

**Outershield® 690-H****CLASSIFICATION**

AWS A5.29/A5.29M : E111T1-K3M-JH4  
 ISO 18276-A : T 69 4 Z P M 2 H5

**GENERAL DESCRIPTION**

All position gas shielded rutile flux cored wire, for high strength steel grades like grade S690

Outstanding operator appeal

Excellent mechanical properties (CVN >70J at -40°C)

Superior product consistency with optimal alloy control

Good wire feeding

**WELDING POSITIONS****CURRENT TYPE / SHIELDING GAS (ISO 14175)**

DC +  
 M21 : Mixed gas Ar+ (>15-25%) CO<sub>2</sub>  
 Flow rate : 15-25 l/min

**APPROVALS**

Shielding gas	ABS	DNV	LR	GL	RINA
M21	4YQ690H5	IVY69SH5	4Y69SH5	4Y69H5S	4Y69SH5

**CHEMICAL COMPOSITION (W%), TYPICAL, ALL WELD METAL**

Shielding gas	C	Mn	Si	P	S	Ni	Mo	H <sub>DM</sub> ml/100 g
M21	0.06	1.5	0.2	0.015	0.010	2.0	0.3	3

**MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL**

	Shielding gas	Condition	Yield strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Impact ISO-V(J)		
						-29°C	-40°C	-46°C
Required: AWS A5.29			min. 680	760-900	min. 15	min. 27		
ISO 18276-A			min. 690	770-940	min. 17		min. 47	
Typical values	M21	AW	780	810	18	85	80	65

**PACKAGING AND AVAILABLE SIZES**

Diameter (mm)	1.2	1.6
Unit : 4.5 kg plastic spool S200	X	
14 kg S300 (alu bag)	X	
15 kg spool B300	X	X
15 kg spool BS300	X	X

Outershield® 690-H: rev. EN 26

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## MATERIALS TO BE WELDED

Steel grades/Standard	Type
<b>Fine grained steel</b>	
EN 10025 part 6	S500Q to S690QL1
API 5L	X100
MIL-S-162164	HY100
ASTM A514	Grade F
ASTM A517	Grade A, B, F, H, D
ASTM A709	Grade 690 type F, grade 100W type F

## CALCULATION DATA

Diameter (mm)	Electrical stick-out (mm)	Wire Feed Speed (cm/min)	Current (A)	Arc Voltage (V)	Deposition rate (kg/h)	kg wire/kg weldmetal
1.2	20	445	130	20-22	1.6	1.20
		700	180	23-25	2.5	1.20
		950	220	25-27	3.4	1.20
		1270	265	27-29	4.5	1.20
		1590	305	30-32	5.9	1.20
1.6	20	320	170	21-23	1.9	1.20
		510	235	22-24	3.1	1.20
		635	275	24-25	3.9	1.20
		760	310	25-27	4.7	1.20
		890	350	27-29	5.6	1.20
		1015	385	28-30	6.4	1.20
		1080	400	30-31	6.8	1.20

## WELDING PARAMETERS, OPTIMUM FILL PASSES IN SHIELDING GAS Ar + (>15-25)% CO<sub>2</sub>

Diameter (mm)	Welding positions				
	PA/1G	PB/2F	PC/2G	PF/3Gup	PE/4G
1.2	230-280A	230-280A	200-240A	200-240A	160-220A
	26-32V	26-32V	25-32V	25-28V	23-30V
1.6	250-350A	250-350A	230-280A	220-260A	170-240A
	24-29V	24-29V	24-28V	24-26V	22-26V