

Can advanced high strength steel save this planet?

B1. Advanced Steels

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Abstract

The global demand for advanced high strength steel (AHSS) is increasing, whereas today high strength steel has become a commodity. The increased demand is driven by more light weight and more sustainable constructions mainly due to rising environmental challenges. There are many different materials available on the market but very few covers the unique properties that advanced high strength steel cover, additional, the environmental foot print from production of steel is relatively low. This paper will not only cover the historical development of advanced high strength steel and a forecast of future demand of AHSS global consumption, but also evolution of the mechanical properties. As well, this paper will illustrate FEM analysis of mild steel vs AHSS steel in the chassi of a truck, where the more advanced material along with a more complex design reduce the weight of the vehicle significantly as well as improving the strength of the structure. Additional this paper will simulate the using FEM the load subjected to a lifting boom and how advanced design in combination with AHSS material can increase the lifting capacity with more than five times the original design. This paper will also cover the properties of a weld from an AHSS material and how an advanced welding technique can improve the properties of the weld to match the bulk properties.

Selected references

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