



AS3020: Aerospace Structures

Module 2: Aircraft Materials

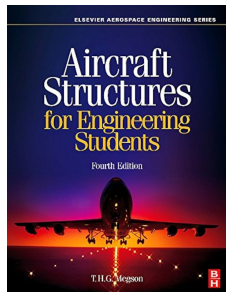
Instructor: Nidish Narayanaa Balaji

Dept. of Aerospace Engg., IIT-Madras, Chennai

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- 1 Understanding the Stress-Strain Curve
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*Chapters 11
in Megson [1]*

1. Understanding the Stress-Strain Curve

Terminology

- 1 Proportionality Limit;
- 2 Elastic Limit;
- 3 Yield Point;
- 4 Ultimate Strength;
- 5 Fracture Point;
- 6 Elongation at Failure;

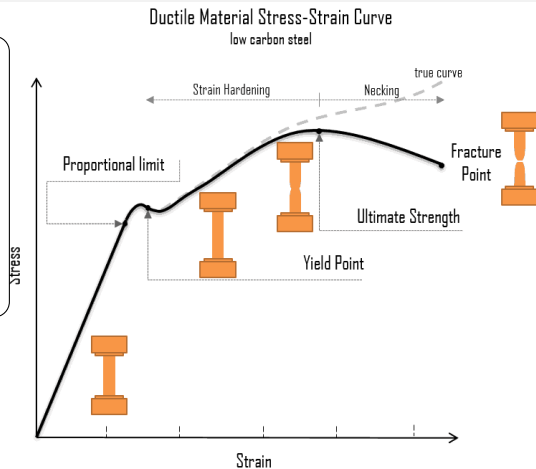
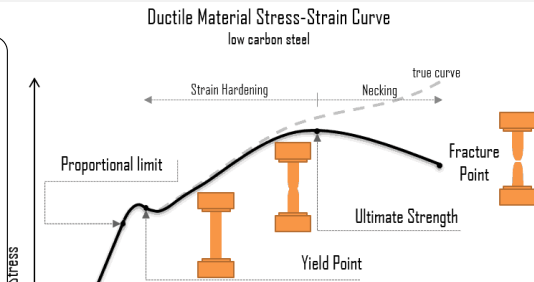


Figure from [2]

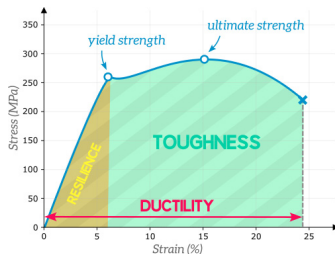
1. Understanding the Stress-Strain Curve

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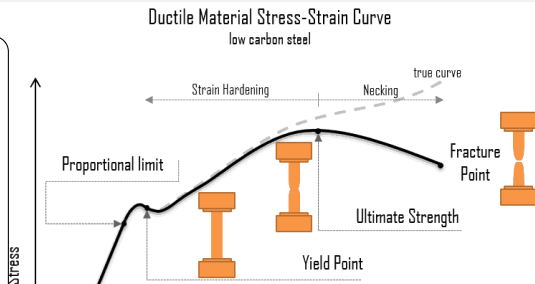
Toughness, Resilience [3]



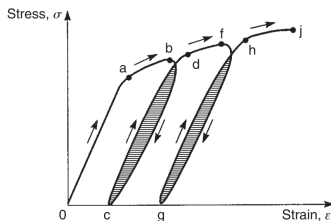
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Strain Hardening [1]



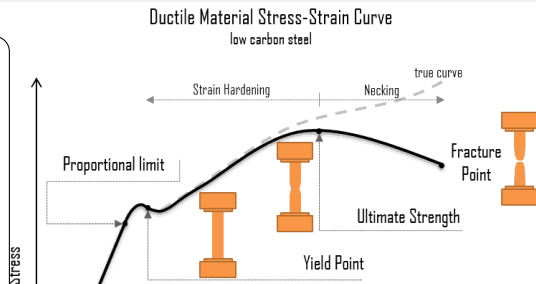
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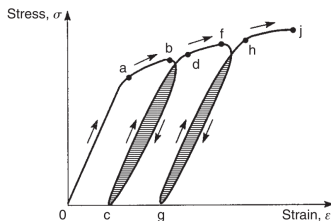
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Classifications

- Brittle, Ductile
- Non-dissipative: Elastic, Hyper-elastic
- Dissipative: Elastic-perfectly plastic, Bi-linear elastoplastic, etc.



Strain Hardening [1]



References I

- [1] T. H. G. Megson. *Aircraft Structures for Engineering Students*, Elsevier, 2013. ISBN: 978-0-08-096905-3 (cit. on pp. 2–6).
- [2] N. Connor. *What Is Stress-strain Curve - Stress-strain Diagram - Definition*. July 2020. URL: <https://material-properties.org/what-is-stress-strain-curve-stress-strain-diagram-definition/> (visited on 08/07/2024) (cit. on pp. 3–6).
- [3] T. E. Engineer. *Understanding Material Strength, Ductility and Toughness*. Nov. 2020. URL: <https://efficientengineer.com/material-strength-ductility-toughness/> (visited on 08/07/2024) (cit. on pp. 3–6).