

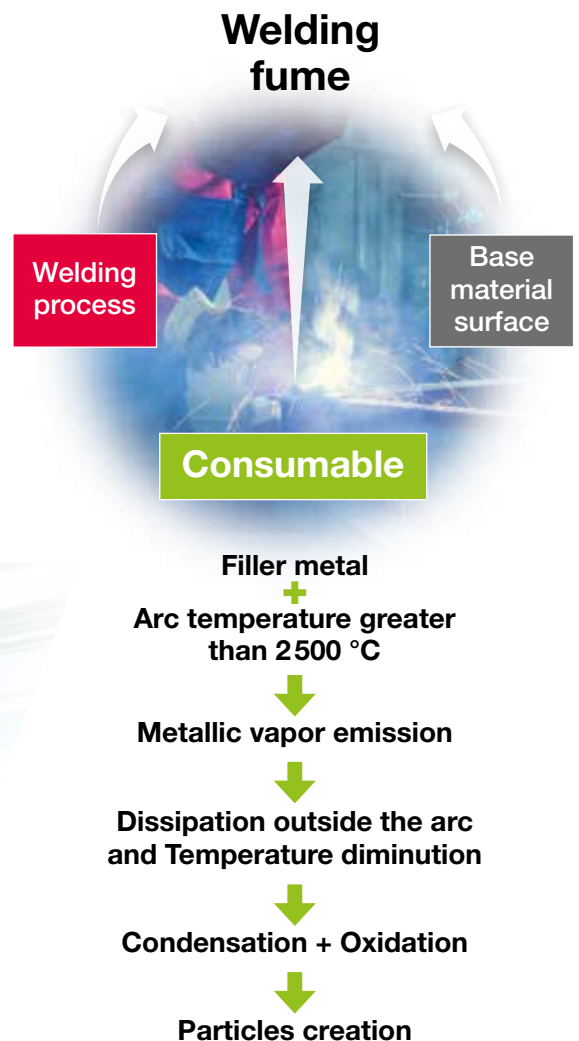
# **CLEARINOX RANGE**

*Low Hexavalent  
Chromium Emission  
Consumables*



# Help employers create a safer welding environment is a priority

Welding fume emission rates are influenced by different factors such as welding consumables, welding process selection & parameters and base materials. It is important to understand each factor and their influence in fume emission rate in order to reduce generation of CrVI in the fume. Ensure the base material is clean, optimize your welding parameters for the application and use the **CLEARINOX product range**, one of the most advanced consumables in reducing overall fume emission rates and the concentration of CrVI in the welding fume.



## How can I reduce CrVI in welding fume ?

**CLEARINOX consumables** reduce the CrVI emission rate. Use of **CLEARINOX** products **in conjunction with a fume control strategy** to minimize worker exposure to CrVI in welding fume.

LOWER HEXAVALENT CHROMIUM CONCENTRATION

# MMA range CLEARINOX E

## Available in 308L, 316L and 309L

### Double coated stick electrodes

High operator appeal and control due to the more stable and focused arc transfer:

- ⇒ Suitable for root pass
- ⇒ Lower porosity
- ⇒ Good striking and restriking
- ⇒ Excellent slag removal

### Bead appearance after welding

- ⇒ Excellent behaviour in flat position
- ⇒ Good striking and restriking
- ⇒ Excellent slag removal
- ⇒ Low fumes residues along bead line less cleaning



**CLEARINOX E 308L**

**Competition E 308L-17**

### Higher efficiency



**CLEARINOX E 308L**



**Competition E 308L-17**

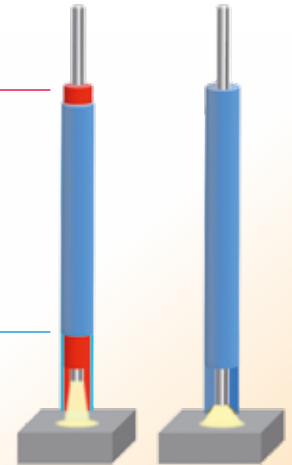
- ⇒ Lower overheating
- ⇒ Lower stub end thus saving

### Understanding double-coated technology

Inside coat provides:

- better arc protection due to greater depth of the cone that is formed between the outer coating and core
- high arc "stiffness" and burning stability
- stable and low-spatter drop transition

Outside coat provides a slag metallurgically effective



### Available In DRY PACK

- ⇒ No rebaking, no holding oven and no quiver
- ⇒ Can be used right after opening and during 8h



### Ordering information

Product name	Ø (mm)	Length (mm)	Quantity		Reference
			Per pack	Per Box	
<b>CLEARINOX E 308L</b>	2.5	300	90	540	W000387142
	3.2	350	55	330	W000387152
	4	350	40	240	W000387153
	5	350	20	120	W000387154
<b>CLEARINOX E 316L</b>	2.5	300	90	540	W000387159
	3.2	350	55	330	W000387160
	4	350	40	240	W000387161
	5	350	20	120	W000387162
<b>CLEARINOX E 309L</b>	2.5	300	90	540	W000387155
	3.2	350	55	330	W000387156
	4	350	40	240	W000387157
	5	350	20	120	W000387158

### Specifications

Product name	AWS A 5.4	ISO 3581-A	Chemistry									Typical Ferrite	Mechanical properties			
			C	Mn	Si	Cr	Ni	Mo	S	P	WRC -92	RP0.2	RM	Elongation (%)	Impact toughness (J)	
<b>CLEARINOX E 308L</b>	E 308L-17	E 19 9 L R 22	0.03	0.8	1	19.5	10	-	0.01	0.025	5-10 (6)	450	570	40	60J @ +20 °C	
<b>CLEARINOX E 316L</b>	E 316L-17	E 19 12 3 L R 22	0.03	0.8	1	19.5	10	2.7	0.01	0.025	5-10 (8)	450	570	40	60J @ +20 °C	
<b>CLEARINOX E 309L</b>	E 309L-17	E 23 12 L R 22	0.03	0.9	1	24.0	13	-	0.01	0.025	8-15 (11)	480	580	40	55J @ +20 °C	

# FCAW range CLEARINOX F

## Available in 308L, 316L and 309L

### Features

**High operator appeal and control due to the more stable and focused arc transfer:**

- ➔ As unparalleled consistency in weldability and mechanical properties as standard grades
- ➔ Eliminates typical disadvantages of GMAW and SMAW welding (lack of penetration, cold laps, slag inclusions)
- ➔ Reduced welding cost compared to GMAW, standard M21 shielding gas is used
- ➔ Works better than GMAW both on standard CV and pulse welding modes
- ➔ Very good weld appearance and regularity
- ➔ Optimal slag system helps to achieve best results



### Specifications

Product name	Chemistry								Typical Ferrite		Mechanical properties					
	C	Mn	Si	Cr	Ni	Mo	S	P	WRC -92	RP0.2	RM	Elongation (%)	Impact toughness (J)			
													-20 °C	-60 °C	-110 °C	-196 °C
<b>CLEARINOX F 308L</b>	0.03	1.3	0.7	19.5	10	-	0.01	0.02	3-12 (7)	400	570	45	50	-	-	30
<b>CLEARINOX F 316L</b>	0.03	1.3	0.7	18.5	12	2.7	0.01	0.02	3-12 (7)	470	580	35	50	-	38	-
<b>CLEARINOX F 309L</b>	0.03	0.8	0.7	23.0	13	-	0.01	0.02	10-30 (14)	400	550	40	45	40	-	-

### Ordering information

Product name	AWS A5.22	ISO 17633	Ø (mm)	Weight (kg)	Reference
<b>CLEARINOX F 308L</b>	E308LT1-1 E308LT1-4	17633-A: T 19 9 L P C 1 17633-A: T 19 9 L P M 1 17633-B: TS308L-FB1	1.2	15	W000387175
<b>CLEARINOX F 316L</b>	E316LT1-1 E316LT1-4	17633-A: T 19 12 3 L P C 1 17633-A: T 19 12 3 L P M 1 17633-B: TS316L-FB1	1.2	15	W000387177
<b>CLEARINOX F 309L</b>	E309LT1-1 E309LT1-4	17633-A: T 19 12 3 L P C 1 17633-A: T 19 12 3 L P M 1 17633-B: TS316L-FB1	1.2	15	W000387176

### Recommended starting parameters

Welding position	WFS (m/min)	Current (A)	Voltage (V)	Travel speed (cm/min)
<b>PF</b>	7 - 9	160 - 180	25.5 - 26.5	12 - 16

EXPOSURE TO CrVI REDUCED





# CLEARINOX

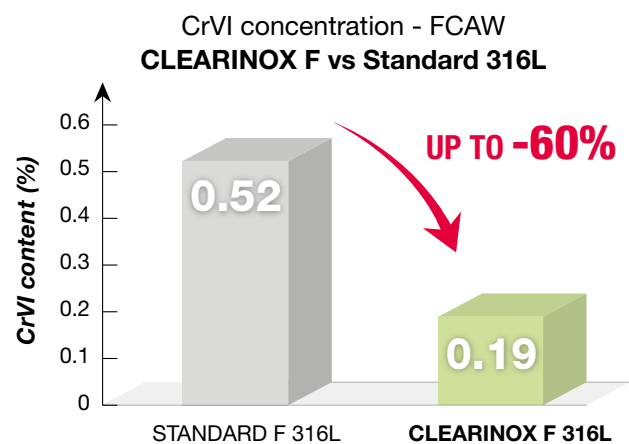
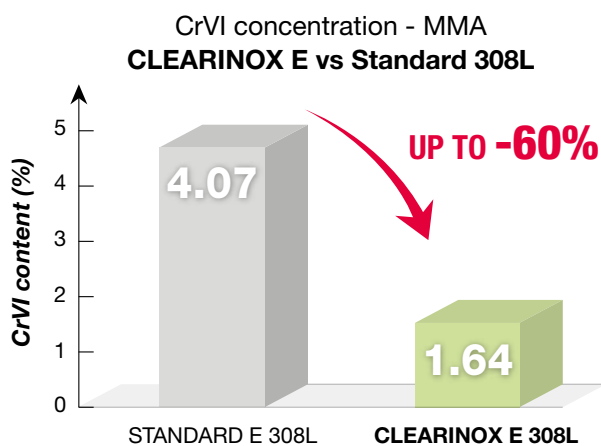
Innovative range of stick electrodes and flux-cored wires

**which significantly reduce your welding fume and emission of CrVI.**

## Comparative fume characteristics

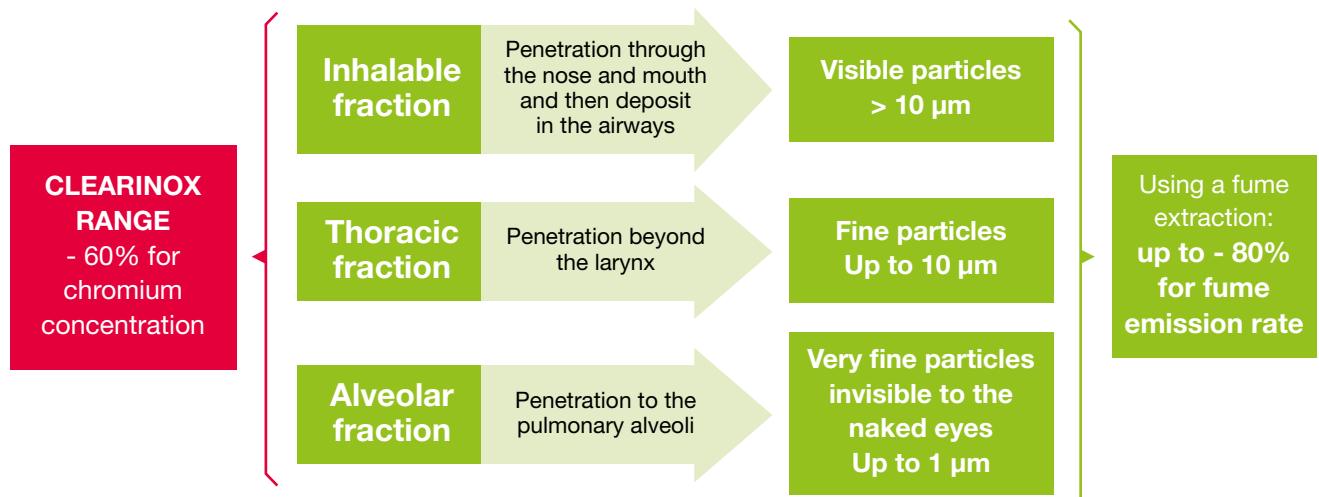
Results generated by TWI (The Welding Institute Ltd), Cambridge UK, June 2016.

- ⇒ Emission rate testing according to EN ISO 15011-1,4
- ⇒ Fumes analysis according to BS ISO 16740:2005
- ⇒ Welding performed with an inverter on degreased stainless steel (AISI 304)
- ⇒ Welding conditions:
  - Electrode: 115 A - 29V
  - Flux cored wire: 200 A - 28V
  - Gas protection: M21
- ⇒ A reduction up to -40% is also observed for fume rate using Clearinox range
- ⇒ Comparable results in fume emission and CrVI concentration between 308L, 316L and 309L



## Different types of particles ranked by diameter

Welding processes such as FCAW or SMAW produce 80% of a solid phase. Solid particles have a diameter between 0.2 - 5  $\mu\text{m}$



Source: Aide-mémoire technique, ed 6132, INRS, 2012



[www.oerlikon-welding.com](http://www.oerlikon-welding.com)

#### CUSTOMER ASSISTANCE POLICY

The business of Lincoln Electric is manufacturing and selling high quality welding equipment, consumables, and cutting equipment. Our challenge is to meet the needs of our customers and to exceed their expectations. On occasion, purchasers may ask Lincoln Electric for information or advice about their use of our products. Our employees respond to inquiries to the best of their ability based on information provided to them by the customers and the knowledge they may have concerning the application. Our employees, however, are not in a position to verify the information provided or to evaluate the engineering requirements for the particular weldment. Accordingly, Lincoln Electric does not warrant or guarantee or assume any liability with respect to such information or advice. Moreover, the provision of such information or advice does not create, expand, or alter any warranty on our products. Any express or implied warranty that might arise from the information or advice, including any implied warranty of merchantability or any warranty of fitness for any customers' particular purpose is specifically disclaimed.

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