1.0892 Mpa and the deformation is 0.0018103 mm, projected portion of tile near the fixed portion is the maximum stressed area. If we compare these values with material properties of the re designed product still safe under all possible load conditions. This analysis done after redesign the model in this case reducing the thickness of tile by 3/4 of the original thickness, but the results obtained is well fall within the limit so model is safe under all possible conditions.

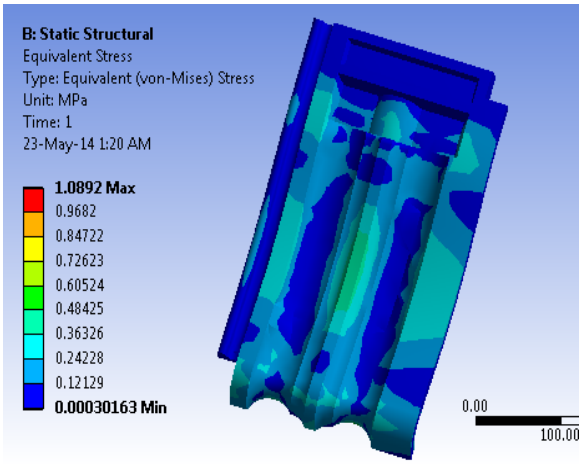


**Figure 12:** Stress obtained in fourth case

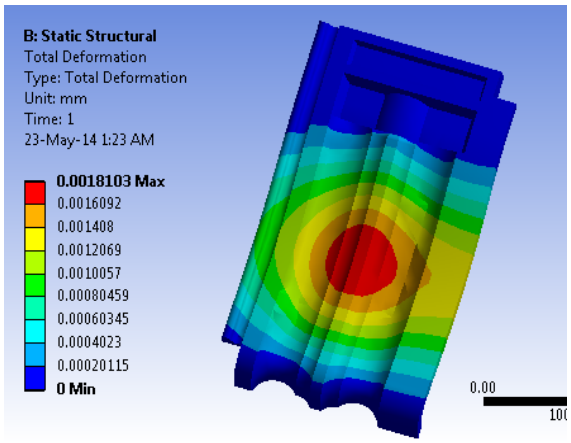


**Figure 13:** Deformation occurred in fourth case

## 4. Conclusion

From the analysis done for the original mangalore roofing tile model 420x250 mm it is evident that roofing tile is for the possible load condition. The stress and deformation plots also given the same condition, but it is an over design. The amount of clay per tile for the original manufacturing model is 2.3 kg.

Since clay is exhaustible raw material we tried a new model with less thickness 3/4 of the original thickness and the amount of clay required for the model is 1.98 kg. From the analysis it is found that the new design is also safe with sufficient strength. It is saves about 25% of the total weight raw material than the original model. Besides the time required for drying is also less which enhance the production rate. Burning (firing) temperature required for these tiles also less which saves the fuel consumption. But the strength at the wet condition after a prolonged aging period is questionable. Hence thus need to strength such tiles with technologies of composites materials.

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