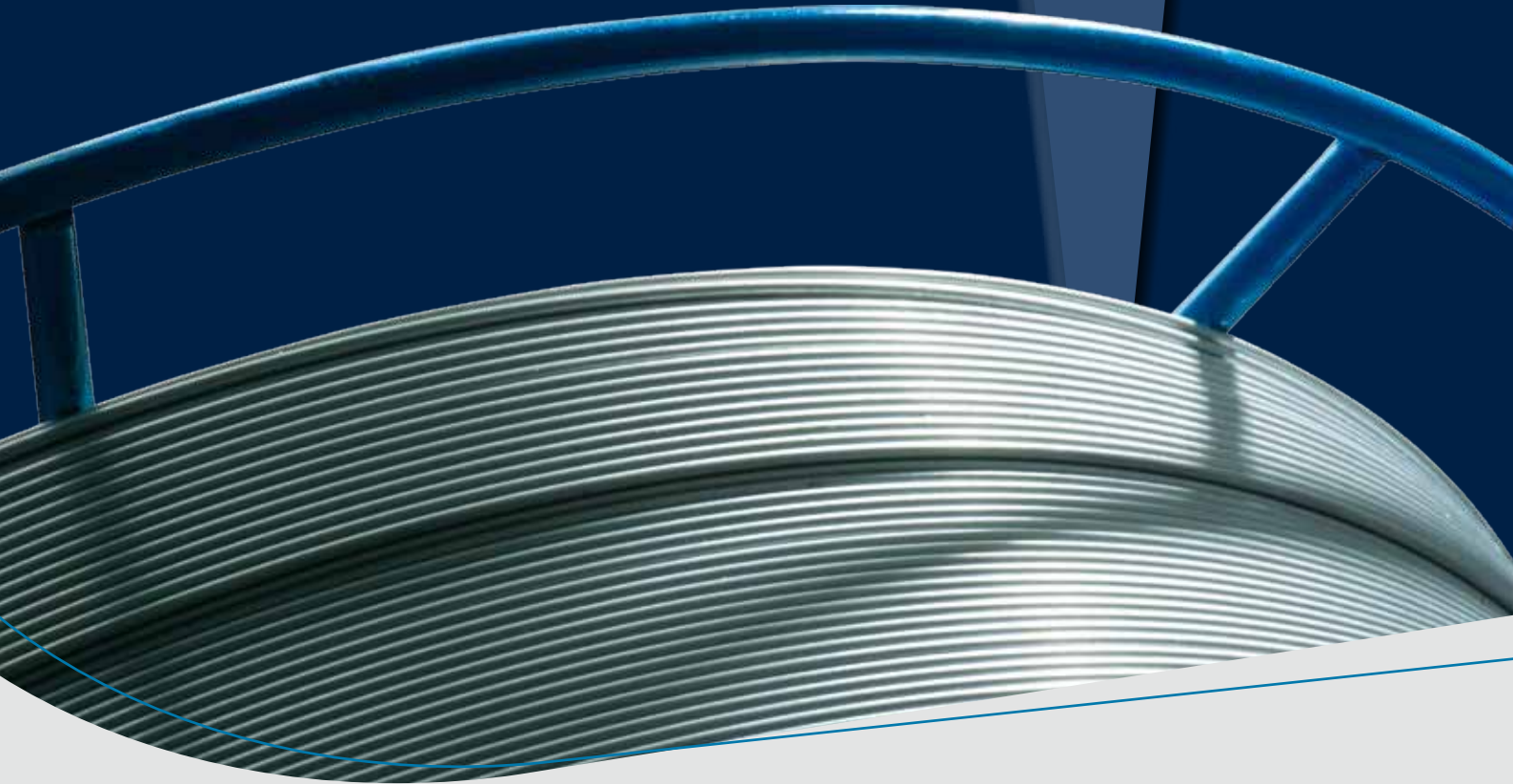




Metal Cored Wires  
BÖHLER HL 46-MC  
BÖHLER HL 51-FD



# Excellent Welding Characteristics and significant reduction of Welding Time maximizes Economic Benefits

Developed to have advantages like low spatter, low silicates, high bridging capability and superior feedability and arc stability to use with fine grained and unalloyed steels!

Both products have the general advantages of metal cored wires which are higher efficiency due to high deposition rate, high travel speed, low spatter formation, high duty cycles therefore downtime of machines is minimized. In general BÖHLER HL 51-FD can be used for higher impact values than BÖHLER HL 46-MC. BÖHLER HL 46-MC shows significantly reduced levels of silicates, allows for maximum welding speed with minimal spatter and is thus optimally suited for fully automatized applications, where productivity is the decisive factor.

## Offering you the Best

Welding with Metal Cored Wires is commonly used when productivity improvements are required. Especially this is the case for the Transport Segment where productivity is one of the highest priorities.

### Target Segments

- Transportation (Automotive, Industrial Vehicles and Railway)
- General Fabrication
- Shipbuilding

## Brand Information

Böhler: Creating lasting connections is the most important part of the welding process. More than 2,000 products for joint welding in all conventional arc welding processes are now united under the Böhler Welding brand in a product portfolio that is unique throughout the world. Therefore, our customers benefit even more from our personal application consultations, because we are also passionate about creating lasting connections between people.

## Fields of Application

### Automotive and Commercial Vehicle Manufacturers:

Axles manufacturing: (longitudinal- and circumferential welds);  
Ride Control: Suspension Link arms – Overlap welds.

### Industrial Vehicles Applications:

OEM Manufacturers; Chassis manufacturers for SUVs.

**Railway:** Trains; Wagons, Bogies (in case of BÖHLER HL 51-FD)

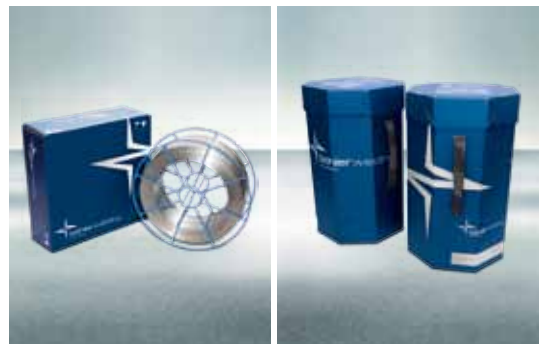


## Packaging

Our products are delivered in 16 kg spools (BS 300) & 250 kg eco-drums.

Benefits of octagonal eco-drums:

- Maximum productivity
- Once empty drums can be folded and thus require much less storage space
- Fully recyclable



# BÖHLER HL 46-MC

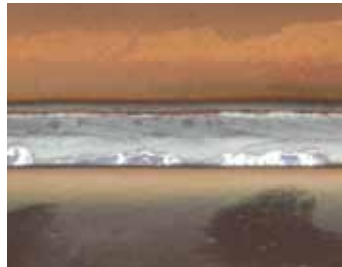
## Product Characteristics and Features

BÖHLER HL 46-MC in dia. 1,2 mm has been developed to meet better welding characteristics and more economical welding time. The service temperature ranges from -20 °C to +450 °C. This wire is to be used in the high speed applications where the bottle neck is related to total output time. This product is developed with a focus on thin plates outperforming the productivity and quality of solid wires. This high-efficient metal cored wire is suitable for many applications specifically for unalloyed and fine-grained construction steel and is especially produced for robotic welding.

- Low Spatter
- Low silicates
- High deposition rate 9 kg/hr
- 20% higher productivity compared to solid wires
- High metal recovery between 93% and 97 %
- High bridging capability
- Easy use with standard spray arc transfer with very good restarting behavior
- Superior feedability and arc stability in comparison to copper coated solid wires
- Low hydrogen content <5 ml/100 g



Dia: 1,2 mm  
Parameter: 222A, V= 24,6 V,  
vd= 7 m/min, vs= 40 cm/min



Dia: 1,2 mm  
Parameter: 351A, V= 28,8 V,  
vd= 13,5 m/min, vs= 80 cm/min

Material Properties and Classification	
Classification:	T 46 2 M M 1 H5 (EN ISO 17632-A), T552T15-1MA-H5 (EN ISO 17632-B), E70C-6MH4 (AWS A5.18), E48C-6MH4 (AWS A5.18M)
Chemical analysis:	C 0,07 Wt-%, Si 0,7 Wt-%, Mn 1,5 Wt-%
Mechanical / technological values:	Yield strength $R_e$ ( $\geq 460$ MPa); tensile strength $R_m \geq 530-680$ MPa; elongation A ( $L_0=5d_0$ ) % $\geq 20$ ; impact work ISO-V KV J at -20°C $\geq 47$ .
Welding Characteristics	
Welding characteristics:	Re-drying: not necessary ; shielding gases: Argon + 15-25% CO <sub>2</sub> ; Welding with standard GMAW-facilities possible.
Dimension and spool form:	Ø 1,2 mm, 16 kg spools (BS 300)
Additional requirements:	Approvals: TÜV, DB, BV, GL, DNV, LR, CE
Remarks:	Polarity: DC (+)

### Competitive Analysis / Benchmarking

Producer	C	Si	Mn	P	S	Cr	Ni	Mo	V	Cu	Ti	B	Zr	O <sub>2</sub>
Competitor	0,057	0,69	1,47	0,006	0,029	0,16	0,02	0,04	0,005	0,03	0,012	0,0005	0,005	0,054
<b>BÖHLER HL 46-MC</b>	<b>0,033</b>	<b>0,8</b>	<b>1,6</b>	<b>0,013</b>	<b>0,019</b>	<b>0,03</b>	<b>0,02</b>	<b>0,02</b>	<b>0,007</b>	<b>0,03</b>	<b>0,008</b>	<b>0,0005</b>	<b>0,005</b>	<b>0,068</b>

Product Names	Re N/mm <sup>2</sup>	Rm N/mm <sup>2</sup>	A %	ISO-V J @RT	ISO-V J @-20°C	ISO-V J @-30°C
Competitor	462	547	27	133, 140, 132, 135	72, 85, 74, 77	54, 63, 25, 47
<b>BÖHLER HL 46-MC</b>	<b>505</b>	<b>587</b>	<b>24</b>	<b>119, 108, 113, 113</b>	<b>66, 69, 71, 69</b>	<b>52, 40, 60, 51</b>

### Approvals

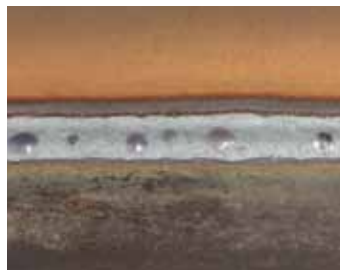
Authority	TÜV	DB	DNV	GL	LR	BV	CE
Further details if applicable	12542.	42.014.43		ø 1,2 mm	ø 1,2 mm	ø 1,2 mm	

# BÖHLER HL 51-FD

## Product Characteristics and Features

This Metal Cored wire with high efficiency can be used for semi-automatic and fully automatic joint welding of unalloyed and fine-grained steels. The service temperature ranges from -40 °C to +450 °C. Increased welding speed compared to solid wires guarantees an economical advantage. BÖHLER HL 51-FD has only minimal spatter formation therefore post weld cleaning is kept to a minimum.

- High deposition rate 9 kg/hr
- 20% higher productivity compared to solid wires
- High metal recovery between 93% and 97%
- Minimal spatter formation
- Good penetration and high resistance to porosity
- Low hydrogen content <5 ml/100 g
- Application with requirements of higher impact values



Dia: 1,2 mm  
Parameter: 35222A, V= 24,6 V,  
vd= 7 m/min, vs= 40 cm/min



Dia: 1,2 mm  
Parameter: 361A, V= 28,6 V,  
vd= 13,5 m/min, vs= 80 cm/min

Material Properties and Classification	
Classification:	T 46 4 M M 1 H5 (EN ISO 17632-A), T554T15-1MA-UH5 (EN ISO 17632-B) E70C-6MH4 (AWS A5.18), E48C-6MH4 (AWS A5.18M)
Chemical analysis:	C 0,07 Wt-%, Si 0,7 Wt-%, Mn 1,5 Wt-%
Mechanical / technological values:	Yield strength $R_{\sigma} \geq 460$ MPa; tensile strength $R_m \geq 550-740$ MPa; elongation A ( $L_0=5d_0$ ) % $\geq 20$ ; impact work ISO-V KV J -40°C $\geq 47$ .
Welding Characteristics	
Welding characteristics:	Re-drying: not necessary; shielding gases: Argon + 15-25% CO <sub>2</sub> ; Welding with standard GMAW-facilities possible.
Dimension and spool form:	Ø 1,2 mm, 16 kg spools & 250 kg eco-drums; Ø 1,4 mm, 250 kg eco-drums
Additional requirements:	Approvals: TÜV, DB, ABS, BV, GL, DNV, LR, CE
Remarks:	Polarity: DC (+)

### Competitive Analysis / Benchmarking

Producer	C	Si	Mn	P	S	Cr	Ni	Mo	V	Cu	Ti	B	Zr	O <sub>2</sub>
Competitor	0,057	0,69	1,47	0,006	0,029	0,16	0,02	0,04	0,005	0,03	0,012	0,0005	0,005	0,054
<b>BÖHLER HL 51-FD</b>	<b>0,047</b>	<b>0,77</b>	<b>1,72</b>	<b>0,009</b>	<b>0,009</b>	<b>0,02</b>	<b>0,02</b>	<b>0,02</b>	<b>0,005</b>	<b>0,09</b>	<b>0,005</b>	<b>0,0005</b>	<b>0,005</b>	<b>0,047</b>

Product Names	Re N/mm <sup>2</sup>	Rm N/mm <sup>2</sup>	A %	ISO-V J @RT	ISO-V J @-20°C	ISO-V J @-30°C	ISO-V J @-40°C
Competitor	462	547	27	133, 140, 132, 135	72, 85, 74, 77	54, 63, 25, 47	21, 12, 19, 17
<b>BÖHLER HL 51-FD</b>	<b>539</b>	<b>628</b>	<b>25</b>	<b>136, 133, 125, 131</b>	<b>72, 97, 90, 86</b>	<b>82, 85, 76, 81</b>	<b>46, 57, 55, 53</b>

### Approvals

Authority	TÜV	DB	ABS	BV	DNV	GL	LR	CE
Further details if applicable	11163.	42.014.29	ø 1,2 mm	ø 1,2 mm		ø 1,2 mm		