



**JOHN KING**

Conveyor Chains & Sprockets Worldwide

# Biomass and EFW Plants.

## CONVEYOR CHAINS, SPARES AND SERVICE



## Material Processing Solutions Since 1926.

Rev23/02/2024  
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# Mission Statement and Values.

Our mission is to produce high-performing products and solutions, in a safe, efficient and consistent manner that is aimed at surpassing the expectations of our global customers. We will support our products by providing superior customer care.

Our care extends to the environment, employees, their families and the wider community. We endeavour to provide a safe, rewarding work environment that recognises individual achievement and fosters the skills of teamwork and communication.

The challenges of competing in a global market are changing all the time, so it is essential to our continued success that everyone who works at John King has the same positive attitude.

What will never change is the commitment to a high degree of professionalism conducted with a high level of courtesy.

## There are six elements to the John King Group positive attitude:



**The manufacturers 'Mentality'**

**A total commitment to 'Quality'**



**With a primary focus on 'Safety'**

**With a high level of 'Integrity'**

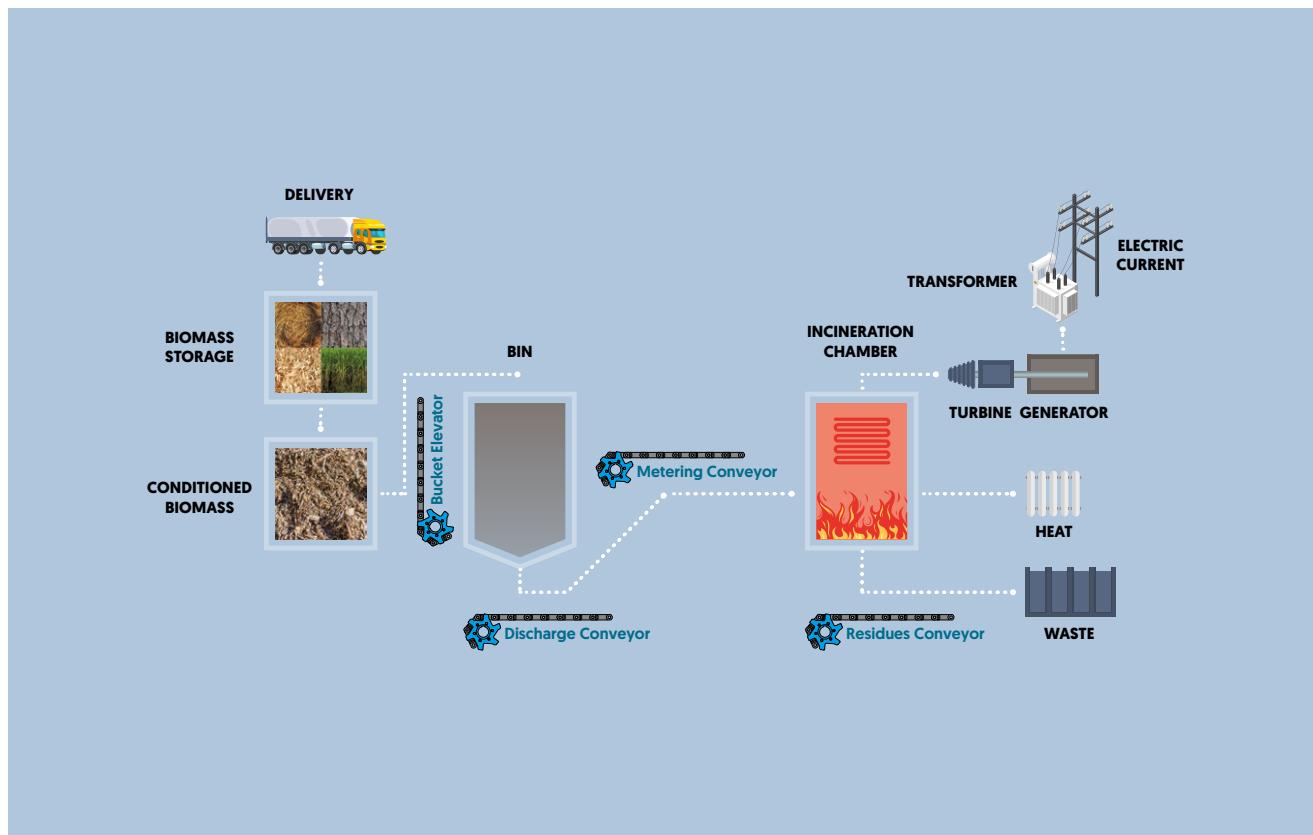


**With an objective to 'Innovate'**

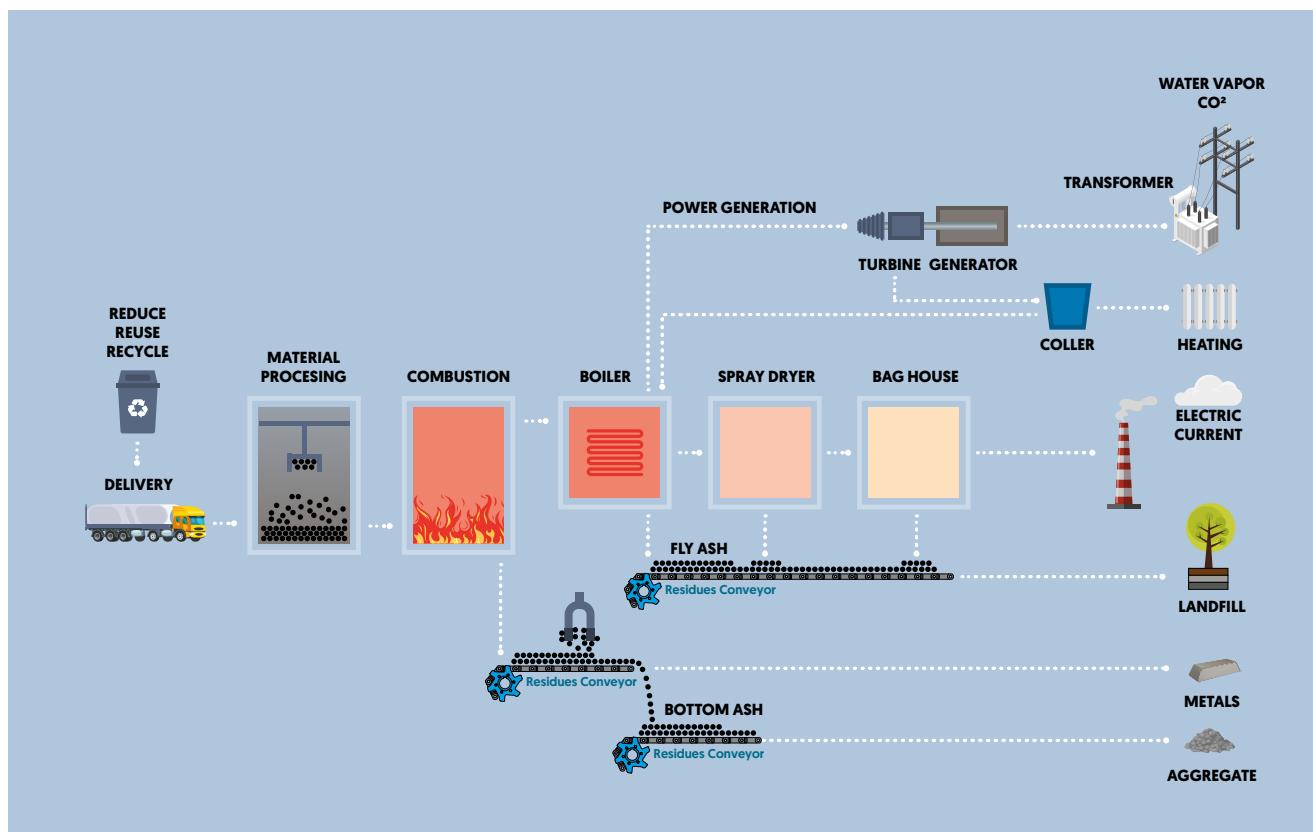
**Always remembering to 'Enjoy' life in the Kingdom!**



# Typical process layout for Biomass Energy plant.



# Typical process layout for Energy from waste plant.



# From Survey to Drawing to Production to Installation Your integrated supply partner.

In the aggressive environment of incineration and steam raising there is an ongoing requirement for refurbishment and replacement of plants and equipment in all areas of the process. John King Group is a combined business uniquely equipped to serve the industry with a full spectrum of essential engineering services to ensure customers' equipment is in the best condition to maintain essential processes.



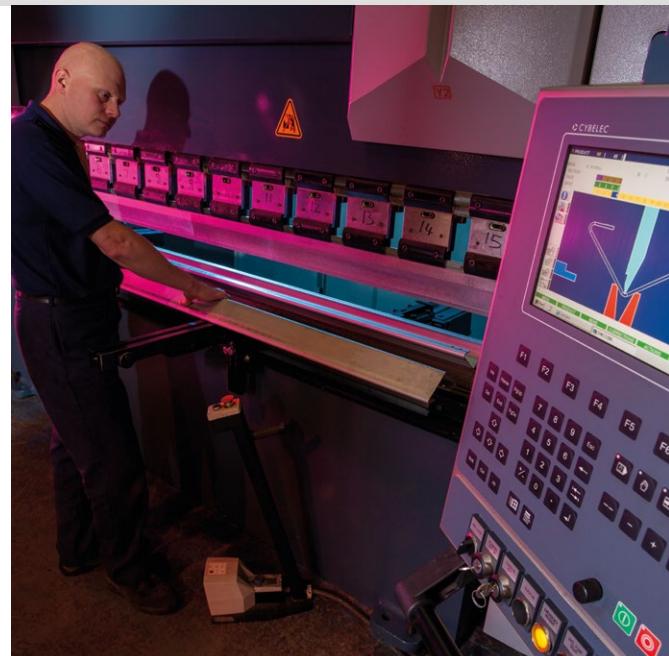
## Inspection, Survey and Consultation.

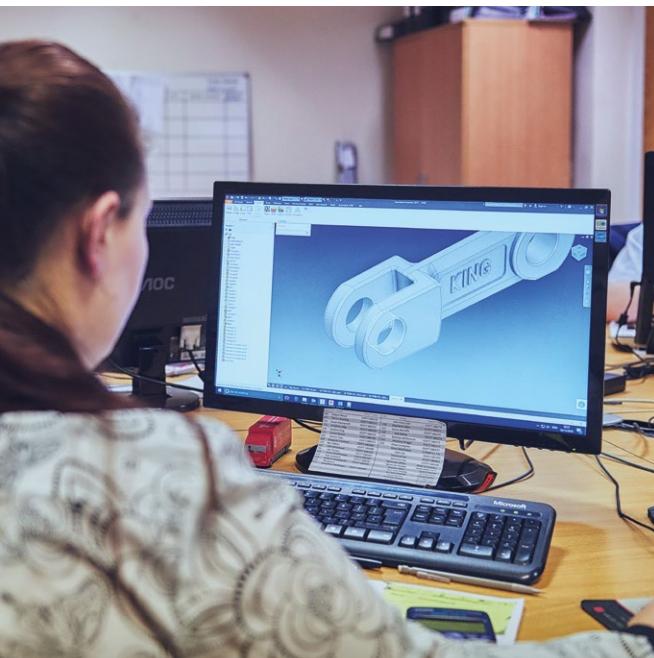
As part of the supply package, qualified engineers will come to site and inspect items of plant and equipment to establish and report on the condition. Subsequent consultation generally includes means for improvement such as: materials employed, design, construction, implementation, additional operation and maintenance advice.



## Industry Leading Steel Processors.

With decades of in-house experience in metal processing and fabrication, we use the latest technology and techniques to deliver quality, bespoke solutions for our clients. From laser cutting to punching, bending and welding our skilled team will deliver a high-quality solution that is both on time and within budget.





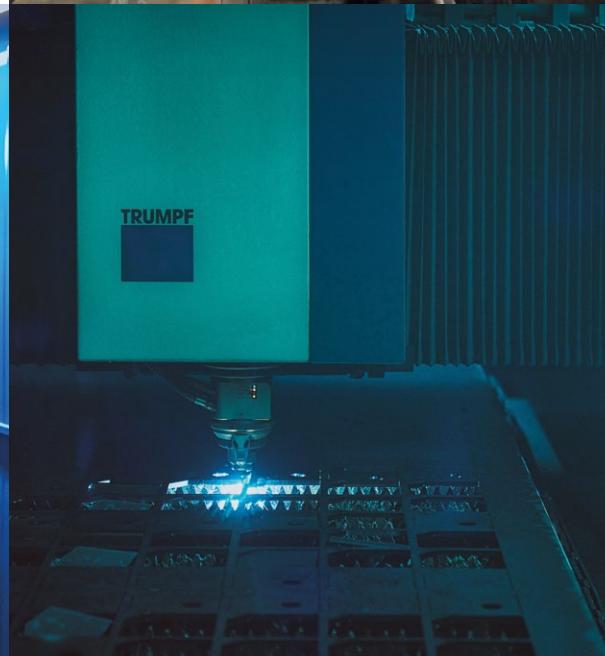
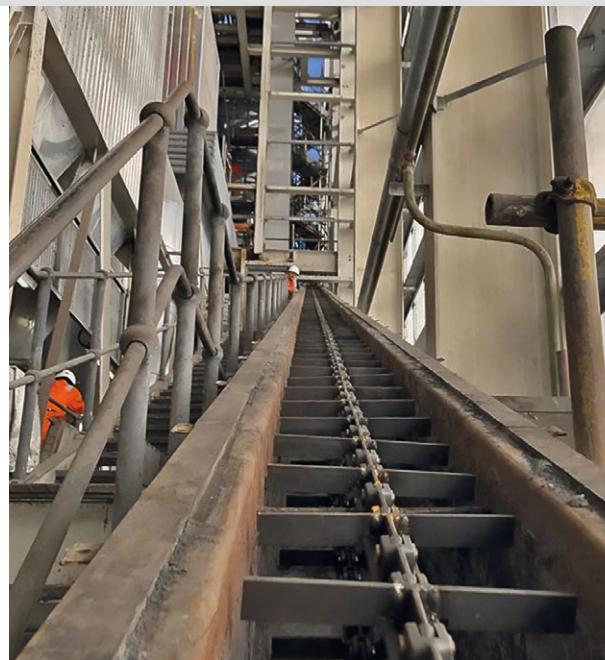
## Design and Drawing Service.

Design and technical drawing are part of our service. We create the technical drawing directly from our site survey or work with you to create a complete design brief to meet your fabrication needs. We will support you in developing and improving the plant and equipment.



## Fully Integrated Installation.

Our site service team, comprising experienced mechanical fitters and fabricators will install all types of mechanical handling equipment, metal fabrications and equipment at your premises in the agreed timescale with a high degree of competence while operating under strict safety protocols.



# The Undisputed Kings of Laser Profiling and Fabrication.



## FROM SURVEY TO DRAWING TO PRODUCTION – THE ONE-STOP SHOP

**John King Laser** was established in 2007 primarily to service the mechanical handling division. It was well understood that the available capacity surpassed that of in-house requirements and the business model from the outset was to sell laser-cut, formed and fabricated parts to a wide variety of customers, producing a wide range of machinery and equipment.

More recently, John King Laser has been able to support the groups' site service division, where bespoke fabrications have been required.

The laser division has remained autonomous from the start while critically benefitting as part of the Group structure in investing in new technology to give the division a distinct advantage in product efficiency and quality. The recent installation of the latest and probably best laser capacity in the country is a testament to this.

## Manufacturing Capabilities.

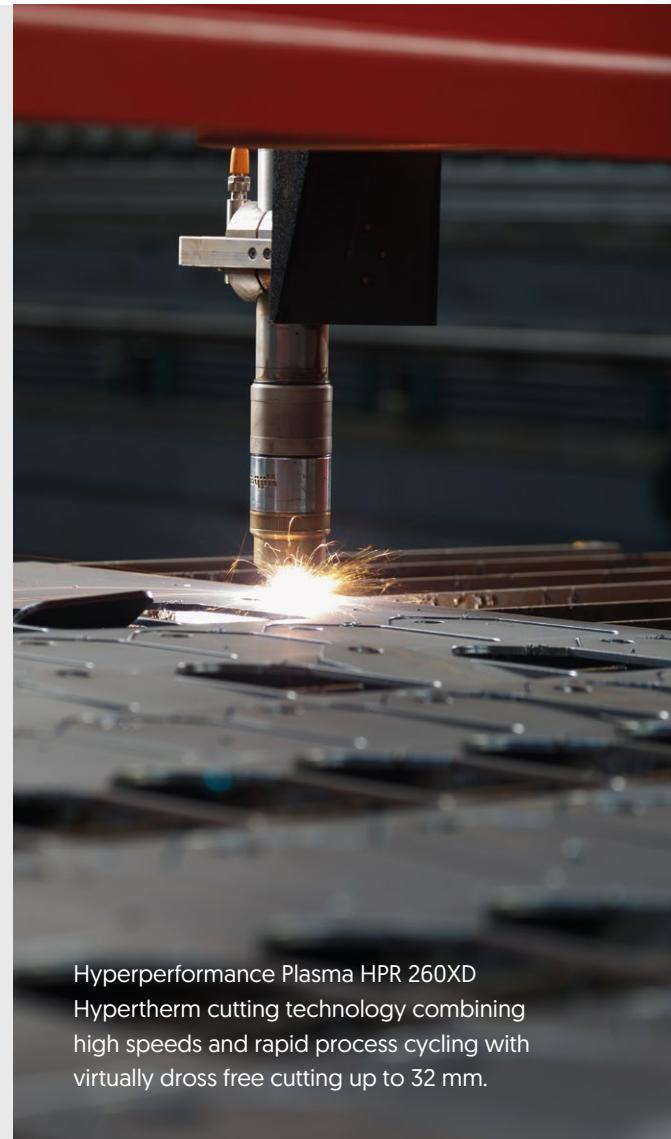
The 2020s business is a lean enterprise working from a modern manufacturing facility employing the best production techniques including fiber laser technology, plasma for thicker material sections, CNC machining and robotics. Group structure provides the internal resources to implement production management systems that ensure the highest quality, consistent and competitive products produced in a safe environment. All manufacturing is conducted within the dictates of ISO 9001 to the latest 2015 standard to ensure quality objectives are monitored and maintained.

### LASER CUTTING CAPABILITIES

- Mild and carbon steel up to 25 mm.
- Stainless steel up to 15 mm.
- Aluminium up to 12 mm.

### FLAME CUTTING AND PLASMA CUTTING CAPABILITIES

- Machine bed size of 4 m x 2.5 m.
- Flame cutting up to 110 mm.
- Plasma cutting up to 30 mm.



Hyperperformance Plasma HPR 260XD  
Hypertherm cutting technology combining high speeds and rapid process cycling with virtually dross free cutting up to 32 mm.



Trulaser 3040 Fibre laser with increased 4000 x 2000 bed size including integrated lift master and plate storage tower for unrivalled efficiency in parts production.



## Press Technology.

In support of our impressive range of flatbed processing capabilities, we operate CNC Synchro press brake machines capable of pressing parts with capacities up to and including 220 tons and 4000 mm in length. With smaller machines with 2000 mm gap and 100 mm stroke for smaller parts in higher volume production.

## Welding and Fabrication.

Our welding and fabrication capacity includes a high level of skill in both internal and external projects. This enables John King's laser and fabrication division to offer an all-encompassing manufacturing service. The site service division will thereafter take charge of the installation as required.

Ash hopper during fabrication as a direct replacement to an existing unit.



Replacement conveyor sections reproduced on a like for like basis.



A new precipitator dust conveyor during manufacture and prior to entering the paint shop.



Chute sections to make up a full arrangement ready for site service installation.



# Site Services

## The Complete Supply Package.



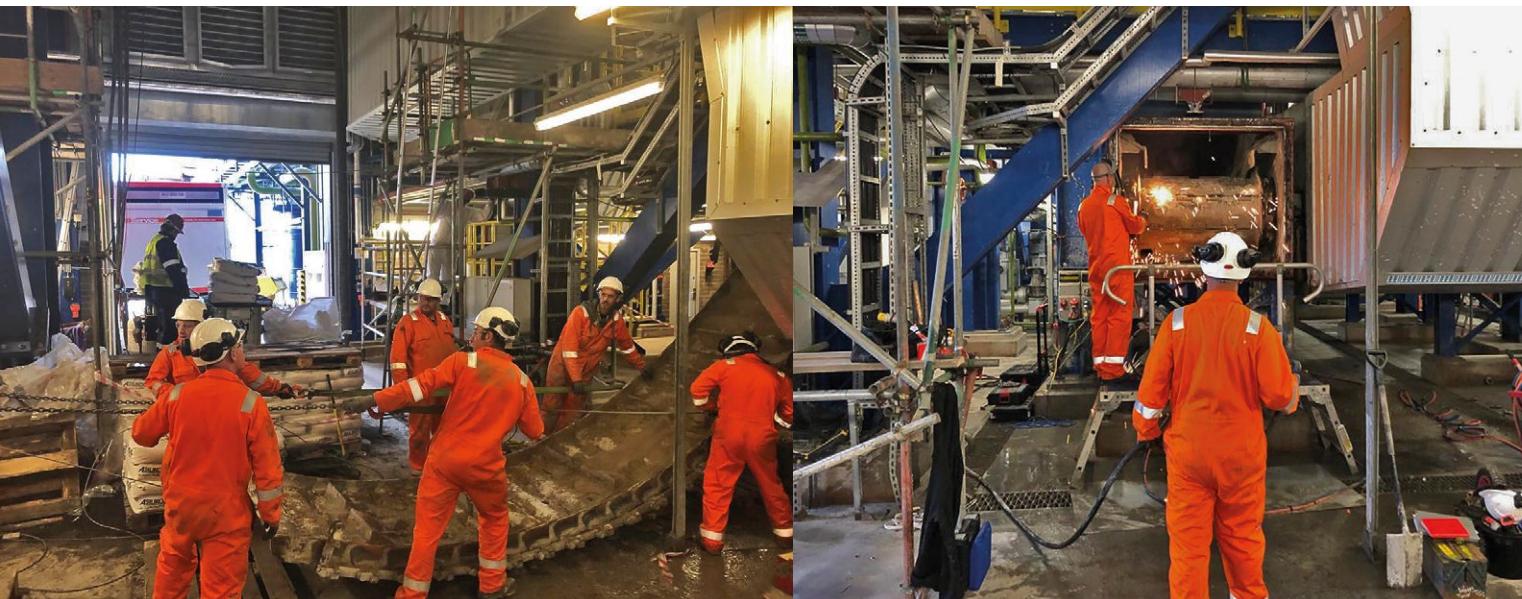
### Bulk handling experts you can rely on.

The John King Site Service Division employs a highly skilled team of engineers solely dedicated to the **service and maintenance of bulk material handling equipment**, which includes – installing, servicing and maintaining all aspects of mechanical handling equipment and related plant and machinery.

The market demands **high-quality chains** and **expert installation**. John King Chains uniquely **offers both**. Make the most of it.

- **Secure optimum equipment reliability** through **best-quality chains** and **conveyor component** spares.
- Take advantage of **the quickest deliveries of conveyor spares** of any manufacturer in the market.
- Let **the conveyor specialist** look after your equipment to ensure **optimum performance** and **service life**.
- Allow us to highlight technical improvements **to enhance the performance of your existing equipment**.
- Enter into **a professional partnership** to develop a service strategy tailored to your needs.





## Site Services Scope of Supply.

- **Inspection and maintenance** of all mechanical handling equipment by specialist engineers
- **Troubleshooting** and problem-solving within mechanical handling equipment.
- **Supply of high-quality conveyor chains** and related conveyor spares.
- **Specialist in the supply of heat resistant components.**
- **In-house laboratory** for material and heat treatment analysis with full metallurgical support.
- **Manufacture and installation of all types of fabrications** from pre-hardened plate, stainless steels or standard materials.
- **Replacement of sections or complete conveyors and elevators** including manufacture and installation.
- **Design and construction of complete bulk handling equipment** including installation service.
- **Repair and maintenance** of all related plant and equipment.



## Safety at Work.

We are committed to providing and maintaining a healthy and safe environment for all employees and protecting the safety of contractors, customers, visitors and all other persons affected by our operations.

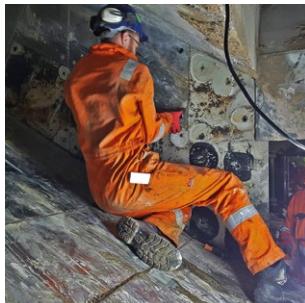
This is achieved by assessing all significant risks, designing safe work systems and eliminating hazards where reasonably practicable. **This is encapsulated within the company HSE policy and enshrined in the everyday culture of our business.**

# John King site service division are pleased to support a Flag ship UK Energy from Waste Plant.

The facility commissioned in 2019 has a generation capacity of 70MW, converting waste-derived fuel into enough electricity to power around 180,000 homes. In doing so, it helps divert an estimated **570,000 tonnes of waste from landfill annually**. There is no better means of generating power in a safe and clean manner.

**John King Group** are proud to be associated with this enterprise as a manufacturer and installer of a range of conveyor chains, sprockets as well as wearing parts and fabrications.

Removal of worn liner plates



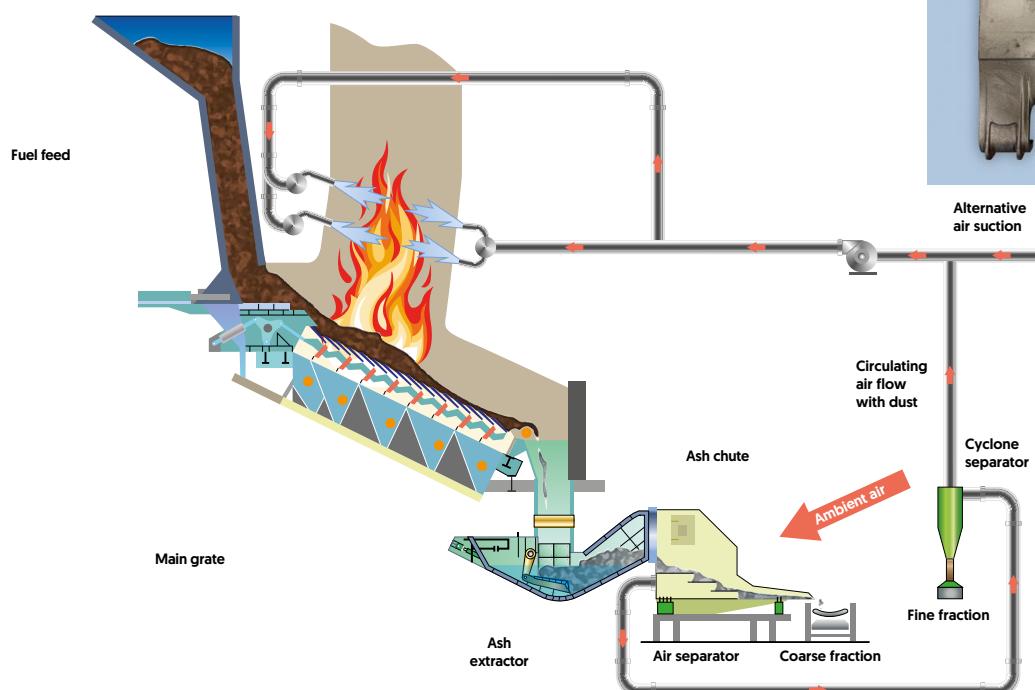
Installation of new liner plates



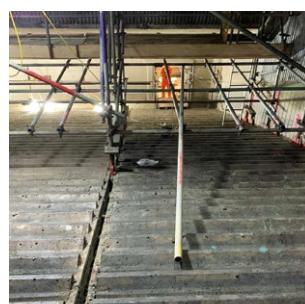
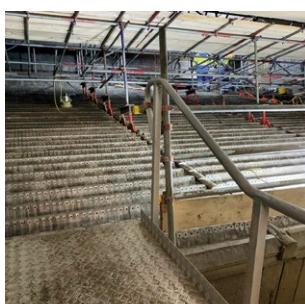
Standard bars



Water cooled HD bar



Refurbishment of the grate including manufacture and installation of replacement bars



Replacement liner plates within the submerged ash extractor



# Heat Resistant Cast Steels and Irons.

**John King Chains** has a long tradition in the production and supply of ferrous iron and steel castings. Formally focusing on cast links for conveyor chains in wear resistant materials this has allowed the business to develop expertise in special iron and steel castings. This includes heat resistant materials used in grate bars for **BIOMASS INCINERATION** and **WASTE INCINERATION**.

- We offer 8 standards of heat resistant cast steels to BS3100 under JK designations [see table].
- We offer 9 standards of heat resistant alloyed flake and spheroidal graphite irons to BS3468 and EN1561 under JK designations [see table].
- With cast components material specifications are infinitely variable so OEM standards can be reproduced.
- Casting processes employed ensure close tolerances to achieve best performance.
- In-house machining of cast parts for best quality control.
- Full verification through our management quality system as ISO 9000:2015.
- Installation package by the Company's qualified site services team [refer page 8 and 9].
- Samples can be analysed in our in-house laboratory and chemical analysis reproduces exactly or improved as considered appropriate.

## Heat Resistant Cast Steel – JK Standards

	JOHN KING Designation	British Standard Material Designation	American Material Designation	CHEMICAL COMPOSITION (figs are % maxima except where noted or where range is shown)										Tensile Strength	Proof Stress	CHARPY *	Brinell Hardness	Elongation	Maximum Operating Temperature
				% C Si Mn S P Ni Cr Mo Cu															
				C	Si	Mn	S	P	Ni	Cr	Mo	Cu							
13% chromium steel	JK/H1	410C21	A743:CA-15	0.15	1.00	1.00	0.04	0.04	1.00	11.5-13.5	-	-	540 [35]	370 [24]	-	152-207	15	750	
	JK/H2	420C29	A743:CA-15	0.20	1.00	1.00	0.04	0.04	1.00	11.5-13.5	-	-	690 [45]	465 [30]	-	201-255	11	750	
13% chromium 4% nickel steel	JK/H3	425C11	A743:CA-6NM	0.10	1.00	1.00	0.04	0.04	3.4-4.2	11.5-13.5	0.60	-	770 [50]	620 [40]	30	235-321	12	800	
Chromium steel for high temps	JK/HC1	452C11	A297:HC	1.00	2.00	1.00	0.06	0.06	4.00	25.0-30.0	150	-	-	-	-	-	-	1000	
Chromium steel for high temps	JK/HC2	452C12	-	1.00-2.00	2.00	1.00	0.06	0.06	4.00	25.0-30.0	150	-	-	-	-	-	-	1000	
Chromium steel for high temps	JK/HC3	420C24	-	0.25	2.00	1.00	0.06	0.06	-	12.0-16.0	-	-	-	-	-	-	-	750	
Alloy steel for high temperatures	JK/HH	309C35	A297:HH	0.20-0.50	1.50	2.00	0.04	0.04	11.0-14.0	24.0-28.0	150	-	510 [33]	-	-	-	-	-	1000
	JK/HK	310C40	A351:HK40	0.30-0.50	1.50	2.00	0.04	0.04	19.0-22.0	24.0-27.0	150	-	450 [29]	-	-	-	-	-	1150

## Heat Resistant Cast Irons – JK Standards

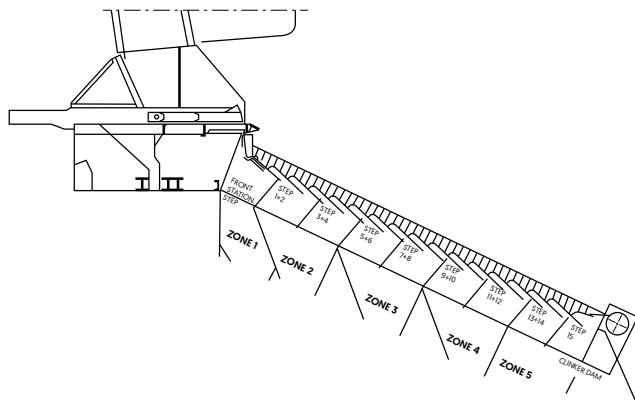
2% Chromium Cast iron	JK/CI/CR2	EN1561	-	3.0-3.8	2.0-3.0	1.0	0.08	0.10	-	1.0-2.0	-	-	150 [9.7]	-	-	207-288	-	550
16% Chromium Cast iron	JK/CI/CR16	EN1561	-	16-2.4	1.5-2.2	1.0	0.05	0.10	-	15-18	-	-	340 [22]	-	-	400-405	-	600
Ni resist Cast Iron	JK/CI/F1	BS3468 F1	ASTM A436/84 TYPE 1	3.0 Max	1.5-2.8	0.5-1.5	-	0.2	13.5-17.5	1.0-2.5	-	Cu 5.5-7.5	170 [11]	-	-	140-220	1-2	750
Ni resist Cast Iron	JK/CI/F3	BS3468 F3	ASTM A436/84 TYPE 3	2.5 Max	1.5-2.8	0.5-1.5	-	-	28.0-32.0	2.5-3.5	-	Cu 0.5 Max	170 [11]	-	-	120-215	1-3	800
High silicon molybdenum SG Iron	JK/DI/SiMo	EN GJS SiMo	-	2.7-3.5	3.5-4.5	0.5	0.015	0.07	-	-	0.5-0.9	-	540 [35]	-	-	197-280	-	750
High silicon aluminium addition SG Iron	JK/DI/ALSi	EN GJSAISI	-	2.3-2.8	4.5-5.2	0.5	0.015	0.07	-	-	-	Al 5.0-5.8	200 [13]	-	-	302-363	-	900
Ni Resist SG Iron	JK/DI/S2	BS3468 S2	ASTM A436/84 TYPED2	3.0 Max	1.5-2.8	0.5-1.5	-	0.08	18.0-22.0	1.5-2.5	-	Cu 0.5 Max	370 [24]	210 [14]	-	140-230	7-20	750
Ni Resist SG Iron	JK/DI/S3	BS3468 S3	ASTM A436/84 TYPE D3	2.5 Max	1.5-2.8	0.5-1.5	-	0.08	28.0-32.0	2.5-3.5	-	Cu 0.5 Max	370 [24]	210 [14]	-	130-200	7.20	800
Ni Resist SG Iron	JK/DI/S55	BS3468 S55	ASTM A436/84	2.2 Max	4.8-5.4	1.0 Max	-	0.08	34.0-36.0	1.5-2.5	-	Cu 0.5 Max	370 [24]	210 [14]	-	130-180	-	850

## WEAR RESISTANT STEELS

11-14% austenitic manganese steel	JK/MN	BW10	A128:GrA	1.00-1.25	1.00	11.00 min	0.06	0.07	-	-	-	-	-	-	-	-	-	1000
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\* Impact value at 20°C unless otherwise shown

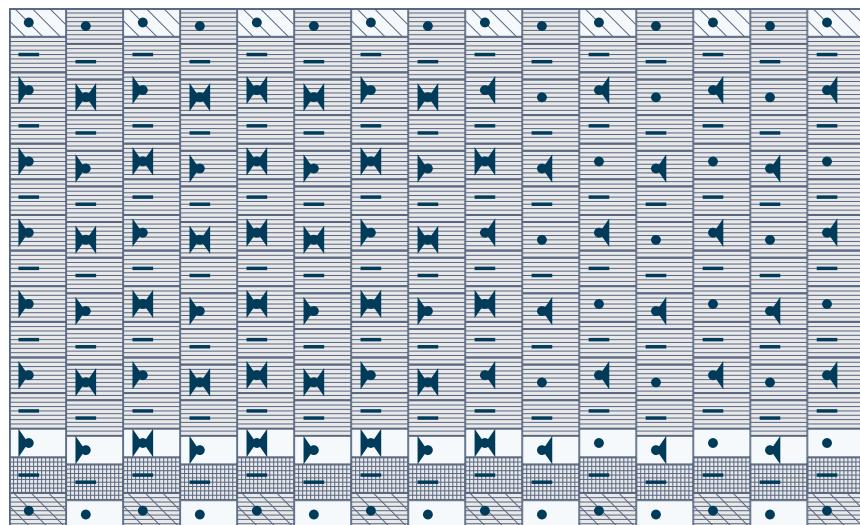
# Grate Bar Castings.



Front Stationary Grate Castings					
Icon	Name	Width	JK Num	OEM Part Number	Typical Quantity per Surface
	Stationary grate bar	150	42/5185	07.200.1101 Z1	6 [8]
	Stationary grate bar	170	42/5185 + L	07.200.1102 Z1	14 [12]
	Stationary grate bar	150 170	42/5185 + L	07.200.1101 Z1	2

Grate Step Castings					
Icon	Name	Width	JK Num	OEM Part Number	Typical Quantity per Surface
	Finger grate bar	125	42/N 4686	07.200.2150 Z2 07.200.2150 Z4	150 30
	Stationary grate bar	100	42/N 4681	07.200.2501 Z2 07.200.2501 Z6	6 14
	Grate bar with raking nose	100	42/N 4681 R	07.200.2601 Z2	6
	Grate bar with pushing nose and raking nose	100	42/N 4681 SR	07.200.2801 Z2	8
	Grate bar with pushing nose	100	42/N 4681 S	07.200.2901 Z2	10
	Floating grate bar with strip	Max. 125	42/N 4680 L	07.200.4850 Z2	30
	Stationary grate bar	100	42/4681	07.200.2500	16
	Stationary grate bar	125	42/F 4682	07.200.2550 Z2	16
	Stationary grate bar	125	42/N 4682	07.200.2551 07.200.2551 Z2	14 30
	Grate bar with raking nose	125	42/N 4682 R	07.200.2561 Z2	36
	Grate bar with pushing nose	125	42/N 4682 S	07.200.2571 Z2	38
	Grate bar with pushing nose and raking nose	125	42/N 4682 SR	07.200.2581 Z2	46

## Typical Grate Surface Assembly



42/4686 R



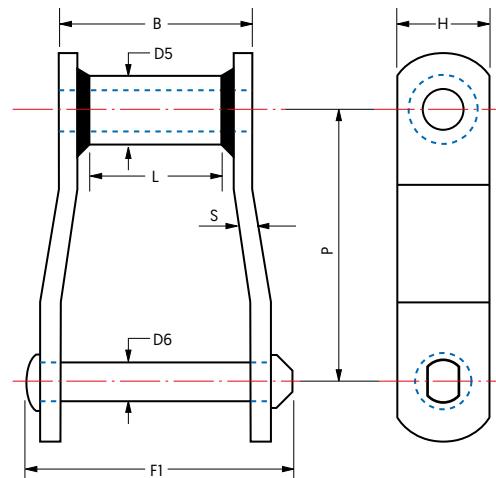
42/4681

42/4682

# Offset Sidebar Welded Steel Chains.



John King welded steel chains have become North America's preferred choice in many materials handling applications. The simple and robust construction offers a superior method of conveying most materials. These chains employ an offset side plate and circumferentially welded bush. The pin is a high interference fit into the plate retained with a heavy hot rivet or cotter. The standard KING specification is uprated over the industry standard with the proven IBR designation. This incorporates standard through hardening, but with additional surface induction hardening of both the bush and pin. The end result is a chain offering maximum toughness and high abrasion resistance for optimum performance in high duty applications.



Offset Sidebar Welded Steel Chains										
Chain Number	P	Bushings	Rivets	Over-All Pin & Cotter	Between Sidebar	Length of Bearing	Sidebar		Breaking Load	Average Weight
		Outside Diameter	Diameter				Thickness	Height		
		D5	D6	inches		lbs		lbs/ft		
WH78/R	2.609	0.84	0.50	3.00	1.00	2.00	0.25	1.25	33,000	4.30
WH82/R	3.075	1.00	0.56	3.38	1.13	2.25	0.25	1.25	36,000	4.70
WH124/R	4.000	1.25	0.75	4.25	1.50	2.75	0.38	1.50	57,000	7.80
WH111/R	4.760	1.25	0.75	4.81	1.75	3.38	0.38	1.75	60,000	8.60
WH110/R	6.000	1.25	0.75	4.00	1.88	3.00	0.38	1.50	50,500	7.00
WH106/R	6.000	1.25	0.75	4.25	1.50	2.75	0.38	1.50	60,000	6.20
WH132/R	6.050	1.75	1.00	6.38	2.75	4.41	0.50	2.00	122,000	14.10
WH150/R	6.050	1.75	1.00	6.50	2.75	4.41	0.50	2.50	122,000	16.30
WH155/R	6.050	1.75	1.13	6.41	2.75	4.44	0.56	2.50	175,000	19.00
WH157/R	6.050	1.75	1.13	6.75	2.75	4.63	0.63	2.50	175,000	20.00
WH159/R	6.125	2.00	1.25	6.75	2.75	4.63	0.63	3.00	210,000	26.00
WH200/R	6.125	2.00	1.25	6.75	2.75	4.63	0.63	2.50	190,000	22.10

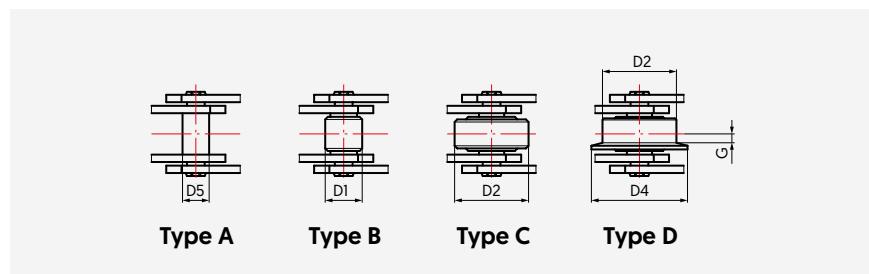
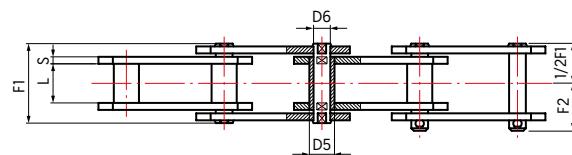
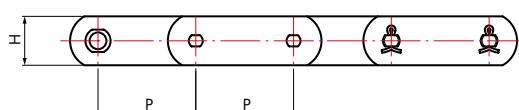
Add IBR for fully heat treated parts plus induction hardened barrels and rivets.  
Suffix R denotes riveted pin style.

ISO 1977, DIN 8167

# M Series Chains.



**John King** M series has become the most universally encountered European standard of Engineering class chain. It is available in standard bush series, with small “gearing” roller and large carrier roller with or without flange. The fundamental difference between the John King product is that in employing better materials and heat treatment characteristics we achieve higher strength and better wear performance. John Kings approach is always to seek improvements in specifications and or constructions that, where appropriate will enhance product performance.



Type B – Small roller

Type C – Large roller

Type D – Flange roller



**Sprockets with split construction** are preferred for ease of replacement [Type TS]. The tooth form incorporates John Kings unique profile allowing for increased gap angle and bottom line clearance to prevent material packing and reduced wear rate during operation.

**Material options:** • BS970 080M40 carbon steel suitable for surface hardening to 550Bhn at a minimum effective depth of 2.5 mm • BS EN 10025 S355J2 high strength steel • Other options available on request.



Pressed bush, welded pin



Welded bush, welded pin



Pressed bush, riveted pin

Special attention should be applied to options in construction.

### M Series Metric Conveyor Chains DIN8167 [ISO1977]

Chain Number	Pitch	Rollers				Bushings	Pins	Over All Pin & Cotter		Between Sidebars	Sidebars		Breaking Load		
		Style			Flange thickness						Thickness	Height			
		P	D1	D2	D4	G	D5	D6	F1	F2	L	S	H	DIN standard	John King*
mm															
<b>M80</b>	80	25	50	60	7	18	12	54.5	32	28	5	35	80	125	
<b>M80</b>	100	25	50	60	7	18	12	54.5	32	28	5	35	80	125	
<b>M80</b>	125	25	50	60	7	18	12	54.5	32	28	5	35	80	125	
<b>M80</b>	160	25	50	60	7	18	12	54.5	32	28	5	35	80	125	
<b>M80</b>	200	25	50	60	7	18	12	54.5	32	28	5	35	80	125	
<b>M112</b>	80	30	60	75	7.5	21	15	66	35	32	6	40	112	175	
<b>M112</b>	100	30	60	75	7.5	21	15	66	35	32	6	40	112	175	
<b>M112</b>	125	30	60	75	7.5	21	15	66	35	32	6	40	112	175	
<b>M112</b>	160	30	60	75	7.5	21	15	66	35	32	6	40	112	175	
<b>M112</b>	200	30	60	75	7.5	21	15	66	35	32	6	40	112	175	
<b>M160</b>	100	36	70	90	8.5	25	18	72	43	37	7	50	160	260	
<b>M160</b>	125	36	70	90	8.5	25	18	72	43	37	7	50	160	260	
<b>M160</b>	160	36	70	90	8.5	25	18	72	43	37	7	50	160	260	
<b>M160</b>	200	36	70	90	8.5	25	18	72	43	37	7	50	160	260	
<b>M160</b>	250	36	70	90	8.5	25	18	72	43	37	7	50	160	260	
<b>M224</b>	125	42	85	105	10	30	21	88	47	43	8	60	224	340	
<b>M224</b>	160	42	85	105	10	30	21	88	47	43	8	60	224	340	
<b>M224</b>	200	42	85	105	10	30	21	88	47	43	8	60	224	340	
<b>M224</b>	250	42	85	105	10	30	21	88	47	43	8	60	224	340	
<b>M224</b>	315	42	85	105	10	30	21	88	47	43	8	60	224	340	
<b>M315</b>	160	50	100	125	12	36	25	102	55	48	10	70	315	520	
<b>M315</b>	200	50	100	125	12	36	25	102	55	48	10	70	315	520	
<b>M135</b>	250	50	100	125	12	36	25	102	55	48	10	70	315	520	
<b>M315</b>	315	50	100	125	12	36	25	102	55	48	10	70	315	520	
<b>M315</b>	400	50	100	125	12	36	25	102	55	48	10	70	315	520	
<b>M450</b>	200	60	120	149	14	42	30	118	66	56	12	80	450	700	
<b>M450</b>	250	60	120	149	14	42	30	118	66	56	12	80	450	700	
<b>M450</b>	315	60	120	149	14	42	30	118	66	56	12	80	450	700	
<b>M450</b>	400	60	120	149	14	42	30	118	66	56	12	80	450	700	
<b>M630</b>	250	70	140	170	16	50	36	138	74	66	14	100	630	1050	
<b>M630</b>	315	70	140	170	16	50	36	138	74	66	14	100	630	1050	
<b>M630</b>	400	70	140	170	16	50	36	138	74	66	14	100	630	1050	
<b>M630</b>	500	70	140	170	16	50	36	138	74	66	14	100	630	1050	
<b>M900</b>	250	85	170	210	18	60	44	158	89	78	16	120	900	1250	
<b>M900</b>	315	85	170	210	18	60	44	158	89	78	16	120	900	1250	
<b>M900</b>	400	85	170	210	18	60	44	158	89	78	16	120	900	1250	
<b>M900</b>	500	85	170	210	18	60	44	158	89	78	16	120	900	1250	

Pressed bush with welded or riveted pin

Welded or pressed bush with welded or riveted pin

\* Breaking Load with heat treated plates

## John King EXCEL Standard SFS2380

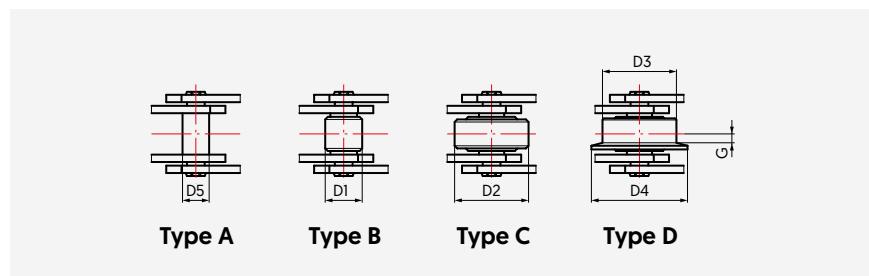
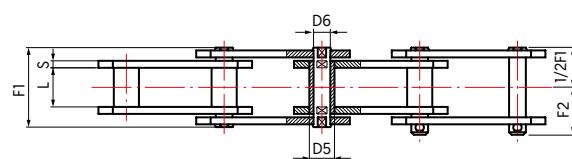
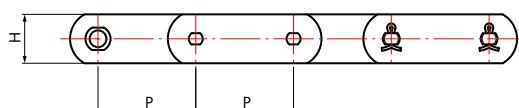
For M series [DIN 8167] and FV series [DIN 8165] John King offer an uprated version to improve performance within more demanding applications. This comes under **the Scandinavian standard SFS2380**. Dimensionally as M and FV series, but with **pin and bush welded to the side plates**. This has the immediate and positive effect of **increasing breaking strength by up to 50% as well as improving impact resistance, shock loading and general service performance**.

DIN 8165

# FV Series Chains.



The second series of metric conveyor chains is the FV standard comparable to M but varying in dimensions and breaking strengths. Construction of the chains is equivalent to M as are the higher specification materials and heat treatments employed by John King.

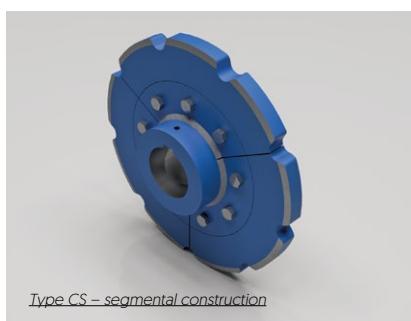


**Type A** – Bush type

**Type B** – Small roller

**Type C** – Large roller

**Type D** – Flange roller



**Sprockets of segmental construction** include bolt on tooth rings for obvious benefit in replacement (Type CS). The tooth form incorporates John Kings unique profile allowing for increased gap angle and bottom line clearance to prevent material packing and reduced wear rate during operation.

**Material options:** • BS970 080M40 carbon steel suitable for surface hardening to 550Bhn at a minimum effective depth of 2.5 mm • BS EN 10025 S355J2 high strength steel • Other options available on request.



Pressed bush, welded pin



Welded bush, welded pin



Pressed bush, riveted pin

Special attention should be applied to options in construction.

### FV Series Metric Conveyor Chains DIN 8165

Chain Number	Pitch	Rollers					Bushings	Pins	Over-All Pin & Cotter		Between Sidebar	Sidebars		Breaking Load		
		Style				Flange thickness	Diameter	Diameter				Thickness	Height			
	P	D1	D2	D3	D4	G	D5	D6	F1	F2	L	S	H	DIN standard	John King*	
mm																
<b>FV90</b>	63	30	48	63	78	6.5	20	14	53	30	25	5	35	100	115	
<b>FV90</b>	80	30	48	63	78	6.5	20	14	53	30	25	5	35	100	115	
<b>FV90</b>	100	30	48	63	78	6.5	20	14	53	30	25	5	35	100	115	
<b>FV90</b>	125	30	48	63	78	6.5	20	14	53	30	25	5	35	100	115	
<b>FV90</b>	160	30	48	63	78	6.5	20	14	53	30	25	5	35	100	115	
<b>FV90</b>	200	30	48	63	78	6.5	20	14	53	30	25	5	35	100	115	
<b>FV90</b>	250	30	48	63	78	6.5	20	14	53	30	25	5	35	100	115	
<b>FV112</b>	100	32	55	72	90	7.5	22	16	62	35	30	6	40	120	170	
<b>FV112</b>	125	32	55	72	90	7.5	22	16	62	35	30	6	40	120	170	
<b>FV112</b>	160	32	55	72	90	7.5	22	16	62	35	30	6	40	120	170	
<b>FV112</b>	200	32	55	72	90	7.5	22	16	62	35	30	6	40	120	170	
<b>FV112</b>	250	32	55	72	90	7.5	22	16	62	35	30	6	40	120	170	
<b>FV140</b>	100	36	60	80	100	9	26	18	67	41	35	6	45	145	180	
<b>FV140</b>	125	36	60	80	100	9	26	18	67	41	35	6	45	145	180	
<b>FV140</b>	160	36	60	80	100	9	26	18	67	41	35	6	45	145	180	
<b>FV140</b>	200	36	60	80	100	9	26	18	67	41	35	6	45	145	180	
<b>FV140</b>	250	36	60	80	100	9	26	18	67	41	35	6	45	145	180	
<b>FV180</b>	125	42	70	100	125	13	30	20	86	51	45	8	50	190	250	
<b>FV180</b>	160	42	70	100	125	13	30	20	86	51	45	8	50	190	250	
<b>FV180</b>	200	42	70	100	125	13	30	20	86	51	45	8	50	190	250	
<b>FV180</b>	250	42	70	100	125	13	30	20	86	51	45	8	50	190	250	
<b>FV180</b>	315	42	70	100	125	13	30	20	86	51	45	8	50	190	250	
<b>FV250</b>	160	50	80	125	150	15	36	26	97	56	55	8	60	275	300	
<b>FV250</b>	200	50	80	125	150	15	36	26	97	56	55	8	60	275	300	
<b>FV250</b>	250	50	80	125	150	15	36	26	97	56	55	8	60	275	300	
<b>FV250</b>	315	50	80	125	150	15	36	26	97	56	55	8	60	275	300	
<b>FV315</b>	160	60	90	140	175	18	42	30	116	66	65	10	70	370	480	
<b>FV315</b>	200	60	90	140	175	18	42	30	116	66	65	10	70	370	480	
<b>FV315</b>	250	60	90	140	175	18	42	30	116	66	65	10	70	370	480	
<b>FV315</b>	315	60	90	140	175	18	42	30	116	66	65	10	70	370	480	
<b>FV315</b>	400	60	90	140	175	18	42	30	116	66	65	10	70	370	480	
<b>FV400</b>	160	60	100	150	185	20	44	32	132	76	70	12	70	400	640	
<b>FV400</b>	200	60	100	150	185	20	44	32	132	76	70	12	70	400	640	
<b>FV400</b>	250	60	100	150	185	20	44	32	132	76	70	12	70	400	640	
<b>FV400</b>	315	60	100	150	185	20	44	32	132	76	70	12	70	400	640	
<b>FV400</b>	400	60	100	150	185	20	44	32	132	76	70	12	70	400	640	
<b>FV500</b>	160	70	110	160	195	21	50	36	142	81	80	12	80	500	750	
<b>FV500</b>	200	70	110	160	195	21	50	36	142	81	80	12	80	500	750	
<b>FV500</b>	250	70	110	160	195	21	50	36	142	81	80	12	80	500	750	
<b>FV500</b>	315	70	110	160	195	21	50	36	142	81	80	12	80	500	750	
<b>FV500</b>	400	70	110	160	195	21	50	36	142	81	80	12	80	500	750	
<b>FV500</b>	500	70	110	160	195	21	50	36	142	81	80	12	80	500	750	
<b>FV630</b>	200	80	120	170	210	23	56	42	154	87	90	12	100	630	1050	
<b>FV630</b>	250	80	120	170	210	23	56	42	154	87	90	12	100	630	1050	
<b>FV630</b>	315	80	120	170	210	23	56	42	154	87	90	12	100	630	1050	
<b>FV630</b>	400	80	120	170	210	23	56	42	154	87	90	12	100	630	1050	
<b>FV630</b>	500	80	120	170	210	23	56	42	154	87	90	12	100	630	1050	

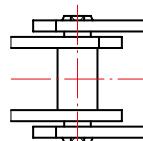
Pressed bush with welded or riveted pin

Welded or pressed bush with welded or riveted pin

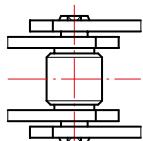
\* Breaking Load with heat treated Plates

## METRIC CONVEYOR CHAINS DIN 8167 AND DIN 8165

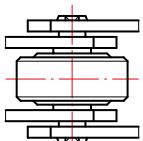
# Weight Table



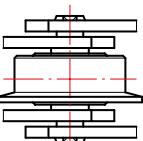
Type A



Type B



Type C



Type D

Metric Conveyor Chains ISO 1977, DIN 8167 (M Series)

Chain Number	Pitch	Average Weight			
		P	Type A	Type B	Type C
	mm	kg/m			
M80	80	4.5	5.2	9.0	9.5
M80	100	4.2	4.7	7.8	8.1
M80	125	3.9	4.3	6.8	7.1
M80	160	3.7	4.0	5.9	6.1
M80	200	3.4	3.8	5.3	5.4
M112	80	6.7	7.7	14.0	14.6
M112	100	6.1	6.9	11.9	12.4
M112	125	5.6	6.3	10.3	10.7
M112	160	5.2	5.8	8.9	9.2
M112	200	4.6	5.5	7.9	8.2
M160	100	9.5	10.9	18.7	19.4
M160	125	8.7	9.9	16.1	16.6
M160	160	8.0	8.9	13.8	14.2
M160	200	7.5	8.2	12.1	12.5
M160	250	6.9	7.9	11.0	12.0
M224	125	12.8	14.5	25.6	26.8
M224	160	11.6	13.0	21.6	22.6
M224	200	10.8	11.9	18.8	19.6
M224	250	10.2	11.0	16.6	17.2
M224	315	9.0	10.9	14.9	15.2
M315	160	17.8	19.9	33.2	35.1
M315	200	16.4	18.1	28.8	30.3
M135	250	15.4	16.7	25.2	26.4
M315	315	14.5	15.5	22.3	23.2
M315	400	13.8	14.8	20.0	20.3
M450	200	23.8	26.8	44.9	46.9
M450	250	22.1	24.5	38.9	40.6
M450	315	20.6	22.6	34.0	35.3
M450	400	19.5	21.0	30.0	31.0
M630	250	34.2	38.0	57.4	60.8
M630	315	31.7	34.7	50.1	52.8
M630	400	29.6	32.0	44.1	46.3
M630	500	28.1	30.0	39.7	41.4
M900	250	50.7	57.4	97.5	103.9
M900	315	46.5	51.7	83.6	88.7
M900	400	43	47.2	72.2	76.2
M900	500	41.5	44.9	64.9	68.1

Metric Conveyor Chains DIN 8165 (FV Series)

Chain Number	Pitch	Average Weight			
		P	Type A	Type B	Type C
	mm	kg/m			
FV90	63	4.84	5.98	9.17	-
FV90	80	4.40	5.52	8.12	-
FV90	100	4.07	4.78	6.79	9.59
FV90	125	3.80	4.38	5.98	8.22
FV90	160	3.57	4.02	5.28	7.02
FV90	200	3.41	3.76	4.77	6.17
FV90	250	3.28	3.56	4.37	5.48
FV112	100	5.84	6.78	10.27	14.95
FV112	125	5.43	6.18	8.97	12.71
FV112	160	5.06	5.65	7.83	10.76
FV112	200	4.80	5.27	7.02	9.36
FV112	250	4.60	4.97	6.37	8.24
FV140	100	7.09	8.34	12.98	19.63
FV140	125	6.52	7.52	11.23	16.55
FV140	160	6.02	6.81	9.70	13.86
FV140	200	5.66	6.29	8.61	11.94
FV140	250	5.38	5.88	7.74	10.10
FV180	125	10.04	11.87	18.44	30.70
FV180	160	9.22	10.85	15.78	25.36
FV180	200	8.63	9.77	13.88	21.54
FV180	250	8.16	9.07	12.36	18.49
FV180	315	7.77	8.50	11.11	15.97
FV250	160	12.11	14.56	22.25	42.01
FV250	200	11.19	13.16	19.30	35.11
FV250	250	10.46	12.03	16.95	29.60
FV250	315	9.86	11.10	15.01	25.05
FV315	160	18.76	23.22	33.83	-
FV315	200	17.21	20.78	29.26	53.72
FV315	250	15.96	18.82	25.60	45.18
FV315	315	14.94	17.20	22.59	38.12
FV315	400	14.10	15.88	20.12	32.36
FV400	160	22.06	26.41	39.80	-
FV400	200	20.29	23.77	36.45	66.19
FV400	250	18.87	21.65	31.79	55.59
FV400	315	17.70	19.91	27.95	46.84
FV400	400	16.74	18.48	24.82	39.69
FV500	160	27.07	34.28	54.41	-
FV500	200	24.67	30.44	46.55	83.05
FV500	250	22.75	27.36	40.25	69.05
FV500	315	21.17	24.83	35.06	58.23
FV500	400	19.87	22.76	30.81	49.06
FV500	500	18.91	21.22	27.66	42.26
FV630	200	33.13	41.99	62.41	-
FV630	250	30.27	37.36	53.70	89.68
FV630	315	27.91	33.54	46.50	75.06
FV630	400	25.99	30.41	40.62	63.12
FV630	500	24.56	28.10	36.27	54.26

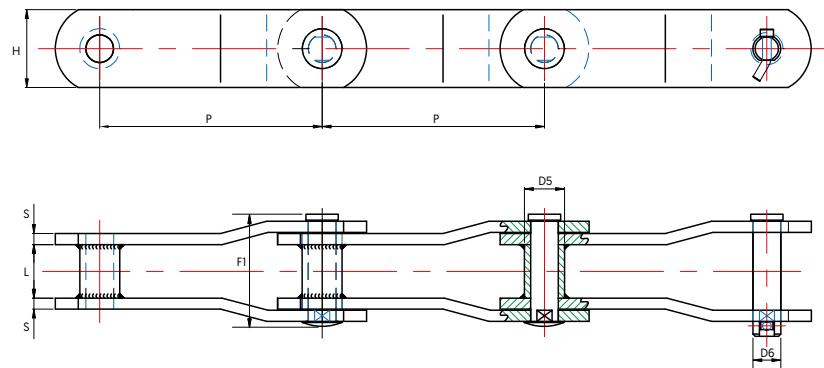
# King WHM Series Equivalent Welded Steel Chains.



**John King** offer a unique range of welded steel chains dimensionally equivalent to M Series bush chains according to DIN8167. The chain offers all the benefits of the "offset" sidebar welded construction and can be offered as a direct replacement in existing conveyors and operate on same sprockets. This allows the user a unique opportunity to improve reliability and service life without major alteration.

## Key Features:

- Direct replacement with Metric standard DIN 8167,
- Increased ultimate tensile strength of up to 65% as compared to standard M series chain,
- Welded bush for increased shock resistance,
- Best specification with all parts through hardened and surface induction hardening on pins and bushes,
- Crank link design as US standard ISO DP6972. A beneficial construction with maintenance advantages,
- Option to induction harden sliding surfaces,
- Grease lubrication can be included if required,
- Ease of maintenance with an option to remove one offset link not two as with straight sidebar chain.



## WHM Series Equivalent Welded Steel Chains

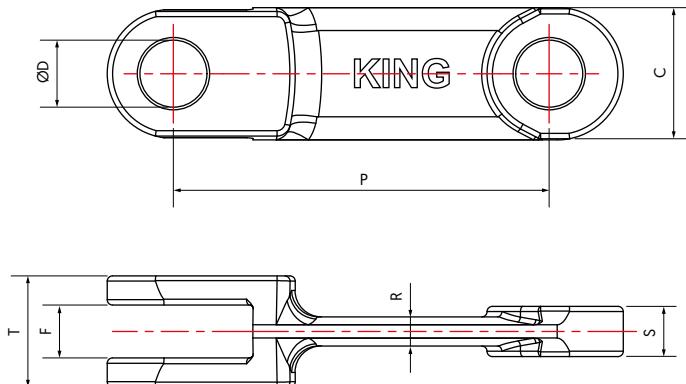
Chain Number	Pitch	Bushings		Pins	Over-All Pin	Between Sidebars	Sidebars		Breaking Load	Average Weight
		Diameter	Diameter				Thickness	Height		
	P	D5	D6	F1	L	S	H	mm	kN	kg/m
WHM224/160/IBR*	160	42	21	93	42	8	60		224	22.87
WHM224/200/IBR*	200	42	21	93	42	8	60		224	19.84
WHM315/200/IBR*	200	48	25	99	48	10	70		315	31.00
WHM315/250/IBR*	250	48	25	99	48	10	70		315	27.00
WHM450/250/IBR*	250	56	30	107	56	12	80		450	41.05
WHM450/315/IBR*	315	56	30	107	56	12	80		450	35.67
WHM560/155/IBR*	153.6	44.45	30	154	86	14	70		560	30.18

\*IBR represents uprated specification with fully heat treated components together with induction hardened barrel (bush) and pin.

# Forged Link Standard Series.



This series represents the leading product within the John King programme. Forged fork link chain has proven to be one of the most reliable conveying mediums offering a combination of versatility, strength and abrasion resistance. These chains, originally of European origin, are now established worldwide. With a wide variety of materials, heat treatments and flight formats the chain is proven in both drag and enmasse handling.



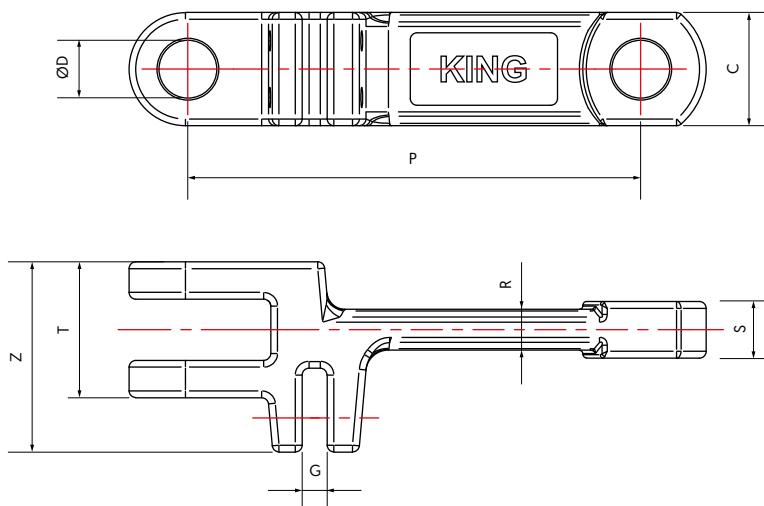
Chain Number	P	T	C	S	F	R	Bolt Hole Diameter	Breaking Loads			Weight
								D	TN*	CN*	
								kN			
<b>JKF 10160</b>	101.6	24	36	9	10	6	14	110	120	210	3.50
<b>JKF 10160R</b>	101.6	30	36	13	14	9	14	180	195	330	4.80
<b>JKF 12514</b>	125	30	36	13	14	10	16	163	175	290	4.40
<b>JKF 14214</b>	142	32	41	14	15	9	18	180	195	330	4.90
<b>JKF 14218</b>	142	42	50	19	20	12	25	290	320	550	9.40
<b>JKF 14222</b>	142	54	50	25	27	16	25	370	400	655	12.20
<b>JKF 14226</b>	142	62	50	28	30	16	25	440	470	790	13.60
<b>JKF 16018</b>	160	46	46	22	24	15	22	320	342	560	9.30
<b>JKF 16025</b>	160	50	53	23	25	13	25	370	400	655	10.80
<b>JKF 20025</b>	200	60	50	25	27	18	25	380	410	670	11.30
<b>JKF 20028</b>	200	66	60	30	32	20	30	500	540	900	16.70
<b>JKF 21640</b>	216	64	72	26	28	20	35	585	630	1035	20.10
<b>JKF 22040</b>	220	64	72	26	28	20	35	585	630	1035	20.30
<b>JKF 22050</b>	220	58	75	28	30	25	32	710	760	1260	19.10
<b>JKF 22060</b>	220	71	75	31	33	21	35	735	790	1300	22.90
<b>JKF 25040</b>	250	70	75	32	34	18	32	735	860	1430	18.80
<b>JKF 26035</b>	260	65	75	31	33	20	32	840	900	1480	19.80
<b>JKF 26040</b>	260	70	75	31	33	20	32	840	900	1480	21.00
<b>JKF 26045</b>	260	78	75	35	37	20	32	930	1000	1650	21.80

\* For further information on materials refer pages 22.

# Forged Link Double Series.



For double strand assemblies John King have a range of links following the standard format but with a forged "double clevis" into which a scraper can be mounted. The flight blade can be retained by either a U bolt or standard fasteners. The chain allows for some built in clearance between strands which obviates any potential problems that may be associated with mismatch. Double strand allows for improved discharge particularly relevant in conveying sticky materials.



Chain Number	P	T	C	S	Z	G	Bolt Hole Diameter	Breaking Loads			Weight
								D	kN		
									TN*	CN*	CD*
mm											
JKF 142182	142	42	50	19	70	13	25	290	320	550	11.80
JKF 142262	142	62	50	28	87	13	25	440	470	790	16.70
JKF 160252	160	50	53	23	82	13	25	370	400	655	13.60
JKF 175402	175	72	60	30	95	16	30	540	580	955	20.30
JKF 200252	200	60	50	25	81	12	25	380	410	670	13.00
JKF 200402	200	70	60	30	95	13	30	540	580	955	19.30
JKF 250252	250	60	50	25	81	12	25	380	410	670	12.00
JKF 250402	250	70	60	30	95	13	30	540	580	955	17.70
JKF 250602	250	100	70	45	140	21	35	975	1050	1720	35.20

Attachment hole positions and sizes can be varied to meet customer requirements.  
\* For further information on materials refer Pages 22.

# Forged conveyor chain.

King manufacture an unrivalled range of high quality forged chains. The standard is for an alloy steel forging and pin case hardened for wear resistance. Specifications can be varied dependent on the operating environment.

Drop forged chain links							
Material reference	JK Reference	Material No		Standard Hardening	JK Heat Treatment Designation	Standard hardening value	Standard hardening depth
		DIN	AISI				
<b>STANDARD QUALITIES</b>							
20CrMnTn	TN	1.8401	A29/A29M	CASE HARDENING	CH	58-62 HRC	0,8-1,0 mm
42CrMo4	CD	1.7225	4140	HARDENING AND TEMPERING	TH	1100-1300 N/mm <sup>2</sup>	
<b>ALTERNATIVES ON REQUEST</b>							
18MnCrB5	BN	1.7168	–	CASE HARDENING	CH	58-62 HRC	0,8-1,0 mm
20MnCr5	MN	1.7147	5120	CASE HARDENING	CH	58-62 HRC	0,8-1,0 mm
21NiCrMo4	CN	1.6523	8620H	CASE HARDENING	CH	58-62 HRC	0,8-1,0 mm
C45	C	1.0503	1045	HARDENING AND TEMPERING	TH	800-900 N/mm <sup>2</sup>	
<b>CORROSION AND ACID RESISTANT MATERIAL</b>							
X5CrNi 18-10 [V 2 A]	SS304	1.4301	304				
X6CrNiMoTi 17-12 2 [V 4 A]	SS316	1.4571	316				
X46Cr13	SS 420	1.4034	420	HARDENING AND TEMPERING	TH	50-52 HRC	
<b>HEAT – RESISTANT MATERIAL</b>							
X10CrAlSi7	JK HK	1.4713		HEAT RESISTANCE IN AIR			
X15CrNiSi 20-12	JK HH	1.4828	309	800° C MAX		420-520 N/mm <sup>2</sup>	
				1000°C MAX		500-750 N/mm <sup>2</sup>	
<b>Chain pins</b>							
Material reference	JK Reference	Material No		Standard Hardening	JK Heat Treatment Designation	Standard hardening value	Standard hardening depth
		DIN	AISI				
<b>STANDARD QUALITIES</b>							
16MnCr5	590M17	1.7131	5115	CASE HARDENING	CH	58-62 HRC	0,8-1,0 mm
15NiCr13	633M13	1.5752	3310	CASE HARDENING	CH	58-62 HRC	0,8-1,0 mm
18CrNi8		1.592		CASE HARDENING	CH	58-62 HRC	0,8-1,0 mm
C45	080M46	1.0503	1045	INDUCTION HARDENING	IH	52-56 HRC	1,5-2,0 mm
				HARDENING AND TEMPERING	TH	45-50 HRC	
42CrMo4	708M40	1.7225	4140	INDUCTION HARDENING	IH	56-60 HRC	1,5-2,0 mm
				HARDENING AND TEMPERING	TH	56-60HRC	
<b>CORROSION AND ACID RESISTANT MATERIAL</b>							
X46Cr13	420S29	1.4034	420	HARDENING AND TEMPERING	TH	50-52 HRC	
X105CrMo17	440S49	1.4125	440	HARDENING AND TEMPERING	TH	50-55 HRC	
<b>Circlips</b>							
Material reference	JK Reference	Material No		Standard Hardening	JK Heat Treatment Designation	Standard hardening value	Standard hardening depth
		DIN	AISI				
<b>STANDARD QUALITIES</b>							
DD12	P12	1.0398	621				
Ferritic – Cromweld 3Cr12	SS410	1.4003	410				
Austenitic	SS304	1.4301	303				

Flights are robotically welded in one of three manufacturing facilities in the UK, Poland and the USA. The integrity of the welding is fundamental to best performance.

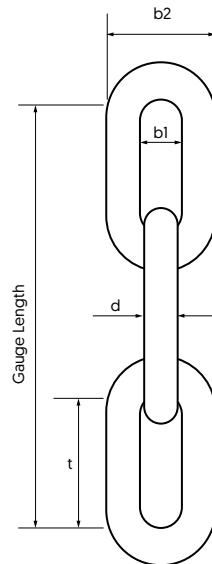
The configuration will vary dependent on the style of machine.

# Round Link Steel Chains.



Round link steel chains are commonplace in Biomass and EFW primarily on ash handling. Their simple and open construction make them effective in such environments. The main standard is DIN 22252. The chains are available in two categories, a through hardening grade (TH) for high strength for long conveyors with high load and a case hardened grade (CH) for best wear resistance. Sprockets with petal style teeth covering all configurations are also produced in house.

## Round Link Chains DIN 22252-2

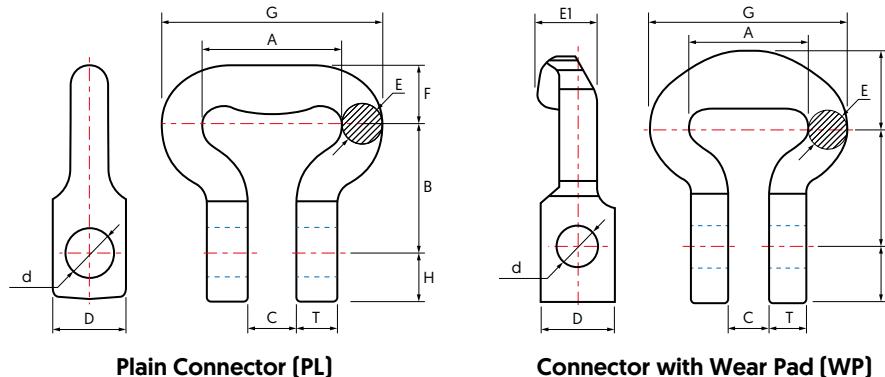


Round Link Steel Chains								
Nominal size	Diameter		Pitch		Width		Gauge Length	
	d	Tolerance	t	Tolerance	Inside b1 min	Outside b2 max	5 x t	Tolerance
mm								
<b>14 x 50</b>	14	±0.4	50	±0.5	17	48	250	±1.0
<b>18 x 64</b>	18	±0.5	64	±0.6	21	60	320	±1.0
<b>22 x 86</b>	22	±0.7	86	±0.9	26	73	430	±1.0
<b>26 x 92</b>	26	±0.8	92	±0.9	30	85	460	±1.0
<b>30 x 108</b>	30	±0.9	108	±1.1	34	97	540	±1.2
<b>34 x 126</b>	34	±1.0	126	±1.3	38	109	630	±1.3

Through Hardened TH			Round Link Steel Chains			Case Hardened CH		
Nominal size	Reference number	Proof load	Breaking Load	Reference number	Proof load	Breaking Load	Weight	
d x t	TH series	min. kN		CH series	max. kN		kg/m	
<b>14 x 50</b>	38/14X50/TH	185	246	38/14X50/CH	89	148	4	
<b>18 x 64</b>	38/18X64/TH	305	407	38/18X64/CH	165	275	6.6	
<b>22 x 86</b>	38/22X86/TH	456	608	38/22X86/CH	220	365	9.5	
<b>26 x 92</b>	38/26X92/TH	637	850	38/26X92/CH	308	510	14	
<b>30 x 108</b>	38/30X108/TH	848	1130	38/30X108/CH	400	680	18	
<b>34 x 126</b>	38/34X126/TH	1090	1450	38/34X126/CH	425	710	22.7	

## Twin outboard chain systems DIN 22253

Flight bar connectors with single or double hole are available for use in conjunction with chain for twin strand operation. Fabricated or forged flight bars are also produced to customer standards.



### Twin outboard chain systems

Nominal size	Reference number		A	B	C	D	E	E1	F	G	H	T	d	Weight	
														PL	WP
mm															
<b>14 x 50</b>	40/14X50	40/14X50/WP	50	51	19	32	14	29	27	78	18	15	17	0.46	0.7
<b>18 x 64</b>	40/18X64	40/18X64/WP	64	55	22	43	18	40	45	100	37	19	21	1	1.25
<b>22 x 86</b>	40/22X86	40/22X86/WP	86	75	26	52	22	46	58	132	44	23	25	1.6	2.6
<b>26 x 92</b>	40/26X92	40/26X92/WP	92	78	30	58	26	56	59	147	44	27	28	2.8	3.8
<b>30 x 108</b>	40/30X108	40/30X108/WP	108	96	34	70	30	59	60	172	44	32	31	4	5.2
<b>34 x 126</b>	40/34X126	40/34X126/WP	126	110	38	70	34	35	65	198	52	36	37	5.8	7.3



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