DAIKOWT SG3 HQ

GTAW

CARBON STEELS
STRUCTURAL STEEL

DESCRIPTION

Copper-coated GTAW rod for carbon and C-Mn steels

Copper-coated GTAW rod for welding carbon and carbon-manganese steels with tensile strength up to 530 MPa. The surface treatment ensures consistent welding performance, reduced spatter, and optimal wire feeding. Used for the manufacturing of vessels, pipelines, and structural steel constructions, it allows for high wire advancement speed and a residue-free weld surface, making it particularly suitable for robotic welding processes.

SPECIFICATIONS

EN ISO 636-A	W 46 5 W 4 S i 1	**AWS A5.18**	ER70S-6
Shielding	I1	**Positions**	PA, PB, PC, PD, PE, PF
Current	DC-	**Packaging Type**	5kg carton tube

ASME QUALIFICATIONS

F-No (QW432)	6
A-No (QW442)	1

CHEM. COMP. %	DEFAULT
C	0.07
Mn	1.64
Cr	0.03
P	0.01
S	0.015
Si	0.95
Cu	0.05

MECHANICAL PROPERTIES	MIN. PER STANDARD	PRODUCT
Tensile strength R_m MPa	490	600
Yield strength $R_{p0.2}$ MPa	460	500
Elongation A (L_0=5d_0) %	22	26
Impact Charpy ISO-V	27J @ -50°C	50J @ -50°C
Impact Charpy ISO-V	-	-

WELDING PARAMETERS	1.6 mm	2.4 mm
Ampere	95A - 135A	145A - 205A
Voltage	-	-
Packaging	Ø 1,2÷3,2 mm	Ø 1,2÷3,2 mm
Packaging Type	5kg carton tube	5kg carton tube

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STRUCTURAL STEEL

DESCRIPTION

APPLICATION

Carbon-manganese steels (C-Mn) are the backbone for a wide range of applications in the structural engineering industry. Welding of these steel structures can be successfully achieved provided the material composition is known, appropriate precautions are adopted, and qualified procedures are followed. Weldability varies based on the type of C-Mn steel, and there is a risk of defects such as hydrogen cracking, solidification cracking, or reheat cracking, which depend on specific operating conditions. The proposed consumables offer effective resistance to these issues, emphasizing the importance of a carefully defined welding process. Preheating and post-weld heat treatment (PWHT) are not always necessary, but their adoption depends on the type and thickness of the base material. The desired mechanical properties in the welded joint can be achieved using appropriate consumables. However, the complex structural transformations that occur during the welding thermal cycle require careful evaluation of critical parameters such as the toughness and hardness of the heat-affected zone (HAZ).

ALLOY TYPE

Consumables for welding mild and C-Mn steels of 340-510MPa tensile strength.

MICROSTRUCTURE

Predominantly ferrite.

MATERIALS

Carbon and carbon-manganese steels encompass a wide range of structural and pressure-grade materials commonly used in construction, mechanical engineering, and industrial plant applications. Among the EN-standardized grades are non-alloy structural steels intended for general use, known for their good weldability and progressively higher mechanical strength. The “P” grades, on the other hand, are pressure vessel steels typically used in boilers and heat exchangers. Equivalent ASTM specifications cover a similar scope of applications and are widely adopted internationally for structural components, piping, and fittings exposed to pressure or high temperatures. Lastly, API specifications are typical of the oil & gas sector, particularly for the production of pipelines used in hydrocarbon transport, offering increasing levels of mechanical strength and specific performance requirements.

EN W.Nr.: S 235 JR, S 235 J0, S 235 J2+N, S 275, S 275 J0, S 275 J2+N, S 355 JR, S 355 J0, S 355 J2+N, S 355 K2+N, P 235 GH, P 265 GH, P 295 GH

ASTM: A36, A106 gr. A, A106 gr. B, A106 gr. C, A139, A210 gr. A1, A210 gr. C, A234 gr. WPB, A334 gr. 1, A216 gr. WCA, A216 gr. WCB, A216 gr. WCC

API: A, B, X42, X52, X60

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