



TM



**Kuplex®**

**DLH online**

**SETTING THE  
STANDARD  
IN CHAIN  
LIFTING  
SYSTEMS**





**Kuplex®**

# **THE MOST VERSATILE CHAIN LIFTING SYSTEM**

Kuplex 8+10™ is the world's first dual grade chain sling system and offers the widest range of chains and components to make it the most versatile chain system ever.

Over two years of research and development using the latest technology and CAD facilities for full stress analysis, Kuplex 8+10™ has a massive 25% extra strength and lifting power over comparable Grade 8 units with a full range of components available to handle loads up to 85 tonnes.

Use of advanced technical design, materials and heat treatment has further enhanced the world-famous Kuplex® high wear and fatigue properties. The highest grade alloy steels are utilised for a range of chain lifting components certified for use with both Grade 8 and Grade 10 chains.

Certified to European and International requirements, Kuplex 8+10™ is a genuine worldwide chain sling system.



## **DESIGNED FOR STRENGTH, SAFETY AND RELIABILITY**



Kuplex® is readily available from a vast network of distributors. Working from stocks of chains and components, it takes only a few minutes to assemble a sling precisely in accordance with the needs of the user.

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TM  
8+10  
KUPLEX



# KUPLEX 8 + 10™



**Kuplex®**

## DUAL GRADE SYSTEM

KUPLEX 8+10 is a unique dual grade chain sling system. Advanced technical design, with precise material and heat treatment selection, has enhanced the high wear and fatigue properties for which KUPLEX is renowned throughout the world.

KUPLEX 8+10 dual rated components can now be combined with either KUPLEX Grade 8 or Grade 10 chain for the most versatile system ever produced (see dual load chart on page 5).

A range of components is available from 7mm up to 32mm allowing a wide variety of slings to be supplied with load ratings up to 85 tonnes.



## DESIGN

KUPLEX 8+10 components have been designed using the latest CAD facilities which allows for a full stress analysis of each component prior to manufacture.



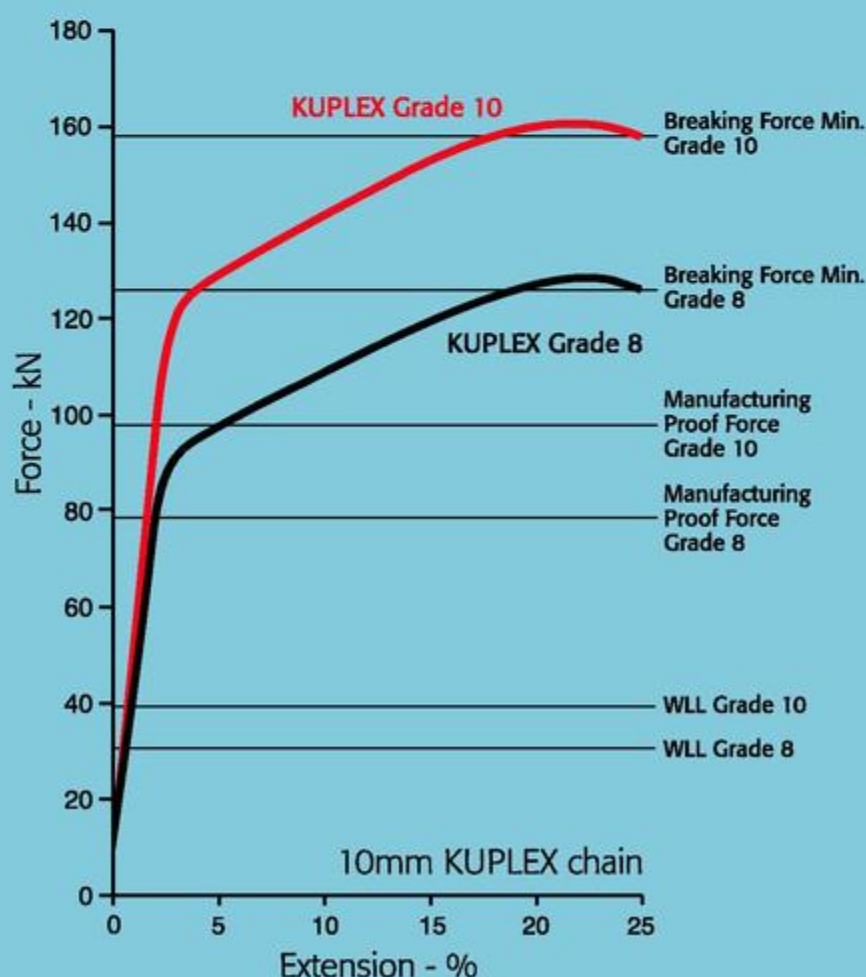
## TESTING

KUPLEX 8+10 components are subjected to non-destructive testing giving the user complete peace of mind.

KUPLEX Grade 8 and Grade 10 chains are subjected to non-destructive tests, calibration and visual inspection.

## GRADE 10 > GRADE 8

KUPLEX 8+10 components and KUPLEX Grade 10 chain are 25% stronger than existing Grade 8 components and chain.



## TRACEABILITY

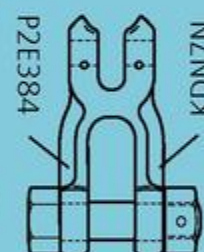


The KUPLEX chain batch number is marked on the box and on a metal tag attached to the end of the chain.

All KUPLEX chain is either double embossed with KUPLEX one side and the Grade 8 or 10 on the other, or single embossed with KX-8 to denote KUPLEX Grade 8 or KX-10 to denote KUPLEX Grade 10, every 20th link or 1 metre, whichever is the lesser distance.

KUPLEX components are marked with part numbers and traceability codes.

Brand Name and Dual Grade	KUPLEX 8+10
Part Number	KDN7N
Manufacturer	P
Die Run Number	2
Year of Manufacture	E
Steel Cast Number	384
Grouped together as	P2E384
Origin	UK



The system allows Parsons to trace components and chains through all manufacturing processes and right back to the cast analysis.

## KUPLEX MANUFACTURER'S CERTIFICATE

The KUPLEX 8+10 system is certified to European and International requirements making it a worldwide system.










# KUPLEX 8 + 10<sup>TM</sup>



## WORKING LOAD LIMITS - TONNES

The working load limits (WLL) listed in the table below are the maximum weights which slings are designed to carry in general lifting service according to the standard uniform load method of rating.

In exceptionally hazardous conditions or in any other circumstances which might indicate a need for a WLL lower than the designed figure, the degree of hazard should be assessed by a competent person and the working load limit adjusted accordingly. The WLL, which should be marked on the sling itself, or on a securely fixed metal tag, must not be exceeded in any circumstances.

 Chain Dia. mm	Grade	 Single Leg	 Two Leg		 Three and Four Leg		 Endless
			$0^\circ < \beta \leq 45^\circ$	$45^\circ < \beta \leq 60^\circ$	$0^\circ < \beta \leq 45^\circ$	$45^\circ < \beta \leq 60^\circ$	
		Factor 1	Factor 1.4	Factor 1	Factor 2.1	Factor 1.5	Factor 1.6
7	8	1.5	2.12	1.5	3.15	2.24	2.5
7	10	2	2.8	2	4.2	3	3.2
8	8	2	2.8	2	4.2	3	3.2
10	8	3.15	4.25	3.15	6.7	4.75	5
10	10	4.0	5.6	4	8.4	6	6.4
13	8	5.3	7.5	5.3	11.2	8	8.5
13	10	6.7	9.5	6.7	14	10	10.7
16	8	8	11.2	8	17	11.8	12.5
16	10	10	14	10	21.2	15	16
19	8	11.2	16	11.2	23.6	17	18
19	10	14	20	14	30	21	22.4
23	8	16	23.6	16	35.5	25	26.5
23	10	21	29.5	21	44	31.5	33.5
26	8	21.2	30	21.2	45	31.5	33.5
26	10	27	38	27	57	40	43
32	8	31.5	45	31.5	67	47.5	50
32	10	40	56	40	85	60	65

KUPLEX Grade 8 working load limits are in accordance with EN 818-4

**Never exceed the working load limit marked on the sling.  
Never use a sling at angles greater than 60° from the vertical.**

The load imposed on a sling leg increases as the angle of the leg from vertical increases.

Account is taken of this fact when calculating working load limits. For example, a 10mm two-leg sling to be used at an angle of 45° from the vertical (90° included angle) will have a WLL 1.4 times that of a 10mm single leg sling when used vertically, and not 2 times the single leg. That same working load limit applies to all angles from 0° - 45° (0° - 90° included angle). Where there is likely to be a need to use a sling at an angle greater than 45° from the vertical, the sling should have additional markings showing the reduced WLL applying at angles from 45° - 60° from the vertical (included angles from 90° - 120°). Refer to 'Restrictions on the Angles of Use' on page 23.

### Alternative method of rating.

An alternative method of rating may be used for specific lifting application where the angle at which the slings legs are disposed is predetermined. This method allows greater working load limits at angles less than 45° from the vertical, always assuming that the sling legs are disposed symmetrically with each leg accepting an equal share of the load to be lifted. For further details refer to your KUPLEX distributor.



# SINGLE LEG SLINGS



**Kuplex®**



Single Leg fitted with KHN L Sling Hooks



Single Leg fitted with KS N Kuplink and KHN L Sling Hooks



Single Leg fitted with KS N Kuplinks each end



Single Leg fitted with KSS N Reeveable Link each end

## Master Links



KM  
7mm - 32mm



KSS N  
7mm - 26mm



KS N  
7mm - 16mm

## Kupler



K N  
7mm - 32mm

## Shortening Clutch



KSC N  
7mm - 19mm















KSC  
7mm - 32mm



KSC Shortening Clutch in use. Basket configuration

## Terminal Fittings - Availability Chart

WORKING LOAD LIMITS - TONNES

Chain Dia. (mm)	Grade												
		KHN L	KHx C	KHx E	KHx S	KC N	KF N	KHW N	KDN N	KDL N	KSS N	KS N	TL N
7	8	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
7	10	2	2	2	2	2	2	2	2	2	2	2	
8	8	2	2	2	2	2	2	2	2	2	2	2	2
10	8	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15
10	10	4	4	4	4	4	4	4	4	4	4	4	
13	8	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3
13	10	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	
16	8	8	8	8		8	8	8	8	8	8	8	8
16	10	10	10	10		10	10	10	10	10	10	10	
19	8	11.2		11.2		11.2	11.2			11.2	11.2		11.2
19	10	14		14		14	14			14	14		
23	8	16		16			16				16		16
23	10	21		21			21				21		
26	8	21.2									21.2		21.2
26	10	27									27		
32	8	31.5											31.5
32	10	40											



KSC N Shortening Clutch in use

Note that the loaded end of the chain must come out of the bottom of both types of clutch.

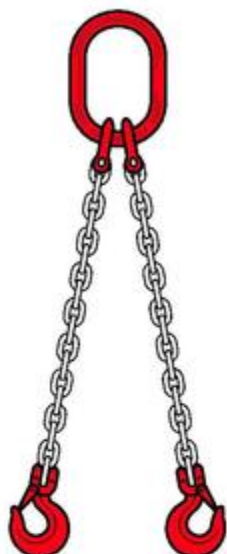
**WARNING - NEVER EXCEED THE WORKING LOAD LIMIT STATED**



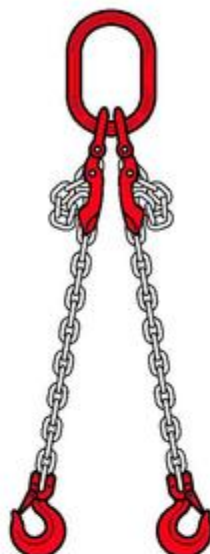
# TWO LEG SLINGS



**Kuplex®**



Two Leg fitted with  
KHN L sling hooks



Two Leg fitted with KSC-N Shortening  
Clutches and KHN L sling hooks

## Master Links



KM  
7mm - 32mm

## Kupler



K N  
7mm - 32mm

## Shortening Clutch















KSC N  
7mm - 19mm



KSC  
7mm - 32mm

## Terminal Fittings - Availability Chart

WORKING LOAD LIMITS - 2,3,4 LEG SLINGS AT 60°

Chain Dia. (mm)	Grade												
		KHN L	KHX C	KHX E	KHX S	KC N	KF N	KHW N	KDN N	KDL N	KSS N	KS N	TL N
7	8	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12
7	10	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	
8	8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
10	8	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25
10	10	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	
13	8	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
13	10	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	
16	8	11.2	11.2	11.2		11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2
16	10	14	14	14		14	14	14	14	14	14	14	
19	8	16		16		16	16			16	16		16
19	10	20		20		20	20			20	20		
23	8	23.6		23.6			23.6				23.6		23.6
23	10	29.5		29.5			29.5				29.5		
26	8	30									30		30
26	10	38									38		
32	8	45											45
32	10	56											

WORKING LOAD LIMITS ARE FOR TWO LEG SLINGS AT 0° - 45°

**WWW.KUPLEX.COM**

**WARNING - NEVER EXCEED THE WORKING LOAD LIMIT STATED**

**KUPLEX SYSTEM**  
**DUAL GRADE**  
**10 + 8**



# THREE LEG SLINGS



**Kuplex®**



Three Leg fitted with  
KHN L Sling Hooks



Three Leg fitted with KSC-N Shortening  
Clutches and KHN L Sling Hooks

## Master Links



KMM L  
7mm - 32mm



KM  
7mm - 32mm



KAL  
7mm - 19mm

## Kupler



K N  
7mm - 32mm

## Shortening Clutch



KSC N  
7mm - 19mm















KSC  
7mm - 32mm



KSC Shortening Clutch  
in use.  
Basket configuration

## Terminal Fittings - Availability Chart

WORKING LOAD LIMITS - TONNES

Chain Dia. (mm)	Grade												
		KHN L	KHXC	KHXE	KHXS	KC N	KF N	KHW N	KDN N	KDL N	KSS N	KS N	TL N
7	8	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15
7	10	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	
8	8	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
10	8	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7
10	10	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	
13	8	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2
13	10	14	14	14	14	14	14	14	14	14	14	14	
16	8	17	17	17		17	17	17	17	17	17	17	17
16	10	21.2	21.2	21.2		21.2	21.2	21.2	21.2	21.2	21.2	21.2	
19	8	23.6		23.6		23.6	23.6			23.6	23.6		23.6
19	10	30		30		30	30			30	30		
23	8	35.5		35.5			35.5				35.5		35.5
23	10	44		44			44				44		
26	8	45									45		45
26	10	57									57		
32	8	67											67
32	10	85											



KSC N Shortening Clutch  
in use

WORKING LOAD LIMITS ARE FOR THREE LEG SLINGS AT 0° - 45°

**WARNING** - NEVER EXCEED THE WORKING LOAD LIMIT STATED

Note that the loaded end of the chain must come out of the bottom of both types of clutch.



# FOUR LEG SLINGS



**Kuplex®**



Four Leg fitted with KHN L Sling Hooks



Four Leg fitted with KSC-N Shortening Clutches and KHN L Sling Hooks

## Master Links



KMM L  
7mm - 32mm



KM  
7mm - 32mm



KAL  
7mm - 19mm

## Kupler



K N  
7mm - 32mm

## Shortening Clutch













KSC N  
7mm - 19mm



KSC  
7mm - 32mm

## Terminal Fittings - Availability Chart

WORKING LOAD LIMITS - TONNES

Chain Dia. (mm)	Grade												
		KHN L	KHXC	KHXE	KHXS	KC N	KF N	KHW N	KDN N	KDL N	KSS N	KS N	TL N
7	8	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15
7	10	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	
8	8	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
10	8	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7
10	10	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	
13	8	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2
13	10	14	14	14	14	14	14	14	14	14	14	14	
16	8	17	17	17		17	17	17	17	17	17	17	17
16	10	21.2	21.2	21.2		21.2	21.2	21.2	21.2	21.2	21.2	21.2	
19	8	23.6		23.6		23.6	23.6			23.6	23.6		23.6
19	10	30		30		30	30			30	30		
23	8	35.5		35.5			35.5				35.5		35.5
23	10	44		44			44				44		
26	8	45									45		45
26	10	57									57		
32	8	67											67
32	10	85											

WORKING LOAD LIMITS ARE FOR THREE LEG SLINGS AT 0° - 45°

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**WARNING - NEVER EXCEED THE WORKING LOAD LIMIT STATED**

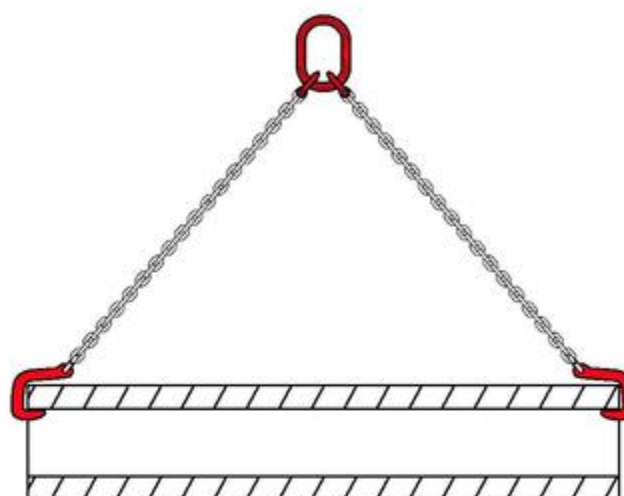
KUPLEX SYSTEM  
DUAL GRADE  
10+8



# SPECIAL PURPOSE SLINGS



Two-leg Basket Sling



Pipe Sling

## Master and Auxiliary Links



KMML  
7mm - 32mm



KM  
7mm - 32mm



KAL  
7mm - 19mm

## Kupler



K N  
7mm - 32mm

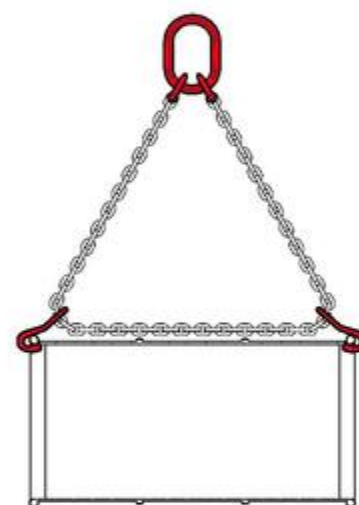
## Shortening Clutch



KSC N  
7mm - 19mm









KSC  
7mm - 32mm

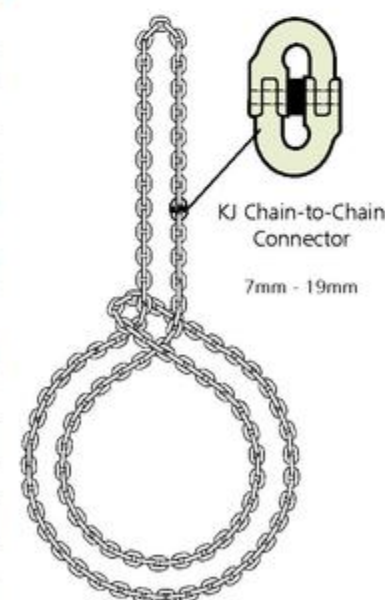


Drum Sling

## Terminal Fittings - Availability Chart

Chain Dia. (mm)	Grade	 KPH10 USED IN PAIRS	 KD USED IN PAIRS	 KB	 SINGLE BASKET	 ENDLESS DOUBLE BASKET	 IN CHOKE
				1 LEG	2 LEG		
7	8		1.5	1.5	2.12	2.12	3.15
7	10		2.0	2.0	2.8	2.8	4.2
8	8		2.0	2.0	2.8	2.8	4.2
10	8	4.25				4.25	6.7
10	10	5.6				5.6	8.4
13	8					7.5	11.2
13	10					9.5	14
16	8					11.2	17
16	10					14	21.2
19	8					16	23.6
19	10					20	30
23	8					23.6	35.5
23	10					29.5	44
26	8					30	45
26	10					38	57
32	8					45	67
32	10					56	85

Working load limits are for slings as illustrated



KJ Chain-to-Chain  
Connector  
7mm - 19mm

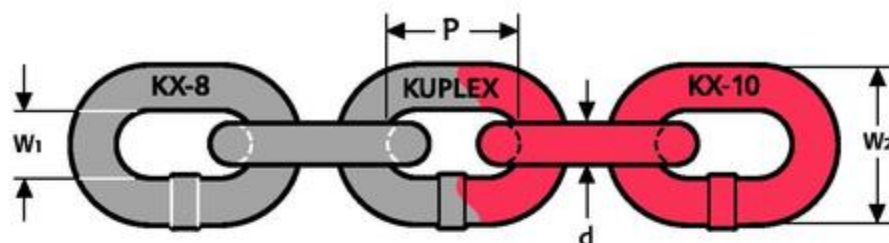
**WARNING - NEVER EXCEED THE WORKING LOAD LIMIT STATED**



# TECHNICAL DETAILS



All KUPLEX chain meets the dimensional requirements of BS EN 818-2 and ISO 3076. All KUPLEX chain is either double embossed with KUPLEX one side and the Grade 8 or 10 on the other, or single embossed with KX-8 to denote KUPLEX Grade 8 or KX-10 to denote KUPLEX Grade 10, every 20th link or 1 metre, whichever is the lesser distance.



## Dimensions and Weights

Nominal Size (d) Diameter mm	Reference Number	Grade	Nominal Pitch (p) mm	Maximum External Width (W <sub>2</sub> ) mm	Minimum Internal Width (W <sub>1</sub> ) mm	Approx Weight kg/m
7	07021RKB 07021RPC	8 10	21	25.9	9.1	1.09
8	08024RKB	8	24	29.62	10.4	1.4
10	10030RKB 10030RPC	8 10	30	37	13	2.2
13	13039RKB 13039RPC	8 10	39	48.1	16.9	3.62
16	16048RKB 16048RPC	8 10	48	59.2	20.8	5.42
19	19057RKB 19057RPC	8 10	57	70.3	24.7	7.96
23	23069RKO 23069RPO	8 10	69	85.1	29.9	11.83
26	26078RKO 26078RPO	8 10	78	96.2	33.8	14.99
32	32096RKO 32096RPO	8 10	96	118	41.6	21.99

## Test Requirements and Working Load Limits

SIZE mm	BREAKING FORCE MIN kN	MANUFACTURING PROOF FORCE kN	WORKING LOAD LIMIT TONNES	MEAN STRESS AT BREAKING FORCE N/mm <sup>2</sup> FACTOR 4	MEAN STRESS AT PROOF FORCE N/mm <sup>2</sup> FACTOR 2.5	MEAN STRESS AT WLL N/mm <sup>2</sup> FACTOR 1
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### KUPLEX Grade 8 Chain and Components

7	61.6	38.5	1.5	800	500	200
8	80.6	50.3	2			
10	126	78.5	3.2			
13	214	133	5.3			
16	322	201	8			
19	454	284	11.2			
23	666	415	16			
26	850	531	21.2			
32	1,290	804	31.5			

KUPLEX GRADE 8 CHAIN IS COLOUR CODED BLACK

### KUPLEX Grade 10 Chain and Components

7	77	49	2	1,000	625	250
10	158	98	4			
13	266	166	6.7			
16	402	251	10			
19	567	354	14			
23	831	519	21			
26	1,062	664	27			
32	1,609	1,005	40			

KUPLEX GRADE 10 CHAIN IS COLOUR CODED RED

## Bend and Tensile Test as Specified in EN 818-2

CHAIN DIA mm	BEND DEFLECTION f MIN mm	NUMBER OF SAMPLES PER 200m LOT
7	5.6	2
8	6.4	2
10	8	2
13	10	2
16	13	2
19	15	1
23	18	1
26	21	1
32	26	1

Single link samples are taken from a lot size of 200m and bent to a minimum deflection  $f$ , as specified in the table above. Following removal of the force, the link is examined by a competent person. The link has to withstand the specified deflection for that diameter without any visible defects.

## Tensile Test

Samples of chain as specified above, and in the finished condition, are subjected to a static tensile test and have to meet the minimum breaking force requirements as stated in the adjacent table, with a total ultimate elongation of not less than 20%.

## Parsons Chain Routine Component Sampling

All KUPLEX components are routinely verified with tensile and fatigue testing. This is a Parsons Chain Company internal specification, above and beyond any current National or International Standards requirement.



# MASTER LINKS

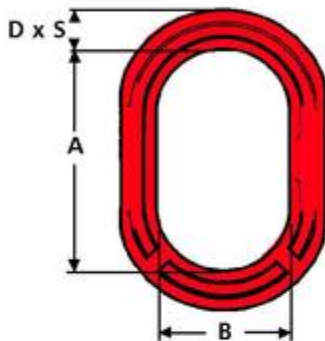


All KUPLEX components have strength characteristics that exceed those of the chain with which they are to be used.

Each KUPLEX component has a reference which relates to one of the chain sizes listed on Page 11. Where the reference includes a number, e.g. KSS 10N, the number itself refers to the chain size with which it is to be used, in this case 10mm chain. KUPLEX 8+10 7mm components are able to accept 7mm and 8mm Grade 8 chain and are marked 7/8-8 accordingly. A component having a reference comprising letters only, e.g. KM-C, is a multipurpose component and in order to determine the relevant chain size it is necessary to refer to the appropriate table. All KUPLEX components are subjected to 100% non-destructive testing in accordance with BS EN 10228:1999 Part 1. Each KUPLEX component conforms in all respects with EN 1677.

## KUPLEX Master Links KM

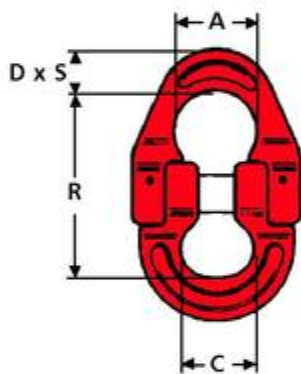
Generous internal dimensions ensure that the KM series Master Links will fit on to a wide range of crane hooks. (For 3 and 4 leg slings, two KAL series Auxiliary Links must be attached or the KMML range utilised.)



REFERENCE	WLL (t)		A	DIMENSIONS mm			S	WEIGHT kg
	8	8+10		B	D			
KM-A	1.5	1.6	152	76	17		12	0.47
KM-B	3.2	4.2	152	76	22		14	0.81
KM-C	6.7	8.4	178	108	30		20	1.7
KM-D	12.8	14	228	127	40		27	4.06
KM-E	17	21.2	254	140	45		28	5.76
KM-F	24.1	30	305	171	53		36	10.56
KM-G	35.5	44	305	203	69		40	16.58
KM-HN	46	57	340	210	74		48	22.02

## KUPLEX Auxiliary Link KAL

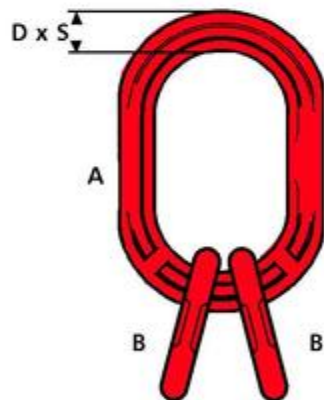
Mechanically assembled link for three and four leg slings used in conjunction with a KM series Master Link.



REFERENCE	WLL (t)	R	C	DIMENSIONS mm			S	WEIGHT kg
				A (DIA)	D			
KAL7	3.2	79	31	34	17		12	0.52
KAL10	6.4	110	44	46	24		17	1.74
KAL13	10.8	143	57	60	30		21	2.89
KAL16	16	187	71	76	37		26	6
KAL19	23	232	90	90	44		31	10.25

## KUPLEX Litalink KMML

A cost-effective alternative to the KM/KAL assembly for three leg and four leg slings designed for use only under the uniform load method of working load rating for general use. \*All welded construction



REFERENCE	WLL (t)		Link A	DIMENSIONS mm			WEIGHT kg
	8	8+10		Link B	Section D x S	B (DIA)	
KMML7	3.2	4.2	152 x 76	63 x 34	22 x 14	13	1.15
KMML10	6.7	8.4	178 x 108	86 x 44	30 x 20	20	2.9
KMML13	12.8	14	228 x 127	113 x 70	40 x 27	26	6.18
KMML16	17	21.2	254 x 140	135 x 70	45 x 28	32.5	10.76
KMML19	23.6	30	305 x 171	155 x 85	53 x 36	38	20
KMML23	35.5	44	305 x 203	175 x 105	69 x 40	47	35
KMML26	45	57	340 x 210	220 x 135	74 x 48	55	48
*KMML32	67	85	406 x 228	254 x 127	70 x 70	57	71

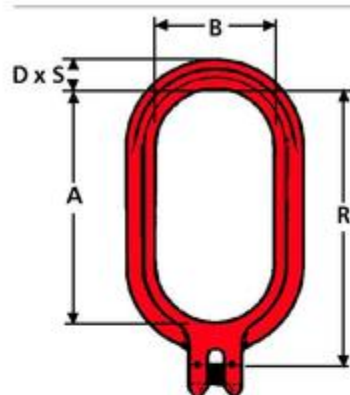
## KUPLEX KM Series Usage Table



REFERENCE	SINGLE LEG		TWO LEG		THREE/FOUR LEG	
	8	8+10	8	8+10	8	8+10
KM-A	7	-	-	-	-	-
KM-B	8/10	7/10	7/8	7	7	7/8
KM-C	13	13	10	10	8/10	10
KM-D	16/19	16/19	13/16	13/16	13	13
KM-E	23	23	19	19	16	16
KM-F	26	26	23	23	19	19
KM-G	32	32	26	26	-	-
KM-HN	32	32	32	32	-	-

**WARNING - NEVER EXCEED THE WORKING LOAD LIMIT STATED**

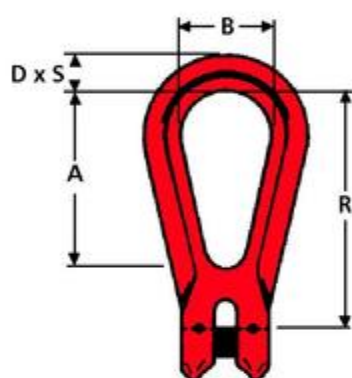




## KUPLEX Kuplink KS

Alternative Master Link for single leg slings dispensing with the need for a Kupler.

REFERENCE	WLL (t)		DIMENSIONS mm					WEIGHT kg
	8	8+10	A	B	R	D	S	
KS7N	1.5	2	152	76	178	17	13	0.64
KS10N	3.2	4	152	76	190	22	16	1.15
KS13N	5.3	6.7	178	108	220	28	21	2.13
KS16N	8	10	228	127	285	38	27	4.69

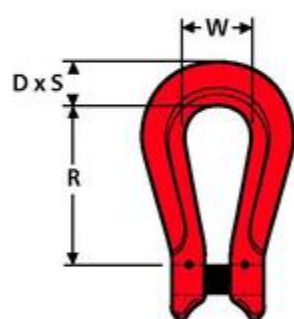


## KUPLEX Reeveable Egg Link KSS

The ideal link for collar slings - fully reeveable and compact.

REFERENCE	WLL (t)		DIMENSIONS mm					WEIGHT kg
	8	8+10	A	B	R	D	S	
*KSS7N	1.5	2	70	35	92	14	10	0.27
KSS10N	3.2	4	102	51	132	19	14	0.74
KSS13N	5.3	6.7	137	67	177	26	20	1.92
KSS16N	8	10	172	83	220	32	24	3.17
KSS19N	11.2	14	203	98	261	38	28	5.58
KSS23N	16	21	238	114	305	40	38	8.42
KSS26N	21.2	27	273	133	351	46	46	14.51

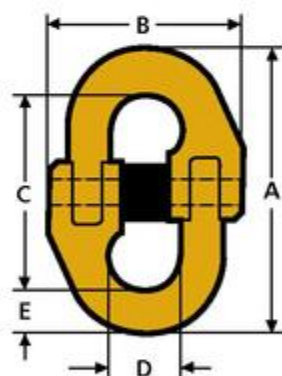
\*NOTE: A KSS7N can be used in place of a KCL7N



## KUPLEX Kupler K

This component is used for joining chain to the top link.

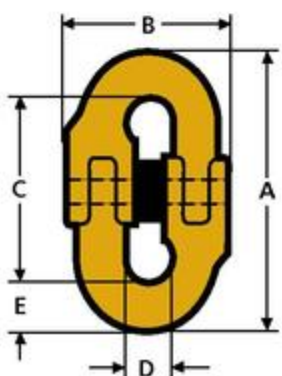
REFERENCE	WLL (t)		DIMENSIONS mm				WEIGHT kg
	8	8+10	R	W	D	S	
K7N	1.5	2	60	26	12	10	0.15
K10N	3.2	4	73	35	19	15	0.47
K13N	5.3	6.7	95	45	25	22	1.01
K16N	8	10	118	54	28	23	1.66
K19N	11.2	14	134	64	34	28	2.78
K23N	16	21	121	64	45	38	4.26
K26	21.2	27	140	82	48	45	6.30
K32	31.5	40	175	96	64	51	11.48



## KUPLEX Component Connector TL\_N

A general purpose link for connecting chain to eye-type components. The TL is currently a Grade 8 component.

REFERENCE	WLL (t)		DIMENSIONS mm					WEIGHT kg
	8	8+10	A	B	C	D	E	
TL7N	1.5		67	49	48	14.3	9	0.11
TL10N	3.2		89	66	70	19.2	13	0.36
TL13N	5.3		118	85	85	26.5	17	0.66
TL16N	8		144	96	106	32	19	1.08
TL19N	11.2		168	115	122	38.5	23	1.77
TL23N	16		206	140	150	49	28	2.8
TL26N	21.2		230	163	166	57	32	4.4
TL32N	31.5		278	210	200	63	39	8.4

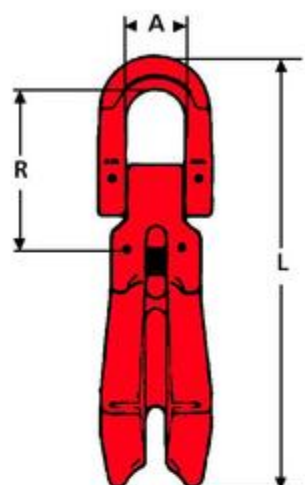


## KUPLEX Chain Connector KJ

A flexible link for chain connection and suitable for making up endless slings. The KJ is currently a Grade 8 component.

REFERENCE	WLL (t)		DIMENSIONS mm					WEIGHT kg
	8	8+10	A	B	C	D	E	
KJ7	1.5		56	34	41	8	7.5	0.09
KJ10	3.2		73	45	51	11.5	11	0.27
KJ13	5.3		94	61	65	14.7	14	0.44
KJ16	8		120	75	84	19.1	18	0.83
KJ19	11.2		142	90	100	22.9	21	1.42

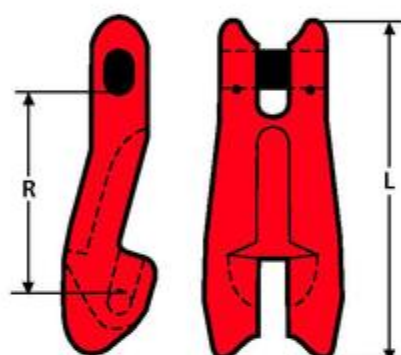




## KUPLEX Shortening Clutch KSC N

This unique component for leg length adjustment is a major feature of the KUPLEX system. It caters for loads of irregular shape or for a general lack of headroom and allows safe leg length adjustment of any number of legs with the load remaining fully in line.

REFERENCE	WLL (t)		DIMENSIONS mm			WEIGHT kg
	8	8+10	L	R	A	
KSC7N	1.5	2	161	60	26	0.53
KSC10N	3.2	4	211	73	36	1.28
KSC13N	5.3	6.7	272	95	46	2.7
KSC16N	8	10	360	118	56	5.26
KSC19N	11.2	14	427	134	68	9.87

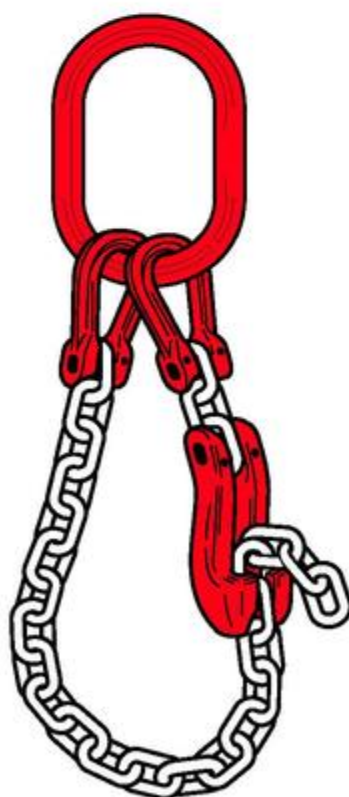


## KUPLEX Shortening Clutch KSC

This performs a function similar to that of the KSCN, but requires separate suspension on the master or auxiliary link using a Kupler and three links of chain.

REFERENCE	WLL (t)		DIMENSIONS mm		WEIGHT kg
	8	8+10	L	R	
KSC7	1.5	2	98	60	0.37
KSC10	3.2	4	132	84	1
KSC13	5.3	6.7	171	108	1.89
KSC16	8	10	213	132	3.42
KSC23	16	21	308	190	10.02
KSC26	21.2	27	360	226	15.39
KSC32	31.5	40	448	310	29

## The correct use of Shortening Clutches

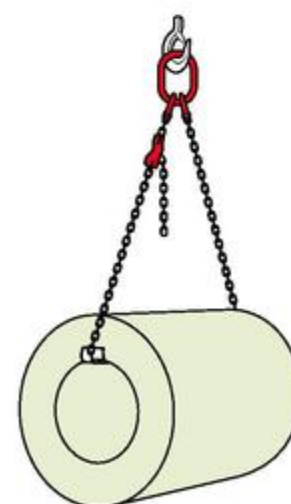


KSC Shortening Clutch  
in use.  
Basket configuration



KSC N Shortening Clutch  
in use

Note that the loaded end of the chain must come out of the bottom of the clutch.

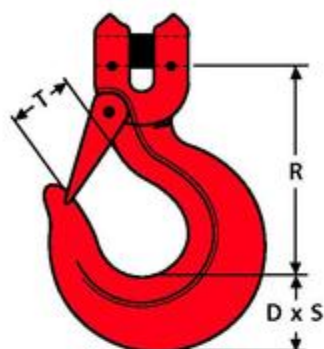






## KUPLEX Sling Hook KHN L

This hook is most widely used in general purpose slinging.



REFERENCE	WLL (t)		DIMENSIONS mm						WEIGHT kg	
	8	8+10	R	D	S	T		No Latch	With Latch	
						No Latch	With Latch	No Latch	With Latch	
KHN7L	1.5	2	75	26	19	25	21.5	0.37	0.42	
KHN10L	3.2	4	107	37	27	35	31	1.06	1.1	
KHN13L	5.3	6.7	139	48	36	45	40	2.24	2.6	
KHN16L	8	10	171	59	43	56	53.5	4.31	4.41	
KHN19L	11.2	14	203	70	50	66	62	7.53	7.81	
*KH23	16	21	222	79	51	76	60	11.39	13.14	
*KH26	21.2	27	251	89	60	85	72	16.06	18.94	
KHN32L	31.5	40	334	118	85	113	106	32.66	34.61	

\*Supplied without a latch as standard.

## KUPLEX Safety Latch KHLN

A robust latch to prevent accidental detachment of the load.



REFERENCE	HOOK REFERENCE
KHL7N	KHN7
KHL10N	KHN10
KHL13N	KHN13
KHL16N	KHN16
KHL19N	KHN19
KHL32N	KHN32

## KUPLEX Hook Latch Assembly KHL

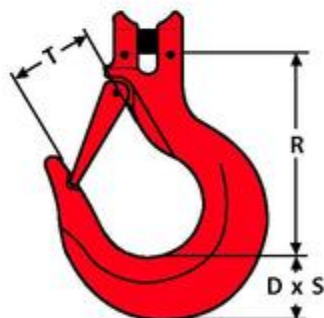
This assembly is for use with KH23 and KH26 and comprises a load pin to which the latch is attached.



REFERENCE	HOOK REFERENCE
KHL23	KH23
KHL26	KH26

## KUPLEX Wide Bowl Hook KHW N

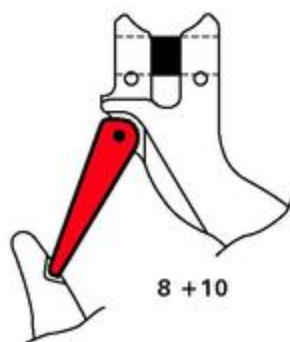
This hook has a more generous throat opening and bowl than the sling hook.



REFERENCE	WLL (t)		DIMENSIONS mm						WEIGHT kg
	8	8+10	R	D	S	No Latch	T	With Latch	
KHW7N	1.5	2	95	29	21	37		32	0.7
KHW10N	3.2	4	130	42	30	48		44	1.9
KHW13N	5.3	6.7	168	52	38	66		59	4
KHW16N	8	10	208	65	48	79		74	7.11

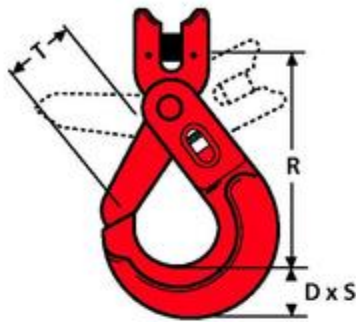
## KUPLEX Safety Latch KHWL

This latch is designed for use on wide bowl hooks.



REFERENCE	HOOK REFERENCE
KHWL7	KHW7N
KHWL10	KHW10N
KHWL13	KHW13N
KHWL16	KHW16N

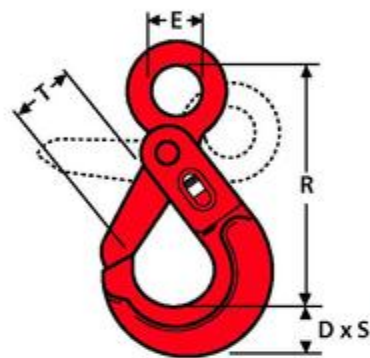




## KUPLEX Safety Hook KHX C

All Safety Hooks in the KHX series are designed so the latch cannot open under load and requires pressure on the trigger to release the hook when the load is grounded.

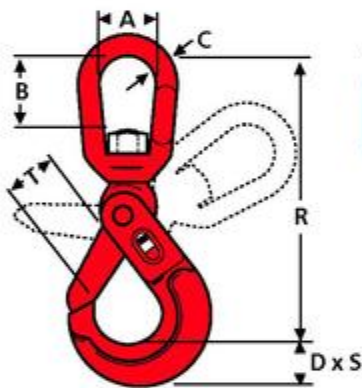
REFERENCE	WLL (t)		DIMENSIONS mm				WEIGHT kg
	8	8+10	R	D	S	T	
KHX7C	1.5	2	117	25	19	36	0.82
KHX10C	3.2	4	146	32	24	47	1.51
KHX13C	5.3	6.7	181	42	30	56	3.15
KHX16C	8	10	223	49	36	70	5.27



## KUPLEX Safety Hook KHX E

A variant on the KHX C with eye instead of clevis.

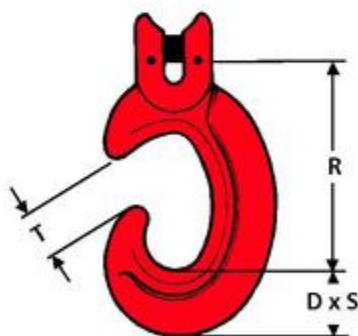
REFERENCE	WLL (t)		DIMENSIONS mm				E (dia)	WEIGHT kg
	8	8+10	R	D	S	T		
KHX7E	1.5	2	142	25	19	36	23	0.85
KHX10E	3.2	4	175	32	24	47	30	1.15
KHX13E	5.3	6.7	217	42	32	56	40	3.06
KHX16E	8	10	272	49	36	70	51	5.24
NEW KHX19E	11.2	14	277	66	53	80	65	9.5
NEW KHX23E	16	21	315	69	63	92	75	13.9



## KUPLEX Swivel Safety Hook KHX S

Another variant incorporating bow and swivel.

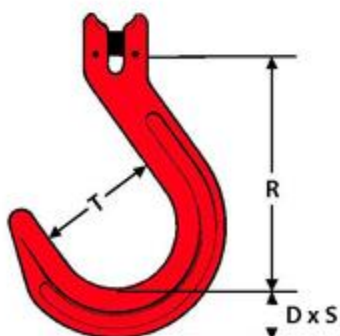
REFERENCE	WLL (t)		DIMENSIONS mm							WEIGHT kg
	8	8+10	A	B	R	D	S	T	C (dia)	
KHX7S	1.5	2	42	42	202	25	19	36	12	1.24
KHX10S	3.2	4	50	46	235	32	24	47	15	2.11
KHX13S	5.3	6.7	60	62	293	42	30	56	19	4.28



## KUPLEX C Hook KC

The profile of this hook is designed to prevent fouling of the tip of the hook on obstructions such as scaffolding.

REFERENCE	WLL (t)		DIMENSIONS mm				WEIGHT kg
	8	8+10	R	D	S	T	
KC7N	1.5	2	90	27	19	20	0.45
KC10N	3.2	4	127	38	27	28	1.26
KC13N	5.3	6.7	165	49	36	39	2.78
KC16N	8	10	203	60	43	45	5.16
KC19N	11.2	14	242	71	52	55	8.83

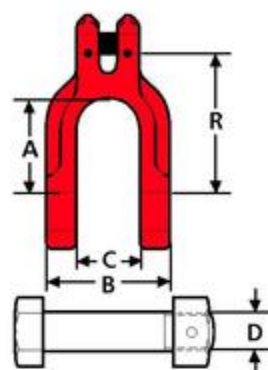


## KUPLEX Foundry Hook KF

Designed with a wide throat to accommodate moulding box trunnions.

REFERENCE	WLL (t)		DIMENSIONS mm				WEIGHT kg
	8	8+10	R	D	S	T	
KF7N	1.5	2	118	24	22	64	0.79
KF10N	3.2	4	137	32	30	76	1.74
KF13N	5.3	6.7	165	41	38	89	3.45
KF16N	8	10	222	52	48	114	7.40
KF19N	11.2	14	248	61	56	127	11.82
KF23N	16	21	280	78	64	140	20.3

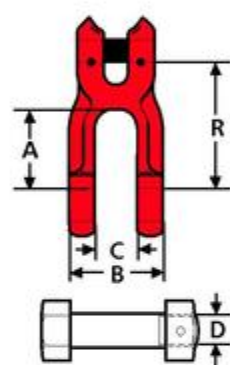




## KUPLEX Shackle KDL

Has a wide jaw and attaches directly to the chain. Complete with bolt, hexagon nut and cotter pin.

REFERENCE	WLL (t)		DIMENSIONS mm					WEIGHT kg
	8	8+10	A	B	C	R	D	
KDL7N	1.5	2	48	65	35	71	19	0.71
KDL10N	3.2	4	74	83	44	104	22	1.36
KDL13N	5.3	6.7	98	109	57	136	29	3.02
KDL16N	8	10	122	140	73	173	35	6.18
KDL19N	11.2	14	145	162	86	203	44	10.62



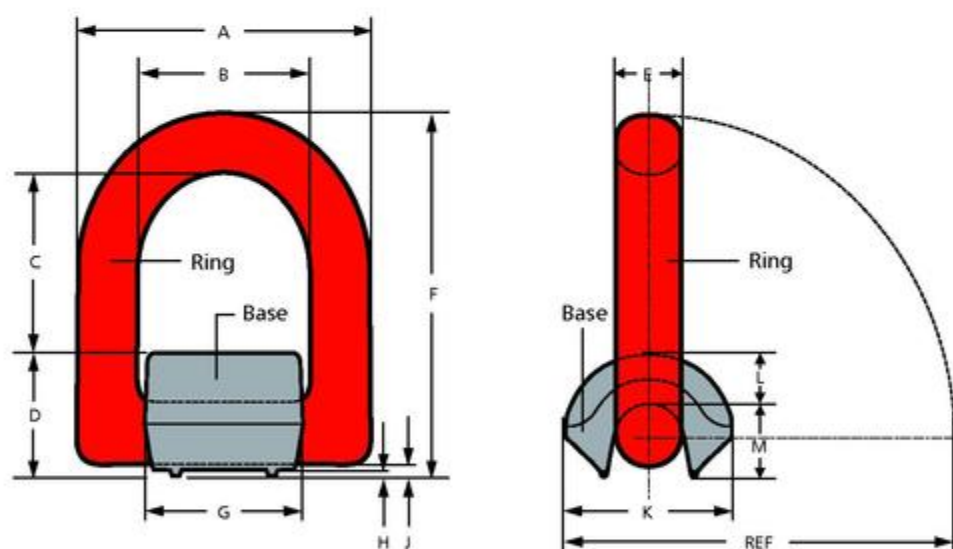
## KUPLEX Narrow Jaw Shackle KDN

Similar to KDL series, but for applications calling for a narrower jaw.

REFERENCE	WLL (t)		DIMENSIONS mm					WEIGHT kg
	8	8+10	A	B	C	R	D	
KDN7N	1.5	2	36	42	20	57	14	0.26
KDN10N	3.2	4	53	58	28	83	20	0.85
KDN13N	5.3	6.7	72	74	35	106	24	1.68
KDN16N	8	10	83	90	44	127	30	3.14

## KUPLEX KWLR Weldable Lifting Ring

A weldable lifting ring, fully compatible with the relevant sized Kuplex 8+10 components.

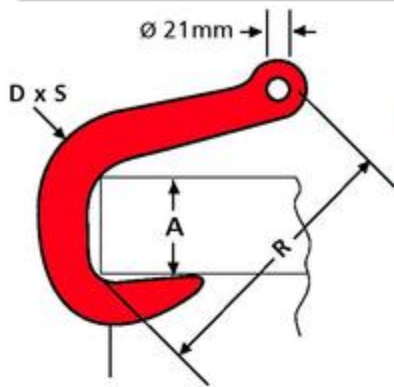


REFERENCE	RING					BASE mm								WEIGHT kg (Ring + Base)	To suit normal chain size (mm)
	A	B	C	D	E	F	G	H	J	K	L	M	REF		
KWLR7(2t)	60	37	39.5	26	13	77	33	2	4	32	10	16	83	0.31	7
KWLR10(4t)	87	51	51	35	18	103	46	2	4	45	12	22	113	0.83	10
KWLR13(6.7t)	109	67	74	44	23	139	60	2	4	60	18	26	154	1.82	13
KWLR16(10t)	117	67	68	54	27	147	60	2	4	75	23.5	30	167	2.75	16
KWLR23(21t)	168	100	103	70	36	207	90	3	7	94	29	41	230	6.95	23

Welding advice leaflets are available on request.



## COMPONENTS

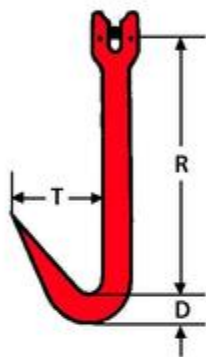


### KUPLEX Pipe Hook KPH

For lifting pipes. Used in pairs.

TYPE SIZE/ REFERENCE	WLL (t)		R	DIMENSIONS mm			WEIGHT kg
	8	8+10		A	D	S	
KPH10	3.2	4	238	82	45	25	3.06

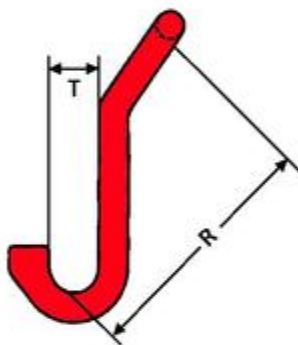
Note: Sling rated at minimum 30° From the vertical (60° included angle)  
**MUST BE USED IN PAIRS**



### KUPLEX Bale Hook KB

For handling soft bales such as wood pulp, scrap paper, etc. Used in pairs.

TYPE SIZE/ REFERENCE	WLL (t)		R	DIMENSIONS mm			WEIGHT kg
	8	8+10		D	T		
KB7	1.5	2	191	22	70		0.85



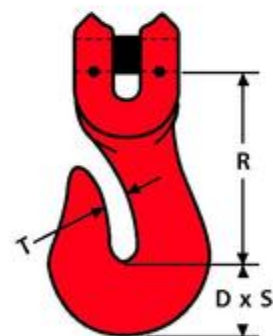
### KUPLEX Drum Hook KD

For lifting steel drums. Used in pairs.

TYPE SIZE/ REFERENCE	WLL (t)		DIMENSIONS mm		WEIGHT kg
	8	8+10	R	T	
KD7	1.5	2	150	28	0.93

Note: Sling rated at minimum 30° From the vertical (60° included angle)  
**MUST BE USED IN PAIRS**

## Lashing Equipment

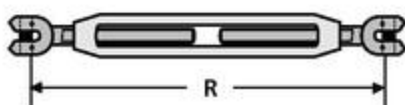


### KUPLEX Grab Hook KG

The narrow throat is intended to engage one link of chain. The preferred use is in lashing chain and similar assemblies.

**It is not suitable for slinging applications and should never be used for shortening sling legs.**

TYPE SIZE/ REFERENCE	Maximum Service Load (t)		R	DIMENSIONS mm			WEIGHT kg
	8	8+10		D	S	T	
KG7N	1.5	2	51	22	14	9	0.23
KG10N	3.2	4	79	31	17	12	0.69
KG13N	5.3	6.7	102	41	22	16	1.54
KG16N	8	10	124	50	27	20	2.71



### KUPLEX Turnbuckle KTB

For chain tensioning in load lashings and anchorages. NOT TO BE USED FOR LIFTING PURPOSES.

TYPE SIZE/ REFERENCE	WLL (t)		DIMENSIONS mm		WEIGHT kg
	8	8+10	R Min	R Max	
KTB10	3.2	4	375	611	2.36
KTB13	5.3	6.7	400	616	3.63

**WARNING - NEVER EXCEED THE WORKING LOAD LIMIT STATED**



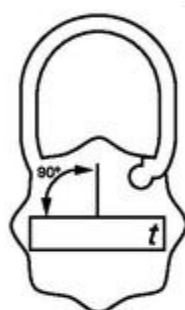
**Sling Tags** One size tag to cover all KUPLEX slings from 7mm to 32mm.



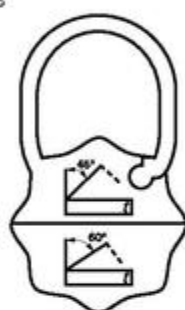
The reverse of Grade 8 KTS and KTP tags



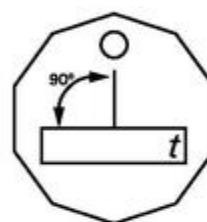
The reverse of Grade 10 KTS10 and KTP10 tags



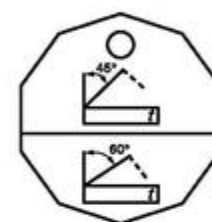
**KTS Tag**  
For single leg slings  
for general service



**KTP Tag**  
For multi leg slings  
for general service



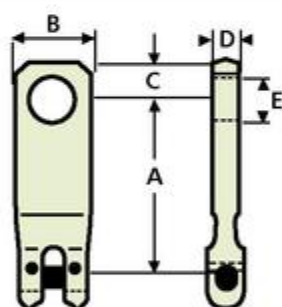
**KTS10 Tag**  
For single leg slings  
for general service



**KTP10 Tag**  
For multi leg slings  
for general service

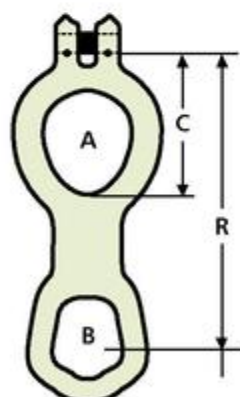
## Skip Lifting Components

All Skip Lifting Components are designed to accommodate 13mm KUPLEX Grade 8 or Grade 10 short link alloy chain and are supplied in a zinc plated finish. All items are tested and certified in accordance with EN 818-2 and EN 1677.



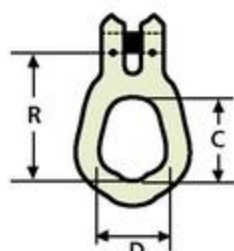
### Top Suspension Plates

TYPE SIZE/ REFERENCE	WLL (t)		A	DIMENSIONS mm				WEIGHT kg
	8	8 + 10		B	C	D	E	
C151401	5.3	6.7	153	62	32	20	36	1.69
C151402	5.3	6.7	140					1.52
C151403	5.3	6.7	127					1.4
C151404	5.3	6.7	114					1.35
C151405	5.3	6.7	101					1.17
C151406	5.3	6.7	88					1.03



### Keep Plate C2247

TYPE SIZE/ REFERENCE	WLL (t)		A	DIMENSIONS mm			WEIGHT kg
	8	8 + 10		B	C	R	
C2247	5.3	6.7	95 x 76	74 x 58	133	301	3.48



### Single Trunnion Plate C1513

TYPE SIZE/ REFERENCE	WLL (t)		R	DIMENSIONS mm		WEIGHT kg
	8	8 + 10		C	D	
C1513	5.3	6.7	112	74	58	1.5



# SAFE USE AND MAINTENANCE



Properly used and maintained your KUPLEX chain slings will give long life and will enable you to carry out your lifting operations efficiently and safely.

## Limitations on Use

Due to risk of embrittlement, KUPLEX slings should not be used in acid or caustic solutions nor in heavily acidic or caustic-laden atmospheres. In uncertain conditions consult your distributor.

KUPLEX slings must not be heat-treated, galvanised, plated, coated or subject to any process involving heating or pickling. Each of these processes can have dangerous effects and will invalidate the manufacturer's certificate.

KUPLEX slings may be used at temperatures down to -40°C with no reduction in the working load limit. The use of KUPLEX chain slings within the permissible temperature range in the tables shown does not require any permanent reduction in working load limit when the chain sling is returned to normal temperatures. A sling accidentally exposed to temperatures in excess of the maximum permissible should be withdrawn from service immediately and returned to the distributor for thorough examination.

SLING TEMPERATURE	REDUCTION IN WORKING LOAD LIMIT	
	GRADE 8	GRADE 10
- 40°C TO 200°C	NONE	NONE
200°C TO 300°C	10%	DO NOT USE
300°C TO 400°C	25%	
ABOVE 400°C	DO NOT USE	

When using KUPLEX slings in exceptionally hazardous conditions, the degree of hazard should be assessed by a competent person and the working load limit adjusted accordingly. Examples include the lifting of persons and lifting of potentially dangerous loads such as molten metals, corrosive materials or fissile material and certain offshore activities.

## Before First Use

No sling should be put into use until a valid Test Certificate has been supplied.

Check that the sling is precisely as ordered and all chain and components are marked 'KUPLEX' or 'KX'.

Check that all identification references and working load limits marked on the sling correspond with the information on the sling Manufacturer's Certificate.

## Before Each Use

Before each use a KUPLEX sling should be subject to inspection with a visual check on the condition of the chain sling to identify obvious damage or deterioration which might affect its fitness for use. Withdraw the sling from service if in any doubt.

## In Use

Never exceed the working load limit (WLL) marked on the sling.

Strictly observe the marked restriction on the angle of the sling legs.

Take into consideration the cumulative effect of de-rating depending on the method of slinging to ensure that the chain sling selected has a working load limit (WLL) equal to or greater than the mass to be lifted.

Ensure that the master link articulates freely on the hook of the crane or other lifting appliance.

The crane hook should be positioned over the centre of gravity of the load and the sling rigged from that point, using shortening clutches for leg adjustment where necessary.

Make sure that the load is free to move and is not bolted or held down in any way. Check also that there are no obstacles to making the lift.

Do not leave a suspended load unattended.

When a chain is used in choke hitch, i.e. with the sling legs passed around the load and hooked or linked back onto the chain, the working load limit (WLL) of the chain sling should be no more than 80% of that marked.

The working load limits stated in EN 818-4 have been determined on the basis that the loading of the chain sling is symmetrical. This is when the sling legs are symmetrically (i.e. equally) disposed in plan and all have the same angle to the vertical. For unequally loaded KUPLEX chain slings the lift should be referred to a competent person to establish a safe rating for the chain sling. Alternatively in the case of asymmetric loading, the chain sling should be rated at half the marked WLL.

ATLAS LIFTING EQUIPMENT LTD.			
MANUFACTURER'S CERTIFICATE & EC DECLARATION OF CONFORMITY: LIFTING ACCESSORIES		REFERENCE NO: CMF16863	
MANUFACTURED BY: ATLAS LIFTING EQUIPMENT LTD. TITAN WORKS PROMETHEUS STREET LINCOLN LN1 2NS		SUPPLIED TO: SAMSON CASTINGS PROVIDENCE WORKS LOWER GORNAL WEST MIDLANDS DY1 3LB	
QTY 1	DESCRIPTION KUPLEX GRADE 8 10MM TWO LEG CHAIN SLING FITTED WITH SHORTENING CLUTCHES AND TERMINATING IN KHX10C SAFETY HOOKS REACH 3 MTR  COMPONENTS/PARTS 1 x KM-C - P2Y246 2 x KSC10N - P5Y246 2 x KHX10C - P1Y213 2 x 2.6 MTRS 10MM KUPLEX 10030RPC GRADE 8 CHAIN - 242967 HARMONISED STANDARD BS EN 818-4	IDENTIFICATION NUMBER KCS8184	WLL 4.25 TONNES 0-45°
ON BEHALF OF THE ABOVE FIRM  SIGNED _____  DATE _____		DECLARATION OF CONFORMITY ON BEHALF OF THE FIRM ABOVE I DECLARE THAT THE PRODUCT DESCRIBED HAS BEEN CONSTRUCTED IN ACCORDANCE WITH THE NAMED STANDARD AND CONFORMS TO ESSENTIAL HEALTH AND SAFETY REQUIREMENTS OF THE MACHINERY DIRECTIVE 90/269/EEC	

An instruction leaflet 'Safe Use of KUPLEX Chain Slings' should be supplied with each new sling.

Enter details of sling in the register of lifting equipment.

Ensure that personnel who are to use the KUPLEX sling have received appropriate instruction and training.

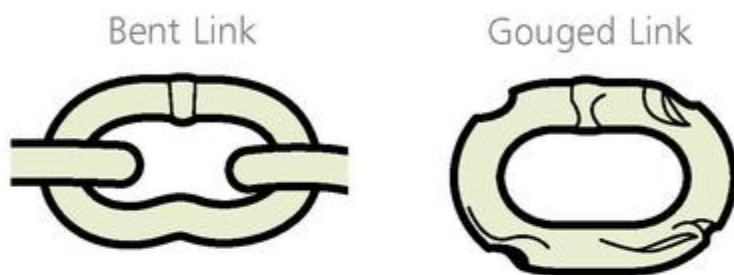


## Maintenance

### Inspection

KUPLEX chain slings should be checked before each period of use and the sling withdrawn from service and referred to a competent person if any of the following are observed:

- Distortion of the links, connectors or hooks
- Stretch in any link of the chain links
- Wear in the chain, especially between adjoining links. The mean diameter at any point should be no less than 90% of the nominal chain diameter. SEE TABLE BELOW



- Cuts, nicks, gouges, cracks, excessive corrosion, heat discolouration or any other defects
- Signs of any increase in the throat opening of hooks. This should not exceed 10% of the nominal value or be such as to allow the safety latch, if fitted, to become disengaged.

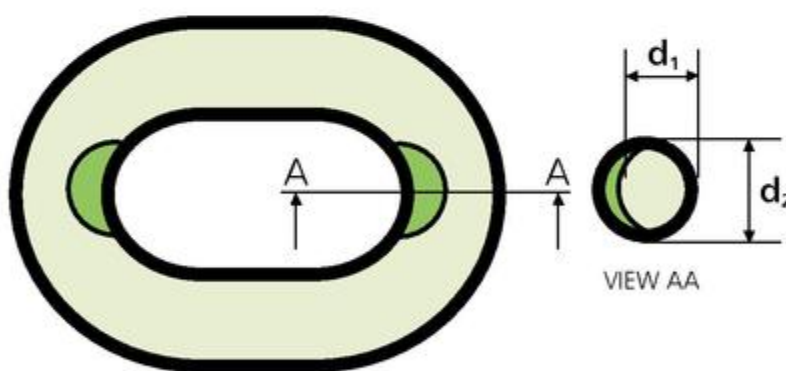
### Thorough Examination

It is a requirement of the European Standards for Grade 8 chain slings that a thorough examination should be carried out by a competent person at intervals not exceeding twelve months. This maximum interval may be less where legal requirements differ throughout the European Union. For example in the UK the majority of industry sectors apply a maximum interval of six months.

- Where slings are in constant use, or the conditions of use are severe, it is advisable to carry out more regular inspections.
- Never attempt on-site repair of KUPLEX slings.
- Your KUPLEX distributor will carry out the examination and any necessary repair, and provide a suitable record for you to enter in your register of lifting equipment.

### Limits of Allowable Wear in KUPLEX Grade 8 and 10 Chains

If it were possible to define allowable wear in precise and simple terms, there would be less need to employ skilled and experienced examiners. The fact is that the decisions as to what is allowable and what is not can be highly subjective and need to take into account a variety of conditions and circumstances. The most common form of wear is that which occurs at the internal inter-link locations and, in order to detect this condition, it is necessary to manipulate the links in such a way as to allow examination and measurement at these points.



NOMINAL DIAMETER mm	MINIMUM MEAN DIAMETER mm $\leq \frac{d_1 + d_2}{2}$
7	6.3
8	7.2
10	9
13	11.7
16	14.4
19	17.1
23	20.7
26	23.4
32	28.8

It should be noted that in the chain in new condition, there may have been some flattening of the material at the link intrados due to contact with the forming mandrel and it is standard practice to determine the diameter of the material in the chain as new by taking the mean of two measurements at right angles in the same plane as  $d_1$  and  $d_2$ .

## Legal Requirements

### Supply

All new KUPLEX chain slings supplied within EU Member States fully comply with the essential health and safety requirements of the Machinery Safety Directive 98/37/EC. Each country is bound to implement this directive with national legislation e.g. in the United Kingdom the applicable regulations are the Supply of Machinery Regulations 1992, which fully applied from 1st January 1995.

### Use

Once a KUPLEX sling has been first put into service within a EU Member State, different EU Directives apply to its subsequent use.

These are the Use of Work Equipment Directive (98/655/EEC) and its amending Directive 95/63/EC. Member States were bound to implement this directive with national regulations by 5th December 1998 and in the United Kingdom these are the Lifting Operations and Lifting Equipment Regulations (LOLER) which are part of the Provision & Use of Work Equipment Regulations (PUWER) relevant to lifting equipment.



The safe and competent use of lifting gear cannot be adequately learned from a manual. A good slinger learns his trade only after practical training and lengthy experience. However, this section establishes some sound basic principles and highlights some of the major malpractices which must be avoided.

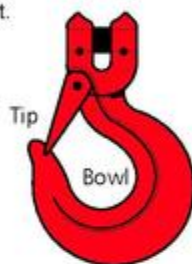
## 1 Evaluating the Load

The user should take all practicable steps to establish the weight of any load. An intelligent guess is not good enough. A drawing may be available giving the weight or it may be calculable within reasonable limits of accuracy. In the case of multi-piece loads (e.g. a bundle of steel rods) one item may be weighed in order to calculate the total weight of the load. If it is likely that the load may have to be lifted again, the weight should be clearly marked on it.

## 2 Tip Lifting of Hooks

All KUPLEX hooks are designed to support the load in the bowl. Users should ensure that the hook of a sling engages freely in the lifting point so that the weight of the load is supported in the bowl of the hook.

Wedging or forcing the hook tip into the lifting points results in the hook being stressed in a manner for which it was not designed which may easily lead to hook deformation and premature failure.



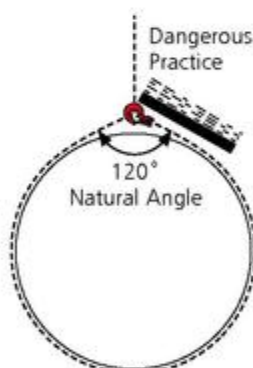
## 3 Mis-use of Shortening Clutches

KUPLEX Shortening Clutches can be mis-used. Ensure that the chain carrying the load always leads out of the bottom of the clutch as illustrated. If the direction is reversed so that the load-carrying chain leads out of the top of the clutch, this can result in the front portion of the clutch being pulled off and the load released.



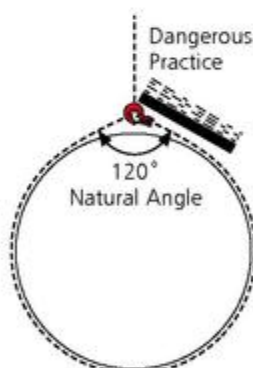
## 4 Knotting, Twisting and Transverse Bending of Chain

Chain is designed to support a load in a straight line with the line of force running through the crowns of each link. Chain which is twisted, or even worse knotted, cannot develop its full strength and will almost certainly fail prematurely. Users should remove twists from a chain leg before lifting and should NEVER knot a chain. If it is necessary to shorten a chain, a KUPLEX Shortening Clutch should be used. Similarly, chain which is bent under tension across a sharp corner is stressed in a manner for which it is not designed. The user should use timber (or any other suitable material) packing pieces to reduce the severity of this type of stressing.



## 5 Battening Down

It is sometimes believed that slings in choke hitch can be made more secure by striking the hook, link or adjacent chain in an attempt to force the bight into closer contact with the load. This malpractice is often known as 'battening down' and is dangerous. The bight should be allowed to assume its natural angle which will be about 120°.



## 6 Load Stability

Good slingers will develop the habit of assessing unusual loads and estimating the centre of gravity and then attaching the sling in such a manner that the centre of gravity is below the lifting points, or if this is impossible, well within them. If there is the slightest doubt of the stability of a load, it should be slowly lifted just clear of the ground. If the load tilts, the sling should be refixed in a more stable position.

## 7 Slingers Duty of Self Protection

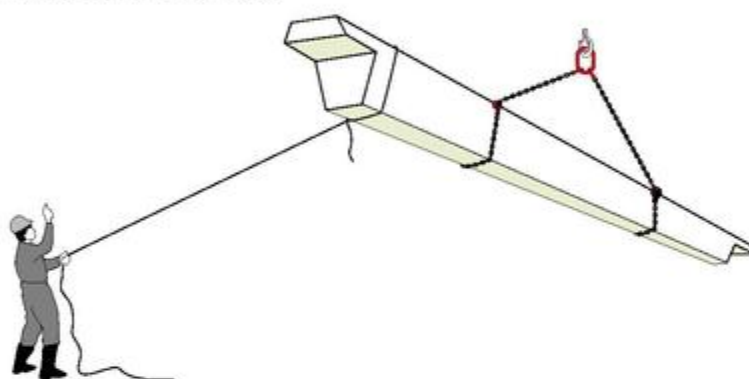
Slingers should wear suitable protective clothing. At the moment when the strain is taken on a sling, the slinger's hands and feet should be clear of the load and he should then position himself so that he does not risk injury if the load were to fail.

## 8 Shock Loading

Crane drivers, particularly, and slingers should be aware of the dangers of shock loading. Shock loads may break a chain even though the weight of the load being lifted is well below the working load limit for that chain. High acceleration forces, or shock loads, may be caused by the sudden operation of the crane, by not taking up slack before starting to lift, or by the sudden impact of falling loads. Crane drivers should always lift and lower slowly.

## 9 Tag Lines

When lifting long loads, particularly in confined spaces, slingers should attach a rope or 'tag line' to one or both ends of the load so that rotational movement may be controlled.

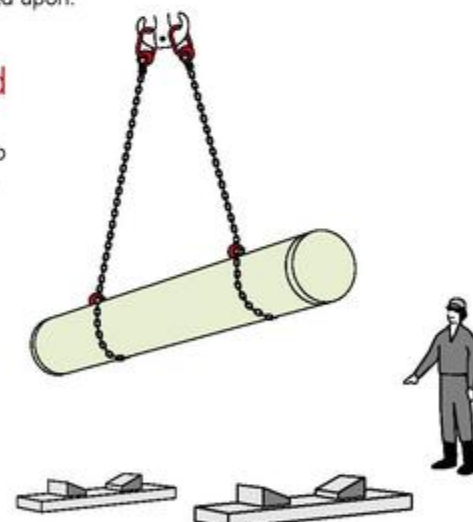


## 10 Code of Signals

Slingers and crane drivers should use an approved Code of Signals before lifting operations are commenced. There should be an agreement between the crane driver and the slingers that one slinger only is in charge of a lift, and only he will give signals. The crane driver should ignore signals from all other personnel except the EMERGENCY STOP signal which may be given by anyone present and must always be acted upon.

## 11 Landing of Load

Before a load is lifted, a place should be prepared where it is to be put down. The nature of the load will determine the type of preparation necessary but most loads should be lowered onto timber battens. The sling may then be easily withdrawn. The load should never be landed directly on to the chain.

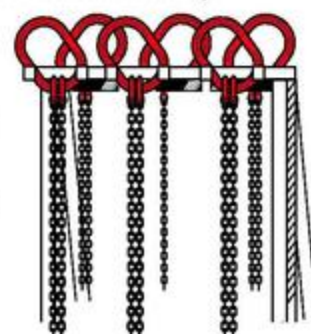


## 12 Hooking Back Unused Legs

In the case of multi-leg slings with not all legs in use, the unused legs should be hooked back by engaging the hook in the master link or the master assembly. Similarly, after finishing a lift, if the sling is to remain on the crane hook, all hooks should be hooked back into the master link or the master assembly.

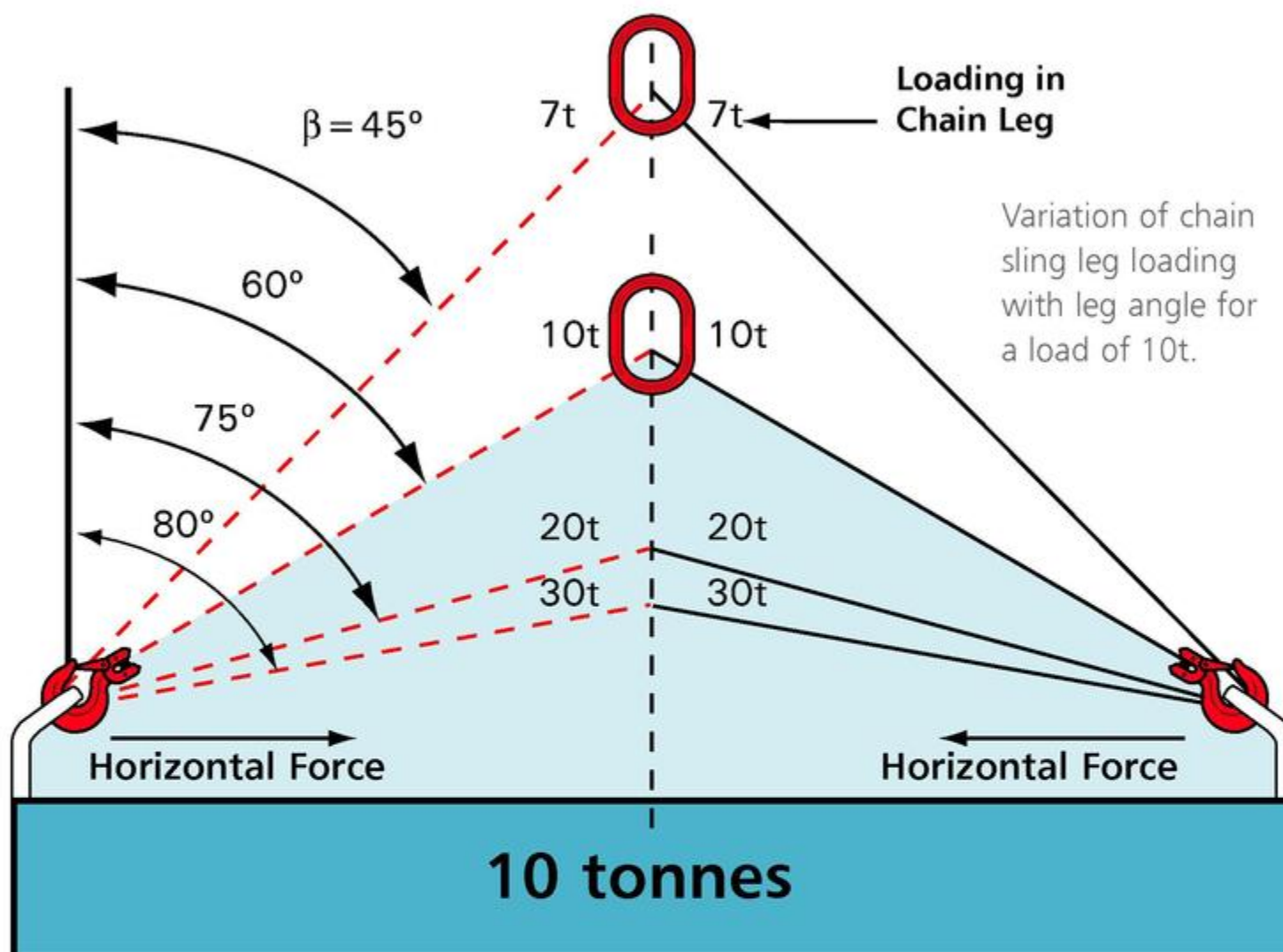
## 13 Sling Stowage

When lifting operations are finished, slings should be removed from crane hooks and stowed on a properly designed rack. They should not be left lying on the floor where they may suffer damage or may be lost.





## Restrictions on the angle of use

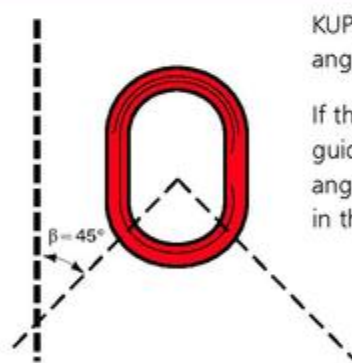


All multi-leg chain slings exert a horizontal component of force, which increases as the included angle becomes greater.

No chain sling should be used if the angle from the vertical exceeds 60°, as beyond this point the forces in the legs drastically increase.

**DO NOT USE MULTI-LEG CHAIN SLINGS AT ANGLES WITHIN THE SHADED AREA.**

Angles of less than 15° should also be avoided as these can lead to the load becoming unstable.



KUPLEX 8+! Master Links have an angle guide forged onto them.

If the sling angles are on or inside the guidelines the sling is within the angle range  $0^\circ < \beta \leq 45^\circ$ , as specified in the load chart on page 5.

## Further Advice and Information

For further advice on any lifting problems, consult first with your KUPLEX distributor, who is fully qualified to advise on all aspects of lifting, as well as providing all the necessary equipment and services.

All the advice and information contained in this publication is in line with recognised European and International Standards and Codes of Practice.

A Code of Practice for the Safe Use of Lifting Equipment is available from the Lifting Equipment Engineers Association.



Lifting Equipment Engineers Association  
3, Osprey Court, Kingfisher Way, Hinchbrook  
Business Park, Huntingdon, Cambs. PE29 6FN UK  
Telephone: + 44 (0) 1480 432801

## Further References

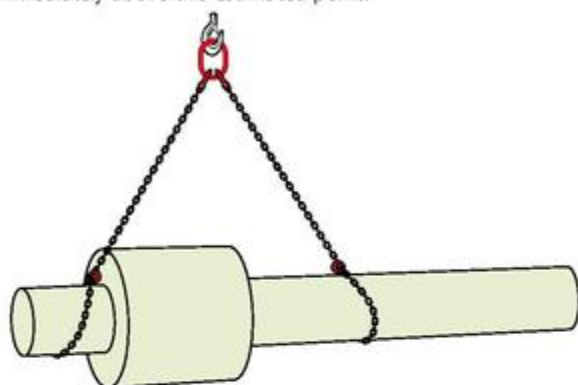
- BS EN 818 Parts 1, 2, 4 and 6 Short Link Chain for Lifting Purposes - Safety
- BS EN 1677 Components for Slings - Safety
- BS 6166 Part 3 Lifting Slings Guide to Selection and Safe Use
- ISO 3056 Use and Maintenance of Non-calibrated Lifting Chain and Chain Slings
- ISO 7593 Chain Slings Assembled by Methods Other Than Welding - Grade T(8)
- ISO 8539 Forged Steel Lifting Components for use with Grade T(8) Chain
- ISO 12480-1 Planning and Management of Lifting Operations and Safe Systems of Working



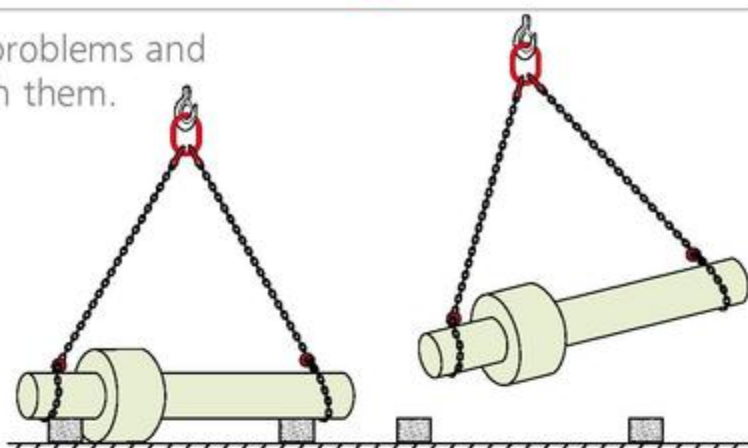
This section deals with more complicated lifting problems and slightly more advanced techniques in dealing with them.

## 1 Out-of-Balance Loads

Some loads are asymmetrical and, therefore, do not balance about their centre point and require more careful handling. It is essential for the slinger to acquire the skill of estimating the position of the centre of gravity and then to place the crane hook immediately above this estimated point.



If the shape of the load permits it, the sling should be positioned equidistant about the centre of gravity ensuring a safe horizontal lift.

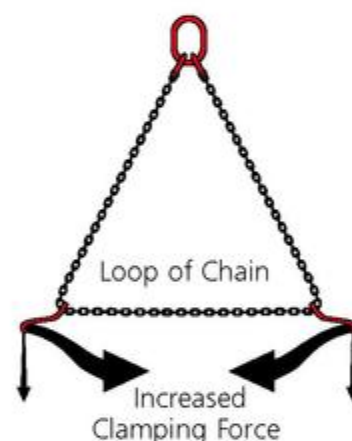
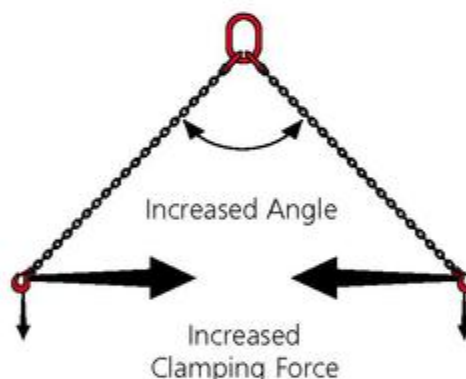


If an out-of-balance load is fitted with a sling attached in such a manner that the crane hook is not immediately above the centre of gravity, the load will tilt until the centre of gravity is directly beneath the crane hook. In this case, the sling leg nearer the heavy end will be withstanding a greater force than the leg at the lighter end. This situation could become progressively more extreme until one leg is supporting virtually all the load whilst the second leg is acting merely as a steadying leg.

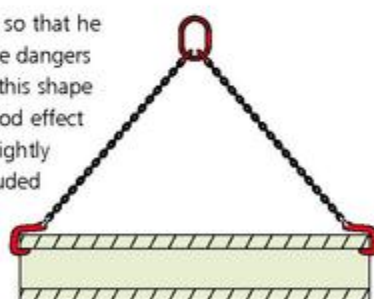
It is impossible to give precise guidance since loads come in an infinite variety of shapes and sizes but the slinger should be aware that when handling an out-of-balance, tilted load the leg at the heavier end could be supporting anything up to 100% of the weight and in extreme cases a sling should be selected which is capable of safely supporting the whole load on one of its legs.

## 2 Clamping Force

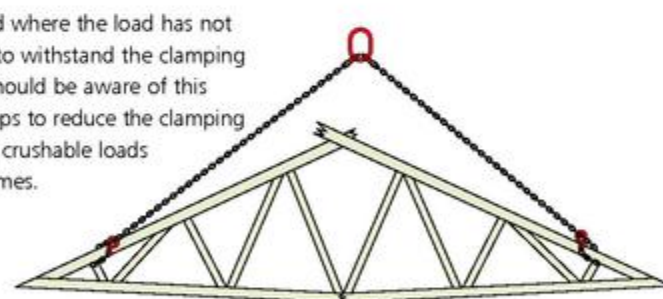
Multi-leg slings impact a 'clamping force' or a compressive force on the load which increases as the included angle is increased. This force is also much increased in the type of sling where the hooks are threaded on a loop chain.



The slinger should be aware of this force so that he may use it to his advantage and avoid the dangers which it might cause. For example, with this shape of load, the clamping force is used to good effect in ensuring that the hooks are clamped tightly against the load. A minimum of 60° included angle is required (30° to vertical).



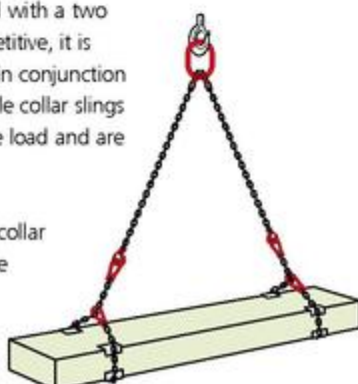
Cases have occurred where the load has not been rigid enough to withstand the clamping pressure. Slingers should be aware of this danger and take steps to reduce the clamping force in the case of crushable loads e.g. lightweight frames.



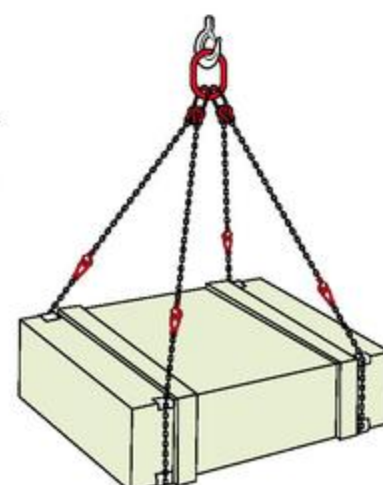
## 3 Combination Slings

Concrete beams, steel joists, etc. can be lifted with a two leg sling in choke hitch but if the work is repetitive, it is better to use two short reeveable collar slings in conjunction with a two leg sling as illustrated. The reeveable collar slings are more convenient to manoeuvre under the load and are cheaper to replace when worn.

When using combination slings the reeveable collar slings must have the same size of chain as the multi-leg sling used in combination with them. In the case illustrated right, therefore, the complete combination should be rated as a two leg sling in choke hitch.



Large packing cases, bundles of steel sheets and similarly shaped loads can be handled by a double basket sling but a more convenient alternative is a four leg sling used in combination with two reeveable collar slings as illustrated. For rating purposes this combination can be regarded as a double basket sling provided, as always, all slings in the combination are of the same chain size.



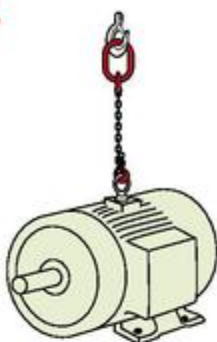


## Single Leg Slings

### 1 Straight lift

**WLL:** Under normal conditions the WLL will be the WLL for single leg slings.

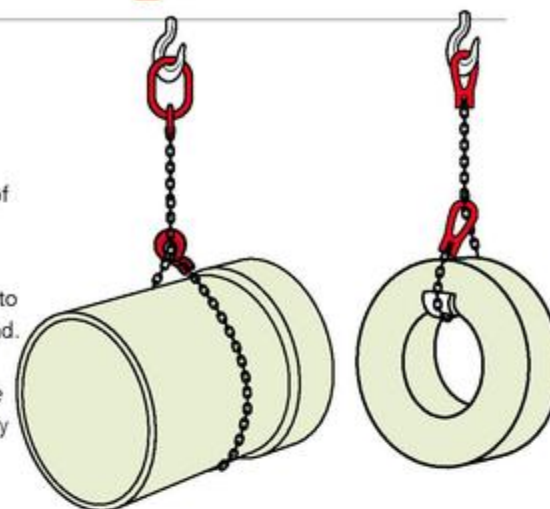
**Comment:** A suitable method of lifting an effectively balanced load from a single lifting point.



### 2 Choke lift

**WLL:** The WLL should be no more than 75% of the WLL for single leg slings.

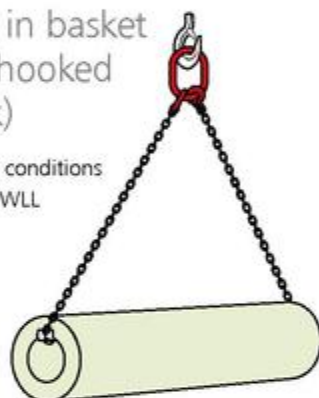
**Comment:** This method forms a loop which tightens as the load is lifted. Do NOT attempt to force the bight into closer contact with the load. Allow the chain to assume its natural angle. Single leg slings in choke hitch are not suitable for lifting long loads which might tilt or for any load which is not effectively balanced in the single loop.



## Single Leg Slings in Basket Hitch

### 1 Single leg in basket hitch (back hooked into top link)

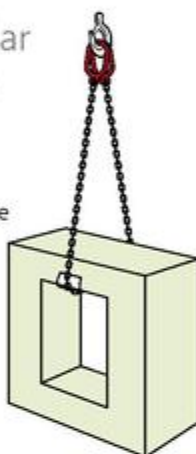
**WLL:** Under normal conditions the WLL will be the WLL for single leg slings.



**Comment:** A single leg sling, back hooked to form a basket hitch, assumes the appearance of a two leg sling but it should never be rated as such. It should be noted that the master link is only designed for single leg loading and, therefore, the single leg WLL should never be exceeded. The included angle should not be allowed to exceed 90°.

### 2 Reeveable collar sling in basket hitch

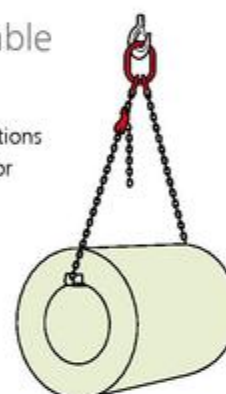
**WLL:** Under normal conditions the WLL will be 1.41 x the WLL for single leg slings.



**Comment:** The included angle should not be allowed to exceed 90°.

### 3 Single adjustable basket sling

**WLL:** Under normal conditions the WLL will be the WLL for single leg slings.



**Comment:** It would be advisable to fit a master link suitable for two leg rating in spite of the single leg rating of this type of sling. The included angle must not be allowed to exceed 120°.

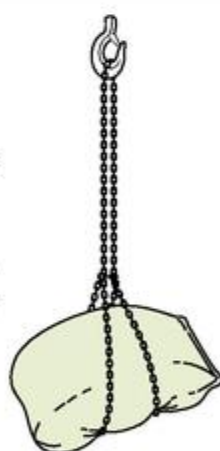
If a 2 leg masterlink is used and the sling is a controlled angle of maximum 90° included the 2 leg rating can apply.

## Endless Slings

### 1 Choked endless

**WLL:** Under normal conditions the WLL will be the WLL for endless slings.

**Comment:** There is no need to de-rate in this instance by virtue of the choked configuration.



### 2 Double endless

**WLL:** Under normal conditions the WLL will be the WLL for endless slings.

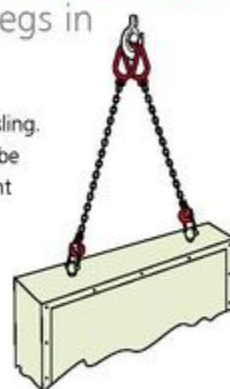
**Comment:** The maximum included angle between diagonally opposite legs should not exceed 90°.



## Two Single Leg Slings Used Together

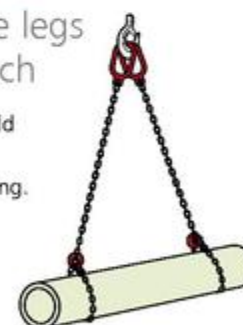
### 1 Two single legs in straight lift

**WLL:** Rate as a two leg sling. The WLL will, therefore, be the same as an equivalent two leg sling.



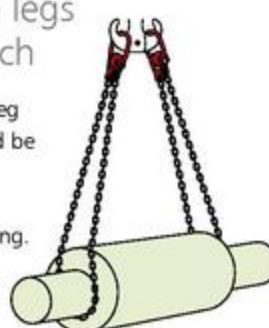
### 2 Two single legs in choke hitch

**WLL:** The WLL should be the WLL for the equivalent reeved sling.



### 3 Two single legs in basket hitch

**WLL:** Rate as a two leg sling. The WLL should be no more than that applicable to an equivalent two leg sling.



**Comment:** Two single leg slings should not be used together to form a pair unless:

- They are of the same type, grade, size and length
- They are both marked with the same WLL
- The included angle between the two legs does not exceed 120° (measured between diagonally opposite legs in example 3)
- The crane hook is large enough to comfortably accept both upper terminal fittings of the slings.



## Two Leg Slings

1 Straight lift



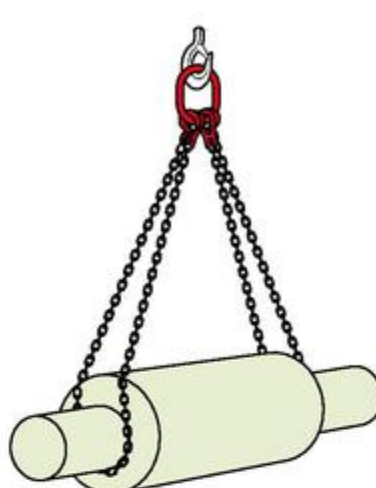
**WLL:** Under normal conditions the WLL will be the WLL for a two leg sling.

2 Choke hitch



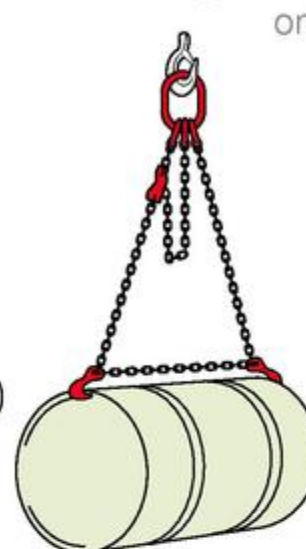
**WLL:** The WLL should be no more than 80% of the WLL for a two leg reeved sling.

3 Basket hitch



**WLL:** Rate as a two leg sling. The angle of any leg should not exceed 45° from the vertical.

4 Drum sling



**WLL:** Should be rated as a single leg sling.

5 Two leg sling - with only one leg in use



**WLL:** Rate at half the working load marked on the sling. The WLL should be no more than 80% if used in choke hitch.

**Comment:** In example 3, basket hitch - the sling assumes the appearance of a four leg sling but it should be noted that the master link will be designed for two leg loads only and the sling should therefore, be rated as a two leg.

**Comment:** In example 4, drum sling - in this configuration the included angle should be maintained as close as possible to 60° (30° from vertical).

If, therefore, drums of different lengths are lifted, a KUPLEX Shortening Clutch should be fitted so that the length of chain can be adjusted to maintain this angle.

**Comment:** In example 5, two leg sling with only one leg in use - ensure the unused leg is hooked back out of harms way.

## Three Leg Slings

1 Straight lift

**WLL:** under normal conditions the WLL will be the WLL for three leg slings.



2 Choke hitch

**WLL:** The WLL should be no more than 80% of the WLL for a four leg sling.



**Comment:** Rate as indicated only in cases where the load appears to be reasonably equally distributed between all three legs. If two are obviously supporting most of the load, rate at 2/3 of the marked working load.

## Four Leg Slings

1 Straight lift

**WLL:** under normal conditions the WLL will be the WLL for four leg slings.



3 Double basket sling

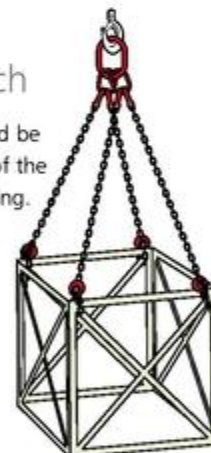
**WLL:** Rated as two leg sling.



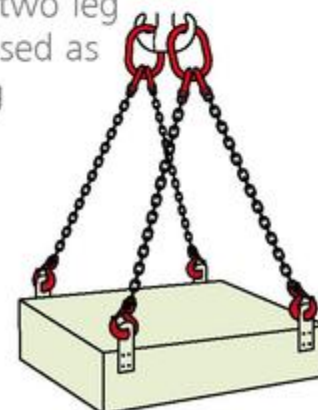
**Comment:** This WLL applies to double basket slings designed as such and fitted with a KUPLEX Master Assembly strong enough for this duty. It does not apply to a back-hooked two leg sling. The maximum included angle should be 90° measured between diagonally opposite legs, or maximum 45° from vertical.

2 Choke hitch

**WLL:** The WLL should be no more than 80% of the WLL for a four leg sling.



4 Two, two leg slings used as four leg



**WLL:** The WLL should be no more than that applicable to an equivalent four leg sling.

**Comment:** Refer to comments on page 25 for slings used in pairs.



# DLH online

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