

## Covered Arc Welding Electrodes for Surfacing

Brand Name	Identification Color		Specifica- tion	Dia. mm	Application and Characteristics
	End	Sec- ondary	JIS		
H-13M	Reddish brown	Brown	☆Z 3251 DFMA- 250-B	4.0 5.0 6.0	Filling up cavities of high manganese cast steel and surfacing of parts subjected to impact abrasion such as boring mills. Weld metal of austenitic structure has chemical composition similar to high manganese cast steel SCMnH2 and the hardness of about 250-300 Vickers as welded. Hardness goes up to 450-550 Vickers after work hardened and improves abrasion resistance remarkably.
H-13MN	Reddish brown	White	☆Z 3251 DFMB- 250-B	4.0 5.0	Filling up cavities of high manganese cast steel and surfacing of parts subjected to impact abrasion such as boring mills. Weld metal has the hardness of about 200~250 Vickers as welded and is work hardened to 450~550 Vickers, like H-13CrM, but toughness and crack resistance are better since it contains Ni.
H-13CrM	Reddish brown	Brown	—	4.0 5.0	Surfacing of hot roll dies, tongue punches and hot shears subjected to impact abrasion at high temperatures. Weld metal of austenitic structure with finely precipitated carbide has high hardness at temperatures of more than 600°C showing high resistance to abrasion under high temperatures.
H-MCr	Light brown	—	☆Z 3251 DFME- 250-B	4.0 5.0 6.0	Joining of high manganese steel and carbon steel and surfacing of hot shears, forging molds, hot rolls and dies subjected to impact abrasion at high temperatures. Weld metal of Mn-Cr type austenitic structure is hardened by impact and shows excellent toughness and resistance to abrasion under high temperatures and impact.
H-11Cr	Blue	—	☆Z 3251 DF4A- 500-B	3.2 4.0 5.0	Surfacing of hot shears, press dies, tongue punches, hydraulic turbine liners, and dredger pump casings and liners subjected to abrasion under high temperatures. Weld metal of austenitic structure a welded shows resistance to abrasion under comparatively high temperatures.

Note : Figure of illustration relating to the symbol of welding position in the table mentioned above.



Typical Chemical Composition of Weld Metal (%)							Typical Hardness of Weld Metal (HV)		
C	Si	Mn	Cr	Mo	V	Others	As Welded	After work-hardened	PWHT
0.49	0.16	13.9	—	—	—	—	280	540	—
0.90	0.26	12.61	—	—	—	Ni: 5.60	235	510	—
0.19	0.51	12.16	13.71	1.56	1.13	Ni: 2.45 W: 3.45	295	—	700°C 160
0.11	0.58	15.55	15.11	—	—	Ni: 2.45	215	490	—
0.21	0.40	1.26	11.85	—	—	—	540	—	—