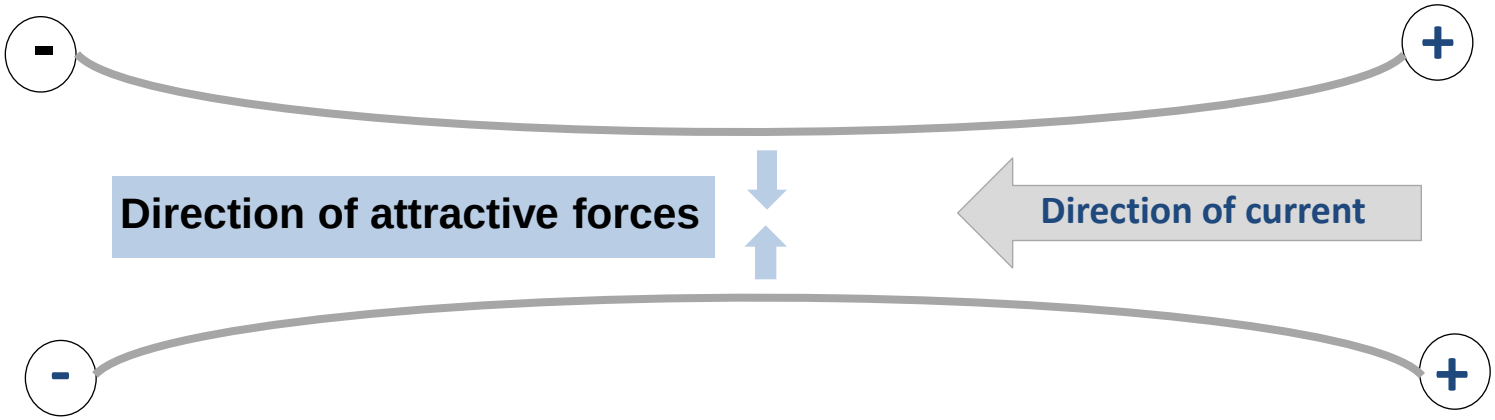
TIG^{er}
technology presentation

POLYSOUDE
THE ART OF WELDING

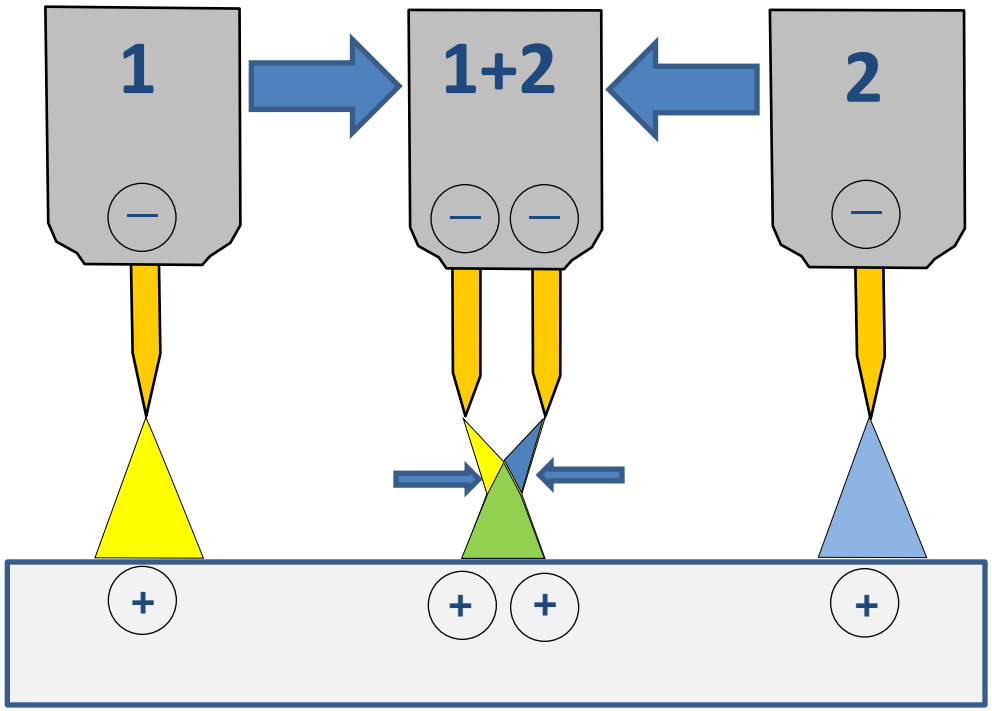

Tungsten
Inert
Gas
electrically
reinforced

Characteristics of the technology

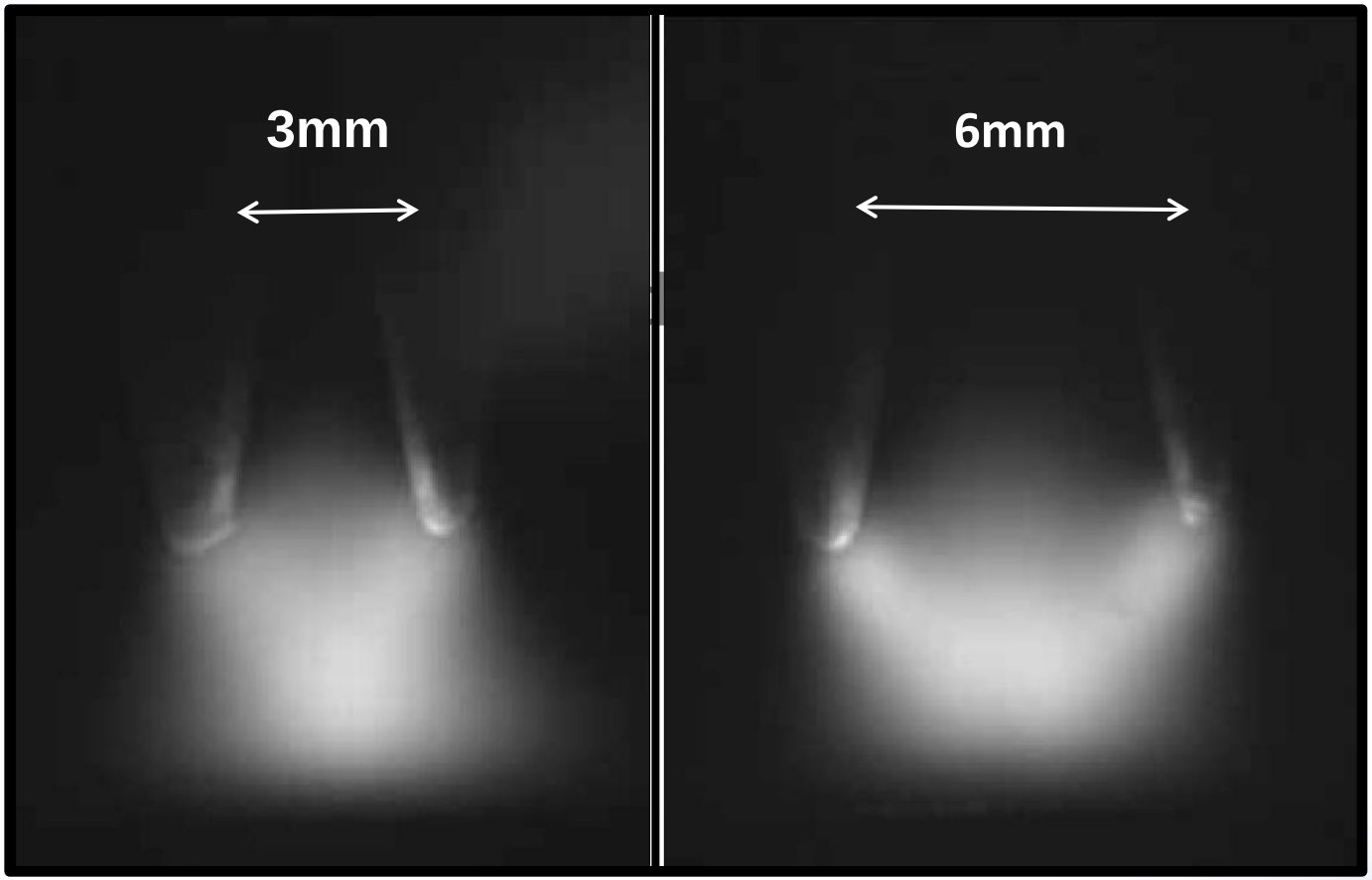
2 conductors in parallel position, through which currents are flowing in the same direction, attract each other



Characteristics of the technology



Characteristics of the technology



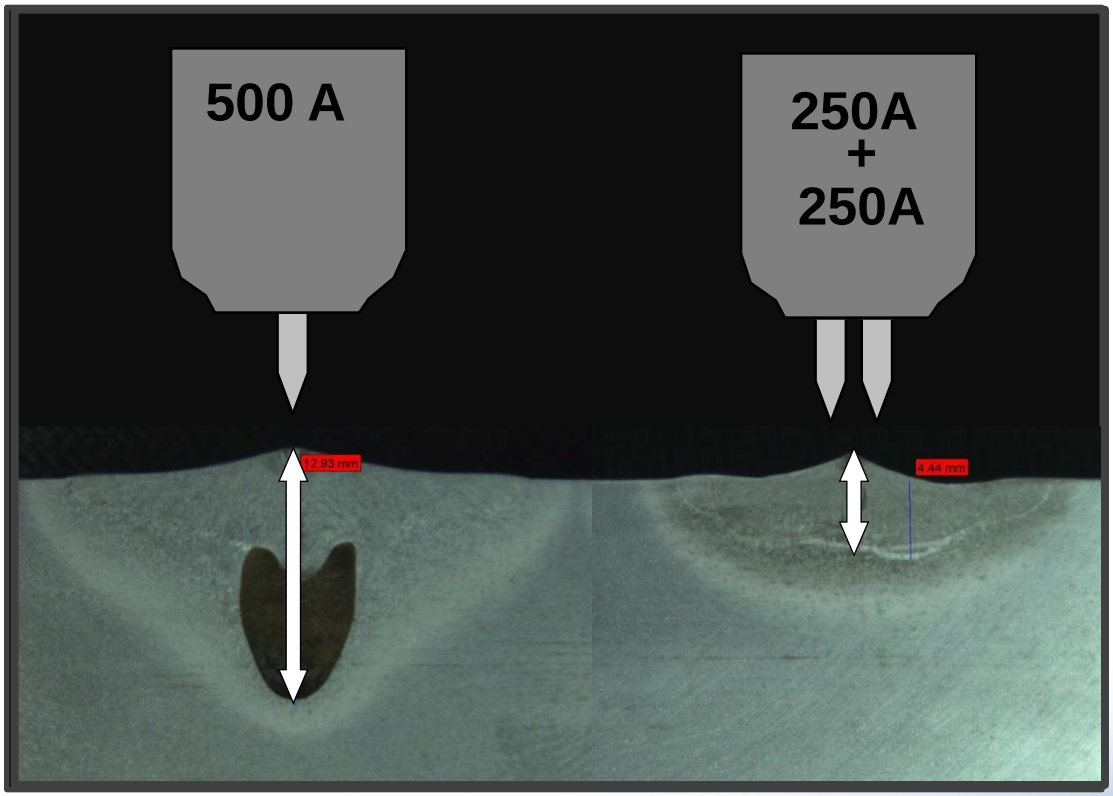
Characteristics of the technology

Advantages:

- Identical weld quality to that obtained by conventional TIG welding
- Low arc pressure allows fast welding speed even when applying strong welding current intensities
- Asymmetrical shape of the arc column and melting bath depending on the position of the electrodes

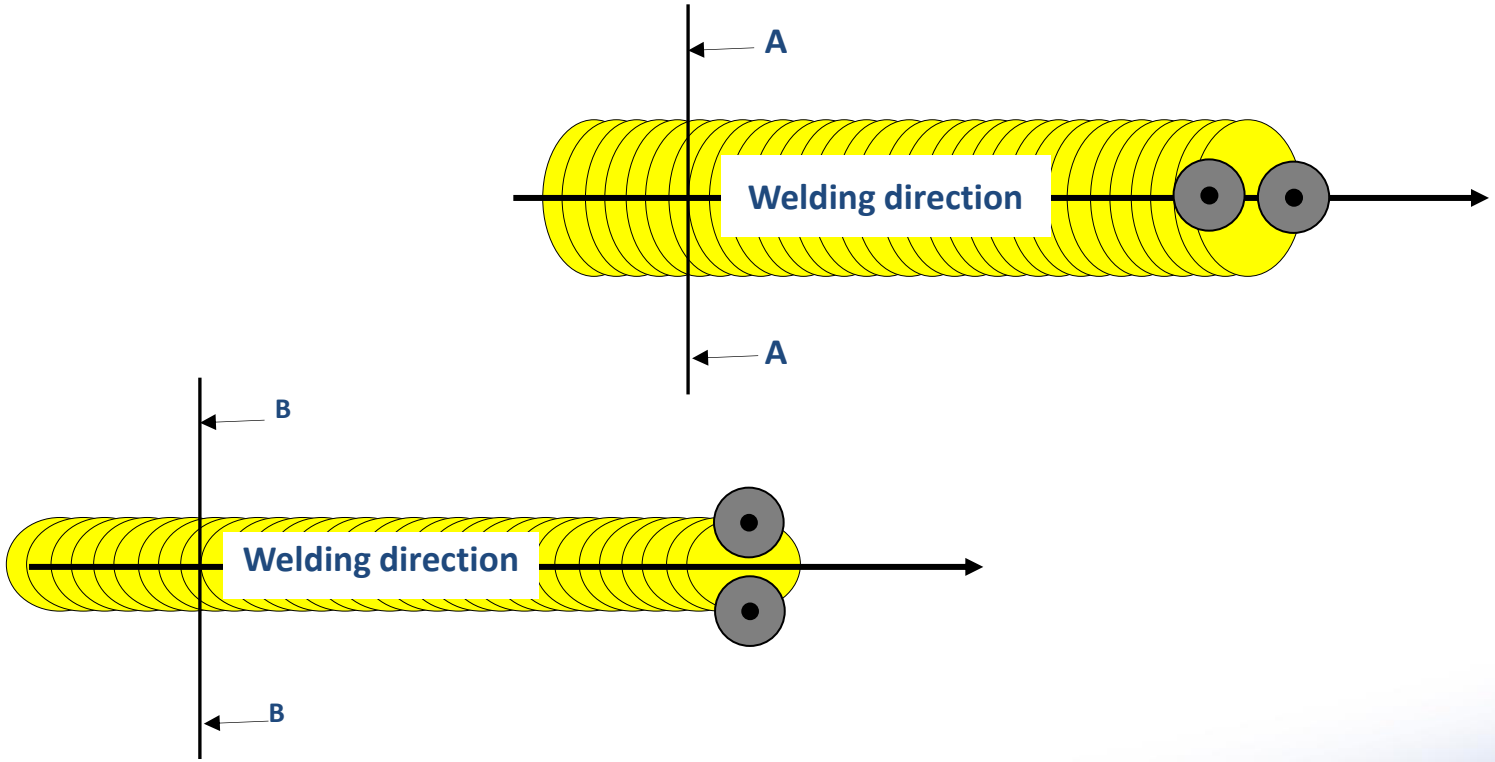
Characteristics of the technology

Characteristics of the bi-cathodic arc



Characteristics of the process

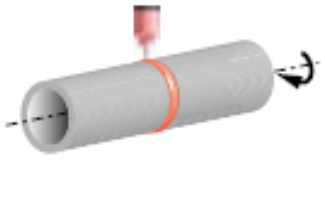
Characteristics of the bi-cathodic arc

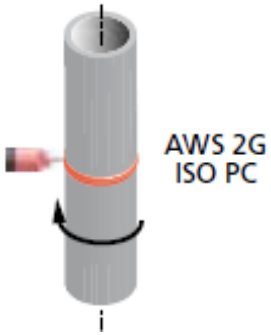


Performance of TIG^{er} weld overlay cladding operations

Coating metal: **Nickel-based alloy wire Ø 1.2mm**

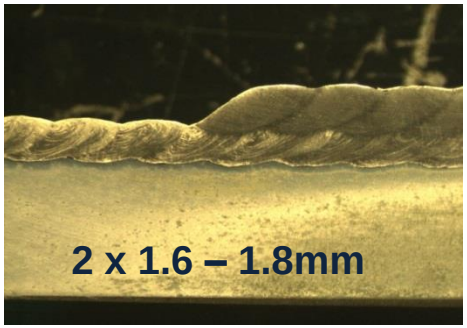
En ISO 18274: S Ni 6625 (NiCr22Mo9Nb)
AWS A5: ERNiCrMo-3

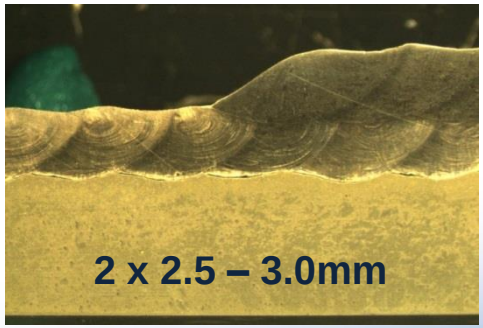




2 positions

2 layer-thicknesses

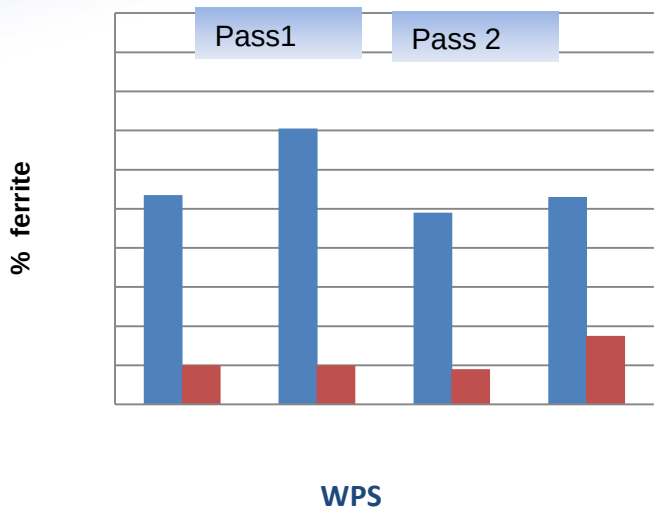


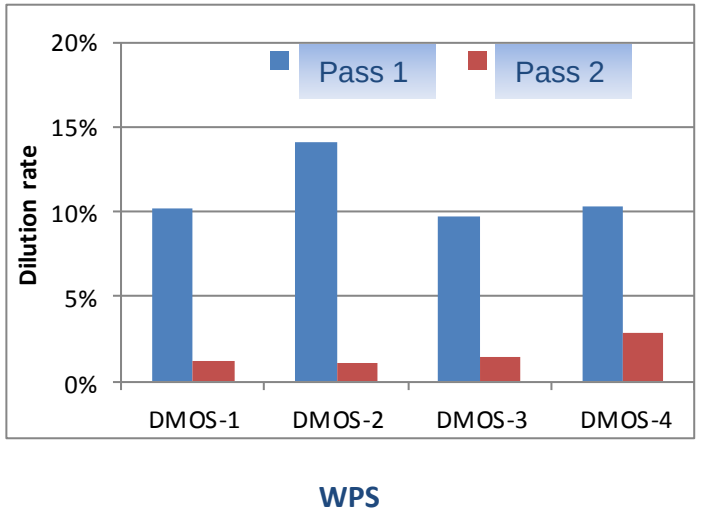


Performance of TIG^{er} weld overlay cladding operations

WPS	Position	Layer no.	Depot thickness mm	Welding speed mm/min	Wire speed mm/min	I average torch 1 A	Arc voltage V	I average torch 2 A	I total A	I hot wire A	Energy input kJ/mm	Melting rate kg/h
DMOS-1	PA (1G)	1	1.80	850	4,800	175	11,1	150	325	90	0.25	2.70
		2	1.80	950	5,350	173	11	145	318	105	0.22	3.00
DMOS-2	PA (1G)	1	2.70	850	10,350	245	12.1	220	465	150	0.40	5.80
		2	2.70	850	10,350	235	12.1	210	445	160	0.38	5.80
DMOS-3	PC (2G)	1	1.85	850	5,000	161	11.05	161	323	90	0.25	2.80
		2	1.85	850	5,000	154	10.6	154	308	95	0.23	2.80
DMOS-4	PC (2G)	1	2.90	850	8,000	218	11.55	218	435	100	0.35	4.40
		2	2.90	850	8,000	208	11.35	208	415	100	0.33	4.40

Performance of TIG^{er} weld overlay cladding operations



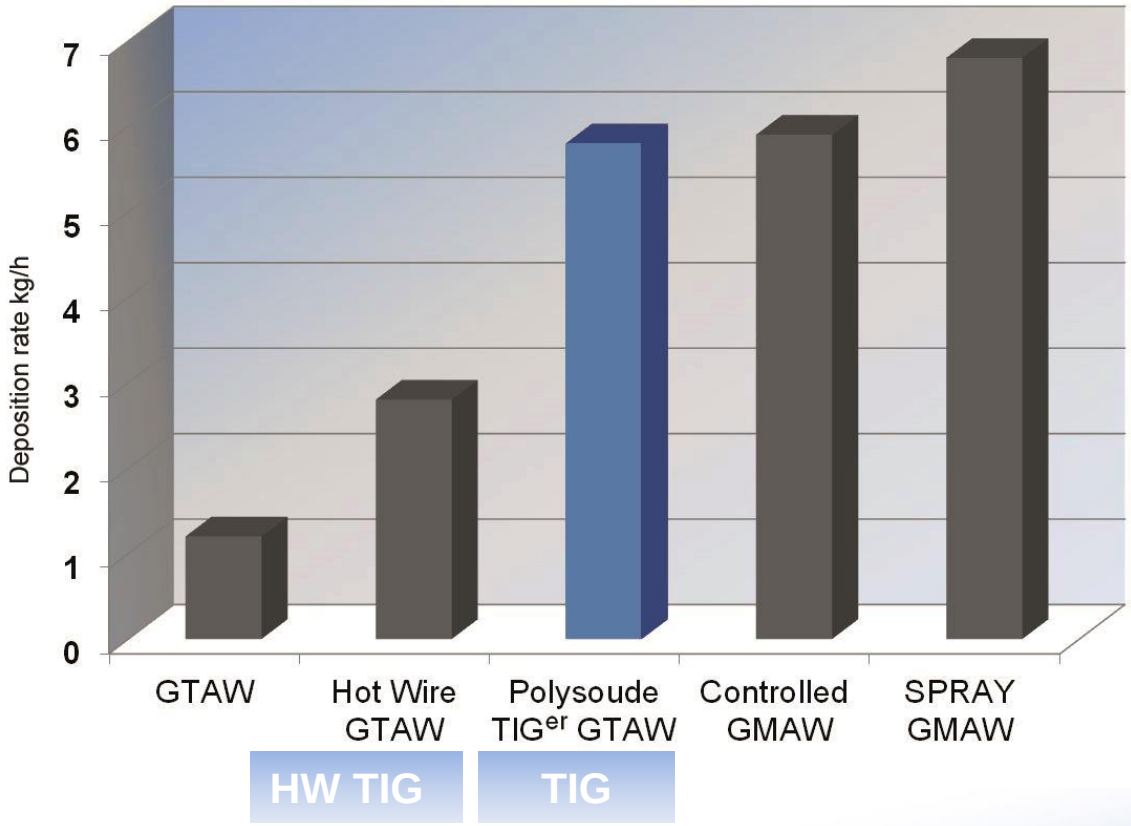


Average dilution ratio of pass n°1: 11.05%

Average dilution ratio of pass n°2: 1.64%

*** Measurements by SEO (Optical Emission Spectrograph)**

Performance of TIG^{er} weld overlay cladding operations



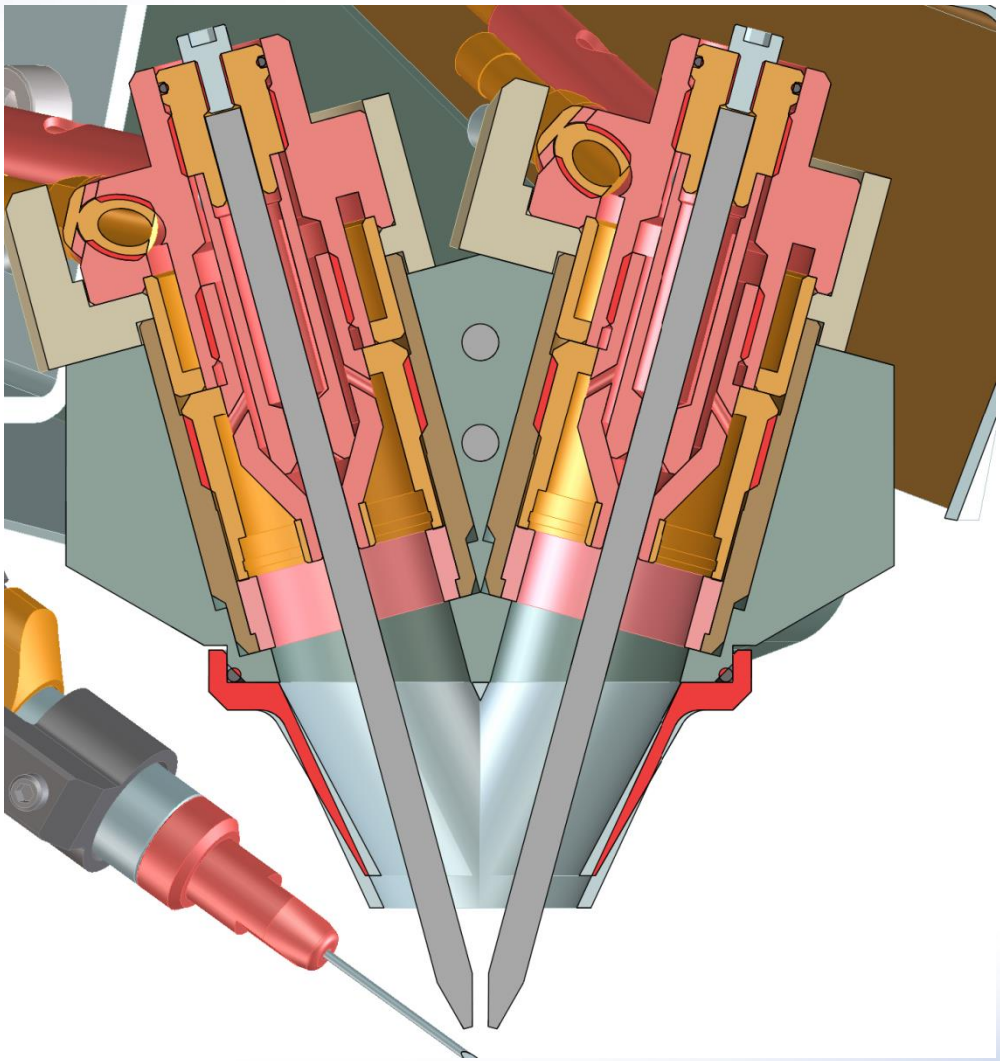
Welding equipment

- Power source: PC 600 n°1
- Power source: PC 600 n°2
- Tetrix 350 AC/DC Hot Wire power source
- Refrigeration unit (KR30 or KR45 depending on the required capacity)
- Slides for AVC/OSC brushless type
- Wire feeder of the type Polyfil 13714 with 4 rolls
- Welding lance of the type TIG^{er}
- Standard welding lance for applications which are not covered by the present version of TIG^{er} lance
- Motorisation for welding speeds up to 1,000 mm/min
- Video system (external camera, video container, …)

Welding equipment

10	8+1s	O	Welding current	HF ignition	Standard	Ignition current	150 A
11	10	N	Aux. 2 2/4	HF ignition 2		Ignition current	150 A
12	11	N	Welding current	Current level	Thermal pulsation	Current high Pulse time high Current low Pulse time low	120 A 150 ms 103 A 100 ms
13		N	Aux. 2 2/4	Current 2 level	Thermal pulsation	Current high Current low	130 A 113 A
14	11+1s	N	AVC	AVC level	Pulse high/low	Voltage high Voltage low	10 V 9.6 V
15	11+1s	N	Wire feeding	Slope feeding speed forward	Without pulse	Slope time Wire feeding speed	3 s 1827 mm/min
16	11+2s	N	Hot wire (2/4)	Slope hot wire	Without pulse	Slope time Hot wire current	3 s 40 A
17	11+3s	N	Welding head rotation	Rotation forward level	Without pulse	Rotation speed	300 mm/min
18	11+4s	N	AVC	AVC level	Pulse high/low	Pulse voltage high Pulse voltage low	10 V 9.6 V
19	11+5s	N	Welding head rotation	Slope rotation forward	Without pulse	Slope time Rotation speed	0.1 s 555 mm/min

Welding equipment



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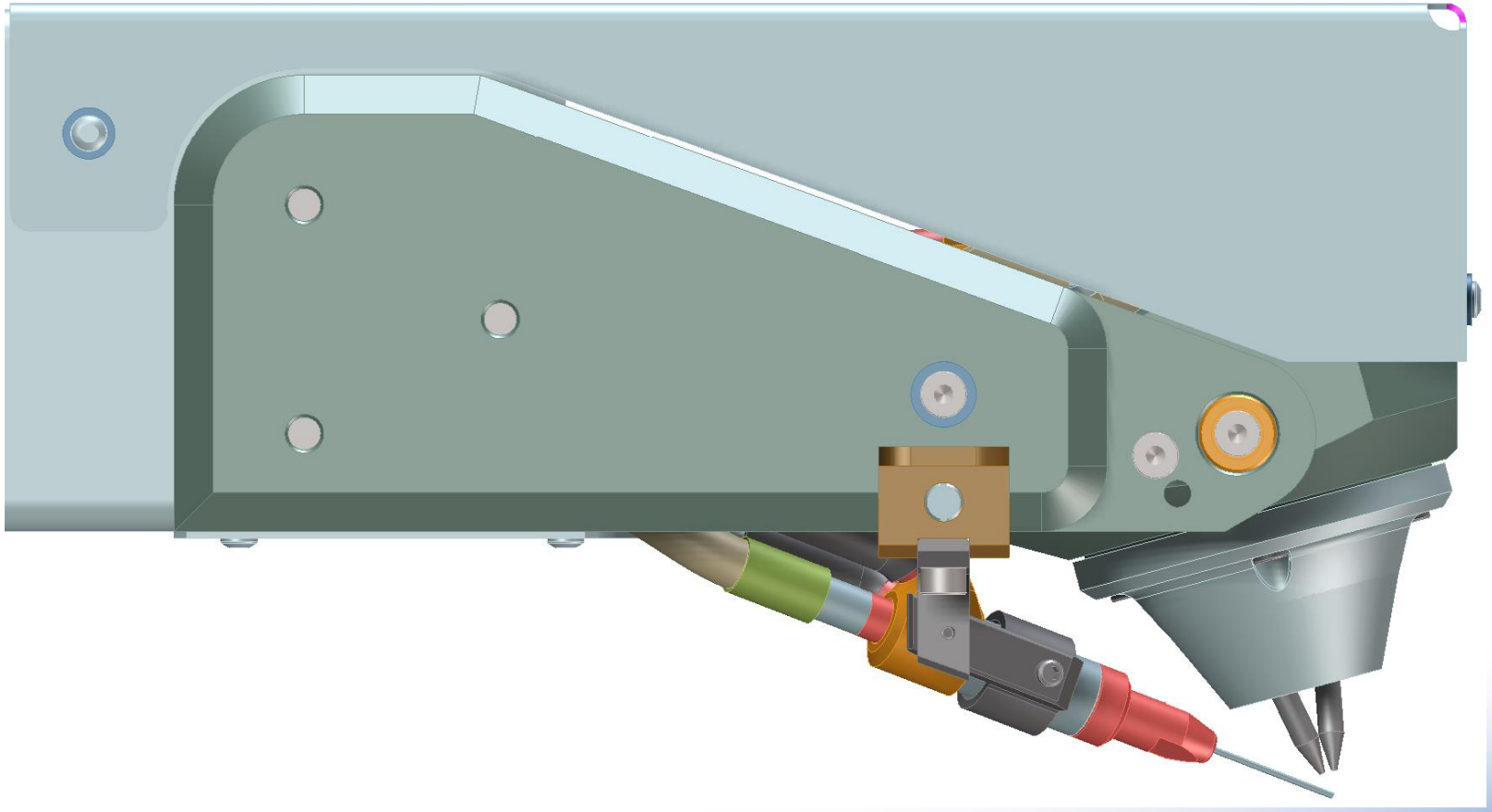
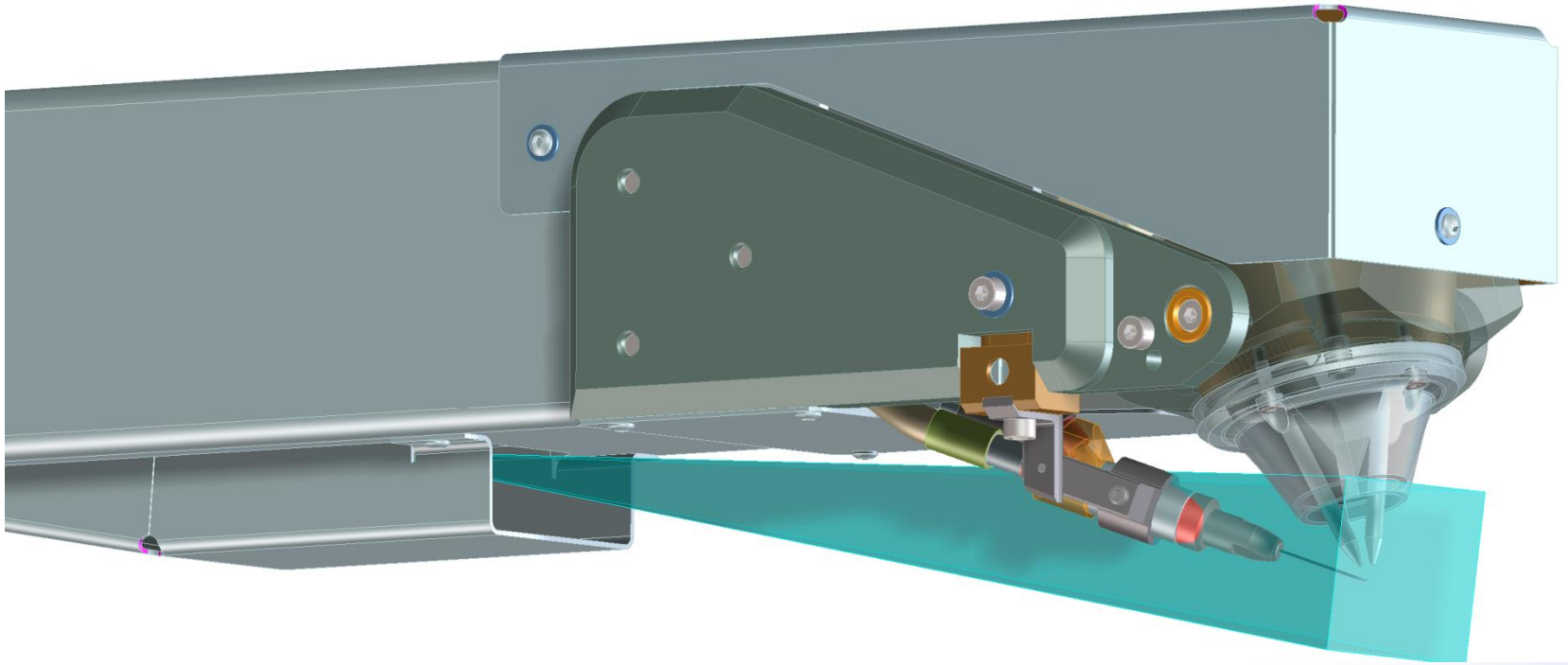


Welding equipment



Welding equipment