Industry Presentation

Title: **Heat Up the Innovation, Cool Down the Emissions: The Heat Treatment Future**

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Abstract:

Decarbonisation is one of the main future challenges for the Automotive industry. However, it can be only achieved with a proper cooperation between steelmakers, forgers and OEMs. Based on Life Cicle Assessment (LCA) methodology, SIDENOR has developed an own and certified product environmental footprint calculation software which analyses the GHG emissions on product level along the entire production chain with high degree of detail and specificity. SIDENOR I+D, the research centre of Sidenor Aceros Especiales, works in direct connection with forging companies to offer specific solutions (steel grade, heat treatment or both) with reduced environmental impact. This works shows different study cases where, through innovation, Sidenor achieved the reduction of Product Carbon Footprint PCF (depending on the necessities/requirements for each steel grade, heat treatment, component or production route):

- Could cold forging be sustainable in the future without spheroidizing annealing?: Spheroidizing annealing is the treatment providing the highest ductility to the steel, however it requires lengthy treatments in gas furnaces with a huge impact on GHG emissions. A new treatment, High Plasticity Annealing, has been proved to significantly reduce the environmental impact while keeping enough ductility. Some examples and characterization methodology will be presented.
- Design of cooling cycle after hot forging: The metallurgical know-how allowed to define the target parameters (time and temperature) to obtain the desired structure after hot forging.