

**BS 3605-2 SEAMLESS AND WELDED AUSTENITIC STAINLESS STEEL PIPE AND TUBES FOR PRESSURE PURPOSES**

**PART 2**

Specification for longitudinally welded tubes

Requirements for longitudinally welded austenitic stainless steel tubes for pressure purposes, includes specified proof stress values at elevated temperature.

**WELDED PIPES WITH SPECTIFIED ROOM TEMPERATURE PROPERTIES**

Grade	Mfg. Process	Chemical composition (%)								
		C	Si	Mn	P	S	Ni	Cr	Mo	Others
304S22	W	0.03Max	0.20-1.00	0.05-2.00	0.040Max	0.030Max	9.0-12.0	17.0-19.0	-	-
304S18	W	0.06Max	0.20-1.00	0.05-2.00	0.040Max	0.030Max	8.0-11.0	-	-	-
316S22	W	0.03Max	0.20-1.00	0.05-2.00	0.040Max	0.030Max	11.0-14.0	16.0-18.5	2.0-3.0	-
316S26	W	0.07Max	0.20-1.00	0.05-2.00	0.040Max	0.030Max	10.0-13.0	16.0-18.5	2.0-3.0	-
321S22	W	0.08Max	0.20-1.00	0.05-2.00	0.040Max	0.030Max	9.0-12.0	17.0-19.0	-	Ti: 5×C-0.60
347S17	W	0.08Max	0.20-1.00	0.05-2.00	0.040Max	0.030Max	9.0-12.0	17.0-19.0	-	Nb: 10×C-1.00

Grade	Tensile Test MPa or N/mm <sup>2</sup>		Remarks (Similar to JIS)
	Min Yield point	Tensile Strength	
304S22	205	490-690	(SUS304LTP) (SUS304LTB)
304S18	235	490-690	(SUS304TP) (SUS304TB)
316S22	215	490-690	(SUS316LTP) (SUS316LTB)
316S26	245	510-710	(SUS316TP) (SUS316TB)
321S22	235	510-710	(SUS321 TP) (SUS321 TB)
347S17	245	510-710	(SUS 347 TP) (SUS 347 TB)

WELDED PIPES WITH SPECIFIED ELEVATED TEMPERATURE PORPERTIES

Grade	Mfg. Process	Chemical Composition (%)								
		C	Si	Mn	P	S	Ni	Cr	Mo	Others
304S22	W	0.03Max	0.20~1.00	0.05~2.00	0.040Max	0.030Max	9.0~12.0	17.0~19.0	-	-
304S25	W	0.06Max	0.20~1.00	0.05~2.00	0.040Max	0.030Max	8.0~11.0	17.0~19.0	-	-
316S22	W	0.03Max	0.20~1.00	0.05~2.00	0.040Max	0.030Max	11.0~14.0	16.0~18.5	2.0~3.0	-
316S26	W	0.07Max	0.20~1.00	0.05~2.00	0.040Max	0.030Max	10.0~13.0	16.0~18.5	2.0~3.0	-
321S22	W	0.08Max	0.20~1.00	0.05~2.00	0.040Max	0.030Max	9.0~12.0	17.0~19.0	-	Ti : 5×C~0.60
347S17	W	0.08Max	0.20~1.00	0.05~2.00	0.040Max	0.030Max	9.0~12.0	17.0~19.0	-	Ti : 10×C~1.00

Grade	Tensile Test MPa or N/mm <sup>2</sup>		Remarks (Similar to JIS)
	Min Yield point	Tensile Strength	
304S22	205	490~690	(SUS304LTP) (SUS304LTB)
304S25	235	490~690	(SUS304TP) (SUS304TB)
316S22	215	490~690	(SUS316LTP) (SUS316LTB)
316S26	245	510~710	(SUS316TP) (SUS316TB)
321S22	235	510~710	(SUS321 TP) (SUS321 TB)
347S17	245	510~710	(SUS 347 TP) (SUS 347 TB)

Material Comparison Tables (ASTM, KS, JIS, DIN, BS, NBN, NF, UNI)

ASTM Standard		KOREA/JAPANES	GERMAN	BRITISH	BELGIAN	FRENCH	ITALIAN
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	UNS NO.	KS/JIS Symbol	KS/JIS Number	Remarks	DIN Type	DIN Number	Material Number	Remarks	B.S Number	B.S Grade	Remarks	NBN Type	NBN Grade	Remarks	AFNOR Type	NF Number	Remarks	UNI Type	UNI Number	Remarks
A 271 Seamless Austenitic Cr-Ni Steel Tubes for Refinery Service																				
TP 304	S30400	STS 304TF / SUS 304TF	D3587 / G3467		X5CrNi 18 9	17440	1.4301	(3b)	3605	304S18					Z6 CN 18.09	A35-573	(3b)	X5 CrNi 18 10	6904	Dalmine 913(3b)
TP 304H	S30409	STS 304HTF / SUS 304HTF	D3587 / G3467		X6 CrNi 18 11		1.4948	WBL-640(3b)	3605	304S59					Z6 CN 19-10	A49-214		X8 CrNi 19 10	6904	(3b)
TP 346	S31600	STS 316 TF / SUS 316TF	D3587 / G3467		X5 CrNiMo 18 10	17440	1.4401	(3b)	3605	316S18		X6 CrNi Mo17.12.2	911		Z6CND17-11	A35-573	(3b)	X5 CrNiMo 17 12	6904	(3b)
TP 321	S32100	STS 321TF / SUS 321TF	D3587 / G3467		X10 CrNiTi 18 9	17440	1.4541	(3b)	3605	321S18		X6CrNi Ti 18 10	911		Z6CNT18.10	A35-573	(3b)	X6 CrNiTi 18 11	6904	(3b)
TP 347	S34700	STS 347TF / SUS 347TF	D3587 / G3467		X5 CrNiNb 18 10	17440	1.4550	(3b)	3605	347S18		X6 CrNi Nb 18 10	911		Z6 CNNb 18.11	A32-573	(3b)	X6 CrNiNb 18 11	6904	Dalmine 991(3b)
TP 347H	S34709	STS 347HTF / SUS 347HTF	D3587 / G3467		X8 CrNiNb 16 13		1.4961	WBL-670(3b)	3605	347S59							(3)	X8 CrNiNb 18 11	6904	(3b)

Material Comparison Tables (ASTM, KS, JIS, DIN, BS, NBN, NF, UNI)

ASTM Standard	UNS NO.	KOREA/JAPANES			GERMAN				BRITISH			FRENCH			ITALIAN		
		KS/JIS Symbol	KS/JIS Number	Remarks	DIN Type	DIN Number	Material Number	Remarks	B.S Number	B.S Grade	Remarks	AFNOR Type	NF Number	Remarks	UNI Type	UNI Number	Remarks
A 312 Seamless and Welded Austenitic Stainless Steel Pipe																	
TP 304	S30400	STS 304TP / SUS 304 TP	D3576 / G3459	(16)	X5CrNi 18 9	17440	1.4301	(3b)	3605	304S18		TU Z6 CN19-10	A 49-230		X5 CrNi 18 10	6904	(3b)
TP 304H	S30409	STS 304HTP / SUS 304HTP	D3576 / G3459	(16)				(3)	3605	304S59		TU Z6 CN19-10	A 49-214		X8 CrNi 19 10	6904	(3b)
TP 304L	S30403	STS 304LTP/SU	D3576 / G3459	(16)	X2 CrNi 19 9	17440	1.4306	(3b)	3605	304S14		TU Z2 CN19-11	A 49-230		X2 CrNi 18 11	6904	(3b)
TP 310	S31000	304LTP	D3576 / G3459	(16)				(3)							X22 Cr Ni 25 20	6904	(3b)(11)
TP 316	S31600	STS 310STP/SU	D3576 / G3459	(16)	X5 CrNiMo 18 10	17440	1.4401	(3b)	3605	316S18		Z 6 CND 17.11	A 35-573	(3b)	X5 CrNiMo 17 12	6904	(3b)
TP 316H	S34609	310STP	D3576 / G3459	(16)				(3)	3605	316S59		TUZ6CND17-12	A 49-230		X8 CrNiNb 17 12	6904	(3b)
TP 316L	S31603	STS 316TP / SUS 316TP	D3576 / G3459	(16)	X2 CrNiMo 18 10	17440	1.4404	(3b)	3605	316S14		TUNZ2CND17-12	A 49-230		X2 CrNiMo 17 12	6904	Dalmine 941(3b)
TP 321	S32100	STS 316HTP /SU	D3576 / G3459	(16)	x10 CrNiTi 18 9	17440	1.4541	(3b)	3605	321S18		Z6 CNT 18.11	A 49-230		X6 CrNiTi 18 11	6904	(3b)
TP 347	S34700	316HTP	D3576 / G3459	(16)	X5 CrNiNb 18 9		1.4543	(3b)	3605	347S18		Z6 CNNb 18.11	A 35-573	(3b)	X6 CrNiNb 18 11	6904	(3b)

TP 347H	S34709	STS 316LTP /SU	D3576 / G3459	(16)				(3)								X6 CrNiNb 18 11	6904	(3b)
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Material Comparison Tables (ASTM, DIN, BS, NBN, NF, UNI)

ASTM Standard	UNS NO.	GERMAN				BRITISH			FRENCH			ITALIAN						
		DIN Type	DIN Number	Material Number	Remarks	B.S Number	B.S Grade	Remarks	AFNOR Type	NF Number	Remarks	UNI Type	UNI Number	Remarks				
A 358 Electric-Fusion Welded Austenitic Cr-Ni Alloy Steel Pipe for High-Temperature Service																		
Grade 304	S30400	X5 CrNi 18 9	17440	1.4301	(3b)	3605	304S25	LWHT(3b)	Z6 CN 18.09	A36-209	(3b)	X6 CrNi 18 10	8317	(3b)				
Grade 310	S31000	X 12 CrNi 25 21		1.4845	WBL-470(3b)			(3)		A36-209		X22 CrNi 25 20	6900	(3b)(11)				
Grade 316	S31600	X5 CrNiMo 18 10	17440	1.4401	(3b)	3605	316S26	LWHT(3b)	Z6 CND 17.11	A36-209	(3b)	X6CrNiMo 17 12	8317	(3b)				
Grade 321	S32100	X10 CrNiTi 18 9	17440	1.4541	(3b)(17)	3605	321S22	LWHT(3b)	Z6 CNT 18.10	A36-209	(3b)	X6 CrNiTi 18 10	8317	(3b)				
Grade 347	S34700	X10 CrNiNb 18 9	17440	1.4550	(3b)(17)	3605	347S17	LWHT(3b)	Z6 CN Nb 18.10	A36-209	(3b)	X6 CrNiNb 18 10	8317	(3b)				

Material Comparison Tables (ASTM, KS, JIS, DIN, BS, NBN, NF, UNI)

ASTM Standard	UNS NO.	KOREA/JAPANES			GERMAN				BRITISH			FRENCH			ITALIAN		
		KS/JIS Symbol	KS/JIS Number	Remarks	DIN Type	DIN Number	Material Number	Remarks	B.S Number	B.S Grade	Remarks	AFNOR Type	NF Number	Remarks	UNI Type	UNI Number	Remarks
A 333 Seamless and Welded Pipe for Low-Temperature Service																	
Grade 1	K03008	SPLT 39 / STPL 380	D3569 / G3460	(16)	TT St 41N		1.0437	WBL-680(3b)			(3)	TU 42 BT	A49-230		C 15	5949	(6)Seamless Only



G3448 G3459	SUS		A312	TP304	SUS	3605	304S18	SUS	2462	X5CrNi189	SUS	A49-117	TUZ6 CN18.09	SUS	2604/2	TS47	SUS	C008
	304TP	SUS	A376	TP304	SUS	"	304S25	SUS	2463	Z5CrNi189	SUS	A49-147	TUZ CN18.09	SUS				
	304TPD	SUS				4128	-	SUS				A49-230	TUZ6 CN18.09	SUS				
	SUS		A312	TP304H	SUS	3605	304S59	SUS							2604/2	TS48	SUS	
	304HTP	SUS	A376	TP304H	SUS													
	SUS		A312	TP304L	SUS	3605	304A14	SUS	2462	X2CrNiMo 1810	SUS	A49-117	TUZ2 CN18.10	SUS	2604/2	TS46	SUS	
	304LTP	SUS				"	304S22	SUS	2463	X2CrNi189	SUS	A49-147	TUZ2 CL18.10	SUS				
												A49-230	TUZ2 CL18.10	SUS				
												A49-645	TUZ2 CL18.10	SUS				
												A49-647	TUZ2 CL18.10	SUS				
	SUS		A312															
	309TP	SUS																
	309STP	SUS																
	SUS		A312									A49-117	TUZ12 CN24.12	SUS	2604/2	TS68	SUS	
	310TP	SUS																
	310STP	SUS																
	SUS		A312	TP316	SUS	3605	316S18	SUS	2462	X5CrNiMo 1810	SUS	A49-117	TUZ6CND 17.11	SUS	1604/2	TS60	SUS	
	316TP	SUS	A376	TP316	SUS	"			2643	X5CrNiMo	SUS	A49-147	TUZ6CND	SUS	"	TS61	SUS	





	329JITP	SUS																
	SUS																	
	329J2LTP	SUS																
	SUS		A312	TP347	SUS	3605	347S18	SUS	2462	X10CrNiNb189	SUS			2604/2	TS50	SUS		
	347TP	SUS	A376	TP347	SUS	"	347S59	SUS										
	SUS		A312	TP347H	SUS	3605	347S59	SUS						2604/2	TS56	SUS		
	347HTP	SUS	A376	TP347H	SUS													
	SUS																	
	405TP	SUS																

JIS Number and Corresponding Foreign Standards

JIS			ASTM			BS			DIN			NF			ISO			Index Number
Standard Number	Grade	Type	Standard Number	Grade	Type	Standard Number	Grade	Type	Standard Number	Grade	Type	Standard Number	Grade	Type	Standard Number	Grade	Type	
G3463			A213	TP304	SUS	3605	304s18	SUS	2462	X5CrNi189	SUS	A49-230	TUZ6CN 18.09	SUS	2604/2	TS48	SUS	C012
	SUS		A249	TP304	SUS	"	304S25	SUS	2463	X5CrNi189	SUS							
	304TB	SUS	A269	TP304	SUS	3606	LWHT304S22	SUS										
			A623	TP304	SUS	3606	LWCF304S22	SUS										
			A688	TP304	SUS	"	LWBC304S25	SUS										
	SUS		A213	TP304H	SUS	3059	CFS304S59	SUS							2604/2	TS48	SUS	
	304HTB	SUS	A249	TP304H	SUS	3606	304S59	SUS										
	SUS		A213	TP304L	SUS	3605	304S14	SUS	2462	X2CrNi189	SUS	A49-207	TSZ2CN 18.10	SUS	2604/2	TS46	SUS	
	304LTB	SUS	A249	TP304L	SUS	"	304S22	SUS	2463	X2CrNi189	SUS	"	TSZ2CN 18.10	SUS				
			A269	TP304L	SUS	3606	LWHT304S22	SUS				A49-230	TSZ2CN 18.10	SUS				



						"	CFS316S30	SUS									
	SUS		A213	TP316H	SUS	3059	CFS316S59	SUS	17455	X5CrNiMo 17122				2604/2	TS52	SUS	
	316HTB	SUS	A249	TP316H	SUS				17456					"	TS61	SUS	
	SUS		A213	TP316L	SUS	3605	316S14	SUS	2462	X2CrNiMo 1810	SUS			2604/2	TS57	SUS	
	316LTB	SUS	A249	TP316L	SUS	"	316S22	SUS		X2CrNiMo 1812	SUS			"	TS58	SUS	
			A269	TP316L	SUS	3606	LWHT316S24	SUS	2463	X2CrNiMo 1810	SUS						
			A632	TP316L	SUS	"	LWCF316S24	SUS		X2CrNiMo 1812	SUS						
			A688	TP316L	SUS	"	LWBC316S24	SUS	17457	X5CrNi 17122							
						"	CFS346S24	SUS	17458								
						"	LWHT316S29	SUS									
						"	LWCF316S29	SUS									
						"	LWBC316S29	SUS									
						"	CFS316S29	SUS									
	SUS		A249	TP317	SUS												
	317TB	SUS	A632	TP317	SUS												
	SUS		A249	TP317	SUS												
	317LTB	SUS															
			A213	TP321	SUS	3605	321S18	SUS	2462	X10CrNi Ti89	SUS	A49-230	TUZ6CNT 18.10	SUS	2604/2	TS53	SUS
	321TB	SUS	A249	TP321	SUS	"	321S22	SUS	2463	X10CrNi Ti189	SUS						
			A269	TP321	SUS	3606	LWHT321S22	SUS	17457								



