

# Welding Consumables for Coal-fired Steam Boiler

## Welding Consumables for Ferritic Heat-resistant Low-Alloy Steel

Welding process	Product	AWS applicable code	Polarity	Chemical composition of weld metal (mass%)														Mechanical properties of weld metal				
				C	Si	Mn	P	S	Cu	Ni	Cr	Mo	V	Al	Nb	N	Mn+Ni	PWHT	0.2% YS (MPa)	TS (MPa)	El. (%)	IV (J)
SMAW	TRUSTARC™ CM-95B9	A5.5-2006 E9015-B9	DCEP	0.10	0.20	0.82	0.006	0.001	0.03	0.49	9.09	1.03	0.25	0.006	0.03	0.05	1.31	760°Cx2h	657	771	21	vE20°C : 71
	TRUSTARC™ CM-96B9	A5.5-2006 E9016-B9	DCEP	0.10	0.23	0.83	0.005	0.001	0.03	0.48	9.08	1.06	0.24	0.006	0.03	0.05	1.31	760°Cx2h	651	768	22	vE20°C : 74
SAW	TRUSTARC™ TRUSTARC™ PF-90B9 / US-90B9	A5.23-2007 F9PZ-EB9-B9	DCEP	0.10	0.21	0.92	0.009	0.004	0.01	0.50	9.00	0.97	0.21	0.010	0.04	0.04	1.42	760°Cx2h	582	716	23	vE20°C : 37
	TRUSTARC™ TRUSTARC™ PF-200S / US-90B9	A5.23-2007 F9PZ-EB9-B9	AC	0.09	0.20	0.82	0.008	0.005	0.01	0.46	8.80	0.92	0.21	0.010	0.04	0.04	1.28	760°Cx2h	609	733	22	vE20°C : 70
GTAW	TRUSTARC™ TG-S90B9	A5.28-1996 ER90S-B9	DCEN	0.12	0.25	0.75	0.006	0.004	0.01	0.49	9.20	1.00	0.21	0.003	0.05	0.04	1.24	760°Cx2h	706	809	22	vE0°C : 160

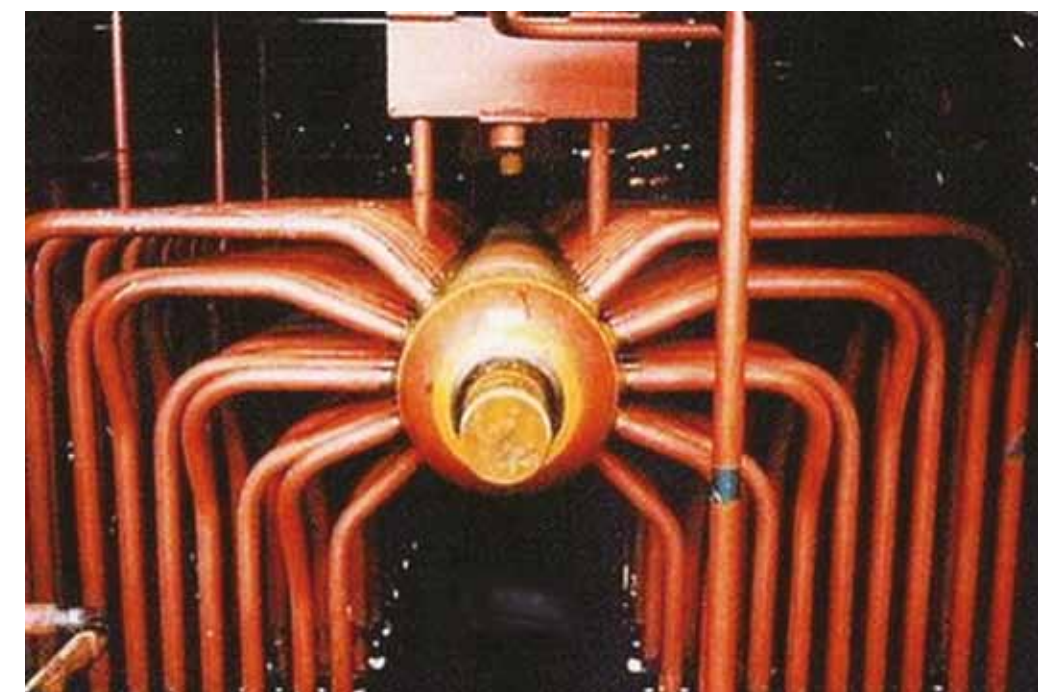
<Recommended PWHT temp. : 710~800°C>

## Application

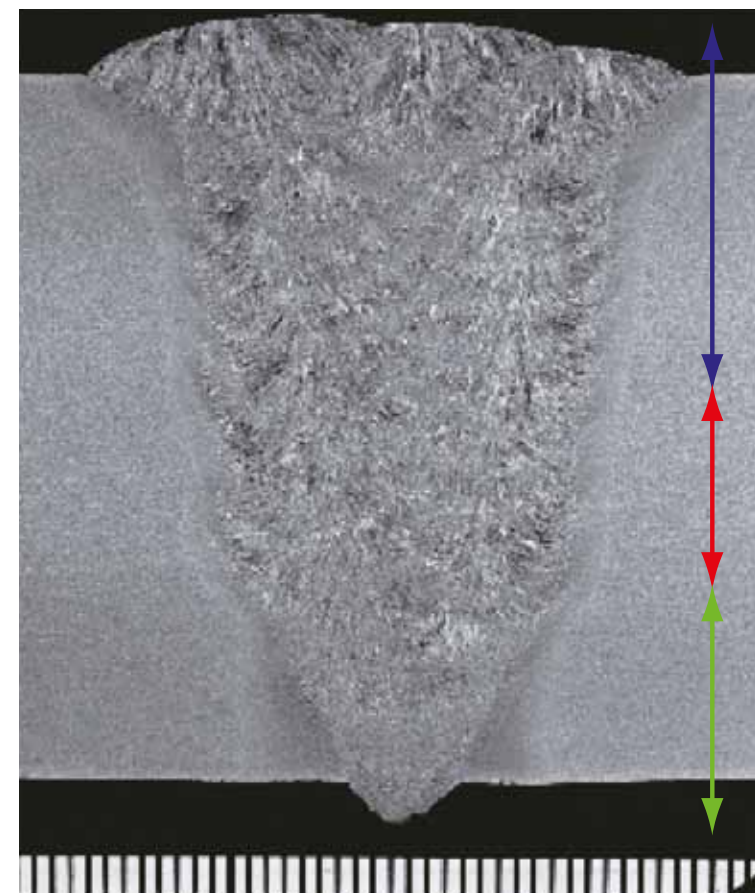
For welding superheater tube & Header of coal-fired Steam Boiler plant, operating under high heat, high pressure.



Coal-fired Steam Boiler Plant



Header



PF-90B9 / US-90B9  
Microstructure of all weld metal

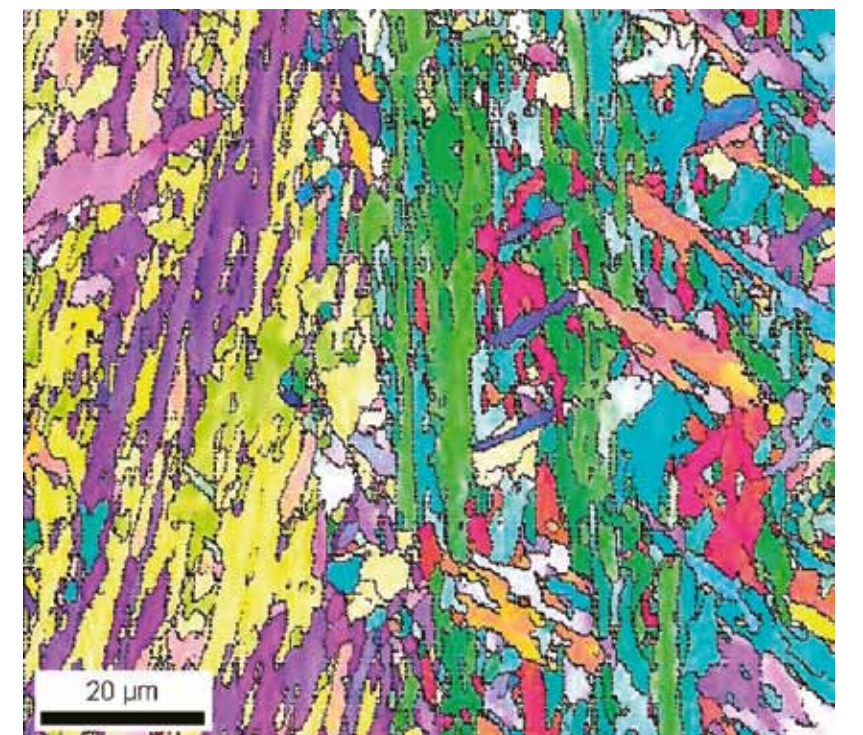
Pass sequence  
 1st~2nd : TG-S90B9  
 3rd~5th : CM-96B9  
 6th~Final layer : PF-90B9 / US-90B9

Microstructure of weld metal has martensite as welded, and after PWHT, it comes to tempered martensite.

Sufficient creep rupture property of Mod. 9Cr-1Mo weld metal.

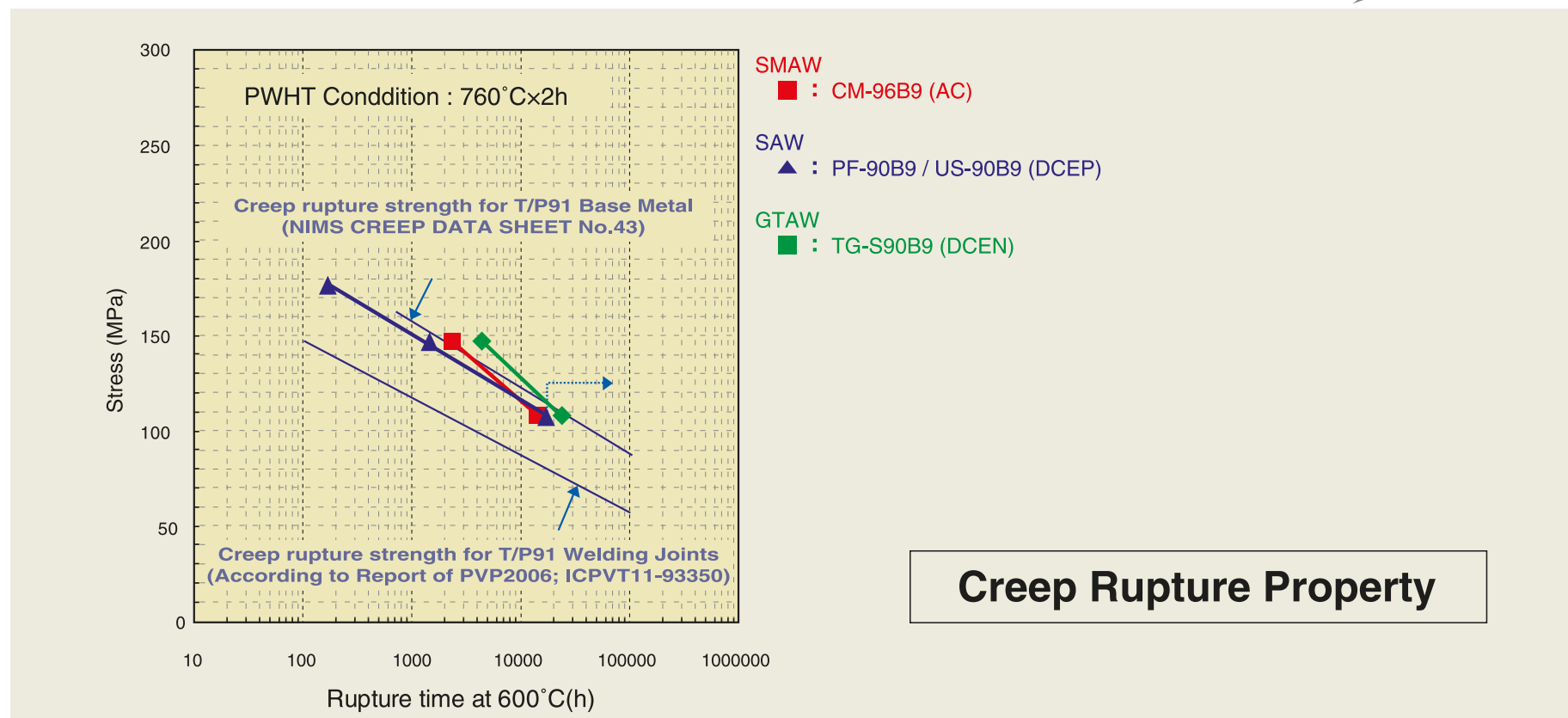


PF-90B9 / US-90B9 Microstructure of all weld metal



EBSP Misorientation Image

PF-90B9 / US-90B9 Microstructure of all weld metal



## Welding Consumables for austenitic heat-resistant stainless steel

### Line-up Austenitic welding Consumables for Ultra Super Critical Boiler piping.

Product	Applicable base metal	Type of filler metal	Chemistry of filler metal
PREMIARC™ TG-Super304H	SUPER304H® ASTM A213 S30432, SUS304J1HTB	Filler wire for GTAW	19Cr-16Ni-3Cu-3Mn-2W -0.5Nb-0.2N-0.1C
PREMIARC™ NC-B1AS	TEMPALOY® AA-1 ASTM A213 S30434, SUS321J2HTB	Covered electrode for SMAW	19Cr-14Ni-3Cu-2.4Mo 1.6Mn-0.4Nb-0.13C
PREMIARC™ TG-S1AS		Filler wire for GTAW	
PREMIARC™ NC-B3A	TEMPALOY® A-3 ASTM A213 S30942, SUS309J4HTB	Covered electrode for SMAW	22r-16Ni-1.4Mn -0.6Nb-0.13N
PREMIARC™ TG-S3A		Filler wire for GTAW	

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