

BS 6323 PART4 SEAMLESS AND WELDED STEEL TUBES FOR AUTOMOBILE MECHANICAL AND GENERAL ENGINEER PUPOSE

1. Scope

Specification for seamless and welded steel tubes for automobile, mechanical and general engineering purposes

PART 4

Specific requirements for cold finished seamless tubes, covers requirements and defines the chemical composition, mechanical properties, dimensions, dimensional tolerances and technical delivery conditions of the tubes.

2. Chemical Composition

Grade	Mfg.	Chemical Composition (%)									
	Process	C	Si	Mn	P	S	Ni	Cr	Mo	Others	
HFW2	AT	0.16Max	-	0.70Max	0.050Max	0.050Max	-	-	-	-	
HFW3	AT	0.20Max	0.35Max	0.90Max	0.050Max	0.050Max	-	-	-	-	
HFW4	AT	0.25Max	0.35Max	1.20Max	0.050Max	0.050Max	-	-	-	-	
HFW5	AT	0.23Max	0.35Max	1.50Max	0.050Max	0.050Max	-	-	-	-	
HFS3	S	0.20Max	0.35Max	0.90Max	0.050Max	0.050Max	-	-	-	-	
HFS4	S	0.25Max	0.35Max	1.20Max	0.050Max	0.050Max	-	-	-	-	
HFS5	S	0.23Max	0.35Max	1.50Max	0.050Max	0.050Max	-	-	-	-	
HFS8	S	0.45~0.55	0.35Max	0.50~0.90	0.050Max	0.050Max	-	-	-	-	
CFS3	S	0.20Max	0.35Max	0.90Max	0.050Max	0.050Max	-	-	-	-	①
											②
											③
											④
CFS3A	S	0.20Max	0.10~0.35	0.60~1.00	0.050Max	0.050Max	-	-	-	-	①
											②
											③
											④
CFS4	S	0.25Max	0.35Max	1.20Max	0.050Max	0.050Max	-	-	-	-	①
											②
											③
											④

CFS5	S	0.23Max	0.50Max	1.50Max	0.050Max	0.050Max	-	-	-	-	①
											②
											③
											④
CFS6	S	0.30~0.40	0.35Max	0.50~0.90	0.050Max	0.050Max	-	-	-	-	①
											②
											③
											④
CFS7	S	0.20~0.30	0.35Max	1.20~1.50	0.050Max	0.050Max	-	-	-	-	①
											②
CFS8	S	0.40~0.55	0.35Max	0.50~0.90	0.050Max	0.050Max	-	-	-	-	①
											②
											③
											④
CFS9	S	0.29Max	0.35Max	1.50Max	0.050Max	0.050Max	-	-	0.15~0.25	-	①
CFS10	S	0.26Max	0.35Max	0.80Max	0.050Max	0.050Max	-	0.80~1.20	0.15~0.30	-	②
											③
CFS11	S	0.45Max	0.35Max	1.00Max	0.050Max	0.050Max	-	0.80~1.20	0.15~0.30	-	④
											⑤
ERW1	E	0.13Max	-	0.60Max	0.050Max	0.050Max	-	-	-	-	-
											-
											③
											④
ERW2	E	0.16Max	-	0.70Max	0.050Max	0.050Max	-	-	-	-	-
											-
											③
											④
ERW3	E	0.20Max	0.35Max	0.90Max	0.050Max	0.050Max	-	-	-	-	-
											-
											③
											④
ERW4	E	0.25Max	0.35Max	1.20Max	0.050Max	0.050Max	-	-	-	-	-

											③
											④
ERW5	E	0.23Max	0.50Max	1.50Max	0.050Max	0.050Max	-	-	-	-	- ④
CEW1	E	0.13Max	-	0.60Max	0.050Max	0.050Max	-	-	-	-	①
											②
											③
											④
CEW2	E	0.16Max	-	0.70Max	0.050Max	0.050Max	-	-	-	-	①
											②
											③
											④
CEW3	E	0.20Max	0.35Max	0.90Max	0.050Max	0.050Max	-	-	-	-	①
											②
											③
											④
CEW4	E	0.25Max	0.35Max	1.20Max	0.050Max	0.050Max	-	-	-	-	①
											②
											③
											④
CEW5	E	0.23Max	0.50Max	1.50Max	0.050Max	0.050Max	-	-	-	-	①
											②
											③
											④
SAW4	AM	0.25Max	0.35Max	1.20Max	0.050Max	0.050Max	-	-	-	-	
SAW5	AM	0.23Max	0.50Max	1.50Max	0.050Max	0.050Max	-	-	-	-	
LW12	A	0.06Max	0.90Max	0.60Max	0.040Max	0.020Max	0.50Max	11.0~13.0	-	N 0.025Max Ti : 5×C~0.70	
LW13	A	0.08Max	0.20~1.00	0.50~2.00	0.045Max	0.030Max	8.0~11.0	17.0~19.0	-	-	- ⑤

LWCF13	A										⑥
LW14	A	0.03Max	0.20~1.00	0.50~2.00	0.045Max	0.030Max	9.0~12.0	17.5~19.0	-	-	⑤
LWCF14	A										⑥
LW15	A	0.06Max	0.20~1.00	0.50~2.00	0.045Max	0.030Max	8.0~11.0	17.5~19.0	-	-	⑤
LWCF15	A										⑥
LW16	A	0.03Max	0.20~1.00	0.50~2.00	0.045Max	0.030Max	11.0~14.0	16.5~18.5	2.25~3.0	-	⑤
LWCF16	A										⑥
LW17	A	0.07Max	0.20~1.00	0.50~2.00	0.045Max	0.030Max	10.0~13.0	16.5~18.5	2.25~3.0	-	⑤
LWCF17	A										⑥
LW18	A	0.08Max	0.20~1.00	0.50~2.00	0.045Max	0.030Max	9.0~12.0	17.0~19.0	-	Ti 5×C~0.70	⑥
LWCF18	A										

① Clod finish (hard) ② Cold finish (soft) ③ Annealed ④ Normalized

⑤ welded and Sized (fully softened) ⑥ Cold finish (fully softened)

HFW: Hot finished welded

HFS: Hot finish seamless

CFS: Cold finish seamless

ERW: Electric resistance weld induction weld

CEW: Cold finished ERW

SAW: Submerged arc weld

LW: Longitudinal welded stainless

LWCF: Cold finished longitudinal welded seamless

3. Mechanical Properties

Grade	Tensile Test MPa or N/mm ²		Remarks
	Min Yield point	Tensile Strength	
HFW2	195	325Min	(STAM340G)

HFW3	215	360Min	(STAM340G)
HFW4	235	410Min	(STAM390G)
HFW5	340	490Min	(STAM500G)
HFS3	215	360Min	(STKM12A)
HFS4	235	410Min	(STKM14A)
HFS5	340	490Min	(STKM14A)
HFS8	340	540Min	(STKM17A)
CFS3	360	450Min	(STKM12C)
	285	400Min	
	170	340Min	
	205	360Min	
CFS3A	360	450Min	(STKM12)
	285	400Min	
	170	340Min	
	215	360Min	
CFS4	410	520Min	(STKM13)
	315	450Min	
	195	400Min	
	235	410Min	
CFS5	480	600Min	(STKM19)
	380	550Min	
	-	-	
	340	490Min	
CFS6	470	590Min	(STKM16)
	350	540Min	
	305	440Min	
	285	460Min	
CFS7	560	700Min	
	460	650Min	
CFS8	580	720Min	(STKM17)

	470	670Min	
	305	510Min	
	340	540Min	
CFS9	580	720Min	
	470	670Min	
CFS10	580	720Min	(SCM418TK)
	470	670Min	
CFS11	580	720Min	(SCM440TK)
	-	670Min	
ERW1	195	305Min	(STAM290GA) (STAM290GB)
	150	275Min	
	160	285Min	
ERW2	255	345Min	(STAM340G)
	160	305Min	
	195	325Min	
ERW3	305	400Min	(STAM5G)
	170	340Min	
	205	360Min	
ERW4	350	450Min	(STAM440H)
	195	400Min	
	235	410Min	
ERW5	420	500Min	(SCM470G)
	340	490Min	(SCM470G)
CEW1	325	400Min	(STAM290GA) (STAM290GA)
	245	350Min	
	150	275Min	
	160	285Min	
CEW2	350	420Min	
	265	370Min	
	160	305Min	

	195	325Min	(STAM340G)
CEW3	370	450Min	
	285	400Min	
	170	340Min	
	215	360Min	
CEW4	410	520Min	(STAM440G) (STAM390G)
	315	450Min	
	195	400Min	
	235	410Min	
CEW5	485	600Min	
	385	550Min	
	-	-	
	340	490Min	
SAW4	235	410Min	(STK400)
SAW5	340	490Min	(STK500)
LW12	305	400Min	-
LW13	450	560Min	(SUS304TK)
	205	510Min	
LWCF13	205	510Min	
LW14	420	520Min	
	185	480Min	
LWCF14	185	480Min	
LW15	450	560Min	(SUS304TK)
	205	510Min	
LWCF15	205	510Min	
LW16	420	520Min	
	185	480Min	
LWCF16	185	480Min	
LW17	450	560Min	(SUS316TK)
	205	510Min	

JIS Number and Corresponding Foreign Standards

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						"	CFSC4	C										
						6323	CFS4	C										
	STKM14A	C	A513	MT1020	C	6323	HFS4	C							2937	TS9	C	
															3304	R42	"	
	STKM14B	C				6323	HFS5	C							3305	R42	C	
	STKM14C	C													3306	"	"	
	STKM15A	C	A513	1030	C													
			A519	1030	C													
	STKM15C																	
	STKM16A	C	A519	1040	C							A49-311	TUXC35	C				
												A49-312	TUXC35	C				
	STKM16C	C																
	STKM17A	C	A519	1050	C	6323	HFS8	C										
	STKM17C	C				6323	CFS8	C										
	STKM18A	C	A519	1518	C	1717	ERWC5	C				A49-310	TU52b	C				
												A49-311	TU52b	C				
												A49-312	TU52b	C				
	STKM18B	C										A49-321	TU52b	C				
												A49-323	TU52b	C				
												A49-326	TU52b	C				
	STKM18C	C										A49-330	TU52b	C				
												A49-341	TS42a	C				
												"	TS47a	C				
												A49-343	TS18M5	C				
	STKM19A	C	A519	1524	C				2391	ST52	C				2937	TS18	C	
									2393	ST52-3	C				2938	Gr.1	C	
									2394	ST52-3	C				3304	R50	C	

															3305	R50	C	
															3306	R50	C	
	STKM20A	C																

JIS Number and Corresponding Foreign Standards

JIS			ASTM			BS			Index Number
Standard Number	Grade	Type	Standard Number	Grade	Type	Standard Number	Grade	Type	
G3441	SCr420TK	Cr							C018
	SCM415TK	CrMo							
	SCM418TK	CrMo				6323	CFS10	CrMo	
	SCM420TK	CrMo	A519	5120	CrMo				
	SCM430TK	CrMo	A519	4130	CrMo				
	SCM435TK	CrMo	A519	4135	CrMo				
	SCM440TK	CrMo	A519	4140	CrMo	6323	CFS10	CrMo	

JIS Number and Corresponding Foreign Standards

JIS			ASTM			BS			NF			Index Number
Standard Number	Grade	Type	Standard Number	Grade	Type	Standard Number	Grade	Type	Standard Number	Grade	Type	
G3446	SUS		A511	MT304	SUS	6323	LW13	SUS	A49-647	TSZ8C17	SUS	C019
	304TKA	SUS	A554	MT304	SUS	"	LWCF131	SUS				
	SUS					"	LW15	SUS				
	304TKC	SUS				"	LWCF15	SUS				
	SUS		A511	MT316	SUS	6323	LW17	SUS				
	316TKA	SUS	A554	MT316	SUS	"	LWCF17	SUS				
	SUS											
	316TKC	SUS										
	SUS		A511	MT321	SUS	6323	LW18	SUS				
	321TKA	SUS	A554	MT321	SUS	"	LWCF18	SUS				

	SUS		A511	MR347	SUS							
	347TKA	SUS	A544	MT347	SUS							
	SUS		A511	MT430	SUS							
	430TKA	SUS	A554	MT430	SUS							
	SUS											
	430TKC	SUS										
	SUS		A511	MT410	SUS							
	410TKA	SUS										
	SUS											
	410TKC	SUS										
	SUS											
	420J1TKA	SUS										
	SUS											
	420J2TKA	SUS										
	STKR41	C	A500	GrB	C	6363	34/26	C	A49-652	TA37a	C	C020
	STKR	C				"	43*36	C				
						"	50/45	C				

JIS Number and Corresponding Foreign Standards

JIS			BS			DIN			ISO			Index Number
Standard Number	Grade	Type	Standard Number	Grade	Type	Standard Number	Grade	Type	Standard Number	Grade	Type	
G3472	STAM	C	6323	ERW1	C	2393	St28		3305	R28	C	C021
	290GA		"	43/36	C	"	USt28					
	(30GA)					"	RSt28					
	STAM	C	6323			2394	St28		3305	R28	C	
	290GB					"	USt28					
	(30GB)					"	RSt28					
	STAM	C	6323	HFW2	C				3305	R33	C	

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