I'm not a robot

Structural steel is a type of iron-carbon alloy that has specific percentage ratios of main components. It's identified by its carbon content: wrought iron has more than 1.7% carbon, while steel has less. Structural steel can be classified into extra-mild (less than 0.15% carbon), mild (0.15-0.25%), semi-hard (0.25-0.50%), hard (0.50-0.75%), and extra-hard (more than 0.75%). It's used in construction, and its strength increases with carbon content, but decreases ductility and weldability. Structural steel usually contains small amounts of other elements like sulfur, phosphorus, nitrogen, oxygen, and hydrogen, which are undesirable as they decrease material properties. Manganese and silica are added to improve weldability and increase strength. Structural Steel Design to Eurocode 3 and AISC Specifications is a book that covers the theory and practical applications of structural steel design in Europe and the USA. It provides theoretical background information, followed by design-oriented coverage focusing on European and United States specifications and practices. The book uses both codes, allowing readers to compare approaches and results. Fully worked examples are presented using both codes. Steel materials are characterized by well-defined percentage ratios of main individual components, primarily iron and carbon. The term steel refers to a family of iron–carbon alloys with carbon content ranging from above 1.7% for wrought iron to below this limit for steel. Steel can be classified into extra-mild (C < 0.15%), mild (C = 0.15 ÷ 0.25%), semi-hard (C = 0.25 ÷ 0.50%), hard (C = 0.50 ÷ 0.75%) and extra-hard materials. Structural steel, also known as constructional or carpentry steel, has a carbon content between 0.1 and 0.25%. Its presence increases strength but reduces ductility and weldability. Structural steel typically contains small amounts of other elements, such as sulfur and phosphorous, which are undesirable due to their negative effects on ductility. Other important alloying elements like manganese and silica contribute significantly to the improvement of weldability characteristics while increasing strength. In some cases, chromium and nickel can also be added, improving corrosion resistance in the case of stainless steel or reducing deformability. Steel exhibits a symmetric constitutive stress-strain law (σ–ε). This is usually determined experimentally through tensile tests on coupons machined from plate material. The stress-strain response shows three distinct regions: an initial linear branch representing the elastic phase, followed by a plastic phase and then a hardening phase.