

ABSTRACT

The subject of this paper is the selection and determination of parameters for testing the weldability of structural steels according to the SEP 1390 test for materials in the new thickness range of 20 mm to 30 mm. The purpose of the SEP 1390 test is to evaluate the weldability of a material by examining the ability to arrest a crack generated in the parent metal of a specimen subjected to bending. In a test plate subjected to bending, it is evaluated whether the material is able to arrest a crack generated in the bead.

In this work, a series of bending tests were carried out on plates made of S355J2+N steel allowing the selection of parameters such as specimen dimensions, bending mandrel diameter, support spacing and support diameter. The objective of this test was to determine the conditions for SEP 1390 testing of materials in the new expanded thickness range of 20 to 30 mm. To determine the optimum bend parameters, we tested 20 mm, 25 mm, and 30 mm thick specimens of S355 J2+N steel. In the applicable SEP 1390 weldability test, materials from a thickness of 30 mm upwards are tested. Testing in the thickness range below 30 mm is important for the verification of structural materials due to the weldability assessment in the thickness range 20-30 mm. Materials in this thickness range are generally considered to be materials for which additional welding heat treatment is often required to improve weldability. Therefore, this range of materials should be considered particularly important in the assessment of weldability, also carried out according to SEP 1390.

The results obtained allowed to determine the optimum parameters for the weldability test according to SEP 1390 for materials with a thickness of 20 mm to 30 mm. These results make it possible to extend the scope of application of the test for the assessment of weldability according to SEP 1390.