

BONDED FLUX AND SOLID WIRE FOR SUBMERGED ARC WELDING, AND
METHOD FOR SUBMERGED ARC WELDING OF STEEL FOR LOW
TEMPERATURE SERVICE

ABSTRACT

Disclosed is a bonded flux and a solid wire for submerged arc welding, and a method for submerged arc welding of a low-temperature steel each of which gives a weld bead (weld metal) having excellent low-temperature fracture toughness with satisfactory weldability. The bonded flux includes 23-43% of MgO, 11-31% of Al₂O₃, 6-16% of CaF₂, 7-20% of SiO₂, 1.0-8.0% as CO₂ equivalent of a metal carbonate, a total of 2-16% of CaO and/or BaO, 0.4-1.5% of metallic silicon, a total of 1.0-7.0% as titanium equivalent of metallic titanium and titanium oxide, a total of 0.01-0.20% as boron equivalent of metallic boron and/or boron oxide, and a total of 1.0-6.0% as equivalents of respective elements of at least one oxide of Na, K, and Li, and has a ratio $([\text{Total Ti}] + [\text{Total B}]) / [\text{SiO}_2]$ of from 0.05 to 0.55.

Fig. 2