International Standard 6971

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION•МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ•ORGANISATION INTERNATIONALE DE NORMALISATION

Welded steel type cranked link drag chains and chain wheels

Chaînes racleuses en acier, de type soudé, à maillons coudés, et roues dentées pour chaînes

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Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 6971 was developed by Technical Committee ISO/TC 100, *Chains and chain wheels for power transmission and conveyors*, and was circulated to the member bodies in July 1981.

It has been approved by the member bodies of the following countries :

Austria	Ireland	Spain
Belgium	Italy	United Kingdom
Czechoslovakia	Korea, Rep. of	USA
Egypt, Arab Rep. of	Netherlands	USSR
France	Poland	
India	Romania	

No member body expressed disapproval of the document.

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Welded steel type cranked link drag chains and chain wheels

1 Scope and field of application

This International Standard lays down dimensions, tolerances, measuring loads and minimum breaking loads, together with the tooth gap forms and rim profiles of the associated chain wheels, and welded cranked link [1] drag chains suitable for the conveying of bulk materials and related applications.

The chain is designed to operate with the closed end of each link forward for maximum scraping action against the material to be conveyed.

Dimensions for five types of attachments are also specified.

The specified chain dimensions ensure complete interchangeability of any given size and provide interchangeability of individual links of chain for repair purposes.

2 References

ISO 286/1, *ISO system of limits and fits — Part 1 : General, tolerances and deviations.* [2]

ISO 1101, *Technical drawings — Geometrical tolerances — Tolerancing of form, orientation, location and run-out — Generalities, definitions, symbols, indications on drawings.*

3 Chains

3.1 Nomenclature

The nomenclature of chains is indicated in figures 1, 2 and 3, and in tables 1 and 1M.

The illustrations do not necessarily define the actual form of the cranked links.

3.2 Designation

Welded steel type cranked link drag chains are designated by the prefix "WD" to indicate that they are of welded design, followed by a number which is the same as the cast type which they replace.

1) In the USA, the term "offset sidebar" is used in place of "cranked link".

2) At present at the stage of draft. (Revision of ISO/R 286-1962.)

3.3 Construction

A chain is constructed from a series of cranked link assemblies (see figures 1 and 2) which are joined by connecting pins passing through each pitch hole. The connecting pins are a press fit in the cranked plate and/or mechanically locked, for example, flats, to prevent their rotation.

3.4 Dimensions

Chains shall conform to the dimensions given in tables 1 and 1M. Maximum and minimum dimensions are specified to ensure interchangeability of links as produced by different makers of chain. They represent limits for interchangeability, but are not the actual tolerances that should be used in manufacture.

Pitch p is a theoretical reference dimension used in calculating strand lengths and chain wheel dimensions; it is not intended for inspection of individual links.

3.5 Breaking loads

The test length shall have a minimum of three free pitches. The ends shall be attached to the testing machine shackles by a pin through the plate holes or the barrel. The shackles shall be so designed as to allow universal movement; the actual method to be used is left to the discretion of the manufacturer.

Tests in which failures occur adjacent to the shackles shall be disregarded.

The minimum tensile breaking loads shall be those given in tables 1 and 1M.

3.6 Length accuracy

Finished chains shall be measured either dry or after only light lubricating.

The standard nominal length for measurement shall be that nearest to 3 048 mm (120 in).

The chain shall be supported throughout its entire length and the measuring load given in tables 1 and 1M applied. To comply with this International Standard, the length shall be the nominal length subject to the limits of tolerance $^{+\ 0,32}_{\ 0}$ %.

The length accuracy of chains which have to work in parallel shall be within the above limits but matched by agreement with the manufacturer.

3.7 Marking

The chain shall be marked with :

a) the manufacturer's name or trademark;

b) the ISO chain number (see 3.2).

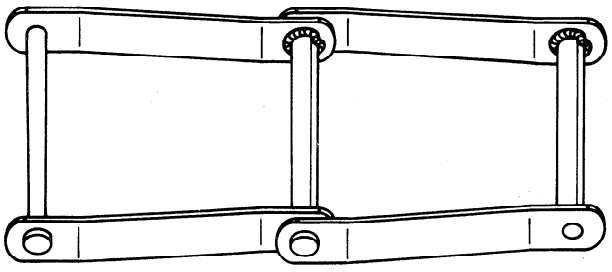


Figure 1 — Cranked link chain assembly

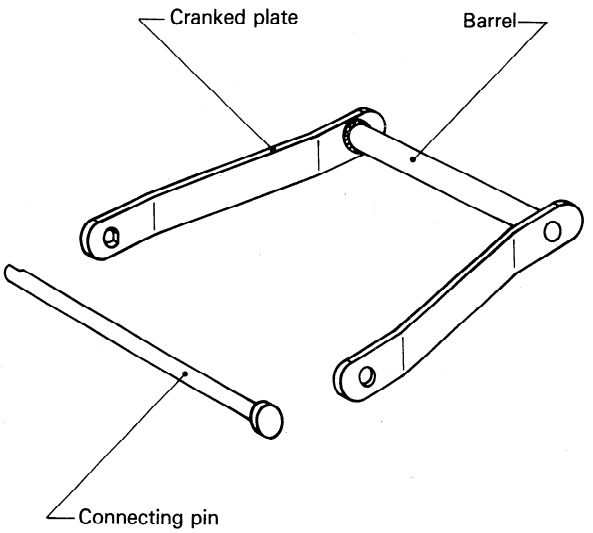


Figure 2 — Typical cranked link components

4 Attachments

4.1 General

Except when otherwise stated, the dimensions and test details for the chain with attachments shall conform to clause 3.

4.2 Designation

Five types of attachments are given, having the following designations and distinguishing features :

— C1, C3 and C4 : a scraper bar attached to the barrel perpendicular to the direction of travel (see figure 4);

— RR : a triangular spur attached to each cranked plate (see figure 5);

— Wing : an angle section attached to the outer face of each cranked plate (see figure 6).

4.3 Dimensions

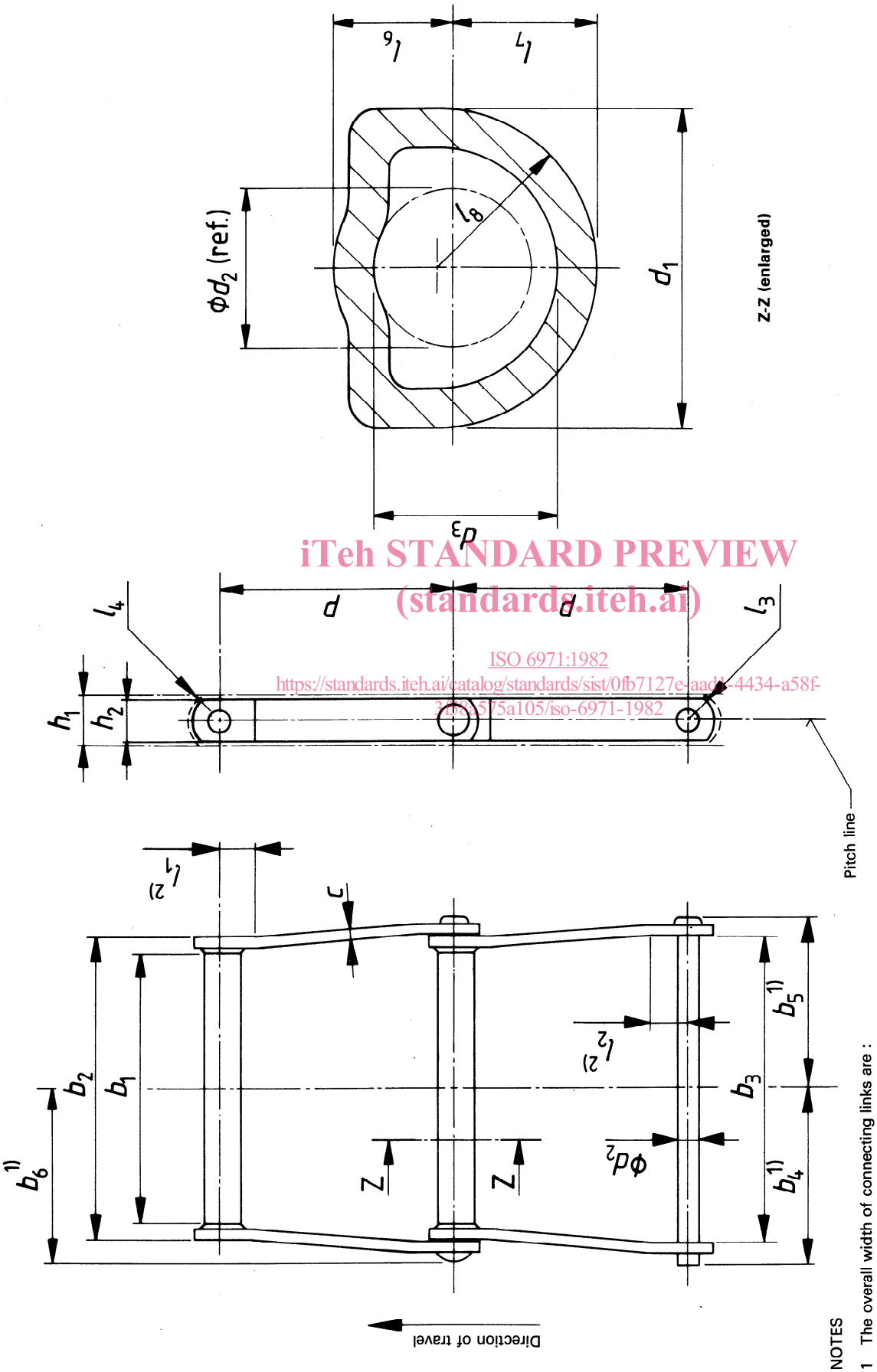
The attachments shall conform to the dimensions given in tables 2 to 6M respectively.

4.4 Manufacture

The actual form of the attachments is left to the discretion of the manufacturer whilst maintaining the dimensions specified in 4.3.

4.5 Marking

The marking of the chain required by 3.7 shall not be obscured by an attachment.



NOTES

1 The overall width of connecting links are :

$b_5 + b_6$, when riveted

$b_4 + b_5$, when fastener at one side

2 b_4, with fastener both sides.

2 The form of the line of cranking, or offset, between l_1 and l_2 is to be straight.

Figure 3 — Symbols related to tables 1 and 1M

Table 1 — Chain dimensions, measuring loads and breaking loads (Inch-pound units)

1	2	3		4	5	6	7	8	9	10	11	12		13		14	15	16	17	18	19	20	21	
ISO chain no.	Pitch	Barrel shape: Width acc. to section Z-Z of barrel		Barrel shape: Plate hole for barrel bore	Barrel shape			Width between plates for wheel contact at inner end	Connecting pin body diameter	Chain path depth	Barrel diameter or plate depth	Crank clearance dimensions		Plate end clearance dimensions		Width over link at inner end	Width between plates at outer end	Width over pin fastening to centre line	Width over pin head to centre line	Width over rivet to centre	Chain plate thickness	Measuring load	Breaking load: Pin, heat treated	Breaking load: All heat treated
	p	d_1		d_3	l_6	l_7	l_8	b_1	ϕd_2	h_1	h_2	l_1	l_2	l_3	l_4	b_2	b_3	b_4	b_5	b_6	c			
		nom.	max.	min.			max.	min.	max.	max.	max.	min.	min.	max.	max.	max.	min.	max.	max.	max.	nom.		min.	
	in	in	in	in	in	in	in	in	in	in	in	in	in	in	in	in	in	in	in	in	in	lbf	lbf	lbf
WD102	5.000	1.50	1.54	0.758	0.56	0.69	0.77	6.38	0.753	1.56	1.54	1.01	1.01	1.00	1.00	7.76	7.78	5.03	4.63	5.03	0.38	600	38 250	55 000
WD104	6.000	1.50	1.54	0.758	0.56	0.69	0.77	4.12	0.753	1.56	1.54	1.01	1.01	1.00	1.00	5.39	5.41	3.70	3.44	3.70	0.38	400	38 250	55 000
WD110	6.000	1.50	1.54	0.758	0.56	0.69	0.77	9.00	0.753	1.56	1.54	1.01	1.01	1.00	1.00	10.39	10.41	6.20	5.95	6.20	0.38	700	38 250	55 000
WD112	8.000	1.50	1.54	0.758	0.56	0.69	0.77	9.00	0.753	1.56	1.54	1.01	1.01	1.00	1.00	10.39	10.41	6.20	5.95	6.20	0.38	600	38 250	55 000
WD113	6.000	1.50	1.54	0.883	0.62	0.69	0.77	9.00	0.878	1.56	1.54	1.01	1.01	1.00	1.00	10.64	10.66	6.50	6.19	6.50	0.50	800	48 000	57 000
WD116	8.000	1.75	1.78	0.758	0.63	0.81	0.89	13.00	0.753	1.81	1.78	1.13	1.13	1.12	1.12	14.14	14.16	8.08	7.90	8.08	0.38	800	55 000	59 000
WD118	8.000	2.00	2.04	0.883	0.81	0.94	1.02	13.25	0.878	2.06	2.04	1.39	1.39	1.38	1.38	14.89	14.91	8.66	8.31	8.66	0.50	1300	70 000	79 000
WD122	8.000	2.00	2.04	0.883	0.81	0.94	1.02	8.75	0.878	2.06	2.04	1.39	1.39	1.38	1.38	10.26	10.28	6.38	6.00	6.38	0.50	900	70 000	79 000
WD480	8.000	2.00	2.04	0.883	0.81	0.94	1.02	11.12	0.878	2.06	2.04	1.26	1.39	1.25	1.38	12.76	12.78	7.63	7.25	7.63	0.50	1000	70 000	79 000

Table 1M — Chain dimensions, measuring loads and breaking loads (Metric units)

1	2	3		4	5	6	7	8	9	10	11	12		13		14	15	16	17	18	19	20	21	
ISO chain no.	Pitch	Barrel shape: Width acc. to section Z-Z of barrel		Barrel shape: Plate hole for barrel bore	Barrel shape			Width between plates for wheel contact at inner end	Connecting pin body diameter	Chain path depth	Barrel diameter or plate depth	Crank clearance dimensions		Plate end clearance dimensions		Width over link at inner end	Width between plates at outer end	Width over pin fastening to centre line	Width over pin head to centre line	Width over rivet to centre	Chain plate thickness	Measuring load	Breaking load: Pin, heat treated	Breaking load: All heat treated
	p	d_1		d_3	l_6	l_7	l_8	b_1	ϕd_2	h_1	h_2	l_1	l_2	l_3	l_4	b_2	b_3	b_4	b_5	b_6	c			
		nom.	max.	min.			max.	min.	max.	max.	max.	min.	min.	max.	max.	max.	min.	max.	max.	max.	nom.		min.	
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	daN	daN	daN
WD102	127,00	38,10	39,1	19,25	14,2	17,5	19,6	162,1	19,13	39,6	38,12	25,7	25,7	25,4	25,4	197,1	197,6	127,8	117,6	127,8	9,7	270	17 010	24 470
WD104	152,40	38,10	39,1	19,25	14,2	17,5	19,6	104,6	19,13	39,6	38,12	25,7	25,7	25,4	25,4	136,9	137,4	94,0	87,4	94,0	9,7	180	17 010	24 470
WD110	152,40	38,10	39,1	19,25	14,2	17,5	19,6	228,6	19,13	39,6	38,12	25,7	25,7	25,4	25,4	263,9	264,4	157,5	151,1	157,5	9,7	310	17 010	24 470
WD112	203,20	38,10	39,1	19,25	14,2	17,5	19,6	228,6	19,13	39,6	38,12	25,7	25,7	25,4	25,4	263,9	264,4	157,5	151,1	157,5	9,7	270	17 010	24 470
WD113	152,40	38,10	39,1	22,43	15,7	17,5	19,6	228,6	22,30	39,6	38,12	25,7	25,7	25,4	25,4	270,3	270,8	165,1	157,2	165,1	12,7	360	21 350	25 350
WD116	203,20	44,45	45,2	19,25	16,0	20,6	22,6	330,2	19,13	46,0	45,21	28,7	28,7	28,4	28,4	359,2	359,7	205,2	200,7	205,2	9,7	360	24 470	26 240
WD118	203,20	50,80	51,8	22,43	20,6	23,9	25,9	336,6	22,30	52,3	51,80	35,3	35,3	35,1	35,1	378,2	378,7	220,0	211,1	220,0	12,7	580	31 140	35 140
WD122	203,20	50,80	51,8	22,43	20,6	23,9	25,9	222,2	22,30	52,3	51,80	35,3	35,3	35,1	35,1	260,6	261,1	162,1	152,4	162,1	12,7	400	31 140	35 140
WD480	203,20	50,80	51,8	22,43	20,6	23,9	25,9	282,4	22,30	52,3	51,80	23,0	35,3	31,8	35,1	324,1	324,6	193,8	184,2	193,8	12,7	440	31 140	35 140

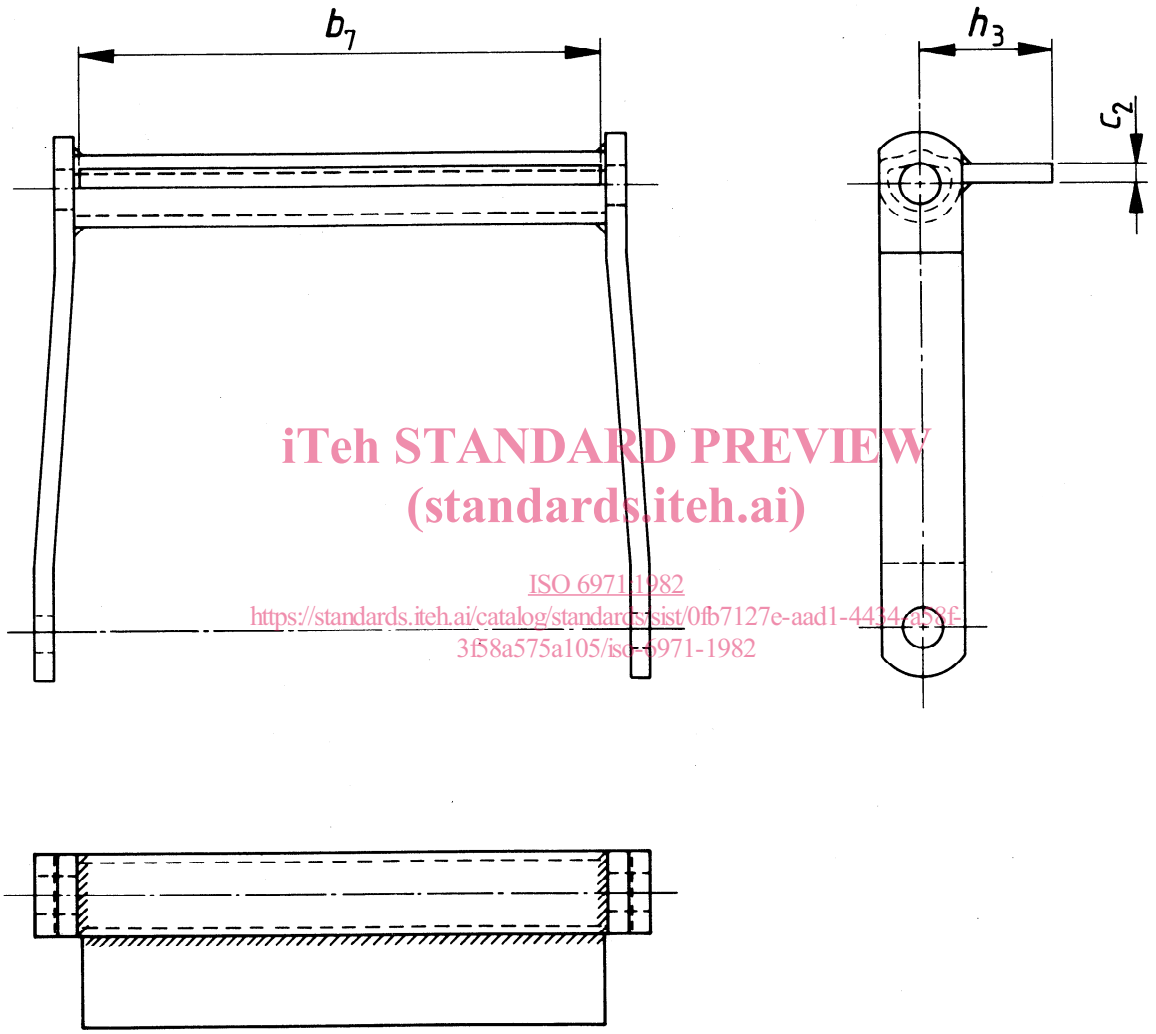


Figure 4 — C1, C3 and C4 attachments

Table 2 — Dimensions of C1 attachments (in inches)

ISO chain No.	c_2	b_7 max.	h_3 max.
WD 102	0.38	7.76	2.44
WD 104	0.38	5.39	2.44
WD 110	0.38	10.39	2.44
WD 112	0.38	10.39	2.44
WD 116	0.38	14.14	2.68

Table 2M — Dimensions of C1 attachments (in millimetres)

ISO chain No.	c_2	b_7 max.	h_3 max.
WD 102	9,7	197,1	62,0
WD 104	9,7	136,9	62,0
WD 110	9,7	263,9	62,0
WD 112	9,7	263,9	62,0
WD 116	9,7	359,2	68,1

Table 3 — Dimensions of C3 attachments (in inches)

ISO chain No.	c_2	b_7 max.	h_3 max.
WD 110	0.50	10.39	2.31
WD 113	0.50	10.64	2.31
WD 118	0.50	14.89	3.06
WD 480	0.50	12.76	3.06

Table 3M — Dimensions of C3 attachments (in millimetres)

ISO chain No.	c_2	b_7 max.	h_3 max.
WD 110	12,7	263,9	58,7
WD 113	12,7	270,3	58,7
WD 118	12,7	378,2	77,7
WD 480	12,7	324,1	77,7

Table 4 — Dimensions of C4 attachments (in inches)

ISO chain No.	c_2	b_7 max.	h_3 max.
WD 102	0.38	7.76	3.81
WD 104	0.38	5.39	3.81
WD 110	0.38	10.39	3.81
WD 112	0.38	10.39	3.81
WD 113	0.50	10.64	4.81
WD 116	0.38	14.14	4.94
WD 480	0.50	12.76	5.06

Table 4M — Dimensions of C4 attachments (in millimetres)

ISO chain No.	c_2	b_7 max.	h_3 max.
WD 102	9,7	197,1	96,8
WD 104	9,7	136,9	96,8
WD 110	9,7	263,9	96,8
WD 112	9,7	263,9	96,8
WD 113	12,7	270,3	122,2
WD 116	9,7	359,2	125,5
WD 480	12,7	324,1	128,5