

OP 41TTW is an agglomerated fluoride-basic type flux for welding unalloyed and low alloyed fine grain pressure vessel and CrMo steels, especially where extended PWHT duration is applied. The flux gives a very high purity in the weld deposit. In the nuclear sector it can be used for many applications such as reactor pressure vessels, steam generators, pressurizers, reactor safety tanks and pipes in the primary and secondary circuits as well as the auxiliary units. Low moisture pick up of the flux and very low diffusible hydrogen content in the weld metal. OP 41TTW can be welded on DC+ and AC and is ideal for single wire and tandem process as well. The very easy slag removal allows application in narrow gap preparation.

Grain size according to EN-ISO 14174: 2-20.

Classification		
	EN ISO	14174 : SA FB 1 65 AC H5
OE-S1 CrMo2	AWS	A5.23: F9P2-EB3-B3
OE-S2 CrMo1	AWS	A5.23: F8P6-EB2R-B2R
OE-SD3	AWS	A5.17: F8A6-F7P6-EH12K
OE-SD3 1Ni ¼Mo	AWS	A5.23: F9A8-F8P8-EG
OE-SD3 1Ni ½Mo	AWS	A5.23: F9A8-F9P8-EF3/EG-F3

Flux Main Components	
CaO + MgO	40 %
CaF2	25 %
Al2O3 + MnO	20 %
SiO2 + TiO2	15 %

Boniszewski Basicity 2,5

Chemical analysis (Typical values in %)

		C	Mn	Si	Cr	Ni	Mo
All weld metal	OE-S1 CrMo2	0.1	0.6	0.3	2.1	-	1.0
All weld metal	OE-S2 CrMo1	0.1	0.8	0.3	1.1	-	0.5
All weld metal	OE-SD3	0.1	1.5	0.4	-	-	-
All weld metal	OE-SD3 1Ni ¼Mo	0.1	1.35	0.35	-	0.9	0.25
All weld metal	OE-SD3 1Ni ½Mo	0.1	1.5	0.4	-	0.95	0.5

SAW Fluxes SAW Basic and Semi-basic Fluxes

All-weld metal Mechanical Properties

	Heat Treatment	Yield Strength (MPa)	Tensile Strength (MPa)	Elongation A5 (%)
OE-S1 CrMo2	690°Cx8h	≥ 460	550-690	≥ 20
OE-S1 CrMo2	690°Cx26h	≥ 450	540-690	≥ 20
OE-S2 CrMo1	690°Cx1h	≥ 500	570-690	≥ 20
OE-S2 CrMo1	690°Cx26h	≥ 485	550-690	≥ 22
OE-SD3	As Welded	≥ 470	550-690	≥ 22
OE-SD3	620°Cx12h	≥ 400	510-650	≥ 25
OE-SD3	620°Cx16h	≥ 400	500-650	≥ 25
OE-SD3 1Ni ¼Mo	620°Cx2h	≥ 510	590-720	≥ 22
OE-SD3 1Ni ¼Mo	As Welded	≥ 540	620-760	≥ 22
OE-SD3 1Ni ½Mo	620°Cx2h	≥ 590	650-760	≥ 20
OE-SD3 1Ni ½Mo	As Welded	≥ 600	650-760	≥ 20
OE-SD3 1Ni ½Mo	620°Cx16h	≥ 540	620-750	≥ 20

All-weld metal Mechanical Properties - CV

	Heat Treatment	Impact Energy (J)			
		-40 °C	-50 °C	-51 °C	-60 °C
OE-S1 CrMo2	690°Cx8h	≥ 54			
OE-S1 CrMo2	690°Cx26h	≥ 54			
OE-S2 CrMo1	690°Cx1h	≥ 54	≥ 27		
OE-S2 CrMo1	690°Cx26h	≥ 54			
OE-SD3	As Welded			≥ 47	
OE-SD3	620°Cx12h				≥ 47
OE-SD3	620°Cx16h				≥ 47
OE-SD3 1Ni ¼Mo	620°Cx2h		≥ 55		
OE-SD3 1Ni ¼Mo	As Welded		≥ 55		
OE-SD3 1Ni ½Mo	620°Cx2h		≥ 47		
OE-SD3 1Ni ½Mo	As Welded		≥ 47		
OE-SD3 1Ni ½Mo	620°Cx16h		≥ 47		

Typical applications

	Materials
OE-S2 CrMo1	ASME: A199 and A200 grade T11, A213 Grades T11, T12 ; EN : 13CrMo4-5, 13CrMoSi5-5
OE-S1 CrMo2	ASME: A387 Gr.22, Cl 1 and 2, A 182 Gr.F 22, A 336 Gr.F22EN: 10CrMo9-10, 12CrMo9-10
OE-SD3	ASME: A516 all Grades EN: P235-P355GH; A516Gr 70 ; SA 537 Cl2
OE-SD3 1Ni ½Mo	Reactor steels: 22NiMoCr37, 20MnMoNi55, WB 36 ; Pressure vesels : P460, P500, A537 Cl.2 , Cl. 3

SAW Fluxes SAW Basic and Semi-basic Fluxes

Redrying

300-350°Cx2-4h

Current Conditions

AC; DC+