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**Review of the concept and of the equations of the weldability window for explosive welding. Application to the explosive welding of stainless steel to carbon steel in cylindrical configuration** JOSE B. RIBEIRO, RICARDO MENDES, ADAI/LEDAP - Mechanical Engineering Department of the University of Coimbra, ALTINO LOUREIRO, CEMUC - Mechanical Engineering Department of the University of Coimbra — Explosive cladding/welding is usually considered a solid state process in which the detonation of a certain amount of an explosive composition is used to accelerate one of the materials to be weld against the other. By this way a high velocity oblique collision is promoted and that will be responsible for the materials bonding. The conditions that should be met to achieve good welds define what is called as a weldability window or criteria. A weldability criteria based on the collision point velocity ( $V_c$ ) and on the collision angle ( $\beta$ ) is the most used today. In the  $\beta$ - $V_c$  space the weldability window is defined by four lines or limits. Despite of its widely used in explosive welding works, neither the concepts behind those limits neither the equations used to define them in the  $\beta$ - $V_c$  space are particularly clear. Contradictory concepts, and equations with undefined variables or parameters, are commonly found in the literature. This paper aims to clarify those concepts and equations through an integrated description of the weldability limits and a presentation of the reviewed associated equations with the variables and parameters, including their units, clearly defined. The reviewed concepts and equations are then used for the description of the explosive welds of stainless steel to carbon steel in cylindrical configuration.

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