

CHROME MOLY ALLOY STEEL MATERIAL FLANGES

USAGE OF CHROME MOLY ALLOY FLANGES

Chrome moly flanges find use in various applications, particularly in connecting pipes, valves, pumps, and equipment to form piping systems. They excel in applications involving corrosive or high-temperature fluids or gases. Industries benefiting from chrome moly flanges include oil and gas, refineries, power generation, and chemical processing.



CHROME MOLY FOR WHEN YOU NEED HIGH STRENGTH

A mid tier metal category typically similar to carbon steel but with an added chromium content. Due to its lower nickel content, chrome is generally more cost effective on a per pound basis in comparison to stainless steel. Common grades include F11, F22, F5, and F9. Much like 304 and 316 stainless, these chrome options fall under the specification ASTM A182.

This specification calls out for F11, often referred to as “one and a quarter chrome.” Similarly, F22 is often called “two and a quarter chrome.” Either of these options is an excellent substitution for the outdated F1 material grade, which is no longer commercially available. Note that F5 and F9 have chromium content in the range of 4-6% and 9% respectively. These chrome flange grades are slightly less cost effective than their “one and a quarter” or “two and a quarter” cousins. Choose F11 and F22 when chromium content is less of a concern (or as a replacement for the obsolete A182 F1), and F5 or F9 for higher chromium content applications.

Note that each subset of chromium grade flanges, designated per A182 by their class number, will result in slightly different mechanical properties. For example, F11 chrome subsets are Class 1, 2, and 3. Each class has a higher yield strength, tensile strength, and Brinell hardness value than the one before it. For more information, please reference the ASTM A182 specification or give us a call to discuss.

Chrome moly flanges offer a level of chromium not quite reaching the levels of common stainless steels like 304 and 316, but more so than typical A105. In comparison to carbon steel, the higher levels of chromium provide a superior hardness and overall mechanical integrity, whereas the higher molybdenum content is useful in resisting oxidation and corrosion.

Under the right circumstances, chrome moly flanges are an excellent alternative to stainless steel when ordered in higher quantities. They are of course mostly utilized in vessels and pipe assemblies calling for chrome moly type fittings such as pipe, elbows, and tees.

Advantages

Chrome Moly offers the following advantages:

- High Tensile Strength
- Corrosion Resistance
- High-Temperature Resistance
- Wear Resistance
- Hardenability
- Ease of Fabrication

Common Grades and Typical Applications

Grade	INDUSTRIES
P5/WP5/F5	PETRO CHEMICAL
P9/WP9/F9	
P11/WP11/F11	
P22/WP22/F22	POWER & ENERGY
P91/WP91/F91	

Chemical and Mechanical properties of Chrome-Moly grades

Grade	UNS	C %	Cr %	Mo %	Si %	Tensile	Yield Point	Elongation
P5/WP5/F5	K41545	0.15	4.00 - 6.00	0.45 - 0.65	0.50	415	205	30
P9/WP9/F9	S50400	0.15	8.00 - 10.00	0.90 - 1.10	0.25 - 1.00	415	205	30
P11/WP11/F11	K11597	0.05 - 0.15	1.00 - 1.50	0.44 - 0.65	0.50 - 1.00	415	205	20
P22/WP22/F22	K21590	0.05 - 0.15	1.90 - 2.60	0.87 - 1.13	0.50	415	205	30
P91/WP91/F91	K91560	0.08 - 0.12	8.00 - 9.50	0.85 - 1.05	0.20 - 0.50	585	415	20

Available size ranges in Chrome-Moly to ASME B36.10 / ASME B36.19 specifications

Category	Construction	Size Range (DN)	SCH/Ratings	Standard
Pipe	Seamless	015 - 400	10S - XXS	ASTM A335 ASTM A691
	Welded	250 - 600		
BW Fittings	Seamless	015 - 400	10S - XXS	ASTM A234
	Welded	300 - 600		
SW Fittings	Forged	015 - 100	CL 3000 - 6000	ASTM A182
Flanges	Forged	015 - 600	CL 150 - 2500	ASTM A182

