

QW-423 ALTERNATE BASE MATERIALS FOR WELDER QUALIFICATION

(19) **QW-423.1** Base metal used for welder qualification may be substituted for the base metal specified in the WPS in accordance with the following table. Any base metal shown in the same row may be substituted in the performance qualification test coupon for the base metal(s) specified in the WPS followed during welder qualification. When a base metal shown in the left column of the table is used for welder qualification, the welder is qualified to weld all combinations of base metals shown in the right column, including unassigned metals of similar chemical composition to these metals.

Base Metal(s) Used for Performance Qualification	Base Metals Qualified
P-No. 1 through P-No. 15F, P-No. 34, or P-No. 41 through P-No. 49	P-No. 1 through P-No. 15F, P-No. 34, and P-No. 41 through P-No. 49
P-No. 21 through P-No. 26	P-No. 21 through P-No. 26
P-No. 51 through P-No. 53 or P-No. 61 or P-No. 62	P-No. 51 through P-No. 53 and P-No. 61 and P-No. 62
Any unassigned metal to the same unassigned metal	The unassigned metal to itself
Any unassigned metal to any P-Number metal	The unassigned metal to any metal assigned to the same P-Number as the qualified metal
Any unassigned metal to any other unassigned metal	The first unassigned metal to the second unassigned metal

QW-423.2 Metals used for welder qualification conforming to national or international standards or specifications may be considered as having the same P-Number as an assigned metal provided it meets the mechanical and chemical requirements of the assigned metal. The base metal specification and corresponding P-Number shall be recorded on the qualification record.

QW-424 BASE METALS USED FOR PROCEDURE QUALIFICATION

(19) **QW-424.1** Base metals are assigned P-Numbers in [Table QW/QB-422](#); metals that do not appear in [Table QW/QB-422](#) are considered to be unassigned metals except as otherwise defined for base metals having the same UNS numbers. Unassigned metals shall be identified in the WPS and on the PQR by specification, type, and grade, or by chemical analysis and mechanical properties. The minimum tensile strength shall be defined by the organization that specified the unassigned metal if the tensile strength of that metal is not defined by the material specification.

Base Metal(s) Used for Procedure Qualification Coupon	Base Metals Qualified
One metal from a P-Number to any metal from the same P-Number	Any metals assigned that P-Number
One metal from a P-Number to any metal from any other P-Number	Any metal assigned the first P-Number to any metal assigned the second P-Number
One metal from P-No. 15E to any metal from P-No. 15E	Any P-No. 15E or 5B metal to any metal assigned P-No. 15E or 5B
One metal from P-No. 15E to any metal from any other P-Number	Any P-No. 15E or 5B metal to any metal assigned the second P-Number
One metal from P-No. 3 to any metal from P-No. 3	Any P-No. 3 metal to any metal assigned P-No. 3 or 1
One metal from P-No. 4 to any metal from P-No. 4	Any P-No. 4 metal to any metal assigned P-No. 4, 3, or 1
One metal from P-No. 5A to any metal from P-No. 5A	Any P-No. 5A metal to any metal assigned P-No. 5A, 4, 3, or 1
One metal from P-No. 5A to a metal from P-No. 4, or P-No. 3, or P-No. 1	Any P-No. 5A metal to any metal assigned to P-No. 4, 3, or 1
One metal from P-No. 4 to a metal from P-No. 3 or P-No. 1	Any P-No. 4 metal to any metal assigned to P-No. 3 or 1
Any unassigned metal to the same unassigned metal	The unassigned metal to itself
Any unassigned metal to any P-Number metal	The unassigned metal to any metal assigned to the same P-Number as the qualified metal
Any unassigned metal to any metal from P-No. 15E	The unassigned metal to any metal assigned P-No. 15E or 5B
Any unassigned metal to any other unassigned metal	The first unassigned metal to the second unassigned metal

QW-424.2 For welds joining base metals to weld metal buildup or corrosion-resistant weld metal overlay, the buildup or overlay portion of the joint may be substituted in the test coupon by any P-Number base material that nominally matches the chemical analysis of the buildup or overlay.

**Table QW/QB-422
Ferrous and Nonferrous P-Numbers
Grouping of Base Metals for Qualification (Cont'd)**

Spec. No.	Alloy, Type, or Grade	UNS No.	Minimum Specified Tensile, ksi (MPa)	Weld- ing P-No.	Brazeing		ISO 15608 Group	Nominal Composition	Typical Product Form
					P-No.	B2.2 BM			
Nonferrous (Cont'd)									
B/SB-653	R60702	R60702	55 (380)	61	117	600	61	99.2Zr	Smls. & welded fittings
B/SB-658	R60702	R60702	55 (380)	61	117	600	61	99.2Zr	Smls. & welded pipe
B/SB-658	R60705	R60705	80 (550)	62	117	600	62	95.5Zr+2.5Cb	Smls. & welded pipe
B/SB-668	...	N08028	73 (505)	45	111	420	45	31Ni-31Fe-29Cr-Mo	Smls. tube
B/SB-672	...	N08700	80 (550)	45	111	420	8.2	25Ni-47Fe-21Cr-5Mo	Bar & wire
B/SB-673	...	N08904	71 (490)	45	111	420	8.2	44Fe-25Ni-21Cr-Mo	Welded pipe
B/SB-673	...	N08925	87 (600)	45	111	420	8.2	25Ni-20Cr-6Mo-Cu-N	Welded pipe
B/SB-673	...	N08926	94 (650)	45	111	420	8.2	25Ni-20Cr-6Mo-Cu-N	Welded pipe
B/SB-674	...	N08904	71 (490)	45	111	420	8.2	44Fe-25Ni-21Cr-Mo	Welded tube
B/SB-674	...	N08925	87 (600)	45	111	420	8.2	25Ni-20Cr-6Mo-Cu-N	Welded tube
B/SB-674	...	N08926	94 (650)	45	111	420	8.2	25Ni-20Cr-6Mo-Cu-N	Welded tube
B/SB-675	...	N08367	95 (655)	45	111	420	8.2	46Fe-24Ni-21Cr-6Mo-N	Welded pipe > 3/16 in. (5 mm)
B/SB-675	...	N08367	100 (690)	45	111	420	8.2	46Fe-24Ni-21Cr-6Mo-N	Welded pipe ≤ 3/16 in. (5 mm)
B/SB-676	...	N08367	95 (655)	45	111	420	8.2	46Fe-24Ni-21Cr-6Mo-N	Welded tube > 3/16 in. (5 mm)
B/SB-676	...	N08367	100 (690)	45	111	420	8.2	46Fe-24Ni-21Cr-6Mo-N	Welded tube ≤ 3/16 in. (5 mm)
B/SB-677	...	N08904	71 (490)	45	111	420	8.2	44Fe-25Ni-21Cr-Mo	Smls. pipe & tube
B/SB-677	...	N08925	87 (600)	45	111	420	8.2	25Ni-20Cr-6Mo-Cu-N	Smls. pipe & tube
B/SB-677	...	N08926	94 (650)	45	111	420	8.2	25Ni-20Cr-6Mo-Cu-N	Smls. pipe & tube
B/SB-688	...	N08367	95 (655)	45	111	420	8.2	46Fe-24Ni-21Cr-6Mo-N	Plate, sheet & strip > 3/16 in. (5 mm)
B/SB-688	...	N08367	100 (690)	45	111	420	8.2	46Fe-24Ni-21Cr-6Mo-N	Plate, sheet & strip ≤ 3/16 in. (5 mm)
B/SB-690	...	N08367	95 (655)	45	111	420	8.2	46Fe-24Ni-21Cr-6Mo-N	Smls. pipe & tube > 3/16 in. (5 mm)
B/SB-690	...	N08367	100 (690)	45	111	420	8.2	46Fe-24Ni-21Cr-6Mo-N	Smls. pipe & tube ≤ 3/16 in. (5 mm)
B/SB-691	...	N08367	95 (655)	45	111	420	8.2	46Fe-24Ni-21Cr-6Mo-N	Rod, bar & wire
B/SB-704	1	N06625	120 (825)	43	111	430	43	60Ni-22Cr-9Mo-3.5Cb	Welded tube
B/SB-704	2	N06625	100 (690)	43	111	430	43	60Ni-22Cr-9Mo-3.5Cb	Welded tube
B/SB-704	...	N08825	85 (585)	45	111	430	45	42Ni-21.5Cr-3Mo-2.3Cu	Welded tube
B/SB-705	1	N06625	120 (825)	43	111	430	43	60Ni-22Cr-9Mo-3.5Cb	Welded pipe
B/SB-705	2	N06625	100 (690)	43	111	430	43	60Ni-22Cr-9Mo-3.5Cb	Welded pipe