

## Mild steel rutile cored wire

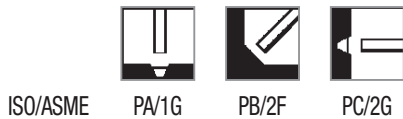
### Classification

AWS A5.20/A5.20M : E70T-9C / E70T-9M  
 EN ISO 17632-A : T 46 0 R C 3 / T 46 0 R M 3

### General description

Gas shielded flux cored wire for semi-automatic or mechanized downhand welds  
 Low spatter, good slag removal, smooth appearance, excellent operator appeal  
 High deposition rate and deep penetration, good resistance to scale and rust  
 Reliable weld metal properties  
 Excellent wire feeding  
 Superior product consistency with optimal alloy control

### Welding positions



### Current type/Shielding gas (ISO 14175)

DC +  
 M21 : Mixed gas Ar+ (>15-25%) CO<sub>2</sub>  
 C1 : Active Gas 100% CO<sub>2</sub>  
 Amount : 15-25 l/min

### Chemical composition (w%), typical, all weld metal

Shielding gas	C	Mn	Si	P	S	H <sub>02</sub> ml/100g
C1	0.06	1.30	0.50	0.015	0.010	< 8
M21	0.06	1.70	0.35	0.015	0.010	< 8

### 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)		
						0°C	-29°C	-30°C
Required: AWS A5.20			min. 400	min. 480	min. 22	min. 27		
EN ISO 17632-A			min. 460	530-680	min. 20	min. 47		
Typical values	C1	AW	480	560	26	80	40	
	M21	AW	530	610	27	70	40	

### Packaging and available sizes

Unit type	Diameter (mm)	
	1.6	2.4
15 kg spool B300	X	
25kg wire reel B435	X	

Outershield® 70: rev. EN 23

**Liability:** All information in this data sheet is based on the best available knowledge, is subject to change without notice and can only be considered as suitable for general guidance **Fumes:** Consult information on Welding Safety Sheet, available upon request

## Materials to be welded

Steel grades/Standard	Type
<b>General structural steel</b>	
EN 10025	S185, S235, S275, S355
<b>Ship plates</b>	
ASTM A131	Grade A, B, D, AH32 to DH36
<b>Cast steel</b>	
EN 10213-2	G P 240R
<b>Pipe material</b>	
EN 10208-1	L210, L240, L290, L360
EN 10208-2	L240NB, L290NB, L360NB, L360QB, L240MB, L290MB, L360MB, L415MB, L415NB
API 5LX	X42, X46, X52, X60
EN 10216-1/	P235T1, P235T2, P275T1
EN 10217-1	P275T2, P355N
<b>Boiler &amp; pressure vessel steel</b>	
EN 10028-2	P235GH, P265GH, P295GH, P355GH
<b>Fine grained steel</b>	
EN 10025 part 3	S275, S355, S420
EN 10025 part 4	S275M, S275ML, S355M, S355ML, S420M, S420ML

## 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 weld metal
1.6	20	320	170	23-25	2.1	1.15
		510	235	25-27	3.4	1.15
		635	275	25-28	4.2	1.15
		760	310	27-29	5.0	1.15
		955	365	29-31	6.4	1.15
2.4	28	320	340	24-27	4.5	1.15
		510	450	28-31	7.3	1.15
		635	510	30-32	9.1	1.15
		700	535	31-34	10.0	1.15
		825	585	33-35	11.8	1.15

## 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
1.6	290-380A	210-375A	290-340A
	25-34V	25-32V	25-32V
2.4	410-560A	410-510A	
	27-34V	28-32V	

# Outershield® 70-H

## Mild steel rutile cored wire

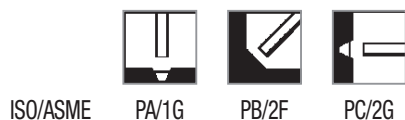
### Classification

AWS A5.20/A5.20M : E70T-1C-H4 / E70T-1M-H4  
 EN ISO 17632-A : T 46 0 R C 3 H5 / T 46 0 R M 3 H5

### General description

Gas shielded flux cored wire for semi-automatic or mechanized downhand welds  
 Low spatter, good slag removal, smooth appearance, excellent operator appeal  
 High deposition rate and deep penetration, good resistance to scale and rust  
 Reliable weld metal properties  
 Very low hydrogen ( $H_{DM} < 5 \text{ ml/100g}$ )  
 Excellent wire feeding  
 Superior product consistency with optimal alloy control

### Welding positions



### Current type/Shielding gas (ISO 14175)

DC +  
 M21 : Mixed gas Ar+ (>15-25%) CO<sub>2</sub>  
 C1 : Active Gas 100% CO<sub>2</sub>  
 Amount : 15-25 l/min

### Approvals

Shielding gas	DB
M21	+
C1	+

### Chemical composition (w%), typical, all weld metal

Shielding gas	C	Mn	Si	P	S	H <sub>DM</sub> ml/100g
C1	0.06	1.30	0.50	0.015	0.010	< 5
M21	0.06	1.70	0.35	0.015	0.010	< 5

### 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)		
						0°C	-18°C	-30°C
Required: AWS A5.20			min. 400	min. 480	min. 22	min. 27		
EN ISO 17632-A			min. 460	530-680	min. 20	min. 47		
Typical values	C1	AW	480	560	26	80	50	
	M21	AW	530	610	27	70	40	

### Packaging and available sizes

Unit type	Diameter (mm)
	2.4
25kg wire reel B435	X
270kg wooden reel	X

Outershield® 70-H: rev. EN 23

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# Outershield® 70-H

## Materials to be welded

Steel grades/Standard	Type
<b>General structural steel</b>	
EN 10025	S185, S235, S275, S355
<b>Ship plates</b>	
ASTM 131	Grade A, B, D, AH32 to DH36
<b>Cast steel</b>	
EN 10213-2	G P 240R
<b>Pipe material</b>	
EN 10208-1	L210, L240, L290, L360
EN 10208-2	L240NB, L290NB, L360NB, L360QB, L240MB, L290MB, L360MB, L415MB, L415NB
API 5LX	X42, X46, X52, X60
EN 10216-1/	P235T1, P235T2, P275T1
EN 10217-1	P275T2, P355N
<b>Boiler &amp; pressure vessel steel</b>	
EN 10028-2	P235GH, P265GH, P295GH, P355GH
<b>Fine grained steel</b>	
EN 10025 part 3	S275, S355, S420
EN 10025 part 4	S275M, S275ML, S355M, S355ML, S420M, S420ML

## 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 weld metal
2.4	28	320	340	24-27	4.5	1.15
		510	450	28-31	7.3	1.15
		635	510	30-32	9.1	1.15
		700	535	31-34	10.0	1.15
		825	585	33-35	11.8	1.15

## Welding parameters, optimum fill passes in shielding gas 100% CO<sub>2</sub>

Diameter (mm)	Welding positions	
	PA/1G	PB/2F
2.4	410-560A	410-510A
	27-34V	28-32V

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# Outershield® 70E-H

## Mild steel rutile cored wire

### Classification

AWS A5.20/A5.20M : E70T-1C-JH4 / E70T-1M-JH4  
EN ISO 17632-A : T 46 3 R C 3 H5 / T 46 3 R M 3 H5

### General description

Gas shielded flux cored wire for high quality welding in downhand position  
Excellent operator appeal due to superior welding characteristics  
Capability with high deposition rate  
Exceptional mechanical properties (CVN > 47J at -30°C)  
Very low hydrogen ( $H_{DM} < 5$  ml/100g)  
Superior product consistency with optimal alloy control  
Excellent wire feeding  
Very suitable for welding of root runs on ceramic backing and welding on primed plate

### Welding positions



ISO/ASME PA/1G PB/2F

### Current type/Shielding gas (ISO 14175)

DC +  
M21 : Mixed gas Ar+ (>15-25%) CO<sub>2</sub>  
C1 : Active Gas 100% CO<sub>2</sub>  
Amount : 15-25 l/min

### Chemical composition (w%), typical, all weld metal

Shielding gas	C	Mn	Si	P	S	H <sub>DM</sub> ml/100g
C1/M21	0.04	1.45	0.6	0.015	0.010	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)	
						-30°C	-40°C
Required: AWS A5.20			min. 400	min. 480	min. 22		min. 27
EN ISO 17632-A			min. 460	530-680	min. 20	min. 47	
Typical values	C1/M21	AW	570	620	25	55	40

### Packaging and available sizes

Unit type	Diameter (mm)
	1.6
15 kg spool B300	X
200kg Accutrak® Drum	X

Outershield® 70E-H: rev. EN 23

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# Outershield® 70E-H

## Materials to be welded

Steel grades/Standard	Type
<b>General structural steel</b>	
EN 10025	S185, S235, S275, S355
<b>Ship plates</b>	
ASTM A131	Grade A, B, D, AH32 to EH36
<b>Cast steel</b>	
EN 10213-2	G P 240R
<b>Pipe material</b>	
EN 10208-1	L210, L240, L290, L360
EN 10208-2	L240NB, L290NB, L360NB, L360QB, L240MB, L290MB, L360MB, L415MB, L415NB
API 5LX	X42, X46, X52, X60
EN 10216-1/	P235T1, P235T2, P275T1
EN 10217-1	P275T2, P355N
<b>Boiler &amp; pressure vessel steel</b>	
EN 10028-2	P235GH, P265GH, P295GH, P355GH
<b>Fine grained steel</b>	
EN 10025 part 3	S275, S355, S420
EN 10025 part 4	S275M, S275ML, S355M, S355ML, S420M, S420ML

## 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 weld metal
1.6	20	320	170	21-23	1.9	1.20
		510	235	22-25	3.1	1.20
		635	275	24-26	3.9	1.20
		760	310	25-27	4.7	1.20
		890	350	27-29	5.5	1.20
		1015	385	28-30	6.3	1.20
		1080	400	29-31	6.7	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/3G up	PG/3G down	PE/4G
1.6	250-350A	250-350A	230-280A	220-260A	170-240A	170-240A
	24-32V	24-32V	24-30V	22-28V	22-28V	22-28V

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## Mild steel rutile cored wire

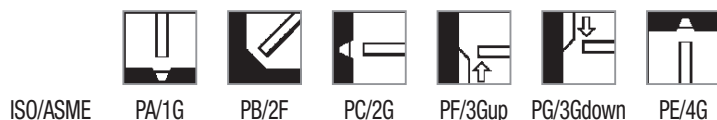
### Classification

AWS A5.20/A5.20M : E71T-1M-JH8  
EN ISO 17632-A : T 46 3 P M 1 H10

### General description

All position gas shielded flux cored wire for high quality welding  
Excellent operator appeal due to superior welding characteristics  
Full out-of-position capability with higher deposition rates  
Exceptional mechanical properties (CVN > 47J at -30°C)  
Superior product consistency with optimal alloy control  
Excellent wire feeding

### Welding positions



### Current type/Shielding gas (ISO 14175)

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

### Chemical composition (w%), typical, all weld metal

Shielding gas	C	Mn	Si	P	S	H <sub>DM</sub> ml/100g
M21	0.05	1.25	0.7	0.015	0.015	< 8

### 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)	
						-30°C	-40°C
Required: AWS A5.20			min. 400	min. 480	min. 22	min. 27	
EN ISO 17632-A			min. 460	530-680	min. 20	min. 47	
Typical values	M21	AW	600	650	24	100	75

### Packaging and available sizes

Unit type	Diameter (mm)
	1.6
15 kg spool B300	X

Outershield® 71E: rev. EN 23

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## Materials to be welded

Steel grades/Standard	Type
<b>General structural steel</b>	
EN 10025	S185, S235, S275, S355
<b>Ship plates</b>	
ASTM A131	Grade A, B, D, AH32 to EH36
<b>Cast steel</b>	
EN 10213-2	G P 240R
<b>Pipe material</b>	
EN 10208-1	L210, L240, L290, L360
EN 10208-2	L240NB, L290NB, L360NB, L360QB, L240MB, L290MB, L360MB, L415MB, L415NB
API 5LX	X42, X46, X52, X60
EN 10216-1/	P235T1, P235T2, P275T1
EN 10217-1	P275T2, P355N
<b>Boiler &amp; pressure vessel steel</b>	
EN 10028-2	P235GH, P265GH, P295GH, P355GH
<b>Fine grained steel</b>	
EN 10025 part 3	S275, S355, S420
EN 10025 part 4	S275M, S275ML, S355M, S355ML, S420M, S420ML

## 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 weld metal
1.6	20	320	170	21-23	1.9	1.20
		510	235	22-25	3.1	1.20
		635	275	24-26	3.9	1.20
		760	310	25-27	4.7	1.20
		890	350	27-29	5.5	1.20
		1015	385	28-30	6.3	1.20
		1080	400	29-31	6.7	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/3G up	PG/3G down	PE/4G
1.6	250-350A	250-350A	230-280A	220-260A	170-240A	170-240A
	24-32V	24-32V	24-30V	22-28V	22-28V	22-28V



# Outershield® 71E-H

## Mild steel rutile cored wire

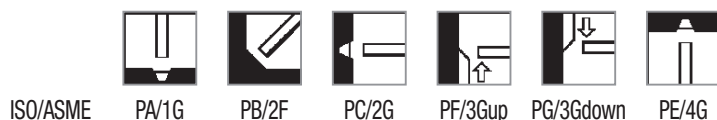
### Classification

AWS A5.20 : E71T-1M-JH5  
EN ISO 17632-A : T 46 3 P M 1 H5

### General description

All position gas shielded flux cored wire for high quality welding  
Excellent operator appeal due to superior welding characteristics  
Full out-of-position capability with higher deposition rates  
Exceptional mechanical properties (CVN > 47J at -30°C)  
Very low hydrogen (H<sub>DM</sub> < 5 ml/100g)  
Superior product consistency with optimal alloy control  
Excellent wire feeding  
Very suitable for welding of root runs on ceramic backing  
By preference use OS 71 M-H for 100 % CO<sub>2</sub> shielding gas

### Welding positions



### Current type/Shielding gas (ISO 14175)

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

### Approvals

Shielding gas	ABS	BV	DB	DNV	GL	LR	RINA	RMRS	TÜV
M21	3YSAH5	SA3YMH5	+	IIYMS(H5)	3YH5S	3YSH5	3YSH5	3YSH5	+

### Chemical composition (w%), typical, all weld metal

Shielding gas	C	Mn	Si	P	S	H <sub>DM</sub> ml/100g
M21	0.04	1.4	0.6	0.013	0.010	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)		
						-20°C	-30°C	-40°C
Required: AWS A5.20			min. 400	min. 480	min. 22			min. 27
EN ISO 17632-A			min. 460	530-680	min. 20		min. 47	
Typical values	M21	AW	570	620	25	90	65	40

### Packaging and available sizes

Unit type	Diameter (mm)
	1.2
5 kg plastic spool S200	X
15 kg spool B300	X
200kg Accutrak® Drum	X

Outershield® 71E-H: rev. EN 25

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# Outershield® 71E-H

## Materials to be welded

Steel grades/Standard	Type
<b>General structural steel</b>	
EN 10025	S185, S235, S275, S355
<b>Ship plates</b>	
ASTM A131	Grade A, B, D, AH32 to EH36
<b>Cast steel</b>	
EN 10213-2	G P 240R
<b>Pipe material</b>	
EN 10208-1	L210, L240, L290, L360
EN 10208-2	L240NB, L290NB, L360NB, L360QB, L240MB, L290MB, L360MB, L415MB, L415NB
API 5LX	X42, X46, X52, X60
EN 10216-1/	P235T1, P235T2, P275T1
EN 10217-1	P275T2, P355N
<b>Boiler &amp; pressure vessel steel</b>	
EN 10028-2	P235GH, P265GH, P295GH, P355GH
<b>Fine grained steel</b>	
EN 10025 part 3	S275, S355, S420, S460
EN 10025 part 4	S275M, S275ML, S355M, S355ML, S420M, S420ML

## 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 weld metal
1.2	20	445	130	21-23	1.5	1.20
		700	180	22-24	2.3	1.20
		955	220	25-27	3.2	1.20
		1270	265	27-29	4.3	1.20
		1590	305	30-32	5.4	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/3G up	PG/3G down	PE/4G
1.2	230-260A	230-260A	200-240A	200-240A	160-220A	160-220A
	26-32V	26-32V	25-30V	25-28V	23-26V	23-26V

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# Outershield® 71M-H

## Mild steel rutile cored wire

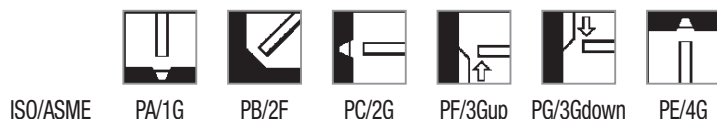
### Classification

AWS A5.20/A5.20M : E71T-1C-JH4  
EN ISO 17632-A : T 46 2 P C 1 H5

### General description

Rutile gas shielded flux cored wire for high quality welding  
Excellent operator appeal due to superior welding characteristics  
Specially developed for welding with 100% CO<sub>2</sub>; smooth arc with low spatter  
Suitable for welding coated plate with use of 100% CO<sub>2</sub>  
Also suitable for welding on ceramic backing  
Good mechanical properties (CVN > 47J at -20°C)  
Very low hydrogen (H<sub>DM</sub> < 5 ml/100g)  
By preference use OS 71 E-H for Ar/CO<sub>2</sub> shielding gas

### Welding positions



### Current type/Shielding gas (ISO 14175)

DC +  
C1 : Active Gas 100% CO<sub>2</sub>  
Amount : 15-25 l/min

### Approvals

Shielding gas	ABS	BV	CRS	NKK	DB	DNV	GL	LR	RINA	RMRS
C1	3YSAH5	SA3YMH5	3YH5S	KSW53G(C)H5	+	III Y40(H5)	3Y46H5S	3YSH5	3YSH53MSH5,3Y40MSH5	

### Chemical composition (w%), typical, all weld metal

Shielding gas	C	Mn	Si	P	S	H <sub>DM</sub> ml/100g
C1	0.05	1.3	0.4	0.015	0.010	4

### 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)	
						-20°C	-40°C
Required: AWS A5.20			min. 400	min. 480	min. 22		min. 27
EN ISO 17632-A			min. 460	530-680	min. 20		min. 47
Typical values	C1	AW	580	620	24	80	40

### Packaging and available sizes

Unit type	Diameter (mm)	
	1.2	1.6
5 kg plastic spool S200	X	
15 kg spool B300	X	X
15 kg spool S300		X
25kg wire reel B435		X
200kg Accutrak® Drum	X	

Outershield® 71M-H: rev. EN 24

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# Outershield® 71M-H

## Materials to be welded

Steel grades/Standard	Type
<b>General structural steel</b>	
EN 10025	S185, S235, S275
<b>Ship plates</b>	
ASTM A131	Grade A, B, D, AH32 to EH36
<b>Cast steel</b>	
EN 10213-2	G P 240R
<b>Pipe material</b>	
EN 10208-1	L210, L240, L290, L360
EN 10208-2	L240NB, L290NB, L360NB, L360QB, L240MB, L290MB, L360MB, L415MB, L415NB
API 5LX	X42, X46, X52, X60
EN 10216-1/	P235T1, P235T2, P275T1
EN 10217-1	P275T2, P355N
<b>Boiler &amp; pressure vessel steel</b>	
EN 10028-2	P235GH, P265GH, P295GH, P355GH
<b>Fine grained steel</b>	
EN 10025 part 3	S275, S355, S420, S460
EN 10025 part 4	S275M, S275ML, S355M, S355ML, S420M, S420ML

## 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 weld metal
1.2	20	445	130	21-23	1.7	1.20
		700	170	22-24	2.3	1.20
		955	220	25-27	3.3	1.20
		1270	260	27-29	4.5	1.20
		1590	290	30-32	5.6	1.20
1.6	20	320	180	21-23	2.2	1.20
		510	255	22-25	3.3	1.20
		635	300	24-26	4.2	1.20
		760	335	25-27	5.0	1.20
		890	370	27-29	5.8	1.20
		1015	395	28-30	6.5	1.20
		1080	415	29-31	7.0	1.20

## Welding parameters, optimum fill passes in shielding gas 100% CO<sub>2</sub>

Diameter (mm)	Welding positions							
	PA/1G	PB/2F	PC/2G	PF/3G up	PG/3G down	PE/4G	PF/3F up	PG/3Fdown
1.2	230-280A	230-280A	200-240A	200-240A	160-220A	160-220A	170-220A	170-220A
	26-32V	26-32V	25-30V	25-28V	23-26V	23-26V	26-28V	26-28V
1.6	250-380A	250-380A	230-280A	220-260A	170-240A	170-240A		
	24-32V	24-32V	24-30V	22-28V	22-28V	22-28V		

**Liability:** All information in this data sheet is based on the best available knowledge, is subject to change without notice and can only be considered as suitable for general guidance **Fumes:** Consult information on Welding Safety Sheet, available upon request

# Outershield® 71C

## Mild steel rutile cored wire

### Classification

AWS A5.20/A5.20M : E71T-1C-H8/E71T-9C-H8  
EN ISO 17632-A : T 46 3 P C 1 H10

### General description

Rutile gas shielded flux cored wire developed for CO<sub>2</sub> shielding gas

Good mechanical properties (CVN > 47J at -30°C)

Smooth arc action and metal transfer; easy slag removal

Suitable for welding with ceramic backing

Applications include general fabrication, shipbuilding, building or bridge erection

### Welding positions



### Current type/Shielding gas (ISO 14175)

DC +  
C1 : Active Gas 100% CO<sub>2</sub>  
Amount : 15-25 l/min

### Approvals

Shielding gas	ABS	BV	CRS	DNV	GL	LR	PRS	RINA	NKK	RMRS	CE
C1	3Y400SAH10	3YSH10	3YH10S	IIIV40MS(H10)	3YH10S	3YSH10	3YSH10	3YSH10	KSW53G(C)H10	3YSH10	+

### Chemical composition (w%), typical, all weld metal

Shielding gas	C	Mn	Si	P	S	H <sub>DM</sub> ml/100g
C1	0.05	1.4	0.4	0.015	0.010	5

### 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)		
						-18°C	-29°C	-30°C
Required: AWS A5.20			min. 400	min. 480	min. 22	min. 27 <sup>1)</sup> min. 27 <sup>2)</sup>		
EN ISO 17632-A			min. 460	530-680	min. 20			min. 47
Typical values	C1	AW	615	660	23	120		85

<sup>1)</sup>: E71T-1 requirement

<sup>2)</sup>: E71T-9 requirement

### Packaging and available sizes

Unit type	Diameter (mm)		
	1.2	1.4	1.6
5 kg plastic spool S200	X		
15 kg spool S300		X	X
15 kg spool B300	X	X	X
15 kg spool BS300	X		

Outershield® 71C: rev. EN 06

**Liability:** All information in this data sheet is based on the best available knowledge, is subject to change without notice and can only be considered as suitable for general guidance **Fumes:** Consult information on Welding Safety Sheet, available upon request

## Materials to be welded

Steel grades/Standard	Type
<b>General structural steel</b>	
EN 10025	S185, S235, S275
<b>Ship plates</b>	
ASTM A131	Grade A, B, D, AH32 to EH36
<b>Cast steel</b>	
EN 10213-2	G P 240R
<b>Pipe material</b>	
EN 10208-1	L210, L240, L290, L360
EN 10208-2	L240NB, L290NB, L360NB, L360QB, L240MB, L290MB, L360MB, L415MB, L415NB
API 5LX	X42, X46, X52, X60
EN 10216-1/	P235T1, P235T2, P275T1
EN 10217-1	P275T2, P355N
<b>Boiler &amp; pressure vessel steel</b>	
EN 10028-2	P235GH, P265GH, P295GH, P355GH
<b>Fine grained steel</b>	
EN 10025 part 3	S275, S355, S420
EN 10025 part 4	S275M, S275ML, S355M, S355ML, S420M, S420ML

## 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	125	21-23	1.5	1.21
		572	150	23-25	1.9	1.21
		699	170	24-26	2.4	1.21
		826	185	25-28	2.9	1.21
		953	210	26-28	3.3	1.21
		1080	230	27-29	3.7	1.21
		1207	245	28-30	4.2	1.21
		1524	285	30-32	5.3	1.21

## Welding parameters, optimum fill passes in shielding gas 100% CO<sub>2</sub>

Diameter (mm)	Welding positions					
	PA/1G	PB/2F	PC/2G	PF/3G up	PF/3F up	PE/4G
1.2	230-280A	230-280A	200-240A	200-240A	170-220A	160-220A
	26-32V	26-32V	25-30V	25-28V	26-28V	23-26V

# Outershield® T55-H

## Mild steel basic cored wire

### Classification

AWS A5.20/A5.20M : E71T-5C-JH4 / E71T-5M-JH4  
 EN ISO 17632-A : T 42 4 B C 2 H5 / T 42 4 B M 2 H5

### General description

All position gas shielded basic flux cored wire  
 Good weldability, also vertical up (3G)  
 Exceptional mechanical properties (CVN >47J at -50°C)  
 Very low hydrogen (H<sub>DM</sub> <5 ml/100g)  
 Superior product consistency with optimal alloy control  
 Excellent wire feeding

### Welding positions



### Current type/Shielding gas (ISO 14175)

DC -  
 M21 : Mixed gas Ar+ (>15-25%) CO<sub>2</sub>  
 C1 : Active Gas 100% CO<sub>2</sub>  
 Amount : 15-25 l/min

### Approvals

Shielding gas	ABS	BV	DB	DNV	GL	LR	RINA
M21	3SA,3YSA	SA3,3YMHH	+	IVYMSH5	4YH10S	4Y40SH15	
C1	3SA,3YSA	SA3,3YMHH	+	IVYMSH5	4YH10S	4Y40SH15	3YS

### Chemical composition (w%), typical, all weld metal

Shielding gas	C	Mn	Si	P	S	H <sub>DM</sub> ml/100g
C1	0.05	1.5	0.55	0.012	0.010	3
M21	0.06	1.5	0.6	0.012	0.010	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)		
						-20°C	-40°C	-50°C
Required: AWS A5.20			min. 400	min. 480	min. 22		min. 27	
EN ISO 17632-A			min. 420	500-640	min. 20		min. 47	
Typical values	M21/C1	AW	480	570	27	130	85	60
		SR	425	550	27		80	

SR : 15h/580°C

### Packaging and available sizes

Unit type	Diameter (mm)		
	1.2	1.6	2.4
4.5kg plastic spool S200	X		
15 kg spool B300	X	X	
25kg wire reel B435		X	X

Outershield® T55-H: rev. EN 24

**Liability:** All information in this data sheet is based on the best available knowledge, is subject to change without notice and can only be considered as suitable for general guidance **Fumes:** Consult information on Welding Safety Sheet, available upon request

# Outershield® T55-H

## Materials to be welded

Steel grades/Standard	Type
<b>General structural steel</b>	
EN 10025	S185, S235, S275, S355
<b>Ship plates</b>	
ASTM A131	Grade A, B, D, AH32 to EH40
<b>Cast steel</b>	
EN 10213-2	G P 240R
<b>Pipe material</b>	
EN 10208-1	L210, L240, L290, L360
EN 10208-2	L240NB, L290NB, L360NB, L360QB, L240MB, L290MB, L360MB, L415MB, L415NB
API 5LX	X42, X46, X52, X60
EN 10216-1/	P235T1, P235T2, P275T1
EN 10217-1	P275T2, P355N
<b>Boiler &amp; pressure vessel steel</b>	
EN 10028-2	P235GH, P265GH, P295GH, P355GH
<b>Fine grained steel</b>	
EN 10025 part 3	S275, S355, S420
EN 10025 part 4	S275M, S275ML, S355M, S355ML, S420M, S420ML

## 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 weld metal
1.2	20	510	130	25-27	1.6	1.20
		760	185	26-28	2.5	1.20
		1015	225	27-29	3.3	1.20
		1270	260	28-30	4.1	1.20
		1525	290	29-31	5.0	1.20
		1780	310	30-32	5.8	1.20
1.6	20	380	170	24-26	2.5	1.15
		510	225	25-27	3.1	1.15
		760	310	27-29	4.7	1.15
		1015	380	29-31	6.3	1.15
		1270	430	31-33	7.9	1.15

## 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/3G up
1.2	215-290A	215-290A	215-250A	110-150A
	28-34V	28-34V	28-30V	17-20V
1.6	320-390A	320-390A	280-350A	130-180A
	28-34V	28-34V	28-32V	18-22V
2.4	350-550A	350-550A		
	30-34V	30-34V		

**Liability:** All information in this data sheet is based on the best available knowledge, is subject to change without notice and can only be considered as suitable for general guidance **Fumes:** Consult information on Welding Safety Sheet, available upon request



# Outershield® MC700

## Mild steel metal cored wire

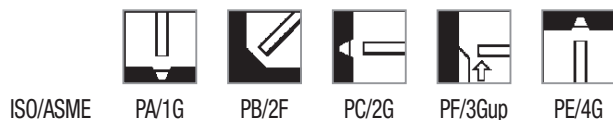
### Classification

AWS A5.18/A5.18M : E70C-6M H8  
EN ISO 17632-A : T 46 2 M M 2 H10

### General description

All position high efficiency gas shielded metal cored wire  
Excellent arc characteristics give outstanding operator appeal  
Very few silicates, virtually no spatter, fast travel speed, excellent wire feeding  
Superior product consistency with optimal alloy control

### Welding positions



### Current type/Shielding gas (ISO 14175)

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

### Chemical composition (w%), typical, all weld metal

Shielding gas	C	Mn	Si	P	S	H <sub>DM</sub> ml/100g
M21	0.05	1.35	0.6	0.015	0.023	5

### 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)	
						-20°C	-30°C
Required: AWS A5.18			min. 400	min. 480	min. 22		min. 27
EN ISO 17632-A			min. 460	530-680	min. 20	min. 47	
Typical values	M21	AW	475	560	24	75	45

### Packaging and available sizes

Unit type	Diameter (mm)
15 kg spool B300	X

Outershield® MC700: rev. EN 04

**Liability:** All information in this data sheet is based on the best available knowledge, is subject to change without notice and can only be considered as suitable for general guidance **Fumes:** Consult information on Welding Safety Sheet, available upon request

# Outershield® MC700

## Materials to be welded

Steel grades/Standard	Type
<b>General structural steel</b>	
EN 10025	S185, S235, S275, S355
<b>Ship plates</b>	
ASTM A131	Grade A, B, D, AH32 to EH36
<b>Cast steel</b>	
EN 10213-2	G P 240R
<b>Pipe material</b>	
EN 10208-1	L210, L240, L290, L360
EN 10208-2	L240NB, L290NB, L360NB, L360QB, L240MB, L290MB, L360MB, L415MB, L415NB
API 5LX	X42, X46, X52, X60
EN 10216-1/	P235T1, P235T2, P275T1
EN 10217-1	P275T2, P355N
<b>Boiler &amp; pressure vessel steel</b>	
EN 10028-2	P235GH, P265GH, P295GH, P355GH
<b>Fine grained steel</b>	
EN 10025 part 3	S275, S355, S420
EN 10025 part 4	S275M, S275ML, S355M, S355ML, S420M, S420ML

## Calculation data

Diameter (mm)	Arc mode	Electrical Stick-out (mm)	Wire feed speed (cm/min)	Current (A)	Arc Voltage (V)	Deposition Rate (kg/h)	kg Wire/kg weld metal
1.2	short-arc	15	230	100	15	1.1	1.10
			320	120	16	1.4	1.10
			400	150	17	1.9	1.10
1.2	spray-arc	20	635	180	28-30	2.7	1.10
			940	275	31-34	4.8	1.10
			1420	340	35-38	6.8	1.10

## 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/3G up	PE/4G
1.2	230-380A	230-380A	230-300A	130-170A	140-175A
	26-36V	26-36V	26-30V	15-17V	16-17V

**Liability:** All information in this data sheet is based on the best available knowledge, is subject to change without notice and can only be considered as suitable for general guidance **Fumes:** Consult information on Welding Safety Sheet, available upon request

# Outershield® MC710-H

## Mild steel metal cored wire

### Classification

AWS A5.18/A5.18M : E70C-6M H4  
 EN ISO 17632-A : T 46 3 M M 2 H5 (ø1.2 and 1.6 mm) / T 46 2 M M 2 H5 (ø2.0 and 2.4 mm)

### General description

All position high efficiency gas shielded metal cored wire  
 Excellent arc characteristics give outstanding operator appeal  
 Very few silicates, virtually no spatter, fast travel speed, excellent wire feeding  
 Superior on scaly plate, good resistance to porosity  
 Very good mechanical properties (CVN >47J at -30°C)  
 Very low hydrogen (H<sub>DM</sub> <5 ml/100g)  
 Superior product consistency with optimal alloy control

### Welding positions



### Current type/Shielding gas (ISO 14175)

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

### Approvals

Shielding gas	ABS	BV	DB	DNV	TUV	GL	LR	RINA	RMRS
M21	3YSAH5	SA3YMH5	+	IIIYMS(H5)	+	3YH5S	3YSH5	3YS	3YSH5

### Chemical composition (w%), typical, all weld metal

Shielding gas	C	Mn	Si	P	S	H <sub>DM</sub> ml/100g
M21	0.05	1.35	0.6	0.015	0.023	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)			
						-20°C	-29°C	-30°C	-40°C
Required:									
AWS A5.18			min. 400	min. 480	min. 22		min. 27		
EN ISO 17632-A (1.2/1.6)			min. 460	530-680	min. 20			min. 47	
Typical values	M21	AW	495	570	26	90		60	
	M21	SR	430	530	28			105	75
SR : 1h/580°C									

### Packaging and available sizes

Unit type	Diameter (mm)				
	1.2	1.4	1.6	2.0	2.4
4.5kg plastic spool S200	X				
15 kg spool B300	X	X	X		
25kg wire reel B435		X	X	X	X
200kg Accutrak® Drum	X	X	X		
270kg metal coil	X		X	X	X

Outershield® MC710-H: rev. EN 25

**Liability:** All information in this data sheet is based on the best available knowledge, is subject to change without notice and can only be considered as suitable for general guidance **Fumes:** Consult information on Welding Safety Sheet, available upon request

# Outershield® MC710-H

## Materials to be welded

Steel grades/Standard	Type
<b>General structural steel</b>	
EN 10025	S185, S235, S275, S355
<b>Ship plates</b>	
ASTM A131	Grade A, B, D, AH32 to EH36
<b>Cast steel</b>	
EN 10213-2	G P 240R
<b>Pipe material</b>	
EN 10208-1	L210, L240, L290, L360
EN 10208-2	L240NB, L290NB, L360NB, L360QB, L240MB, L290MB, L360MB, L415MB, L415NB
API 5LX	X42, X46, X52, X60, X65
EN 10216-1/	P235T1, P235T2, P275T1
EN 10217-1	P275T2, P355N
<b>Boiler &amp; pressure vessel steel</b>	
EN 10028-2	P235GH, P265GH, P295GH, P355GH
<b>Fine grained steel</b>	
EN 10025 part 3	S275, S355, S420, S460
EN 10025 part 4	S275M, S275ML, S355M, S355ML, S420M, S420ML, S460M, S460ML

## Calculation data

Diameter (mm)	Arc mode	Electrical Stick-out (mm)	Wire feed speed (cm/min)	Current (A)	Arc Voltage (V)	Deposition Rate (kg/h)	kg Wire/kg weld metal
1.2	short-arc	15	230	100	15	1.1	1.10
			320	120	16	1.4	1.10
			400	150	17	1.9	1.10
1.2	spray-arc	20	635	180	28-30	2.7	1.10
			940	275	31-34	4.8	1.10
			1420	340	35-38	6.8	1.10
1.4	spray-arc	25	445	170	27-29	2.5	1.10
			890	270	29-32	5.0	1.10
			1400	355	32-34	8.1	1.10
1.6	spray-arc	25	635	325	29-32	5.0	1.10
			890	400	34-37	7.0	1.10
			1145	460	36-38	9.1	1.10
2.0	spray-arc	28	320	290	25-27	3.7	1.05
			510	385	28-31	6.1	1.05
			760	510	32-35	9.3	1.05
2.4	spray-arc	30		400	28-32		
				475	28-32		
				550	30-34		

## 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/3G up	PE/4G
1.2	230-380A	230-380A	230-300A	130-170A	140-175A
	26-36V	26-36V	26-30V	15-17V	16-17V
1.4	240-385A	240-385A	240-340A	160-180A	175-185A
	26-36V	26-36V	26-31V	14-15V	15-16V
1.6	280-460A	280-460A	270-300A		
	28-36V	28-36V	28-30V		
2.0	300-510A	300-510A			
	28-33V	28-33V			
2.4	400-550A	400-550A			
	32-36V	32-36V			

**Liability:** All information in this data sheet is based on the best available knowledge, is subject to change without notice and can only be considered as suitable for general guidance **Fumes:** Consult information on Welding Safety Sheet, available upon request

# Outershield® MC710C-H

## Mild steel metal cored wire

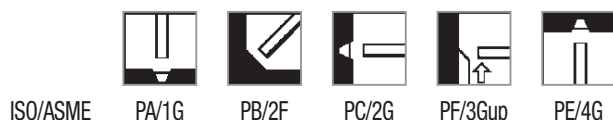
### Classification

AWS A5.18/A5.18M : E70C-6C H4  
EN ISO 17632-A : T 46 3 M C 2 H5

### General description

All position high efficiency CO<sub>2</sub> shielded metal cored wire  
Excellent arc characteristics give outstanding operator appeal  
Few silicates and virtually no spatter, fast travel speed, excellent wire feeding  
Superior on primed or scaly plate, high resistance to porosity on primed plate  
Very good mechanical properties (CVN >47J at -30°C)  
Very low hydrogen (H<sub>DM</sub> <5 ml/100g)  
Superior product consistency with optimal alloy control

### Welding positions



### Current type/Shielding gas (ISO 14175)

DC +  
C1 : Active Gas 100% CO<sub>2</sub>  
Amount : 15-25 l/min

### Approvals

Shielding gas	ABS	BV	DNV	GL	LRS	RINA	TÜV
C1	3YSA-H5	3YH5	III YMS	3YH5	3YH5	3YSH5	+

### Chemical composition (w%), typical, all weld metal

Shielding gas	C	Mn	Si	P	S	H <sub>DM</sub> ml/100g
C1	0.05	1.35	0.6	0.015	0.023	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)		
						-20°C	-29°C	-30°C
Required: AWS A5.18			min. 400	min. 480	min. 22	min. 27		
EN ISO 17632-A			min. 460	530-680	min. 20	min. 47		
Typical values	C1	AW	490	585	27	90	70	

### Packaging and available sizes

Unit type	Diameter (mm)
	1.2
4.5kg plastic spool S200	X
15 kg spool B300	X

Outershield® MC710C-H: rev. EN 22

**Liability:** All information in this data sheet is based on the best available knowledge, is subject to change without notice and can only be considered as suitable for general guidance **Fumes:** Consult information on Welding Safety Sheet, available upon request

# Outershield® MC710C-H

## Materials to be welded

Steel grades/Standard	Type
<b>General structural steel</b>	
EN 10025 part 2	S185, S235, S275, S355
<b>Ship plates</b>	
ASTM A131	Grade A, B, D, AH32 to EH36
<b>Cast steel</b>	
EN 10213-2	G P 240R
<b>Pipe material</b>	
EN 10208-1	L210, L240, L290, L360
EN 10208-2	L240NB, L290NB, L360NB, L360QB, L240MB, L290MB, L360MB, L415MB, L415NB
API 5LX	X42, X46, X52, X60
<b>Fine grained steel</b>	
EN 10025 part 3	S275, S355, S420
EN 10025 part 4	S275M, S275ML, S355M, S355ML, S420M, S420ML, S460

## Calculation data

Diameter (mm)	Arc mode	Electrical Stick-out (mm)	Wire feed speed (cm/min)	Current (A)	Arc Voltage (V)	Deposition Rate (kg/h)	kg Wire/kg weld metal
1.2	short-arc	15	230	100	16	1.1	1.10
			320	120	16.5	1.4	1.10
			400	150	17	1.9	1.10
1.2	spray-arc	20	635	180	28-30	2.7	1.10
			940	275	31-34	4.8	1.10
			1420	340	35-38	6.8	1.10

## Welding parameters, optimum fill passes in shielding gas 100% CO<sub>2</sub>

Diameter (mm)	Welding positions				
	PA/1G	PB/2F	PC/2G	PF/3G up	PE/4G
1.2	230-380A	230-380A	230-300A	100-170A	140-175A
	26-36V	26-36V	26-30V	16-17V	16-17V

**Liability:** All information in this data sheet is based on the best available knowledge, is subject to change without notice and can only be considered as suitable for general guidance **Fumes:** Consult information on Welding Safety Sheet, available upon request

# Outershield® MC715-H

## Mild steel metal cored wire

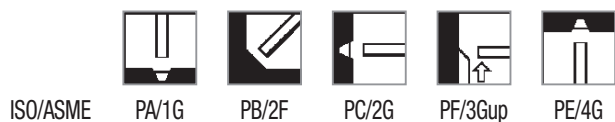
### Classification

AWS A5.18/A5.18M : E70C-6M H4  
EN ISO 17632-A : T 46 4 M M 2 H5

### General description

Metal cored gas shielded wire for all positions  
Few silicates and virtually no spatter, fast travel speed, excellent wire feeding  
Excellent arc characteristics give outstanding operator appeal  
Excellent mechanical properties (CNV >47J at -40°C)  
Very low hydrogen (H<sub>DM</sub> <5 ml/100g)  
Superior product consistency with optimal alloy control  
Depending on application good alternative for basic flux cored wires

### Welding positions



### Current type/Shielding gas (ISO 14175)

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

### Approvals

Shielding gas	BV	DB	DNV	TUV	GL	RINA
M21	SA3,3YMH	+	IV Y40H5	+	4Y40H5S	4YSH5

### Chemical composition (w%), typical, all weld metal

Shielding gas	C	Mn	Si	P	S	H <sub>DM</sub> ml/100g
M21	0.04	1.5	0.4	0.012	0.020	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	-30°C	-40°C	-50°C
Required: AWS A5.18			min. 400	min. 480	min. 22	min. 27			
EN ISO 17632-A			min. 460	530-680	min. 20			min. 47	
Typical values	M21	AW	480	580	27	120	110	80	
	M21	SR	430	485	30			100	

SR : 2h/640°C

### Packaging and available sizes

Unit type	Diameter (mm)		
	1.2	1.4	1.6
4.5kg plastic spool S200	X		
14 kg spool S300 (alu. Bag)	X		
15 kg spool B300	X	X	X
25kg wire reel B435			X
200kg Accutrak® Drum	X	X	X

Outershield® MC715-H: rev. EN 23

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# Outershield® MC715-H

## Materials to be welded

Steel grades/Standard	Type
<b>General structural steel</b>	
EN 10025 part 2	S185, S235, S275, S355
<b>Ship plates</b>	
ASTM A131	Grade A, B, D, AH32 to EH40
<b>Cast steel</b>	
EN 10213-2	G P 240R
<b>Pipe material</b>	
EN 10208-1	L210, L240, L290, L360
EN 10208-2	L240NB, L290NB, L360NB, L360QB, L240MB, L290MB, L360MB, L415MB, L415NB, L445
API 5LX	X42, X46, X52, X60, X65
EN 10216-1/	P235T1, P235T2, P275T1
EN 10217-1	P275T2, P355N
<b>Boiler &amp; pressure vessel steel</b>	
EN 10028-2	P235GH, P265GH, P295GH, P355GH
<b>Fine grained steel</b>	
EN 10025 part 3	S275N, S275NL, S355N, S355NL, S420N, S420NL, S460N, S460NL
EN 10025 part 4	S275M, S275ML, S355M, S355ML, S420M, S420ML, S460ML

## Calculation data

Diameter (mm)	Arc mode	Electrical Stick-out (mm)	Wire feed speed (cm/min)	Current (A)	Arc Voltage (V)	Deposition Rate (kg/h)	kg Wire/kg weld metal
1.2	short-arc	15	230	100	15	1.1	1.10
			320	120	16	1.4	1.10
			400	150	17	1.9	1.10
1.2	spray-arc	20	635	180	28-30	2.7	1.10
			940	275	31-34	4.8	1.10
			1420	340	35-38	6.8	1.10
1.4	short-arc	15	205	105	14.5	1.2	1.10
			255	125	15.0	1.5	1.10
			280	135	15.5	1.6	1.10
1.4	spray-arc	25	445	170	27-29	2.5	1.10
			890	270	29-32	5.0	1.10
			1400	355	32-34	8.1	1.10
1.6	short-arc	18	180	145	15	1.5	1.10
			205	160	16	1.7	1.10
			230	170	18	1.9	1.10
1.6	spray-arc	25	380	235	25-26	2.9	1.10
			635	325	29-32	5.0	1.10
			890	400	34-37	7.0	1.10
			1145	460	36-38	9.1	1.10

## 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/3G up	PE/4G
1.2	230-380A	230-380A	230-300A	130-170A	140-175A
	26-36V	26-36V	26-30V	15-17V	16-17V
1.4	240-385A	240-385A	240-340A	160-180A	175-185A
	26-36V	26-36V	26-31V	14-15V	15-16V
1.6	280-460A	280-460A	270-300A		
	28-36V	28-36V	28-30V		

**Liability:** All information in this data sheet is based on the best available knowledge, is subject to change without notice and can only be considered as suitable for general guidance **Fumes:** Consult information on Welding Safety Sheet, available upon request



# Outershield® MC460VD-H

## Mild steel metal cored wire

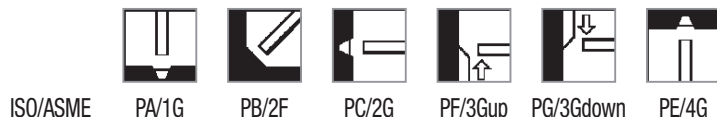
### Classification

AWS A5.18/A5.18M : E70C-6M H4  
EN ISO 17632-A : T 46 2 M M 1 H5

### General description

**Metal cored wire for fillet welding with high efficiency**  
**Especially for vertical down welding in thin plate**  
**Excellent arc characteristics give outstanding operator appeal**  
**No slag, only some silicate islands, very good wire feeding**  
**High resistance to porosity on primed plate**  
**Superior product consistency with optimal alloy control**  
**Very low hydrogen (H<sub>DM</sub> <5 ml/100g)**

### Welding positions



### Current type/Shielding gas (ISO 14175)

DC - for all welding positions  
M21 : Mixed gas Ar+ (>15-25%) CO<sub>2</sub>  
Amount : 15-25 l/min

### Approvals

Shielding gas	ABS	BV	DNV	GL	LR
M21	3YSA,H5	SA3YMH4H	IIIMSH5	3YH5S	3S,3YSH5

### Chemical composition (w%), typical, all weld metal

Shielding gas	C	Mn	Si	P	S	H <sub>DM</sub> ml/100g
M21	0.05	1.25	0.6	0.015	0.015	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)	
						-20°C	-29°C
Required: AWS A5.18			min. 400	min. 480	min. 22	min. 27	
EN ISO 17632-A			min. 460	530-680	min. 20	min. 47	
Typical values	M21	AW	510	600	25	90	60

### Packaging and available sizes

Unit type	Diameter (mm)
	1.2
4.5kg plastic spool S200	X
15 kg spool B300	X

Outershield® MC460VD-H: rev. EN 23

**Liability:** All information in this data sheet is based on the best available knowledge, is subject to change without notice and can only be considered as suitable for general guidance **Fumes:** Consult information on Welding Safety Sheet, available upon request

# Outershield® MC460VD-H

## Materials to be welded

Steel grades/Standard	Type
<b>General structural steel</b>	
EN 10025 part 2	S185, S235, S275, S355
<b>Ship plates</b>	
ASTM A131	Grade A, B, D, AH32 to EH40
<b>Cast steel</b>	
EN 10213-2	G P 240R
<b>Pipe material</b>	
EN 10208-1	L210, L240, L290, L360
EN 10208-2	L240NB, L290NB, L360NB, L360QB, L240MB, L290MB, L360MB, L415MB, L415NB
API 5LX	X42, X46, X52, X60
EN 10216-1/	P235T1, P235T2, P275T1
EN 10217-1	P275T2, P355N
<b>Boiler &amp; pressure vessel steel</b>	
EN 10028-2	P235GH, P265GH, P295GH, P355GH
<b>Fine grained steel</b>	
EN 10025 part 3	S275, S355, S420
EN 10025 part 4	S275M, S275ML, S355M, S355ML, S420M, S420ML

## 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 weld metal
1.2	20	635	180	28-30	2.7	1.10
		940	275	31-34	4.8	1.10
		1420	340	35-38	6.8	1.10

## Welding parameters, optimum fill passes in shielding gas Ar + (>15 - 25)% CO<sub>2</sub>

Diameter (mm)	Welding positions			
	PB/2F	PG/3F down	PG/3G down	PE/4F
1.2	250 - 300A	250 - 300A	200-220A	200-220A
	26-30V	26-30V	21-24V	23-25V

**Liability:** All information in this data sheet is based on the best available knowledge, is subject to change without notice and can only be considered as suitable for general guidance **Fumes:** Consult information on Welding Safety Sheet, available upon request

# Outershield® MC420N-H

## Metal cored wire for applications that need to be normalized

### Classification

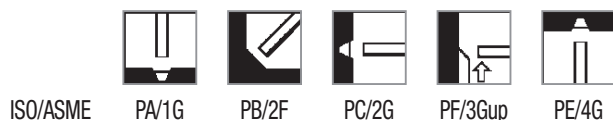
A5.28/A5.28M : E70C-GM H4  
EN ISO 17632-A : T 38 Z Z M M 2 H5

Note: the above mentioned classifications are an indication of the weld metal properties in the as welded condition. However, the Outershield MC420N-H is designed to be used only in the normalized condition. As neither AWS nor EN has included weld metal properties in the normalized condition, the wire cannot be classified for the condition it is designed for.

### General description

All position high efficiency mix gas shielded metal cored wire  
Excellent arc characteristics, few silicates and virtually no spatter, excellent wire feeding  
High resistance to porosity  
Designed to withstand normalizing treatment (4h 900°C)  
Mechanical properties after normalizing meet base material requirements  
Very low hydrogen ( $H_{DM} < 5$  ml/100g)  
Only to be used in normalized condition!

### Welding positions



### Current type/Shielding gas (ISO 14175)

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

### Chemical composition (w%), typical, all weld metal

Shielding gas	C	Mn	Si	P	S	Cr	Ni	H <sub>DM</sub> ml/100g
M21	0.03	0.6	0.45	0.017	0.023	0.03	2.9	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) -50°C
Typical values N = 900°C/4h	M21	N	353	493	32	57

### Packaging and available sizes

Unit type	Diameter (mm)	
	1.2	1.6
15 kg spool B300	X	X
200kg Accutrak® Drum		X

Outershield® MC420N-H: rev. EN 24

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# Outershield® MC420N-H

## Materials to be welded

Steel grades/Standard	Type
<b>General structural steel</b>	
EN 10025 part 2	S185, S235, S275, S355
<b>Ship plates</b>	
ASTM A131	Grade A, B, D, AH32 to EH36
<b>Boiler &amp; pressure vessel steel</b>	
EN 10028-2	P235GH, P265GH, P295GH, P355GH
EN 10028-3	P275N, P355N
<b>Fine grained steel</b>	
EN 10025 part 3	S275N, S275NL, S355N, S355NL

The wire is only applicable for materials that will be normalized after welding

## Calculation data

Diameter (mm)	Arc mode	Electrical Stick-out (mm)	Wire feed speed (cm/min)	Current (A)	Arc Voltage (V)	Deposition Rate (kg/h)	kg Wire/kg weld metal
1.2	spray-arc	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

## 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/3G up	PE/4G
1.2	230-380A	230-380A	230-300A	130-170A	140-175A
	26-36V	26-36V	26-30V	15-17V	16-17V

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