

## Classifications

Type	EN ISO 14171-A	AWS A5.23 / SFA-5.23
Multi-run	(S 46 Z AB SZ H4)	(F8AZ-EG-G-H4)
2-run	S 5T 5 AB SZ H4	F8TA6G-EG-H4

## Characteristics and typical fields of application

**Union S 3 TiB - UV 309 P** is a wire-flux combination for submerged-arc welding of unalloyed and low-alloyed steel grades. This wire-flux combination has been designed to achieve optimum toughness properties of weld metal produced by two-run welding technique. This wire-flux combination is not recommended for multi-pass welding. It is especially recommended for longitudinal pipe manufacturing (pipe mill) with typical welding procedures with

- 2-run-technique with high dilution rate (e.g. > 65%)
- combined with other alloyed / non-alloyed wires in multi-wire configuration
- for high CTOD / charpy toughness requirements at -20°C / -50°C
- to limit hardness in weld metal (e.g. X65 for sour service)

**UV 309 P** is an aluminate-basic flux. For information regarding this welding flux see our detailed data sheet.

## Base materials

Fine grained structural and line pipe steel grades : API X60, X65, X70, EN 10208-2: L415 MB, L450 MB, L485 MB.

## Typical analysis

wt.-%	C	Si	Mn	Mo	B	Ti	S	P
wire	0.07	0.3	1.55	-	0.013	0.15	≤ 0.005	≤ 0.015
all-weld metal	0.05	0.4	1.30	-	0.003	0.02	≤ 0.010	≤ 0.015

## Mechanical properties of all-weld metal - typical values (min. values)

Condition	Yield strength $R_e$	Tensile strength $R_m$	Elongation A ( $L_0=5d_0$ )	Impact energy ISO-V KV J		
	MPa	MPa	%	-20 °C	0 °C	20 °C
u, DC+	≥ 470	550 - 680	≥ 20	≥ 50	≥ 100	≥ 150

u untreated, as welded, single wire

## Operating data

	Polarity	DC + / AC	Dimension mm	
				3.2
				4.0
				5.0

The mechanical properties of weld metal by two-run technique are strongly influenced by:

- the high dilution rate (60 up to 70%)
- chemical composition of the base metal
- relative long cooling time  $t_{8/5}$  of the weld cycle, depending on
  - welding parameters (heat input)
  - wall thickness (2 - resp. 3 dimensional cooling)
  - preheat / interpass temperature

## Approvals

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