

An identification of correlation between mechanical properties and microstructure features in Advanced High Strength Steels (AHSS) will be presented. Commercial steel grades of DP (dual phase) and CP (complex phase) after two different processing routes were selected as case studies. The goal is to provide a methodology to increase fracture resistance and therefore expand present forming limits of these steels for application in the automotive industry. Experimental investigations on the local plastic behaviour on the microscale during processing conditions have been carried out. In addition the local forming behaviour is described by an innovative modelling that is based on the digital material representation concept. This concept predicts mechanical property gradients as a function of microstructural and chemical gradients during forming. This allows the creation of new design rules for better formable steels.