



# G-TECH 5CrMo



CREEP RESISTING STEELS  
5CrMo

## DESCRIPTION

### Basic coated electrode for creep resisting 5%Cr-0,5%Mo steels

Basic coated electrode designed for the welding of Cr-Mo alloyed steels. The 5Cr-0.6Mo type weld metal develops a martensitic-bainitic microstructure that ensures excellent mechanical properties both in tempered and quenched-and-tempered conditions. It is particularly suitable for joint welding of creep-resistant steels and cast steels used in the thermal power and chemical industries, and it is approved for long-term service under creep conditions up to 650 °C. The electrode can be used in all positions except vertical down, offering a stable arc, excellent weldability, and easy slag removal. During solidification, the deposit remains crack-free, ensuring reliable performance. Designed for high-temperature service, it is widely applied in petroleum refineries, pipelines, heat exchangers, pressure vessels, and boiler superheaters.

## SPECIFICATIONS

EN ISO 3580-A	E Cr Mo 5 B 42	AWS A5.5	E8015-B6/E8016-B6
Shielding	-	Positions	PA, PB, PC, PD, PE, PF
Current	DC+	Packaging Type	Carton box

## ASME QUALIFICATIONS

F-No (QW432)	4
A-No (QW442)	5

CHEM. COMP. %		MECHANICAL PROPERTIES		MIN. PER STANDARD			PRODUCT
C	0.07	Tensile strength R <sub>m</sub> MPa		550		620	
Mn	0.8	Yield strength R <sub>p0.2</sub> MPa		460		460	
Ni	0.05	Elongation A (L <sub>0</sub> =5d <sub>0</sub> ) %		19		19	
Cr	5	Impact Charpy ISO-V		-		130J @ 20°C	
P	0.015	Impact Charpy ISO-V		-		-	
S	0.01	<b>WELDING PARAMETERS</b>					
Mo	0.5		2.5 mm	3.2 mm	4.0 mm	5.0 mm	
Si	0.5	Ampere	65A - 90A	90A - 130A	140A - 180A	190A - 230A	
Cu	0.05	Voltage	-	-	-	-	
		Packaging	45 pcs/kg	21 pcs/kg	14 pcs/kg	10 pcs/kg	
		Packaging Type	Carton box	Carton box	Carton box	Carton box	

## NOTES

Pcs/kg is indicative, actual number may vary ± 5%. Preheat and interpass temperature 200 to 300 °C, post-weld heat treatment of test piece 730 to 760°C for 1h.



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# 5CrMo

DESCRIPTION

CREEP RESISTING STEELS

5CrMo

## APPLICATION

Designed to operate in high-temperature services up to approximately 600 °C, this material offers significant corrosion resistance in conditions of superheated steam, hot gases containing hydrogen, and crude oil with high sulfur content. Primarily used in **\*\*boiler superheater tubing, heat exchangers, piping, and pressure vessels in the petroleum industry\*\***, the 5CrMo weld metal has also proven effective for subsequent nitriding processes, such as in the repair of 3Cr-1Mo-V and 2Cr-Mo-1Al steels used for molds intended for plastic injection molding.

## ALLOY TYPE

5%Cr-½%Mo steel for elevated temperature service up to 600°C.

## MICROSTRUCTURE

In the PWHT condition the microstructure consists of tempered bainite.

## MATERIALS

**EN W.Nr.:** 12CrMo 19 5 (1.7362), X7CrMo 6 1 (1.7373), X11CrMo 6 1 (1.7374), GS-12CrMo 19 5 (1.7363)

**ASTM:** A387 gr. 5, A335 gr. P5, P5b, A234 gr. WP5 (fittings), A199 gr. T5, A213 gr. T5, T5b, A182 gr. F5, F5a, A336 gr. F5, A217 gr. C5

## WELDING & PWHT

Given the hardness of the deposited metal (up to 400 HV) and its bainitic microstructure with relatively reduced fracture toughness, 5CrMo requires preheating and a minimum interpass temperature of 200 °C to prevent hydrogen-induced cold cracking. The use of controlled and well-maintained electrodes ensures a hydrogen content in the weld metal of <5 ml/100 g. For root TIG welds or when fully employing TIG welding, a lower preheat of below 150 °C may be acceptable, although faster cooling may result in partially martensitic and harder deposits. The transformation of 5CrMo during welding is completed within the operating range of 200-350 °C, allowing direct transition (at > 150 °C) to post-weld heat treatment (PWHT), followed by non-destructive examinations (NDE). If PWHT is applied after full cooling and NDE, maintaining the preheat temperature for a set period, according to thickness, is essential to aid in the dispersion of residual hydrogen. This precaution is less critical in solid wire TIG and MAG processes. The PWHT temperature for weld tempering usually varies between 705-760 °C (in accordance with ASME B31.3 705-760 °C). The minimum recommended holding time is two hours. For castings, the minimum recommended temperature for PWHT is lower, reaching temperatures up to 670 °C.

