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Variation of Tensile and Bending Rigidities of a Duplex Embossed Steel Sheet by Small Uniaxial Tensile Deformation

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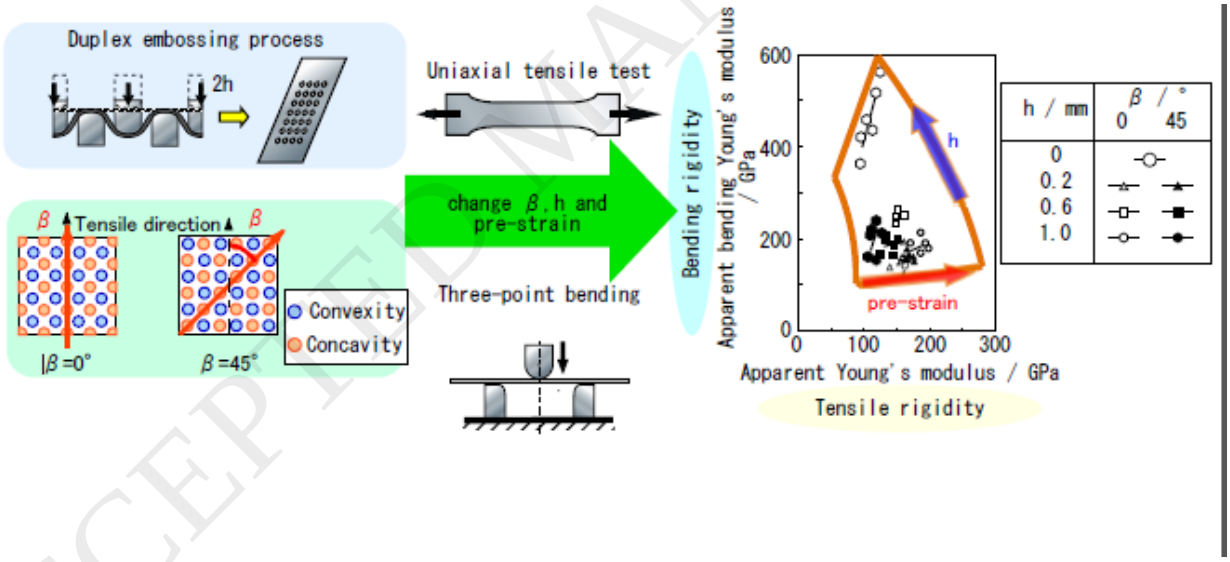
Graphical abstract



ABSTRACT

Materials which have periodic macroscopic structure have some potential for becoming an advanced method to enhance the mechanical properties of sheet metal which will be applied to automotive parts and architecture. This structure, achieved here by embossing sheet metal, could improve mechanical features, especially bending rigidity. In addition to the microscopic aggregate structure, periodic configurations given by embossing bring about new quasi-uniform “apparent” macroscopic properties. When an embossed sheet is subjected to plastic deformation, the new shape would include these apparent