

Asymmetric three point bending test with three holes

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Experimental crack path of three point bending experiment of an asymmetrically notched-beam with three holes is given in [1]. The geometry and the loading conditions can be seen in Figure 1. The Youngs modulus E , is 20.8 GPa , Poisson's ratio ν , is 0.3 and the fracture toughness g_c , is 1 N/mm . The geometry is constrained on the bottom edge by fixed boundary condition, 1 unit from the left edge and a roller boundary condition 1 unit from the right edge. The geometry is subjected to a load point displacement u at the center of the top edge i.e., at a distance of 10 units from the left edge.

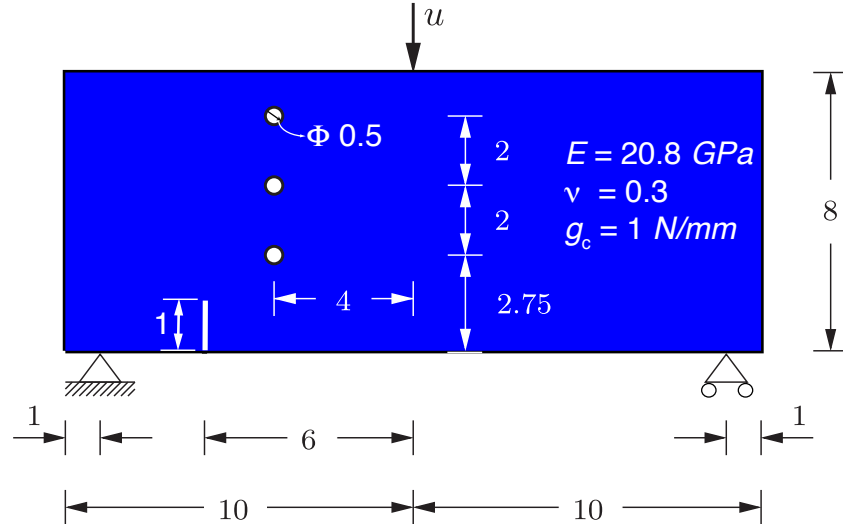


Figure 1: The geometry and the loading conditions is shown in (figure adapted from [2]). The diameter of the holes is indicated by ϕ , and is equal to 0.5 units.

References

- [1] TN Bittencourt, PA Wawrzynek, AR Ingraffea, and JL Sousa. Quasi-automatic simulation of crack propagation for 2d lefm problems. *Engineering Fracture Mechanics*, 55(2):321–334, 1996.
- [2] Christian Miehe, Martina Hofacker, and Fabian Welschinger. A phase field model for rate-independent crack propagation: Robust algorithmic implementation based on operator splits. *Computer Methods in Applied Mechanics and Engineering*, 199(45):2765–2778, 2010.