DAIKOWM 307Si

GMAW

AUSTENITIC STAINLESS STEELS
307

DESCRIPTION

Solid wire for dissimilar joints and buffer layers

Mixed welding applications including the welding of C-Mn, stainless, hardenable and armour steels to themselves or each other. Suitable also for depositing stress relaxing buffer layers on crack sensitive base metals and hardfacing jobs. Weld metal has a high degree of corrosion resistance and resistant to operating temperatures up to 300°C and non-scaling up to 850°C. Resistance to hot cracking is provided by the high manganese content. The increased silicon results in increased weld pool fluidity to give a smooth deposit appearance.

SPECIFICATIONS

EN ISO 14343-A	G 18 8 Mn	**AWS A5.9**	(ER307Si)
Certifications	CE, TUV, DB	**Shielding**	M12, M13
Positions	PA, PB, PC, PD, PE, PF, PG	**Current**	DC+
Packaging Type	Drums, B300, D200 and D100 spools.		

ASME QUALIFICATIONS

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

FERRITE

~5 FN

PREN

18.525

CHEM. COMP. %

C	0.085
Mn	7
Ni	8
Cr	17.7
P	0.02
S	0.01
Mo	0.25
Si	0.85
Cu	0.25

MECHANICAL PROPERTIES

	MIN. PER STANDARD	PRODUCT
Tensile strength R_m MPa	500	620
Yield strength $R_{p0.2}$ MPa	350	420
Elongation A (L_0=5d_0) %	25	40
Impact Charpy ISO-V	-	50J @ -80°C
Impact Charpy ISO-V	-	-

WELDING PARAMETERS

	1.0 mm	1.2 mm
Ampere	160A - 220A	200A - 270A
Voltage	25V - 29V	26V - 30V
Packaging	Ø 0,8÷1,6mm	Ø 0,8÷1,6mm
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APPLICATION

Applications for this subfamily include the welding of different materials such as mild steels, stainless steels, hardenable and ballistic steels, both among themselves and with other metals, with or without the need for preheating. The high manganese content ensures excellent dilution tolerance and resistance to hot cracking, unlike ballistic steels and type 309, which require a high ferrite content. In some situations, this material can effectively replace those with high nickel content in joints between cast iron and stainless steels. Welds subjected to post-weld heat treatment (PWHT) maintain good ductility and toughness down to -50°C. Additionally, it offers moderate resistance to scale formation at temperatures up to 850°C. It is ideal as a cushion layer for welding or repairing steels with 13% Mn used in crushing plants or earthmoving equipment. It is also recommended as an intermediate layer on cast iron before a hard facing. This consumable is designed for surfacing operations with hardening between 200 and 400 HV, and is well-suited for repairing alloy rails, sleepers, and crossings, avoiding preheating. However, the hardening rate is lower compared to steel with 13% Mn, and overlays beyond a single layer may collapse under heavy rolling loads.

ALLOY TYPE

Strong tough austenitic weld metal composition for dissimilar joints and buffer layers.

MICROSTRUCTURE

Consists of austenite with approximately 5FN.

MATERIALS

Dissimilar combinations of C-Mn, stainless, hardenable, wear-resistant and armour steels. Suitable for 13% Mn steel also known as Hadfield steel.

WELDING & PWHT

In general, preheating is not necessary, unless working with very thick sections. However, in-service conditions require consideration of Heat-Affected Zone (HAZ) properties for high-carbon hardenable steels. When welding steels with 13% Mn, it is essential to minimize brittleness and the risk of cracking by keeping the workpiece cool. Therefore, the following precautions must be applied: no preheating, controlling interpass temperature to a maximum of 150°C, low heat input, making small weld beads, and cooling with water if necessary.