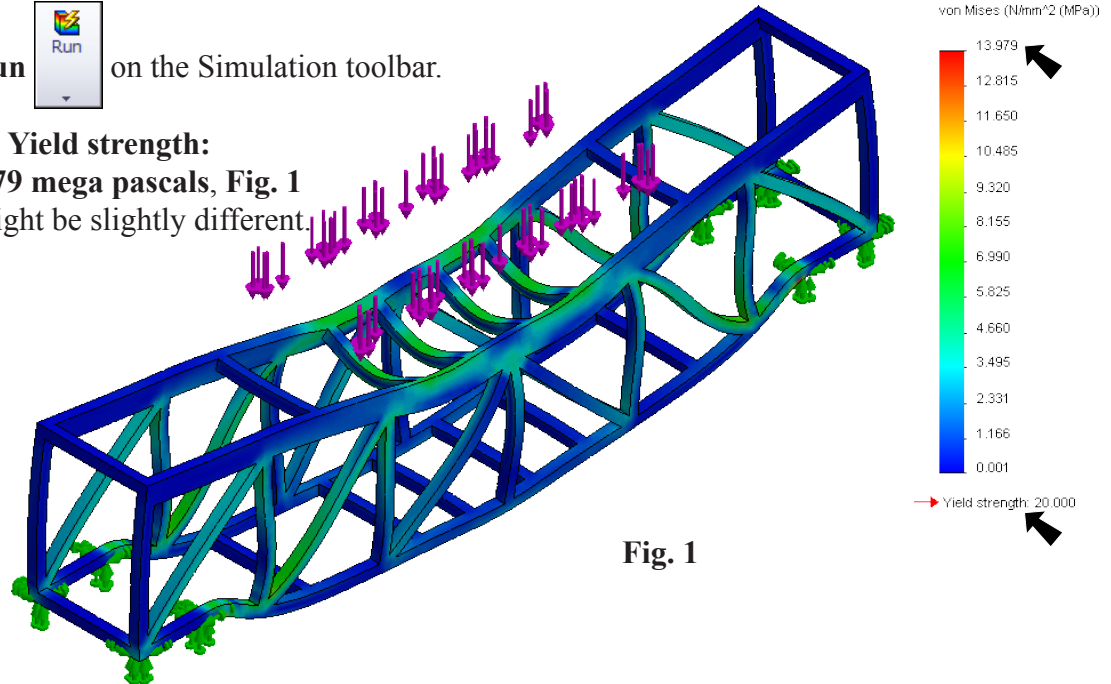



Fig. 1

## C. Results - Factor of Safety.

Step 1. **Double click Factor of Safety1** twice in the Simulation Study Tree to display the Factor of Safety1 plot, Fig. 2.

Step 2. In the Factor of Safety Property Manager click **Next**  and **Next** , Fig. 3

select **Areas below factor of safety**  
note **Minimum factor of safety 1.43067**  
your FOS might be slightly different  
click **OK** .

Step 3. Next, we'll change load using formula  
**current FOS x current Force = safe load**  
or  $1.43067 \times 29.549 \text{ lbs.} = 42.274 \text{ lbs!!}$   
Try 42.272 lbs of force.

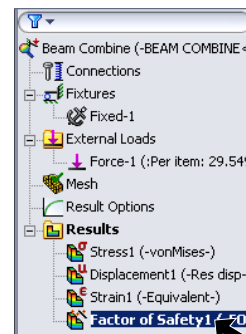


Fig. 2



Fig. 3

## D. Edit Force.

Step 1. **Double click Force1** in the Simulation Study Tree to display the Force Property Manager, **Fig. 4**.

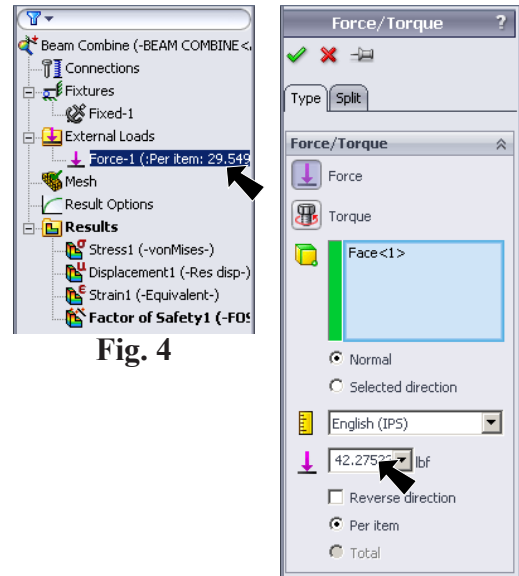
Step 2. In the Force/Torque Property Manager set:  
under Force, **Fig. 5**

**Force Value 42.272**

Tip: Key-in \*1.43067 in the Force Value field after the 29.549, press Tab key and let SW do

the math  $\downarrow$  29.54925\*1.43067  $\downarrow$  lbf

click OK 



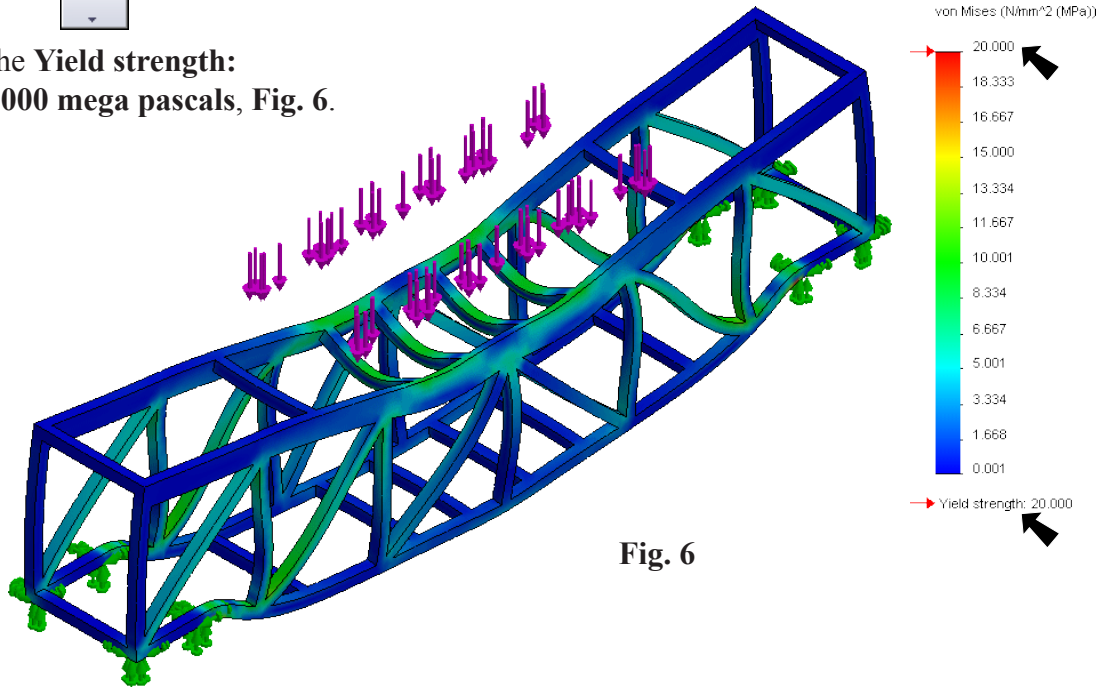
**Fig. 4**

**Fig. 5**

## E. Run.

Step 1. Click **Run**  on the Simulation toolbar.

Step 2. Note the **Yield strength:**  
**20,000 mega pascals, Fig. 6.**



**Fig. 6**

## F. Confirm Factor of Safety = 1.

Step 1. Double click **Factor of Safety1** twice in the Simulation Study Tree to display the Factor of Safety1 plot, **Fig. 7**.

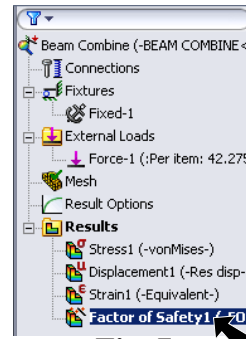



Fig. 7

Step 2. In the Factor of Safety Property Manager click **Next**  and **Next** , **Fig. 8**.

select **Areas below factor of safety**  
note **Minimum factor of safety .999998**  
your FOS might be slightly different  
click **OK** .

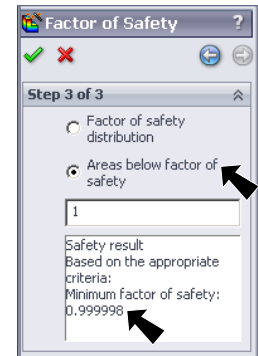



Fig. 8

## G. Efficiency.

Step 1. Click Tools Menu > Mass Properties.

Step 2. Make note of **Mass in grams** in the Mass Properties dialog box and close dialog , **Fig. 9**.

Step 3. Use formula **total load in lbs. x 4.45 / Structure Mass in grams = Efficiency**

$$42.275 \times 4.54 / 5.27 = 36.41$$

Step 4. Save. Use **Ctrl-S**.

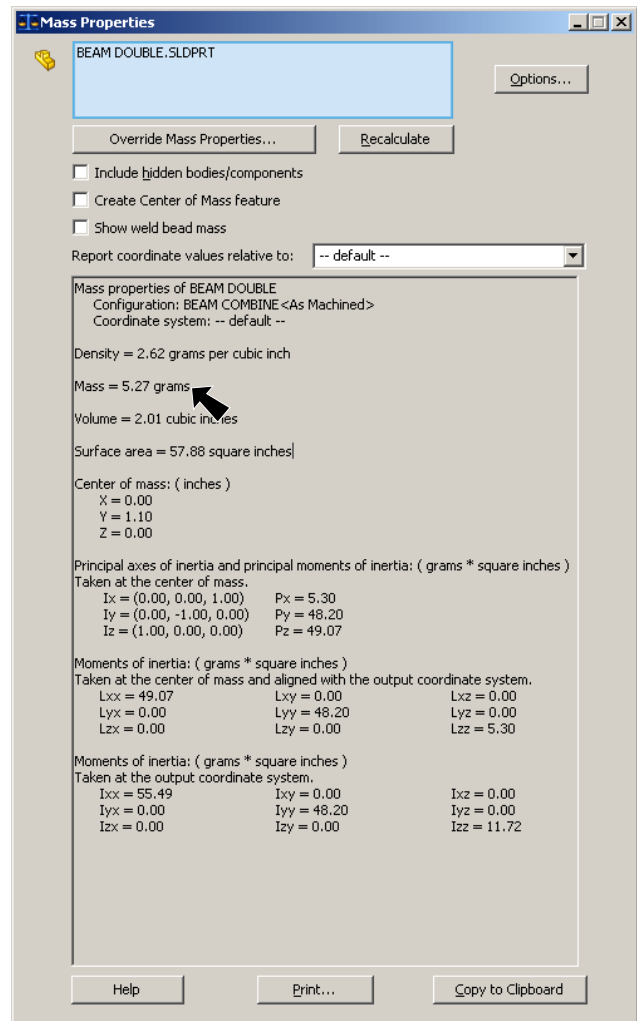


Fig. 9