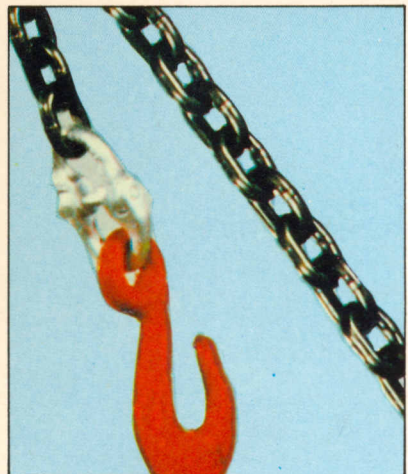
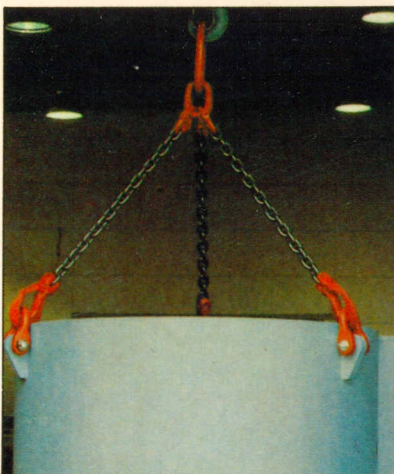
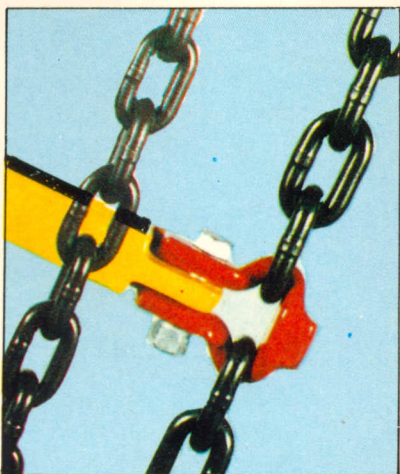
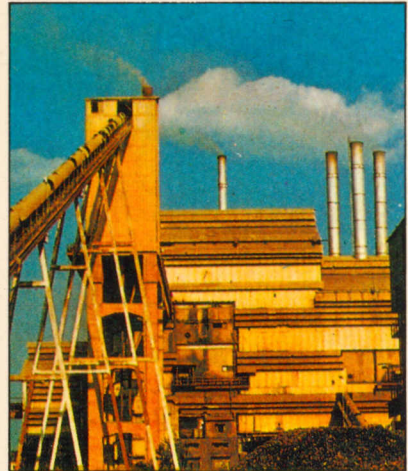
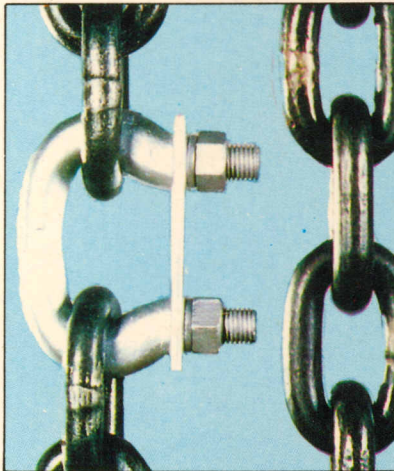
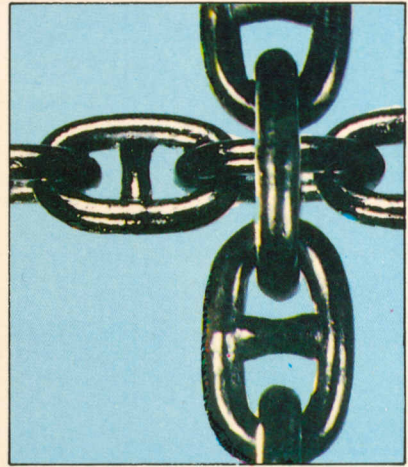


CHAINS & ACCESSORIES

For All Applications



INDIAN CHAIN

INDIAN CHAIN

ISO 9002
CERTIFIED

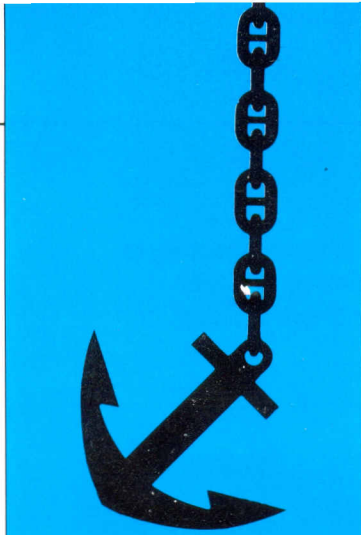
On the Growth Track

In the past 27 years Indian Chain has come a long way, constantly adding to its capabilities and growing in experience to improve its product quality. Today it has emerged as one of the leading suppliers of high performance welded chains and their accessories, catering to a wide spectrum of Industries in India and abroad.

Fine tuned to market needs Indian Chain has always been able to innovate and supply products tailored to customer's exacting requirements.

Whether Stud Link chains for shipping and mooring, Elevator chains for cement plants, Scraper chains for ash handling in power plants, Conveyor chains for coal mining or Short Link chains for lifting purpose, our products have withstood the extreme conditions and established their mark in respective industries.





Stud Link Anchor Chain

Indian Chain has been manufacturing Stud Link Anchor Chain and the Accessories for the past 30 years for various Shipbuilding yards in India and abroad. Being the first Company in India to have produced anchor chains to stringent quality requirements, we are approved by all major Classification Societies like, IRS, ABS, LRS, DNV, BV, GL, NKK. Most of the Naval Frigates built in India are equipped with chains manufactured by Indian Chain. Over the years we have developed and produced all accessories for anchor chains like,

Kenter Shackles, Swivels, Anchor Shackles, Senhouse slips and various type of Anchors. We have been able to keep pace with new technology and are fully equipped to manufacture Grade U3 chains for over 10 years. Our chains are now exported all over the world.

Chain Cable

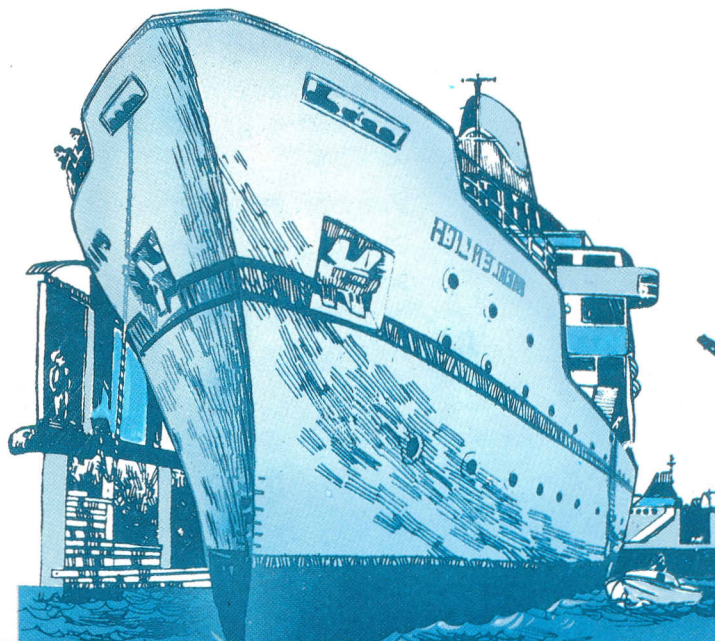
Stud Link Chain Cables upto 70mm diameter are generally produced in the lengths of 27.5 mtrs or half lengths of 13.75 mtrs. These can be produced to desired shorter or longer lengths also. We also manufacture Open Link Chains for Mooring buoys.

Accessories

Accessories like Kenter Shackles, 'D' Type Joining Shackles, Anchor Shackles (End Shackles), Swivel Adapters etc. are produced in our own forge shop and precision machined. Special naval requirements of Box Swivel Adapters, Screw Stoppers, Blake Stoppers, and Senhouse slips are also catered to.

Anchors

Cast steel and fabricated anchors upto 10 Tonnes are manufactured in various types and designs and tested in our testing machine.





Mechanical Properties of Chain Cable Materials

Material

The steel used for the manufacture of chain cables and accessories is procured from modern steel plants. It is fully killed fine grain steel manufactured by latest steel making technology. Anchors are cast or fabricated.

Mechanical Properties

Grade	Heat Treatment	Tensile Strength N/mm ²	Yield Stress N/mm ²	Elongation % (min)	R.A. % (min)	Charpy V Notch Impact Test	
						Test Temp.	Avg. Energy Joules (Min)
U1	Normalised	300 - 490	—	25	—	—	—
U2	Normalised	490 - 690	295	22	—	—	—
U3	Quenched & Tempered	Min. 690	410	17	40	0°C	60 50 (weld)

Manufacturing Process

Chains are welded on automatic flash butt welding machines. The weld area is trimmed all around the weld on specially designed machines to give a smooth weld. Studs are hydraulically pressed in the link.

Heat treatment

To ensure required physical properties and homogeneous grain structure, all chains are heat treated in automatic controlled furnaces.

Inspection and Testing

Proof and Break Load testing of each chain and accessories is carried out on 500 Tonnes capacity Horizontal Testing Machine. Visual link by link inspection and dimensional check up is done after Proof Load Testing.

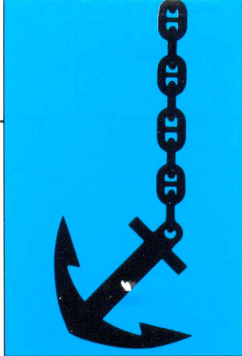
Magnetic particle test is carried out on forged and machined components to ensure flawless components.

Tensile tests and impact tests are performed on each batch of finished chain and accessories to comply with the requirement of the specifications. Testing is certified by Classification Societies as required by the Customer.

Painting and Packaging

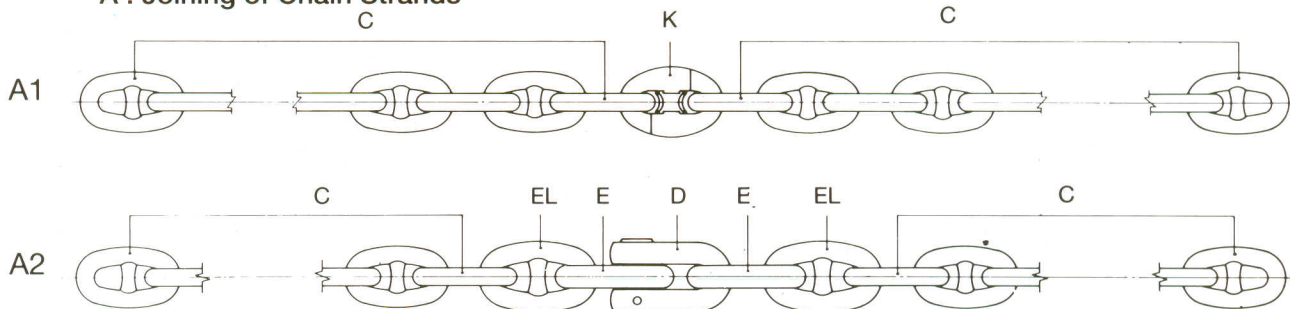
Chains and accessories are generally coated with bitumin. If desired these can be supplied in electro zinc plated or Hot dip galvanised condition. Chains are bundled and tied with wire ropes and loose items packed in wooden boxes.



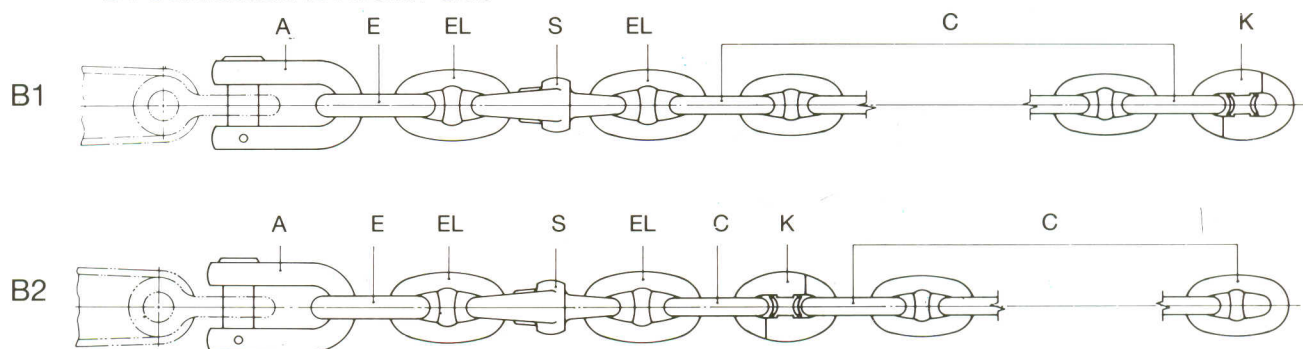


Standard Arrangements

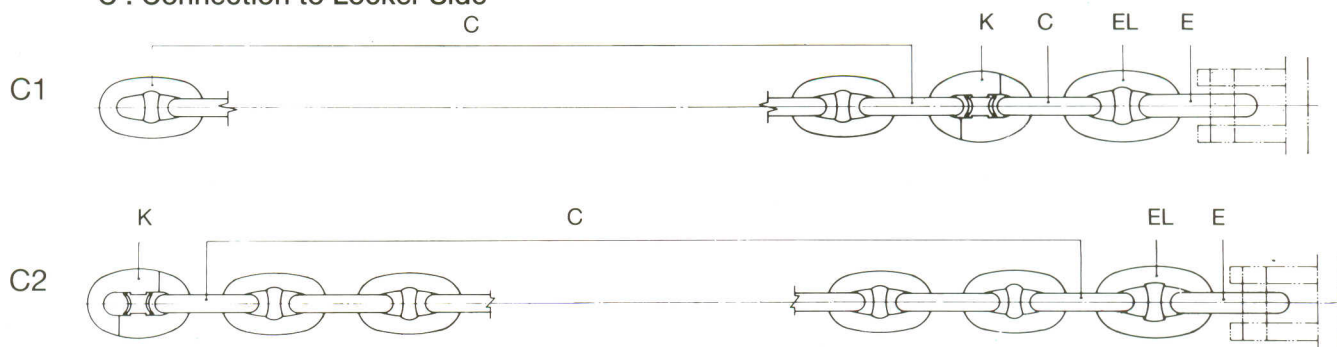
A : Joining of Chain Strands



B : Connection to Anchor Side



C : Connection to Locker Side



C – Common Link □ EL – Enlarged Link □ E – End Link □ D – 'D' Type Joining Shackle □ A – 'D' Type Anchor Joining Shackle □ K – Kenter Joining Shackle □ S – Swivel Piece



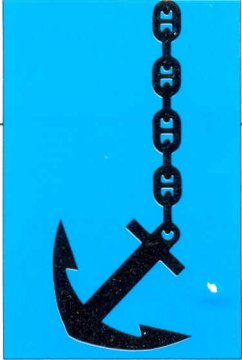
Testing Requirements

Chain size (mm)	GRADE U1		GRADE U2		GRADE U3		Weight of each length of 27.5 M with Kenter (kg)
	Proof Load	Breaking Load	Proof Load	Breaking Load	Proof Load	Breaking Load	
14	58	82	82	116	116	165	130
16	76	107	107	150	150	216	160
17.5	89	127	127	179	179	256	195
19	105	150	150	211	211	301	225
20.5	123	175	175	244	244	349	260
22	140	200	200	280	280	401	300
24	167	237	237	332	332	476	360
26	194	278	278	389	389	556	420
28	225	321	321	449	449	642	480
30	257	368	368	514	514	735	550
32	291	417	417	583	583	833	620
34	328	468	468	655	655	937	710
36	366	523	523	732	732	1050	800
38	406	581	581	812	812	1160	890
40	448	640	640	896	896	1280	980
42	492	703	703	981	981	1400	1080
44	538	769	769	1080	1080	1540	1170
46	585	837	837	1170	1170	1680	1280
48	635	908	908	1270	1270	1810	1380
50	686	981	981	1370	1370	1960	1480
52	739	1060	1060	1480	1480	2110	1600
54	794	1140	1140	1590	1590	2270	1720
56	851	1220	1220	1710	1710	2430	1865
58	909	1290	1290	1810	1810	2600	1990
60	969	1380	1380	1940	1940	2770	2120
62	1030	1470	1470	2060	2060	2940	2280
64	1100	1560	1560	2190	2190	3130	2440
66	1160	1660	1660	2320	2320	3310	2590
68	1230	1750	1750	2450	2450	3500	2750
70	1290	1840	1840	2580	2580	3690	2950

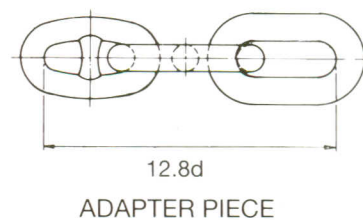
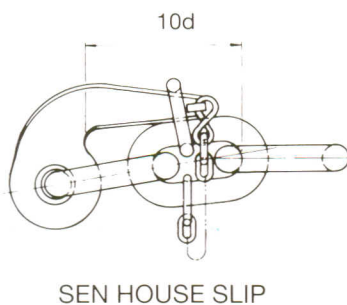
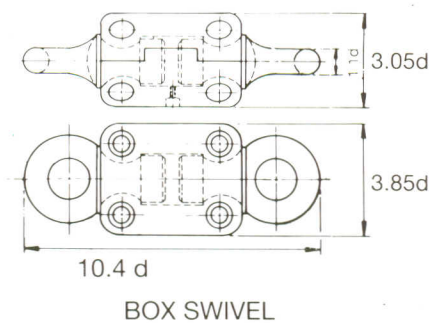
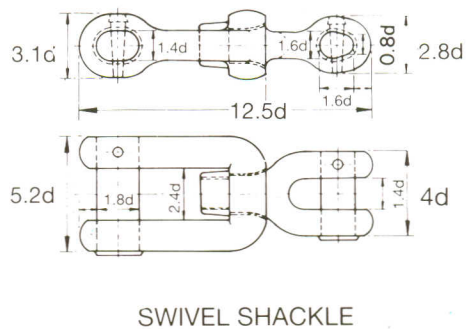
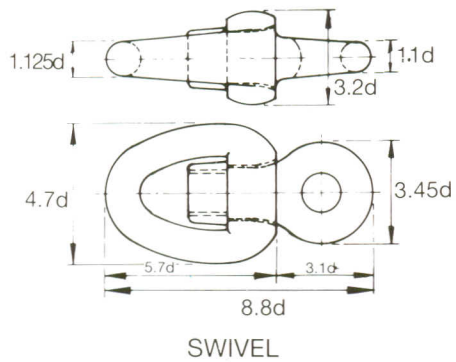
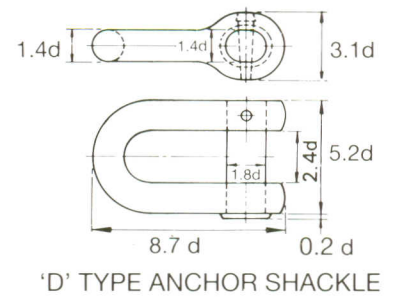
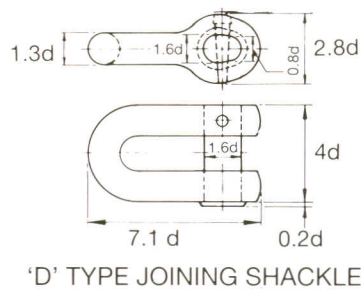
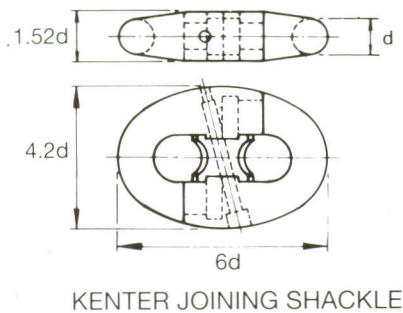
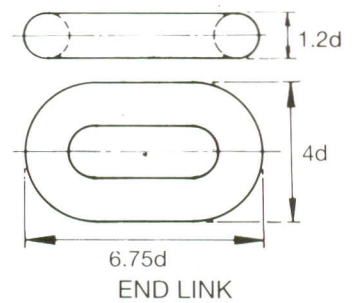
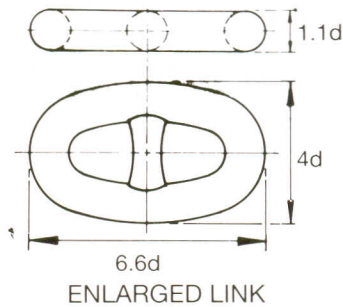
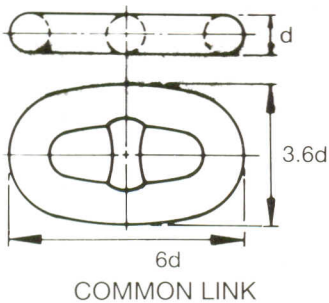
Load in kN



INDIAN CHAIN



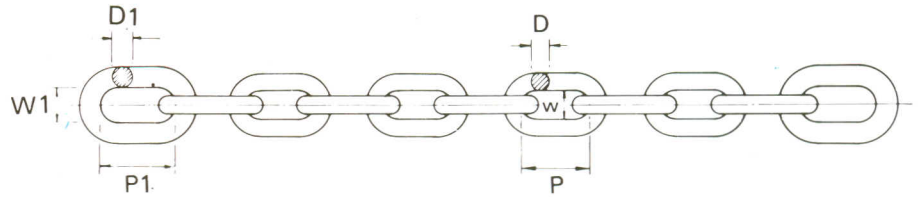
Anchor Chain Accessories



d = diameter of chain



Open Link Chain and Anchor



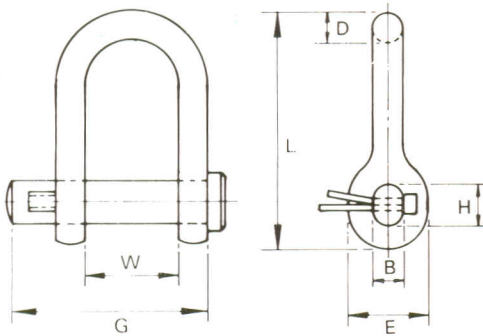
OPEN LINK CHAIN Grade - U2

Nominal dia (D)	Inside Length (P)	Inside Width (W)	Safe Working Load (kN)	Proof Load (kN)	Min. Breaking Load (kN)	Kg/M (approx)	Corresp. Shackle size
20	80	32	50	100	200	7.8	25
25	100	40	80	160	320	12.1	35
32	128	51	130	260	520	19.9	42
36	144	58	170	340	680	25.1	42
38	152	61	190	380	760	29.5	46
42	168	67	230	460	920	36.0	46
44	176	70	250	500	1000	39.4	50
50	200	80	330	660	1320	50.5	57

END LINK

Dia (D1)	Inside length (P1)	Inside width (W1)
24	96	38
30	120	48
34	136	54
38	152	61
43	172	69
48	192	77
53	212	85
60	240	96
67	268	107
76	304	122

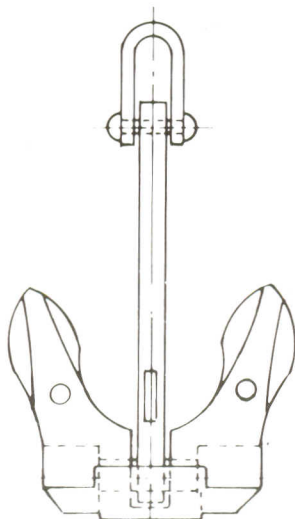
FORELOCK END SHACKLE



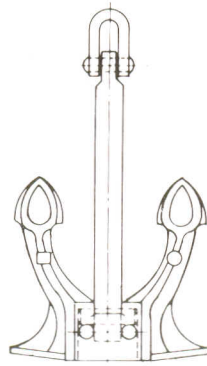
Size							Weight each (kgs)	SWL (kN)	Proof Load (kN)
D	W	L	E	B	H	G			
25	74	190	57	25	35	159	3.3	50	100
35	79	243	82	38	49	189	7.3	80	160
42	86	276	93	43	56	210	11.8	170	340
46	100	311	105	49	63	238	15.8	230	460
50	113	346	118	54	70	257	22.2	250	500
57	123	370	133	57	79	292	29.6	330	660

Dimensions in mm

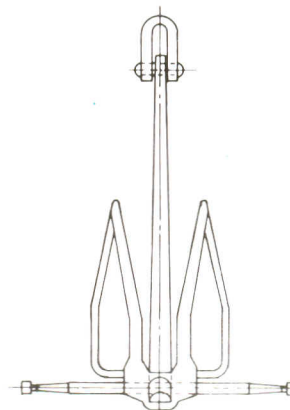
Load in kN



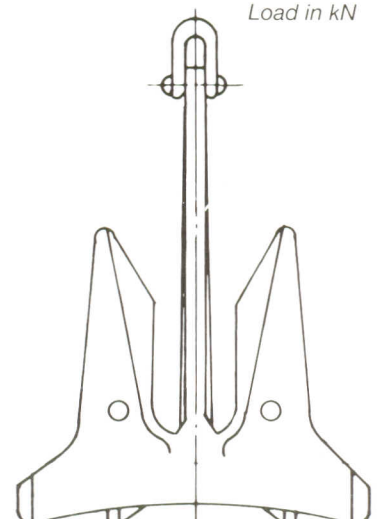
STOCKLESS ANCHOR



SPEK ANCHOR



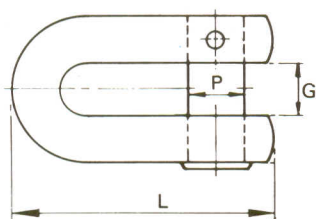
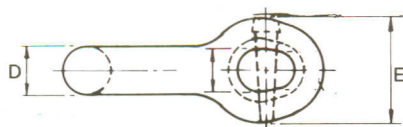
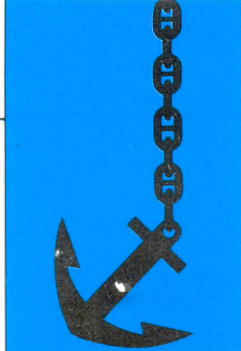
DANFORTH ANCHOR



AC 14 ANCHOR

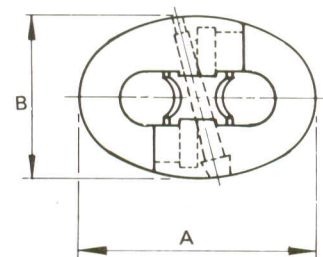
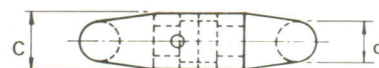


INDIAN CHAIN



'D' Type Joining Shackle

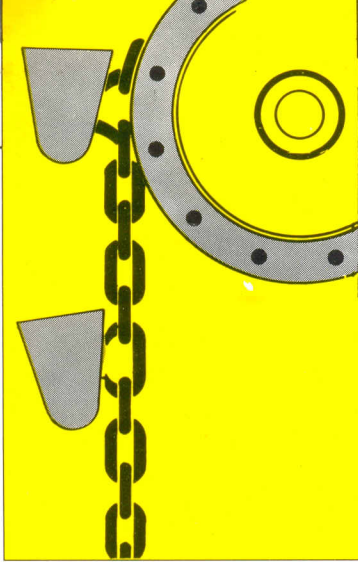
Chain Size	D	P	G	E	L	Weight (kgs)
14	18	22	20	39	99	1.0
16	21	26	22	45	114	1.5
17.5	23	28	24	49	124	2.0
19	25	30	26	53	135	2.2
20.5	27	33	28	57	146	2.3
22	29	35	30	61	156	2.8
24	31	38	34	67	170	3.8
26	34	42	36	73	185	4.5
28	36	45	40	78	199	5.5
30	39	48	42	84	213	6.8
32	42	51	44	90	227	8.0
34	44	54	48	95	241	11.1
36	47	58	50	101	256	11.7
38	49	62	54	106	271	13.2
40	52	64	56	112	284	17.0
42	55	68	58	118	300	19.0
44	57	70	62	123	312	23.0
46	60	74	64	129	327	24.4
48	62	77	68	134	341	27.0
50	65	80	70	140	355	31.0
52	68	83	74	146	369	35.0
54	70	86	76	151	383	39.5
56	73	90	78	157	398	44.0
58	75	93	82	162	412	45.0
60	78	96	84	168	426	52.0
62	81	99	86	174	440	61.0
64	83	102	90	180	454	66.0
66	86	106	92	185	469	71.0
68	88	109	96	190	483	78.9
70	91	112	98	196	497	84.5



Kenter Shackle

Chain Size d	A	B	C	Weight (kgs)
14	84	59	21.3	0.5
16	96	67	24.3	0.6
17.5	105	74	27	0.8
19	114	80	29	1.1
20.5	123	86	31	1.2
22	132	92	33	1.8
24	144	101	36	2.5
26	156	109	40	2.9
28	168	118	43	3.8
30	180	126	46	4.7
32	192	134	49	5.0
34	204	143	52	6.6
36	216	151	55	7.2
38	228	160	58	8.3
40	240	168	61	9.7
42	252	176	64	10.4
44	264	185	67	13.0
46	276	193	70	14.9
48	288	202	73	15.5
50	300	210	76	18.0
52	312	218	79	22.0
54	324	227	82	24.2
56	336	235	85	24.7
58	348	244	88	27.0
60	360	252	91	33.4
62	372	260	94	36.7
64	384	269	97	40.0
66	396	277	100	44.0
68	408	286	103	48.3
70	420	294	106	50.0

Dimensions in mm



Bucket Elevator and Scraper Conveyor Chains and Their Accessories

We manufacture surface hardened chains for Bucket Elevators used in Cement and Fertilizer Plants and for Scraper Conveyors for ash removal system of Thermal Power Plants which are required to operate continuously.

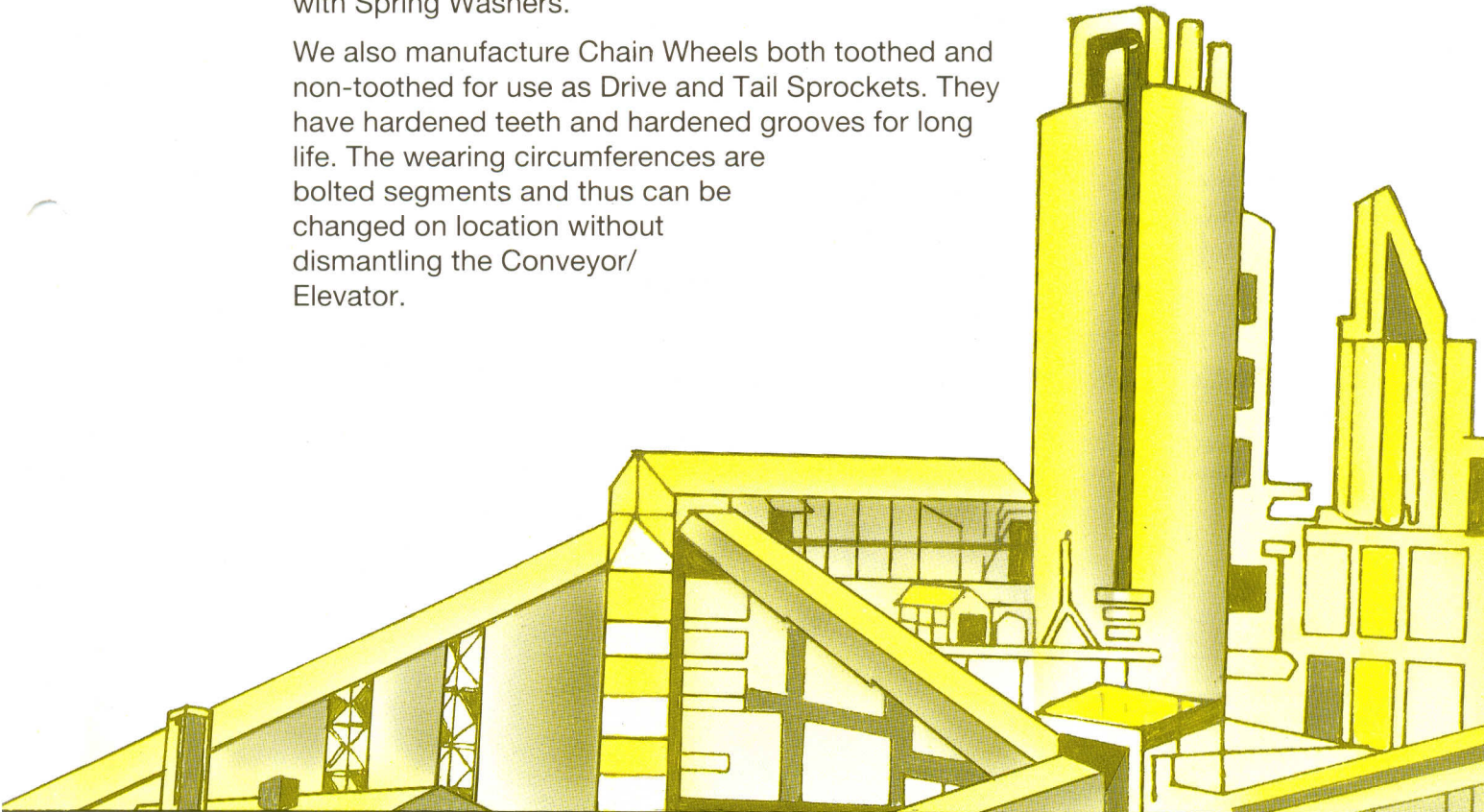
Due to constant abrasion of these chain links against each other as well as due to the abrasive material which is being handled in the ash removal system, surface treated chains are essential, to give a reasonable service life and to work without frequent replacement.

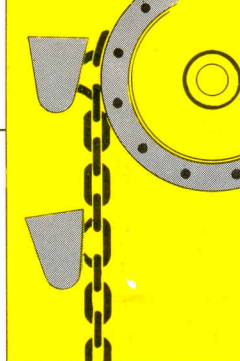
To meet these requirements we have complete in-house facilities like gas carburising having carbon and temperature controlled atmosphere furnaces and extensive testing facilities for mechanical and metallurgical testing to ensure that the required quality is attained and maintained.

Chain Bows and Chain Shackles are manufactured in closed dies and the wearing portions are locally induction hardened by specially developed process. The legs which are extra tempered to make them softer are threaded with accurate leg centre.

Our Chain Bows are supplied with a carbon steel Distance Plate which closely fits on the leg roots to give the bows added strength. We recommend the use of Spring Washers and carbon steel Hexagonal Nuts. Chain shackles are supplied with high tensile Bolts and matching Nuts with Spring Washers.

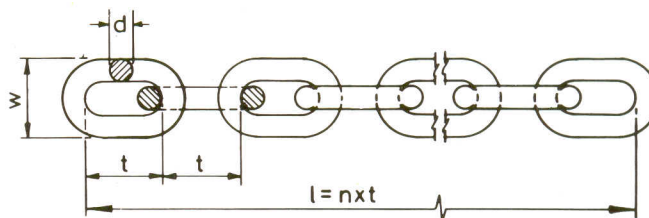
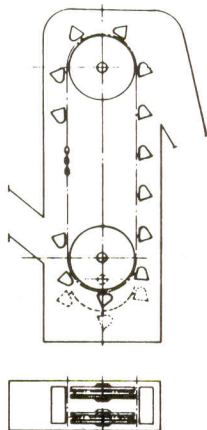
We also manufacture Chain Wheels both toothed and non-toothed for use as Drive and Tail Sprockets. They have hardened teeth and hardened grooves for long life. The wearing circumferences are bolted segments and thus can be changed on location without dismantling the Conveyor/Elevator.





High Tensile Chains for Bucket Elevators

- Grade** : IC 60 RC and IC 60 RC Special
- Material** : Special Fine grained High Strength Steel 20 Mn2 as per IS 5517
- Process of Manufacture** : Flash Butt Welded
- Heat Treatment** : Gas Carburised, Double Quenched with Core Refining and Tempered.
- Case Depth** : 0.1 d \pm 0.01d, upto 28 mm dia
+ 0.01d/ - 0.02d from 30 mm dia
- Skin Hardness** : RC 60 - 64 (HV30 Min. - 720 Kp/mm²)
- Mechanical Properties** : Proof Strength : 120 N/mm² Min.
Breaking Strength : 240N/mm²
- Delivery Condition** : Chains are supplied in Matched pairs.



CHAIN WITH PITCH 3.5d AS PER DIN-764

Nominal Size	Pitch	Outside Width	Recommended No. of Links	Length of Chain	Weight of each chain	Grade IC 60 RC		Pitch of Appropriate Chain Bow (Plain Sprocket)
						Test Load	Minimum Breaking Load	
d	t	w	n	l	kgs	kN	kN	t
16	56	54	9	504	2.7	50	100	63
18	63	60	9	567	3.8	63	126	70
20	70	67	7	490	4.2	80	160	80
23	80	77	7	560	6.2	100	200	91
26	91	87	5	455	6.4	126	252	105
30	105	101	5	525	10.4	170	340	126
36	126	122	5	630	17.2	250	500	147
42	147	142	5	735	26.5	340	680	147

CHAIN WITH PITCH 2.8 d AS PER DIN-766

16	45	54	9	405	2.3	50	100	63
18	50	60	9	450	3.3	63	126	70
20	56	67	7	392	3.6	80	160	80
23	64	77	7	448	5.5	100	200	91
26	73	87	7	511	7.7	126	252	105
30	84	101	7	588	12.0	170	340	126
36	101	122	7	707	21.0	250	500	147
42	118	142	7	826	33.0	340	680	147

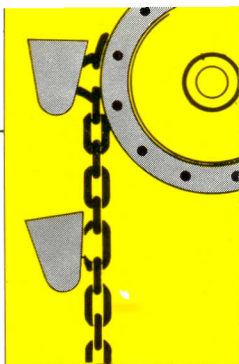
Dimensions in mm

10 kN = 1.02 tonne

* Grade IC 60 RC Special made out of Alloy Steel has 20% higher Breaking Load

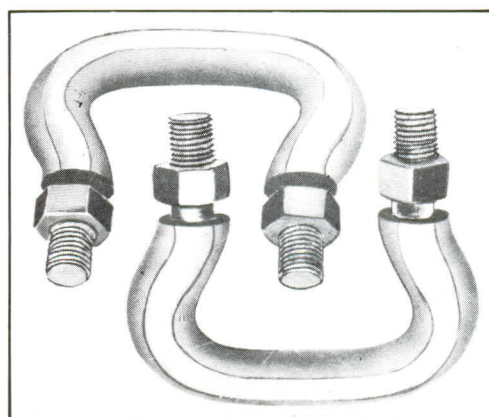
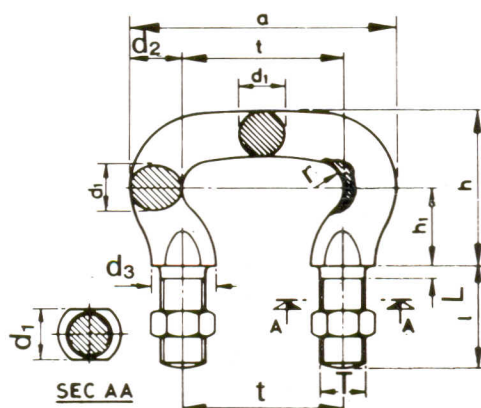


INDIAN CHAIN



Chain Bows for Bucket Elevators

Grade	: IC 55 RC
Material	: Steel C45 as per IS 5517
Process of Manufacture	: Solid Forged and Die Swaged
Heat Treatment	: Hardened and Tempered all over to a strength of 1000-1200 N/mm ²
Special Crown Hardening	: Wearing points specially hardened to RC 55-60 (HV30 Min. - 600 Kp/mm ²).
Hardening Depth	: 0.1 d min.
Mechanical Properties	: Proof Strength : 120 N/mm ² Min Breaking Strength : 280 N/mm ²
Delivery Condition	: Chain Bows are supplied with Carbon Steel Distance Piece and a pair of Carbon Steel Hex Nuts, together with spring washers.
Finish	: Black/Special Rust Preventive.



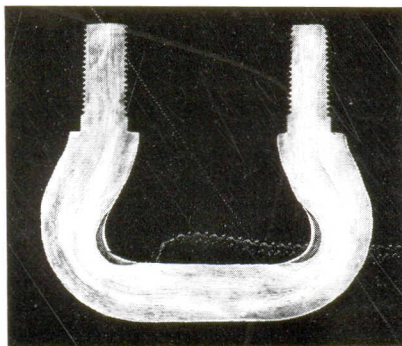
AS PER DIN-745

t	a	d ₁	d ₂	d ₃	h	h ₁	l	L	r	T	Proof Load kN	Breaking Load kN	Appropriate Chain Size	Weight Each Kgs
56	92	15	18	19	50	25	32	8	9.5	12	50	112	13	0.36
63	105	18	21	23	60	30	40	8	10.5	16	63	142	16	0.50
70	116	20	23	28	68	34	45	10	12	20	80	176	18	0.80
80	132	23	26	31	74	37	45	10	13	20	100	230	20	1.00
91	149	26	29	34	86	43	55	12	14.5	24	126	300	23	1.70
105	172	30	34	38	100	50	55	12	17	24	170	395	26	2.20
126	206	36	40	44	118	59	70	16	20.5	30	250	570	30	3.80
147	239	42	46	50	136	68	70	16	23.5	30	340	775	36	5.30
147	239	42	46	50	136	68	85	16	23.5	36	340	775	36	6.50

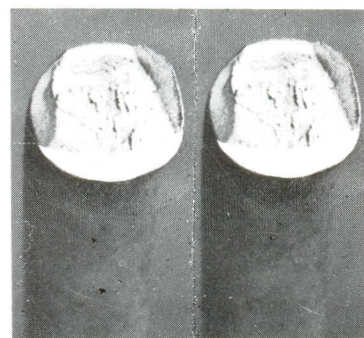
Dimensions in mm

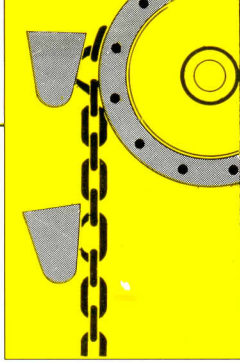
10 kN = 1.02 tonne

Microetchching of the Chain Bow section shows uniform hardening depth all over the wearing area at the Crown.



A fractured structure of the Chain Bow Link clearly distinguishes the hardened area at the Crown and a Ductile Core structure.

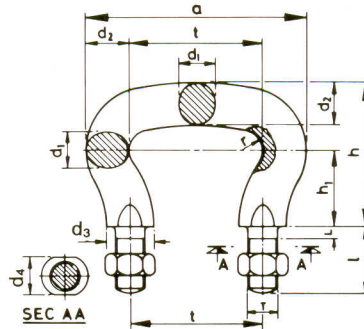
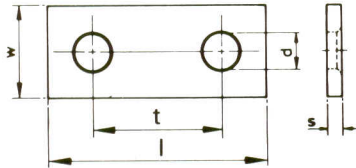




Chain Bows for Bucket Elevators

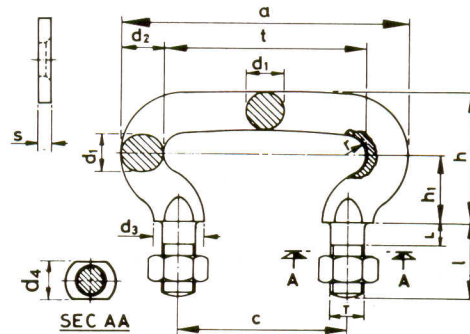
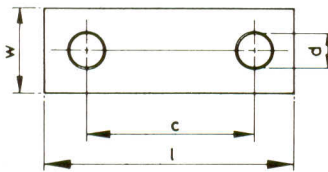
**DISTANCE PLATE FOR CHAIN BOWS
AS PER DIN 745 AND DIN 5699**

t	l	w	s	d	kg
56	95	40	6	13	0.17
63	110	40	6	17	0.20
70	120	50	8	21	0.33
80	130	50	8	21	0.37
91	150	60	8	25	0.50
105	165	60	8	25	0.56
126	200	70	10	31	1.00
147	220	70	10	31	1.10
147	230	70	10	37	1.10



AS PER DIN-5699

t	a	d ₁	d ₂	d ₃	d ₄	h	h ₁	l	L	r	T	Proof Load kN	Breaking Load kN	Appropriate Chain Size mm	Weight Each kg
56	92	16	18	19	17	64	34	35	8	9.5	14	50	125	13	0.36
63	105	18	21	23	20	71	37	40	8	10.5	16	63	165	16	0.60
70	116	20	23	28	23	80	42	45	10	12.0	20	80	200	18	0.90
80	132	23	26	31	25	89	47	45	10	13.0	20	100	260	20	1.20
91	149	26	29	34	29	99	52	55	12	14.5	24	150	330	23	1.90
105	173	30	34	38	31	114	60	55	12	16.5	24	200	450	26	2.60
126	206	36	40	44	37	134	71	65	16	19.5	30	280	635	30	4.40
147	241	42	47	50	42	157	81	75	16	22.5	36	380	870	36	7.30



**DISTANCE PLATE FOR
LONG PITCH BOW LINK**

c	l	w	s	d	kg
100	150	50	8	20.5	0.45
120	180	60	8	24.5	0.62
130	190	60	8	24.5	0.68
150	220	70	10	31	1.10
180	250	70	10	31	1.26
210	310	100	12	37	2.75

LONG PITCH CHAIN BOWS

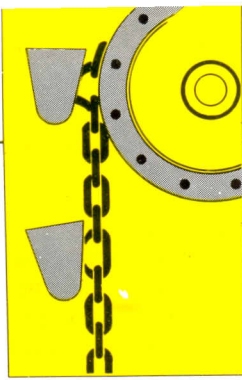
d ₁	d ₂	d ₃	d ₄	t	c	h	h ₁	l	L	a	r	T	Proof Load kN	Breaking Load kN	Appropriate Chain Size mm	Weight Each kg
22	25	30	24	120	100	78	40	45	15	170	12	20	86	220	20	1.05
25	28	33	28	140	120	88	45	50	17	196	14	24	106	265	23	1.60
28	31	38	30	150	130	98	50	55	17	212	16	24	132	340	26	2.10
34	37	44	37	180	150	119	60	70	20	254	20	30	195	500	30	3.90
40	45	50	42	220	180	144	70	70	20	310	24	30	250	630	36	5.90
48	54	58	48	250	210	176	85	80	20	358	33	36	345	775	42	10.10

Dimensions in mm



INDIAN CHAIN

10 kN = 1.02 tonne



Alloy Steel Chains for Scraper Conveyors

Grade :

IC 60 RC Alloy

Material :

Nickel Chrome Moly Steel/ Nickel Moly Steel

Process of Manufacture :

Flash Butt Welded

Heat Treatment :

Gas Carburised, Double Quenched with Core Refining & Tempered

Case Depth :

$0.08d \pm 0.01d$

Skin Hardness :

RC 60-64 (HV30 Min. - 720 Kp/mm²)

Mechanical Properties :

Proof Strength : 150 N/mm²

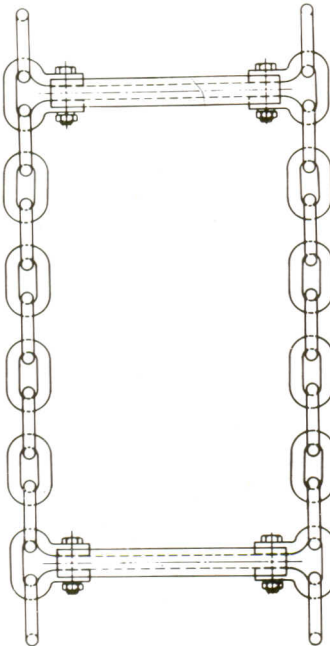
Breaking Strength : 300 N/mm²

Delivery Condition :

Chains are calibrated and supplied in matched pairs.

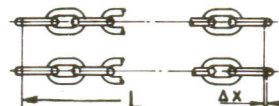
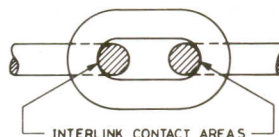
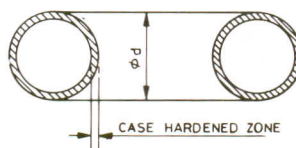
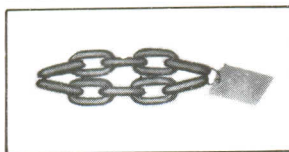
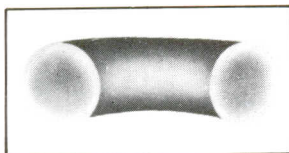
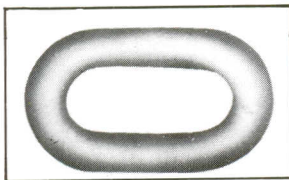
Finish :

Black/Special Rust Preventive

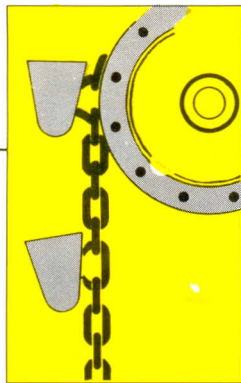


Nominal Size	Pitch	Outside Width	Safe Working Load kN	Proof Load kN	Minimum Breaking Load kN	Weight per meter kg/m
d	t	w				
18	63	60	40	80	160	6.5
20	70	67	50	100	200	8.6
22	86	74	60	120	240	9.7
26	92	86	80	160	315	13.7

Dimensions in mm

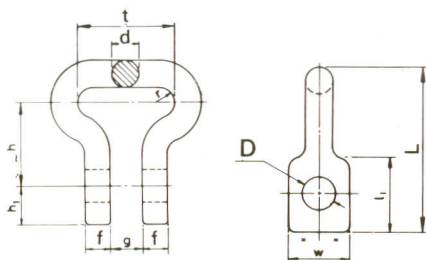


1. Gas Carburising ensures uniform case depth all over the link. Use of fine grained steel prevents grain growth. Chains are double quenched and tempered to achieve high surface hardness of 60-64 HRC as well as high core toughness.
2. Fracture structure of the finished chain shows a ductile core with high surface hardness of 60-64 HRC. The contact areas of the link are ensured to have high hardness and optimum wear resistance for longer life of the chains.
3. Chains are calibrated to close tolerances in calibrating machine. They are then supplied in matched pairs. ($\Delta x = \pm 0.1\%$ of L)



Flat Head Chain Shackle for Scraper Conveyor

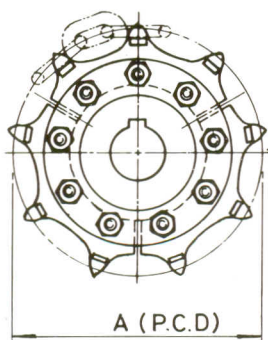
Chain Shackles are manufactured from fine grained C45 Steel by Drop Forging. The Scraper bar is fixed between the opening of the shackle with the help of High Tensile bolt & nut. The Shackles are heat treated to a strength of 100-120 kg/mm² all over the surface. The wearing points at the crown are hardened by special method to a hardness of RC 54-60 and depth of 1.5-2.0 mm. They are subjected to proof and Breaking loads as per the size of the corresponding chain.



Nominal Chain Size d x t	t	d	h	h ₁	f	g	L	w	r	D	Weight each kg.
18 x 64	64	18	56	26	16	22	110	41	12	21	0.8
20 x 70	70	20	85	26	20	22	144	43	13.5	21	1.0
22 x 86	86	22	89	28	22	24	153	48	15	25	1.25
26 x 91	91	26	95	30	26	28	168	52	17.5	25	2.25

CHAIN WHEELS

TOOTHED CHAIN WHEELS are suitable for drive with calibrated round link steel chains in Scraper Conveyors. The toothed sprocket made of high quality steel are bolted to the C I Hub. The Sprocket is carburised to a case depth of 1.5 to 2.0 mm and hardened to RC 55-60 for long life. The Sprocket is supplied in segments, thus making it convenient to replace them at site without removing the Chain Wheel.

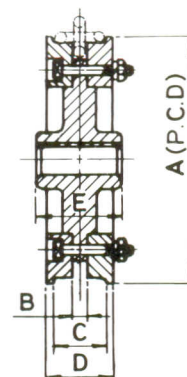
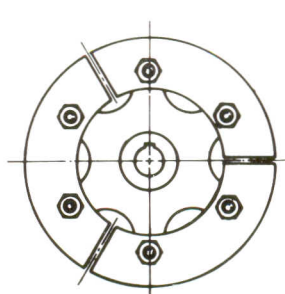


Chain Size			A (P.C.D.)	No. of Teeth	a	b
Dia	Pitch	Outside Width				
16	56	54	323	9	19	100
18	63	60	363	9	21	120
20	70	67	403	9	24	120
23	80	77	461	9	27	120
26	91	87	525	9	31	130
30	105	101	605	9	37	150
36	126	122	726	9	45	180

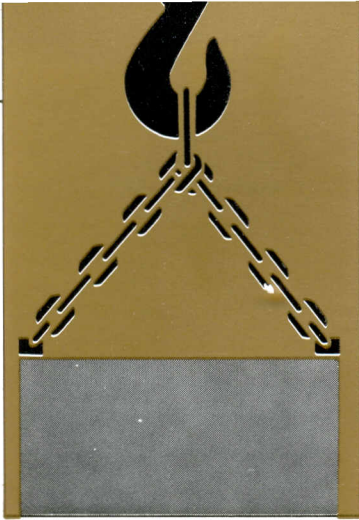
NON TOOTHED CHAIN WHEELS made of three parts used with chains and Shackles for Bucket Elevator Drive. Pair of steel rings made of high quality steel are bolted to the central C.I.Hub. Steel rings are carburised to a case depth to 1.5 to 2.0 mm and hardened to RC 55-60 for long life. The rings are supplied in segments, thus making it convenient to replace them at site without removing the chain wheel.

Chain Size			A (P.C.D.)	B	C	D	E
Dia	Pitch	Outside Width					
16	56	54	323	20	58	66	100
18	63	60	363	23	66	76	120
20	70	67	403	26	74	84	120
23	80	77	461	28	84	94	120
26	91	87	525	32	96	106	130
30	105	101	605	36	110	122	150
36	126	122	726	42	132	144	180

Dimensions in mm



INDIAN CHAIN



Alloy Plus Grade-80 Chain Sling

General Information

1. Chains are manufactured from fine grained special Alloy Steel on electronically controlled Welding Machines.
2. Chain fittings like Hooks, Coupling links, Connectors are forged and heat treated to rigid specification and quality control requirements.
3. Induction hardening of chain ensures uniform hardness throughout the length of Chain.

What is Alloy Plus

1. It is a superior quality of fine grained Nickel-Chrome-Molybdenum fully killed steel.
2. By subsequent spheroidising and drawing operations, the properties of this steel are further improved to give a combination of high strength and ductility.

Why should you use Grade-80 Chain Sling

1. They are lighter in weight compared to other grades of Chain Sling.
2. They offer a factor of safety of 4:1 between the ultimate Breaking Load and Working Load Limit of the Sling.
3. They have higher wear resistance properties and therefore offer longer working life.

TERMINOLOGY

Working Load Limit

It is the maximum load to which the Chain Sling can be subjected to during use.

Manufacturing Test Force

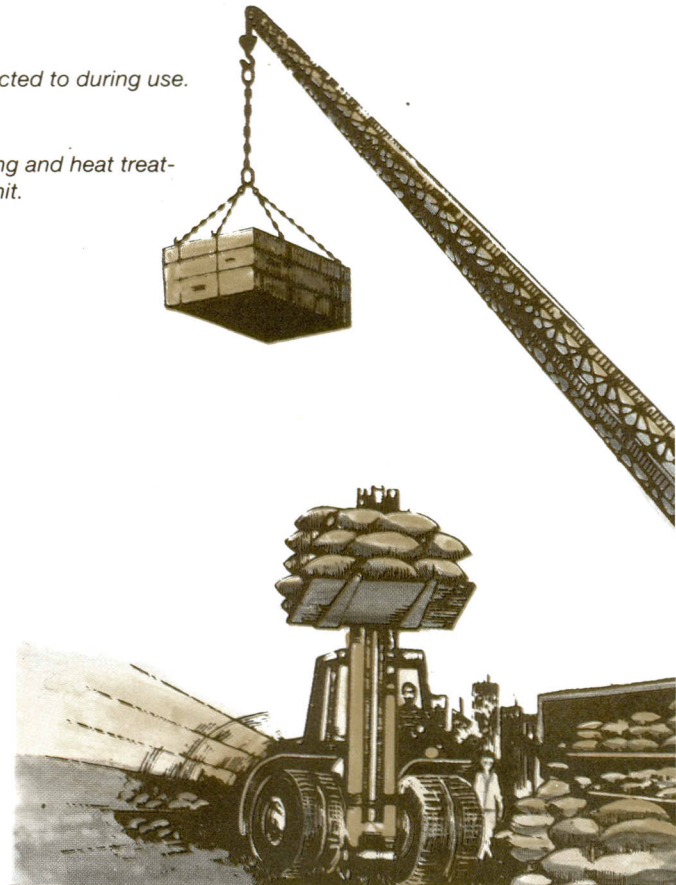
The load to which the chain is subjected to after manufacturing and heat treatment process. It is generally twice the Safe Working Load Limit.

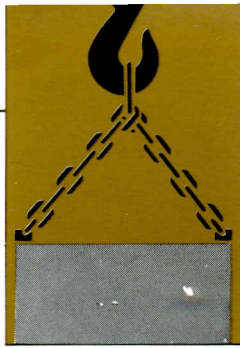
Minimum Breaking Force

It is the minimum load that the chain must withstand during the application of destruction load.

Proof Force (Acceptance)

The load to which the finished chain sling is subjected to after heat treatment. It is twice the Working Load Limit





Lifting Capacity

WORKING LOAD LIMIT

Chain Size (mm)	Single leg	Endless	Multi-leg Slings at 90° Angle			
Grade 80						
			2 Legs	3 Legs	4 Legs	2 Loop
12	5	5	7	10.5	10.5	7
14	6.3	6.3	8.8	13.2	13.2	8.8
16	8	8	11.2	16.8	16.8	11.2
18	10	10	14	21	21	14
20	12.5	12.5	17.5	26.2	26.2	17.5
22	16	16	22.4	33.6	33.6	22.4
25	20	20	28	42	42	28
28	25	25	35	52.5	52.5	35
32	32	32	44.8	67.2	67.2	44.8

Working Load in Metric Tonnes.

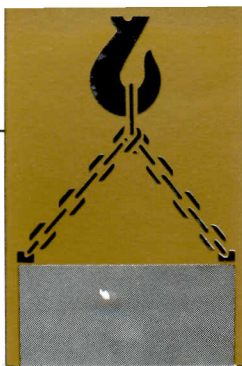
SLING USED AT ELEVATED TEMPERATURES

Sometimes Grade 80 sling may have to be used in conditions where the chain is subjected to higher temperature. The adjacent table gives a general guideline of reduction in working load limit at elevated temperature. We do not recommend use of chain slings above 400°C.

Chain Temperature	Reduction on working load limit (%)
up to 200°C	NIL
200°C – 300°C	10
300° – 400°C	25

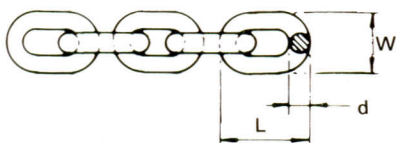


INDIAN CHAIN



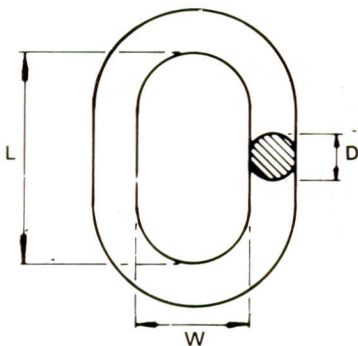
Chain and Accessories

ALLOY PLUS SHORT LINK CHAIN

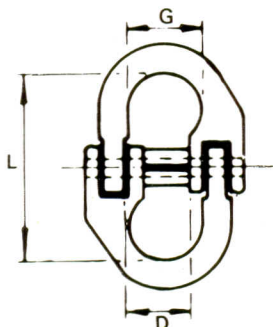


Size d	Length L	Width W	Working Load Limit (kgs)	Mfg Test Force (kgs)	Minimum Breaking Force (kgs)	Weight (kg/m)
12	60	42	4600	11200	18600	3.0
16	80	56	8000	19700	32900	5.6
18	90	63	10000	25000	41700	7.1
20	100	70	12500	30800	51400	8.5
22	110	77	16000	38000	63300	10.4
25	125	87.5	20000	48200	80200	13.4
28	140	98	25000	60400	100600	17.1
32	160	112	32000	78900	131400	23.0

OBLONG LINK



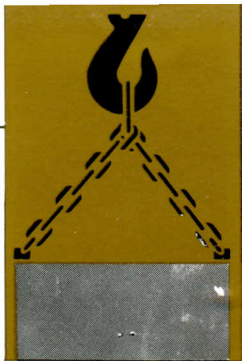
Oblong link dimensions			Suitable for Chain Size			Working Load Limit kgs.
D	L	W	1 Leg	2 Leg	3 & 4 Leg	
25	135	75	12	—	—	5000
28	160	90	16	12	—	8000
32	160	90	18	16	12	11200
36	200	110	20	18	—	14000
40	200	110	22	20	16	17500
45	250	125	25	22	18	22400
50	250	125	28	25	20	28000
56	275	140	32	28	22	40000
63	325	165	—	32	25	50000
71	325	165	—	—	28	63000
80	360	200	—	—	32	70000



INDLOCK CONNECTOR

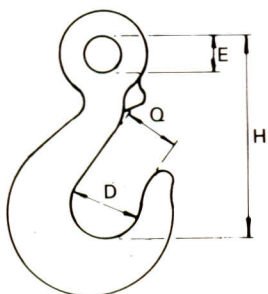
Chain size	G	L	D	Working Load Limit (kgs)	Weight Each (kgs)
12	35	90	24	5000	0.7
16	42	104	33	8000	1.2
20	48	114	42	12500	1.8

Dimensions in mm

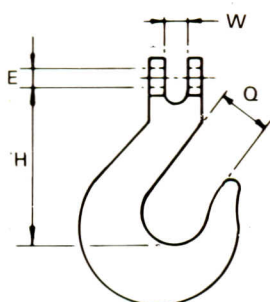


Chain Sling Accessories

EYE HOOK

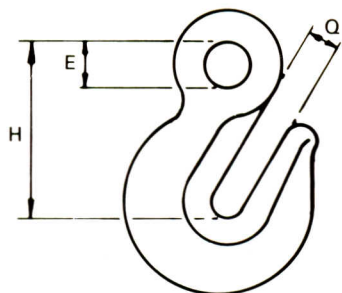


Chain Size	H	D	Q	E	Working Load Limit (kgs)
12	144	50	41	23	5000
16	192	67	54	30	8000
20	240	84	68	38	12500
22	264	92	75	42	16000
25	300	105	85	47	20000
28	336	118	95	53	25000
32	384	134	105	60	32000



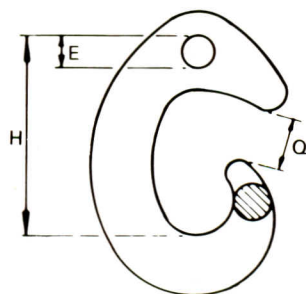
CLEVIS HOOK

Chain Size	H	Q	E	W	Weight (kgs)	WLL (kgs)
12	129	36	15	17	1.95	5000
16	172	46	20	21	3.4	8000
20	217	58	23	25	5.5	12500



GRAB HOOK

Chain Size	H	E	Q	Weight (kgs)	WLL (kgs)
12	100	24	15	1.24	5000
16	123	28	20	2.9	8000
20	146	36	23	3.75	12500



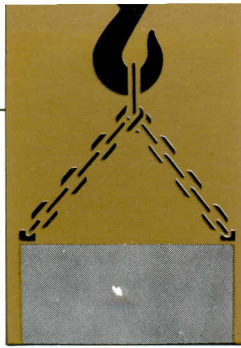
'C' HOOK

Chain size	H	E	Q	WLL (kgs)
12	212	23	39	5000
16	263	30	48	8000
20	335	37	60	12500

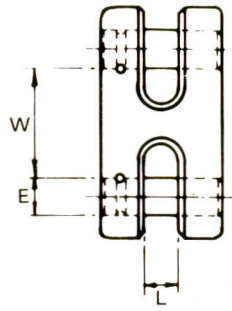
Dimensions in mm



INDIAN CHAIN

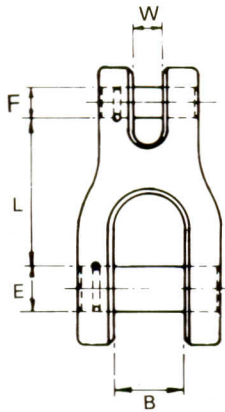


Chain Sling Accessories



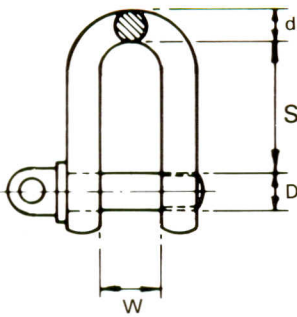
CHAIN CONNECTOR

Chain Size	L	W	E	WLL (Kgs)
12	61	14	15	5000
16	81	18	20	8000
18	94	20	22	10000
20	102	22	25	12500



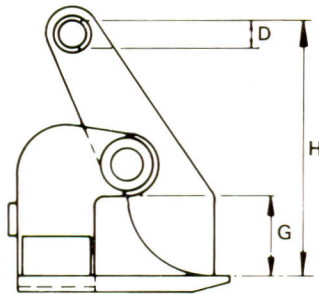
SLING CONNECTOR

Chain Size	L	W	B	E	F	WLL (Kgs)
12	105	14	32	22	15	5000
16	126	18	36	25	20	8000
18	140	20	45	31	22	10000
20	150	22	45	31	25	12500



'D' SHACKLE

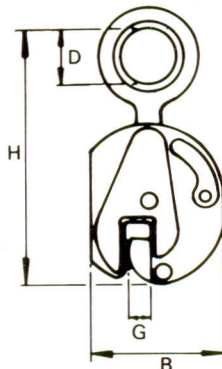
d	S	D	W	WLL (Kgs)
12	44	14	20	1600
16	55	19	25	2500
19	70	22	32	4000
22	79	26	34	5000
24	88	28	40	6300
27	99	31	45	8000
34	124	39	56	12500
38	139	44	63	16000



HORIZONTAL PLATE LIFTING CLAMP

(To be used in Pairs)

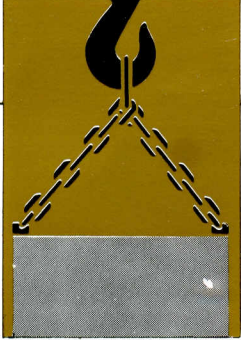
WLL (Kgs)	H	G	D
1000	115	30	22
2000	190	50	26
3000	200	55	26
5000	225	63	30



VERTICAL PLATE LIFTING CLAMP

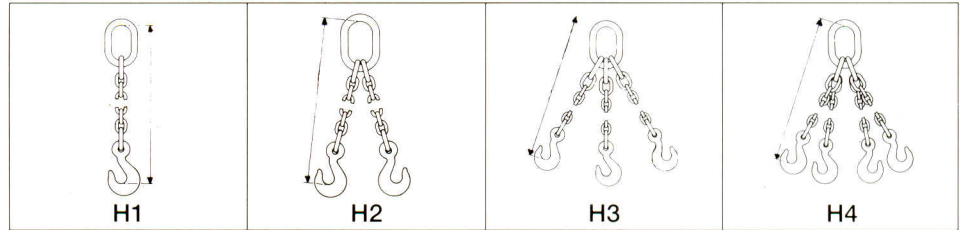
WLL (Kgs)	Weight (Kgs)	H	G	D	B
1000	7	343	20	70	161
1500	8	355	25	70	165
2000	16	355	25	75	225
3000	17	360	32	75	230
5000	28	510	32	80	330

Dimensions in mm

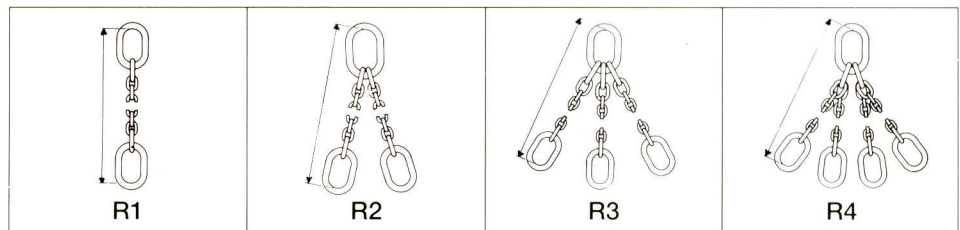


Chain Slings to suit your requirements

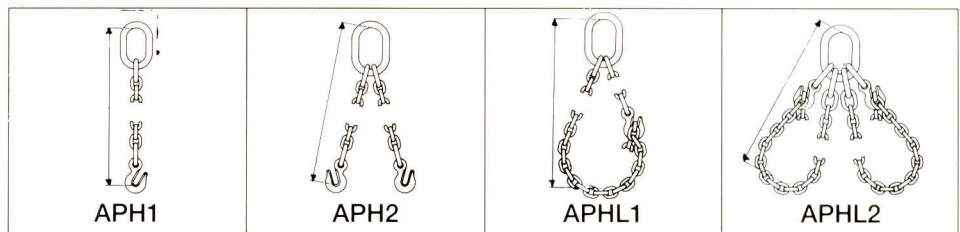
SLINGS WITH HOOK ENDS



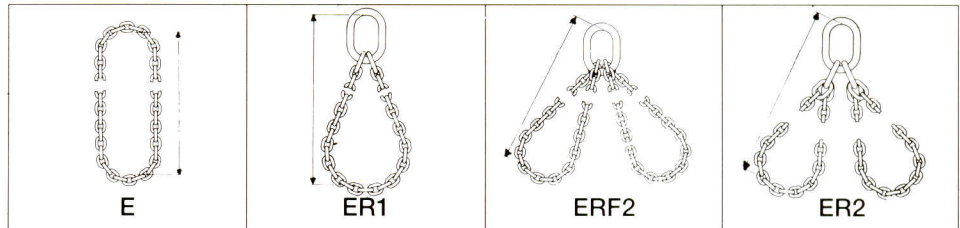
SLINGS WITH LINK ENDS



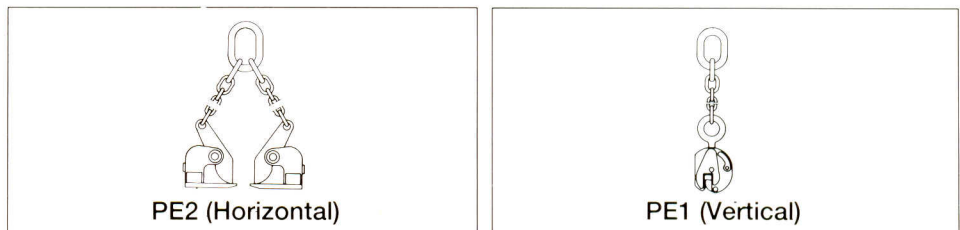
SLINGS WITH ADJUSTABLE LOOPS



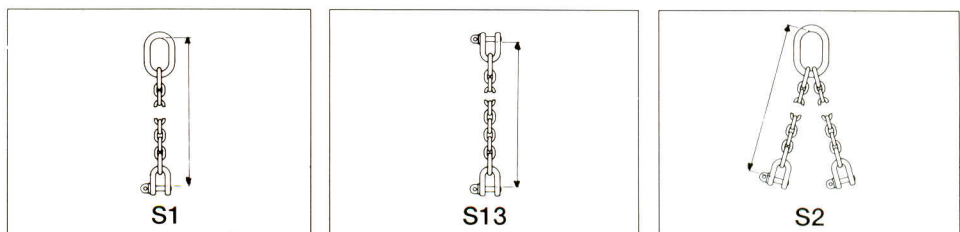
ENDLESS SLINGS



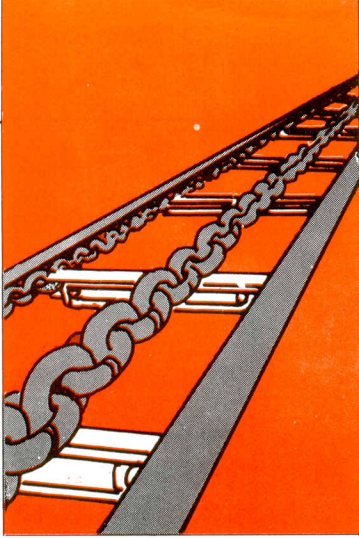
SLING FOR PLATE LIFTING



MISCELLANEOUS



INDIAN CHAIN



Mining and Dragline Chains and Accessories

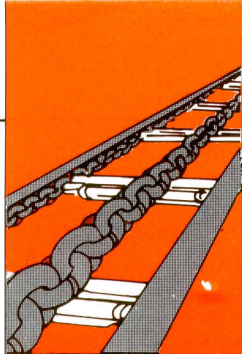
The mechanisation of Coal Mining Industry in India has assumed great importance in the face of decrease in availability of oil and rising cost of energy. With proven reserves of 160 billion tonnes, increasing Coal production in shortest possible time has become necessary. Chains and Components for Scraper Conveyors and Draglines are important implements in Coal Mining.

Indian Chain has been engaged in the development of Chain and Components of high quality for a long time. Using best of raw material, modern manufacturing equipment, use of latest technology and stringent quality control, Indian Chain, is keeping its quality at a high level. We have been striving for higher production and better quality by installing the latest equipments and continuing devotion to quality.

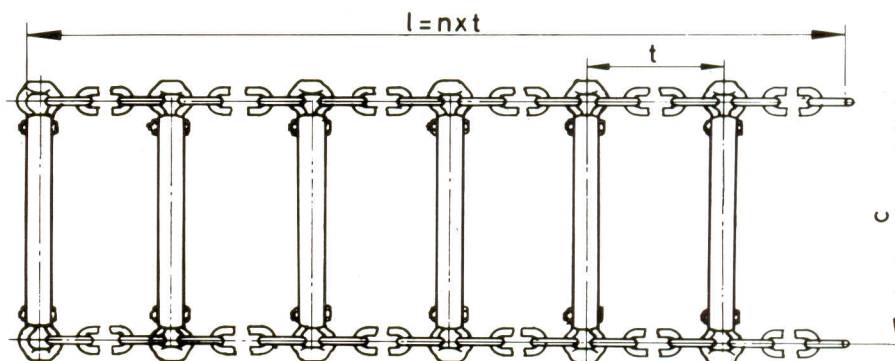
Our Mining Chains are manufactured in fully automated chain plants, induction hardened for uniform hardness and are calibrated within close tolerance.

We also manufacture accessories like Shackle Type Connectors, Flat Type Chain Connectors, Scraper Bars for Twin Outboard and Inboard chain assemblies etc. We manufacture Drag and Hoist chain with connecting links which are used in Drag Line Equipment for open cast mines.





Twin Outboard Chain Assemblies

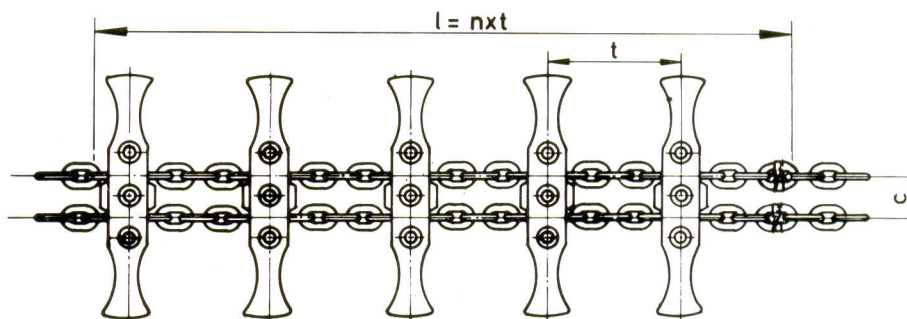


Nominal Size	Chain Centres c	Scraper Bar Spacing t	No. of Links	Assembly Length	No of Scraper
				l	
14	350	800	15	4800	6
18	400	1024	15	5120	5
	500				
19	500	1032	15	5160	5
	600				
22	500	1032	11	5160	5
	600				
26	700	920	9	4600	5

Twin Outboard Chain Assemblies for Longwall Mining consist of chains in matched pairs which are joined together with shackles. Scraper bars are fastened to these shackles at equal intervals with the help of bolts. These are made of 2.5 or 5 metre long assemblies.

Continuous Twin Outboard Assemblies consist of 25 metre long matched chains connected with the help of Flat type connectors.

Twin Inboard Chain Assemblies



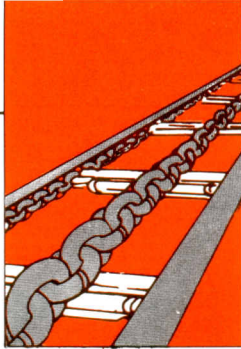
Nominal Size	Chain Centres c	Scraper Bar Spacing		Assembly Length		
		No. of Links	Spacing t	No. of Links	Length l	No. of Bars n
22	85	10	860	119	10320	12
26	100	10	920	199	18400	20

Twin Inboard Chain Assemblies consist of 2 continuously matched chains running in the centre of line pans. The scraper bars are clamped on to the chain at required spacing.

Dimensions in mm



INDIAN CHAIN



Calibrated High Tensile Steel Chain for Chain Conveyors and Haulage Systems

IS3948 AND ISO610

Grade :
B and C

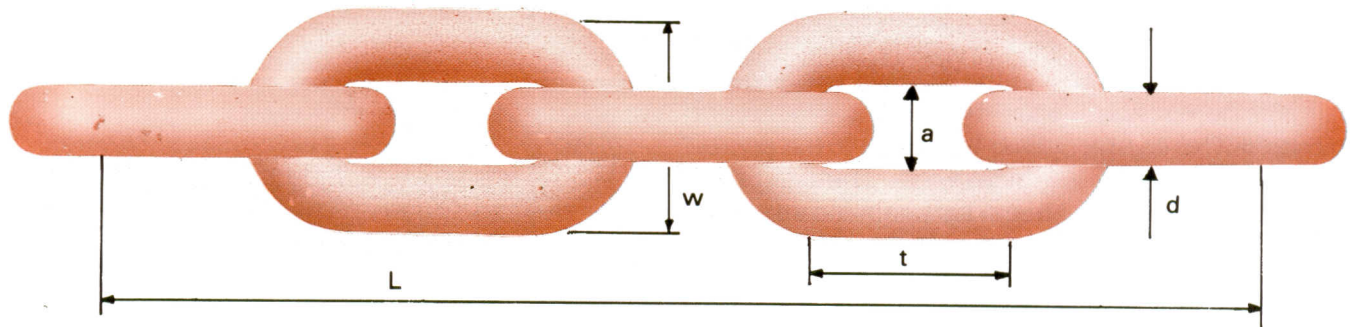
Material :
High grade Manganese Steel and special Ni - Cr - Mo Steel

Manufacture :
On electronically controlled chain making plant

Heat Treatment :
Induction hardened and tempered

Testing :
On Automatic Hydraulic Calibrating Machine

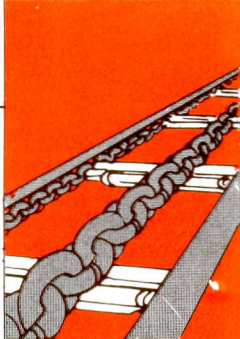
Delivery Condition :
Chains are supplied in matched pairs



DIMENSIONS AND WEIGHT

Nominal Size d x t	Nominal Dia		Pitch		Width		Effective Length			Mass per metre approx. kg/m
	d	Tolerance	t	Tolerance	Inside a min.	Outside w max.	Number of links	L	Tolerance	
14 x 50	14	± 0.4	50	± 0.5	17	48	15	750	± 1.5	4.0
18 x 64	18	± 0.5	64	± 0.6	21	60	15	960	± 2.1	6.6
19 x 64.5	19	± 0.5	64.5	± 0.6	22	63	15	967.5	± 2.1	7.5
22 x 86	22	± 0.7	86	± 0.9	26	74	9	774	± 2.0	9.5
24 x 86	24	± 0.8	86	± 0.9	28	79	9	774	± 2.0	11.6
26 x 92	26	± 0.8	92	± 0.9	30	86	9	828	± 2.2	13.7
30 x 108	30	± 0.9	108	± 1.0	34	98	9	972	± 2.5	18.0

Dimensions in mm



Mechanical Properties and Testing Procedure

SPECIFIED TEST REQUIREMENTS

Nominal Size and Pitch (mm)	GRADE B		GRADE C		Bend Test Deflection f mm	Elongation at Test Force % (max.)		Elongation at Fracture % (min.)	
	Test* Force	Minimum Breaking Force	Test Force	Minimum Breaking Force		Gr-B	Gr-C	Gr-B	Gr-C
	kN	kN	kN	kN					
14 x 50	150	190	200	250	11	1.4	1.6	12	12
18 x 64	250	320	330	410	14				
19 x 64.5	280	360	360	450	15				
22 x 86	380	480	490	610	18				
24 x 86	450	570	580	720	20				
26 x 92	530	670	680	850	21				
30 x 108	710	890	900	1130	24				

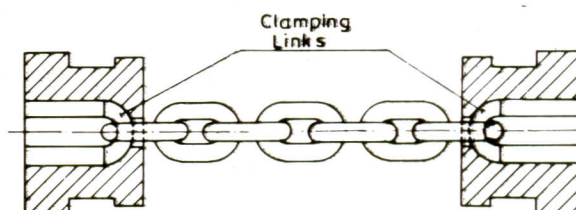
* Proof Force is atleast 90% of Test Force specified.

10 kN = 1.02 tonne

TESTING PROCEDURE

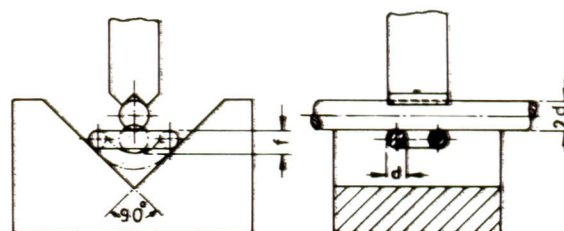
1. Tensile Test :

From each lot of chain in the finished condition, a sample comprising 5 links minimum is selected at random. This sample is then subjected to the appropriate test load as shown in the figure. The elongation observed at test load should be within the specified limits. After the test load has been applied and elongation determined the load shall be increased till fracture occurs. Values of breaking load & elongation at fracture shall not be less than those specified.



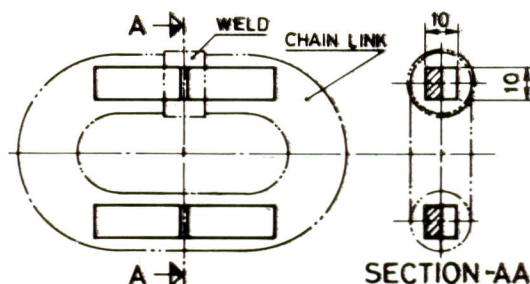
2. Bend Test :

One chain link from each lot shall be selected after heat treatment & calibration. This specimen link is bent as shown in the figure with increasing force to test the ductility of the link. The link should withstand the minimum deflection specified without fracture.

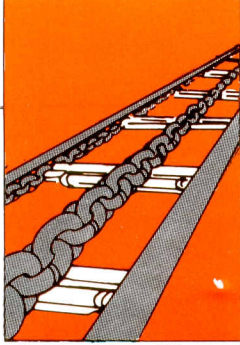


3. Notch Impact Test:

This test is optional and is conducted to determine the notch ductility of steel in the welded side of the chain compared to the unwelded side. The tests are carried at 20°C and the minimum charpy value shall not be less than 300 kJ/mm².



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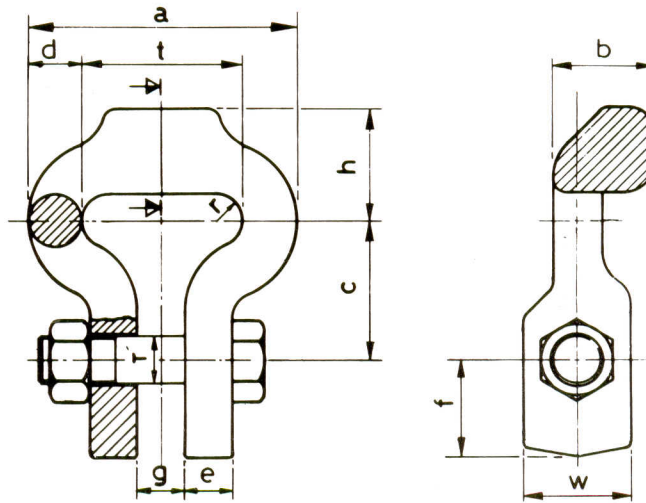


Shackle Type Connector

AS PER ISO 1082

These connectors are designed to connect the chain strands in a chain assembly while rigidly bolting the scraper bar. They are drop forged from carefully selected alloy steel. After heat treatment and testing, individual pieces are subjected to magnetic particle test. The bolts used are high tensile hexagonal bolts.

It is important that the bolt is tightened correctly as per the torque values indicated.



DIMENSIONS AND WEIGHT

Nominal Size	d	t	a max	c	h	b	g	e	f	w	r	T	Weight kg
14 x 50	14	50	81	51	27	29	18	14.5	17	32	7.5	M16	0.7
18 x 64	18	64	103	55	44	40	21	18.5	40	43	9.5	M20	1.25
19 x 64.5	19	64.5	105	55	44	40	21	19	40	43	10	M20	1.3
22 x 86	22	86	134	75	58	46	24	22	44	52	11.5	M24	2.5
24 x 86	24	86	138	78	58	51	26	24	44	53	12.5	M24	2.8
26 x 92	26	92	148	85	58	53	30	26	46	58	14	M27	3.25

MECHANICAL PROPERTIES

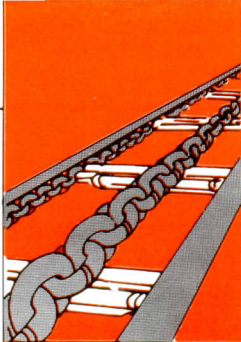
Nominal Size	Test Force kN	Breaking force kN min.	% Elongation at	
			Test Force max.	Breaking Force min.
14 x 50	150	210	2	6
18 x 64	300	370	2	6
19 x 64.5	330	428	2	8
22 x 86	415	580	2	8
24 x 86	510	650	2	8
26 x 92	575	765	2	8

HEXAGONAL BOLTS AND NUTS

Nominal Size	Thread Size and Length	Grade	Torque	Weight
			Nm	Kg.
14 x 50	M 16 x 65	10.9	100	0.16
18 x 64	M 20 x 80	10.9	400	0.32
19 x 64.5	M 20 x 80	10.9	400	0.32
22 x 86	M 24 x 98	10.9	500	0.60
24 x 86	M 24 x 105	10.9	600	0.62
26 x 92	M 27 x 114	10.9	700	0.90

Material : Ni-Cr-Mo Alloy Steel
Tensile Strength : 1150-1250 N/mm²

Dimensions in mm

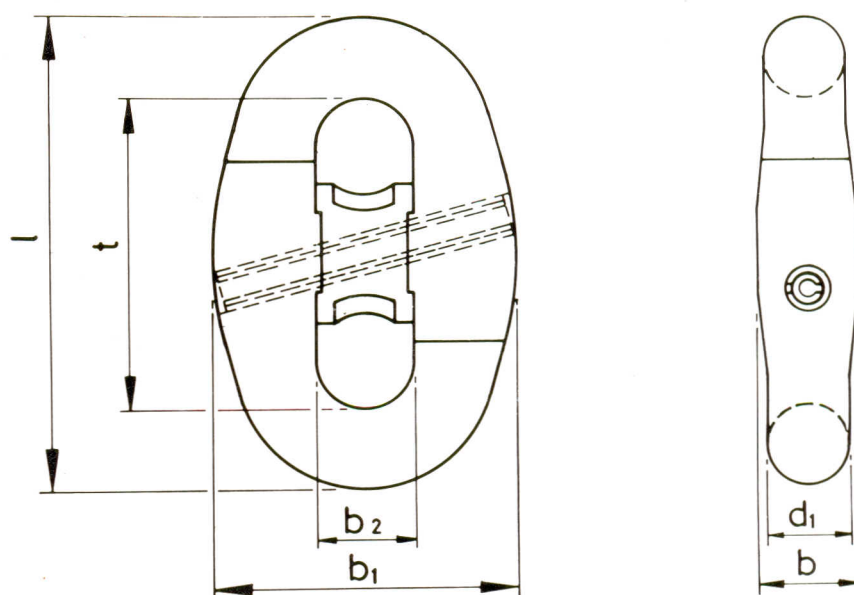


Flat Type Chain Connector

The Flat type connectors are used with heavy duty mining chains in scraper chain conveyors, ploughs and shearers. They are designed to operate in the horizontal as well as the vertical planes of the sprocket.

The two symmetrical halves are hooked to the end links of the chain to be connected and slide into each other. The centre choke is fitted in a manner so that the arrowheads coincide. The assembled connector is secured by double spring dowel pins.

After heat treatment and testing each flat connector is subjected to magnetic particle test to ensure crack free surface.



DIMENSIONS, WEIGHT AND MECHANICAL PROPERTIES

Nominal Size	d_1	t	l	b	b_1	b_2	Test Force kN	Breaking Force kN	Weight in kg.
18 x 64	18 ± 0.5	64 ± 0.6	100	22	64	20	320	370	0.65
22 x 86	22 ± 0.7	86 ± 0.9	130	28	83	26	480	550	1.35
24 x 86	24 ± 0.8	86 ± 0.9	134	30	87	28	570	660	1.55
26 x 92	26 ± 0.8	92 ± 1.0	144	33	96	30	640	770	2.17
30 x 108	30 ± 0.9	108 ± 1.0	168	36	110	36	850	1020	3.30

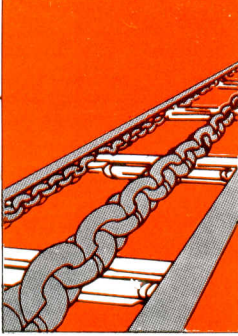
Dimensions in mm

10kN = 1.02 tonne

● Elongation at test force 1.2% max ● Material Ni Cr Mo Alloy Steel ● Tensile Strength : 1200 – 1400 N/mm²



INDIAN CHAIN

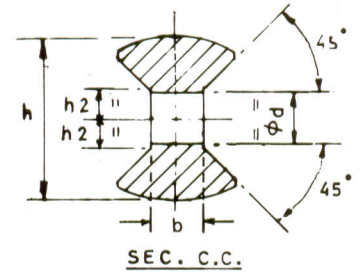
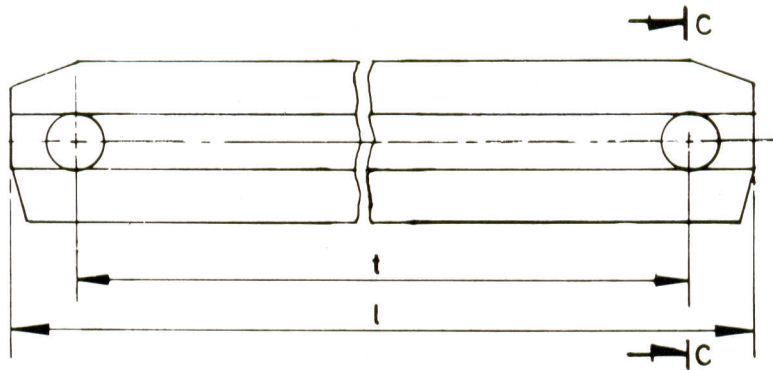


Scraper Bar For Twin Outboard·Chain Assembly

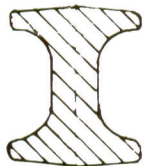
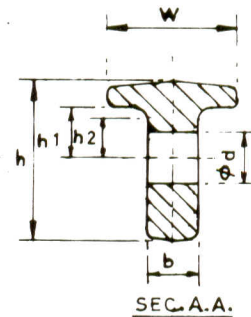
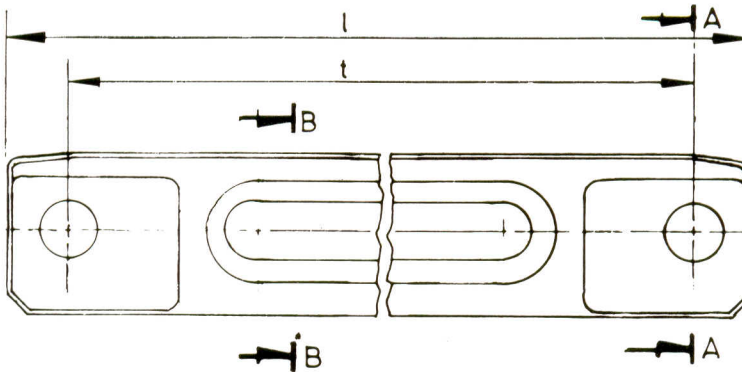
IS 11619 AND ISO 5612

Scraper Bars are manufactured by drop forging from fine grained forging quality carbon steel. The holes for connecting to shackle body are accurately drilled in special jigs. The bars are heat treated to have optimum strength and hardness. They are subjected to deflection test as per specification.

TYPE 1



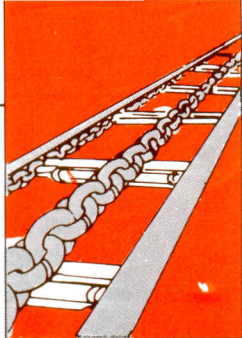
TYPE 2



Type	Chain Size	Applica- tion	Chain Centre	Overall Length l	Hole Centre t	Hole Dia- meter d	Height h	Web. Thick- ness b	Vertical Clear- ance h1	Location of Chamfer h2	Width W	Weight each kg.
1	14x50	Twin Out- board	350	300	248	17	51	12.5	—	9	—	2.0
2	18x64	Twin out- board	500	440	390	21	64	19	21	15	55	5.5
	19x64.5	board	650	590	540							7.5 9.0

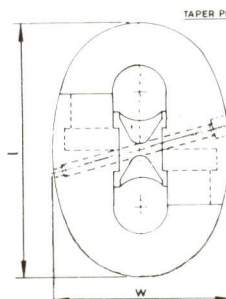
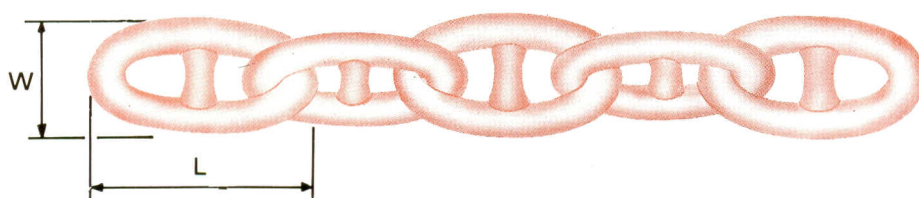
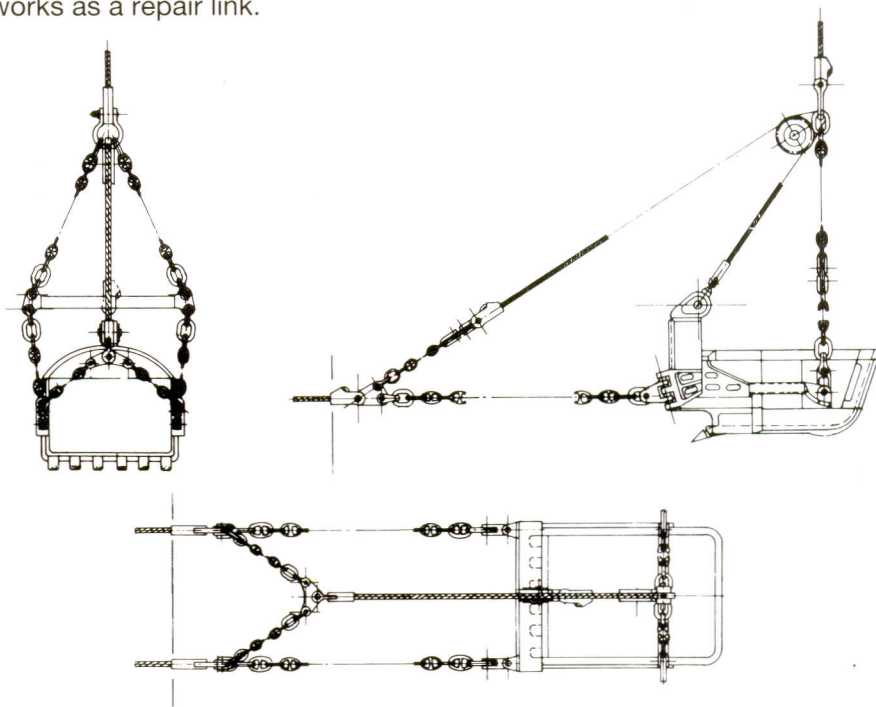
Material : Fine grained forging quality carbon steel
Tensile Strength : 900 - 1100 N/mm²

Dimensions in mm



Drag and Hoist Chain and Connecting Link

Drag and hoist chains are manufactured by flash butt welding process on automatic machines from Low carbon High manganese fine grained steel. Studs are hydraulically pressed and subsequently welded all around on one side of the link to avoid displacement. The chain is specially heat treated to provide high wear resistance and impact strength together with high load bearing capacity. Open end links are provided at both ends for easy fitting. Connecting shackle is used to join two studded link and works as a repair link.



Diameter d	Chain		Connecting Link		Proof Load kN	Breaking Load kN	Weight	
	Length L	Width W	Length l	Width w			Chain kg/m	Connecting shackle each (kg.)
38	228	137	228	160	812	1160	32	8.5
45	270	162	270	189	1125	1610	44	14.5
50	300	180	300	210	1370	1960	54	18.0
62	372	223	372	260	2060	2940	82	37.0
70	420	252	420	294	2580	3690	106	51.5

Material : High Strength Fine grained Special Steel.
Tensile Strength : 690-850 N/mm²

Dimensions in mm



INDIAN CHAIN



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