

MATERIAL DATA SHEET · CHROME-MOLY ALLOY STEEL

ASTM A234 WP91 Type 1 — Chemical Composition & Mechanical Properties

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ASTM A234 WP91 Type 1 is a chrome-moly alloy steel grade for wrought butt-weld fittings (UNS K90901, EN / W.Nr 1.4903). It is also known as P91 / 9Cr-1Mo-V. This sheet summarises its chemical composition limits, minimum mechanical properties, heat treatment and typical service. Teshi Group manufactures flanges and fittings in this grade.

At a glance

Material family	Chrome-moly alloy steel
Product form	Wrought butt-weld fittings
UNS	K90901
EN / W.Nr	1.4903
Also known as	P91 / 9Cr-1Mo-V

Mechanical properties

Tensile strength, min	585 MPa
Yield strength (0.2 % offset), min	415 MPa
Elongation, min	20 %
Tensile strength, max	760 MPa
Hardness	248 HBW max

Chemical composition (weight %)

C 0.08–0.12	Mn 0.30–0.60	P 0.020 max	S 0.010 max	Si 0.20–0.50
Cr 8.0–9.5	Ni 0.40 max	Mo 0.85–1.05	V 0.18–0.25	Nb 0.06–0.10
N 0.030–0.070	Al 0.02 max			

Single values are maximums unless shown as a range or "min".

Heat treatment

Normalised 1040–1080 °C and tempered 730–800 °C

Typical service

Main steam and hot reheat lines in power plants

International equivalents (nearest)

USA — ASTM / ASME	ASTM A234 WP91 Type 1 · ASME SA-234 WP91 Type 1
USA — UNS	K90901
Europe — EN designation	X10CrMoVNb9-1
Europe — W.Nr	1.4903
Japan — JIS	STPA28 (JIS G3458) / SFVAF28 (JIS G3203)
China — GB / NB	10Cr9Mo1VNbN (GB/T 5310)

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