

ASME P-Numbers

ASME P numbers, also known as P-No, are a system of grouping base metals for welding procedures and qualifications. The American Society of Mechanical Engineers (ASME) has developed this system to simplify the standardization of welding procedures and provide a better understanding of the properties of base metals.

The P number system categorizes different materials based on similar welding characteristics, allowing welders to easily identify the appropriate welding processes, including the appropriate filler metals and welding procedures.

This system is particularly crucial in industries such as oil and gas, petrochemical, and power generation, where welding different materials is a common practice.

Each P number is associated with specific groups of materials. For instance, P-No. 1 includes carbon and low alloy steels, while P-No. 8 includes stainless steels. These numbers provide a quick reference to identify the group of materials being welded.

Understanding ASME P numbers is essential for welders, engineers, and anyone involved in welding operations or inspections. This knowledge ensures that welding procedures are performed with the right materials, reducing the risk of defects and ensuring the overall quality and integrity of welded structures.

In summary, ASME P numbers play a crucial role in simplifying the identification and selection of appropriate materials for welding operations. By providing a standardized system for grouping base metals, it contributes to the overall quality and safety of welded structures in various industries.

P-NUMBER CHART

GROUPING OF BASE METALS INTO P-NUMBERS

P-NUMBER	GENERAL DESCRIPTION	TYPICAL MATERIAL SPECIFICATIONS WITHIN THIS P-NUMBER GROUP
1	Carbon Steel	SA-36, SA-106 GR B, SA-350 GR. LF1, SA-516 GR. 70
3	0.5% Cr & 0.5% Mo Steels	SA-209 T1, SA-213 T2, SA-234 WP1, SA-335 P1 & P2
4	1.25% Cr-Mo Steels	SA-182 F11 CL. 1, SA-213 T11, SA-335 P11
5A	2.25% Cr 1% Mo Steels up to 75 ksi	SA-182 F22 CL. 1, SA-213 T22, SA-335 P22
5B	5% to 9% Cr-Mo Steels up to 85 ksi	SA-182 F5 & F9, SA-213 T5 & T9, SA-234 WP5 & WP9
5C	2.25% to 9% Cr-Mo Steels over 85 ksi	SA-182 F3V, SA-336 F3V, SA-508 3V, SA-541 3V
6	Stainless Steel - Martensitic	SA-216 TP410 & TP429, SA-182 F6B, F6NM & F429, A473 410
7	Stainless Steel - Ferritic	SA-240 TYPE 405, 409, & 410S, SA-240 TYPE 430
8	Stainless Steel - Austenitic	SA-182 F304L, SA-182 F316L, SA-240 TYPE 304L & 316L
9A	2% Ni Steel	SA-182 FR, SA-234 WPR, SA-333 GR. 9, SA-350 LF9
9B	3% Ni Steel	SA-333 3, SA-350 LF3, CL. 2
9C	4.5% Ni Steel	SA-352 LC4
10A	Low Alloy Steel	SA-225 C & D, SA-487 GR. 1, CL. A & B
10B	Low Alloy Steel	SA-213 T17
10C	Low Alloy Steel	SA-612 UNS K02900
10H	Stainless Steel - Duplex	SA-240 S31803, S32205 & S32750, SA-789 S32205
10I	Stainless Steel - High Cr	SA-182 FXM-27CB, SA-240 S44635, SA-336 FXM-27CB
10J	Stainless Steel - High Cr & Mo	SA-240 S44700, SA-268 S44735, SA-479 S44700
10K	Stainless Steel - High Cr, Mo & Ni	SA-240 S44700, SA-268 S44735, SA-479 S44700
11A	HSLA (High Strength Low Alloy)	SA-333 8, SA-420 WPL8, SA-533 TYPE A, CL. 3
11B	HSLA (High Strength Low Alloy)	SA-517 A, E, F, & B, SA-592 F
11C	Age Hardening Alloy Steel Forgings	A859 TYPE A, CL. 1
15E	9% Cr, Creep strength enhanced	SA-182 F92, SA-213 T91 & T92, SA-335 P91 & P92
21	Aluminum - 1000 & 3000 series	SB-209 A95050, SB-221 A91100, SB-234 A91060
22	Aluminum - 5000 series	SB-209 A95052, SB-221 A95454, SB-234 A95052
23	Aluminum - 6000 series	SB-209 A96061, SB-221 A96061, SB-221 A96063
25	Aluminum - 5000 series	SB-209 A95456, SB-221 A95456, SB-241 A95086
26	Aluminum Castings	SB-26 A24430 & A03560
31	Copper	SB-111 C10200, SB-152 C10400, SB-187 C10200
32	Brass	SB-111 C28000, SB-135 C23000, SB-283 C46400
33	Cu-Si Alloys	SB-198 C65500, SB-283 C65500
34	Cu-Ni Alloys	SB-111 C70400, SB-359 C70600, SB-466 C71500
35	Aluminum Bronze Alloys	SB-111 C60800, SB-148 C95500, SB-150 C61400
41	Nickel Alloys	SB-160 N02200, SB-161 N02200, SB-162 N02200
42	Ni-Cu Alloys	UNS' N04400, N04405 (MONEL)
43	Ni-Cr-Fe Alloys	UNS' N06600, N06625, N10276 (INCONEL & HASTELLOYS)
44	Ni-Mo & Ni-Mo-Cr Alloys	UNS' N06022, N10629, N10665, N10675 (HASTELLOYS)
45	Ni-Cr-Fe & Ni-Fe-Cr-Mo-Cu Alloys	UNS' N08020, N08800, N08810, N08825 (INCOLOYS)
46	Ni-Cr-Si Alloys	UNS' N06045, N08330, N12160
49	Ni-Cr-Co-Mo-Fe-W Alloys	SB-815 UNS R31233 SB-818 UNS R31233
51	Titanium Alloy 35-58 ksi	UNS' R50250, R50400, R52400, R52404
52	Titanium Alloy 65-70 ksi	UNS' R50550, R53400
53	Titanium Alloy 90 ksi	UNS' R56320, R56323
61	Zirconium 55 ksi	SB-523 TYPE R60702 - ALL PRODUCT FORMS UNS R60702
62	Zirconium 70-80 ksi	SB-523 TYPE R60705 - ALL PRODUCT FORMS UNS R60705

TO REDUCE THE NUMBER OF PROCEDURE QUALIFICATIONS REQUIRED, BASE METALS HAVE BEEN GROUPED INTO PROCEDURE GROUPS WITH ESSENTIALLY COMPARABLE CHARACTERISTICS ("P" IS FOR PROCEDURE)

1. THESE GROUPINGS OR ASSIGNMENTS DO NOT IMPLY THAT BASE METALS MAY BE INDISCRIMINATELY SUBSTITUTED WITHOUT CONSIDERATION OF COMPATIBILITY; SOUND ENGINEERING SENSE MUST GOVERN. THE MATERIAL SPECIFICATION IS ESSENTIALLY EQUIVALENT TO THE PRODUCT FORM, THE TYPE OR GRADE OF THAT SPECIFICATION CAN DRAMATICALLY CHANGE THE P-NUMBER CLASSIFICATION; SO ALWAYS INCLUDE & REFERENCE BOTH.

EX: SA-213 T2 = P-NUM 3, SA-213 T11 = P-NUM 4 & SA-213 T22 = P-NUM 5A (SA213 = SEAMLESS TUBE) | SA-335 P1 = P-NUM 3, SA-335 P11 = P-NUM 4, & SA-335 P22 = P-NUM 5A (SA-335 = SEAMLESS PIPE)