

List of Questions Discussed in Discussion Session – II

EFM-Lecture 41

1. In the case of a shallow elliptical edge crack, the SIF at the tip of the minor axis is higher than the SIF at the tip of the major axis. This is contrary to our intuition. Can this be explained on the basis of physics?

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2. The plastic zone size obtained through Irwin's model is quite large in comparison to the one obtained through the yield criterion applied to the elastic field why?

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3. Why are the dimensions of the specimen for plane strain K_{IC} test based on material toughness K_{IC} ?

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4. What is the relation between plastic zone size and fracture toughness?

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5. If we use a specimen with large lateral dimension to find K_{IC} the accuracy of the experiment results is high. But in experiments to determine SIF, specimens with large lateral dimensions are not employed why?

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6. Is the compact tension specimen really compact?
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7. How can we determine the material constants ' C ' and ' m ' in Paris law. Whether ' C ' and ' m ' are independent of stress ratio ' R '?
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8. Explain why in case of short cracks or very long cracks the LEFM criteria are no longer valid, even for relatively brittle materials.
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9. Is fracture behavior different in composite materials?
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10. Can fracture mechanics explain the formation of burs during machining?
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11. What is Damage Tolerance approach?
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