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AWARD 2018
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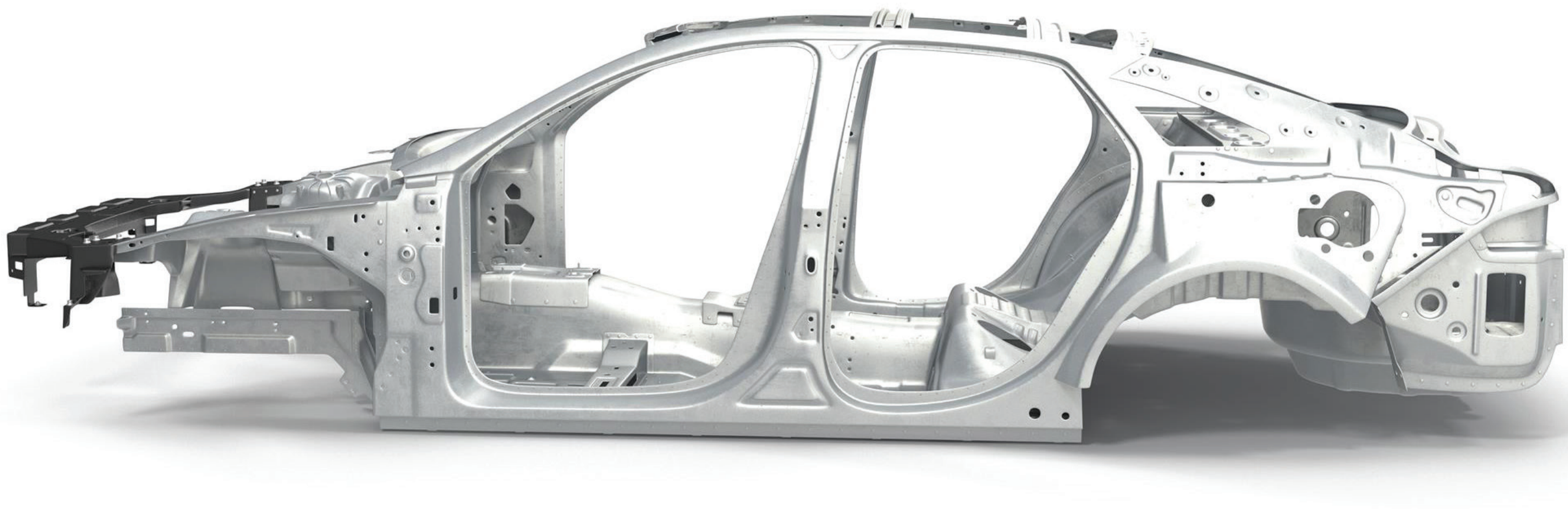
Future of Lightweighting Entry



Auto Steel Partnership

Integrated computational materials engineering approach

The ability of automakers to lightweight automotive components and assemblies is limited by the strength and ductility of available materials. The emergence of third generation advanced high strength steels (3GAHSS), with both exceptional strength and ductility, promises opportunities for lightweighting automotive assemblies while maintaining or improving vehicle performance. Historically automakers base component and assembly designs on known material properties from commercially available alloys, which limits potential mass savings. The desired approach is to have the optimized assembly design define the necessary steel material properties to meet design and performance requirements.
The 3GAHSS ICME Model was proposed to enable the virtual development of the 3GAHSS grades by assembling material models over all the material length scales (atom, crystal, grain, etc.). The 3GAHSS ICME model would enable steelmakers to vary steel chemistry and microstructures to achieve desired mechanical properties with the expectation that this would speed the development of the 3GAHSS steel, which in turn would speed the implementation of the 3GAHSS in automotive designs.

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