



**JOHN KING**

Conveyor Chains & Sprockets Worldwide

# BulkMaster Conveyors and Elevators.



## Material Processing Solutions Since 1926.



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# The principals of King BulkMaster Conveying and Elevating.

- Also described as en masse conveying this relates to the unique method of conveying bulk materials **cleanly, gently and economically**.
- Material is introduced into a sealed conveyor casing, horizontally, on an incline or vertically or a combination of the three. Versatility is the unique ingredient.
- Material is introduced into the conveyor at any point in a uniform load.
- The skeletal flight configuration (refer flight attachment options p. 9-10) induces the material to flow in a solid, placid column.
- The John King BulkMaster is **not a scraper conveyor**. There is no dragging or scraping action. The material simply moves forward as a solid, uniform mass.



## The benefits of the King BulkMaster handling system.

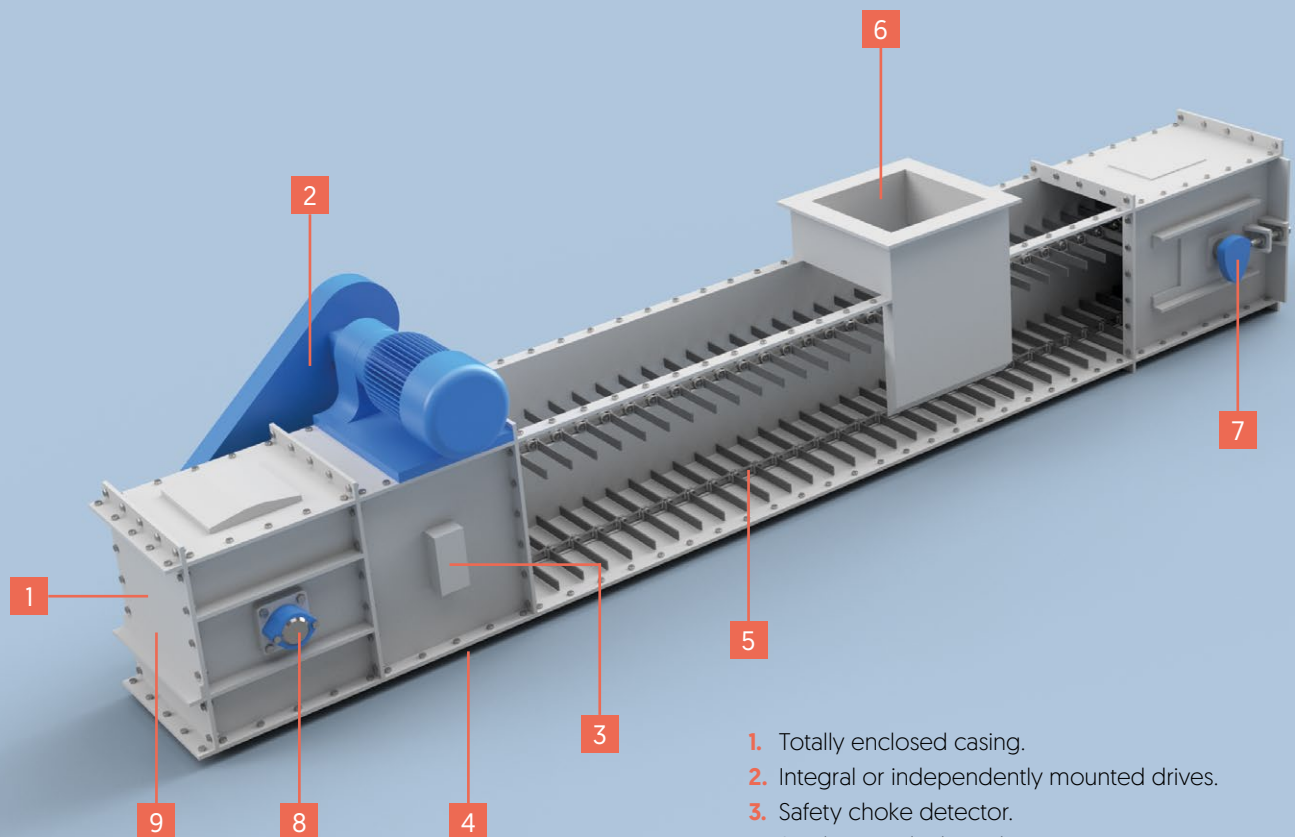
- **Capital costs** Equipment proves to be competitively priced as compared to other forms of handling systems allowing for quicker pay back periods.
- **Power Consumption** Significantly lower as compared to other forms of handling equipment for example the system can be as low as 1/10 of dense phase conveying.
- **Low cost maintenance** Heavy duty rigid conveyor sections in simple modules, high strength forged conveyor chain, choke detection, overload and under-speed switches and high performance wear rails combine to ensure easy maintenance at infrequent intervals.
- **Labour Saving** Manual to fully automatic control of individual or multiple machines systems provided by proven and user friendly control systems.
- **Environmentally friendly** Totally enclosed machines and transfer points with dust tight and weather proof construction.
- **Health and Safety compliant** Safety assured with all moving parts fully enclosed and inaccessible. Explosion vent panels ATEX approved [94/9/CE] as required.
- **Versatility and adaptability** Unique features of King BulkMaster equipment offers best versatility in considering plant layout and adaptability in handling virtually all varieties of dry bulk materials.
- **Gentle handling** Material moved en masse as a solid, uniform and placid column with the chain skeletal form ensures degradation of vulnerable products is virtually eliminated. Chain flight design allows the material column to change direction through bends without degradation.
- **Proven performance** Established in 1926 John King has unique experience in handling bulk materials in a multiplicity of Industrial applications Worldwide.

# King BulkMaster Conveying.

**King BulkMaster machines** employ the principal of en masse conveying. The chain flight will induce movement to its own physical depth and as a result the whole mass of material will flow forward at the same speed in a solid, placid column 'en masse'. Material dragging, particle tumbling or rolling does not occur.

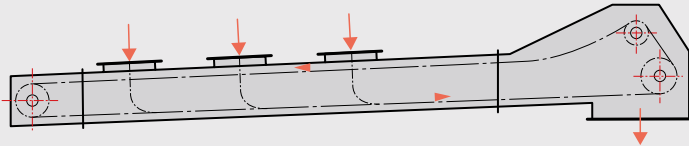
**King BulkMaster machines** are manufactured within a standard range from 200 mm wide to 1500 mm wide with capacities of up to 2000 tons per hour [grain]. All requirements can be catered for.

- Multiple inlets and or outlets will provide proportional capacity intake and output.
- BulkMaster two way machines will allow for material transport in both directions.



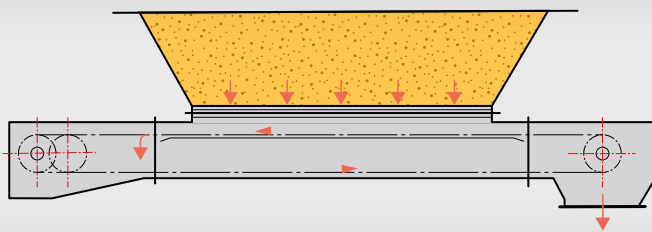
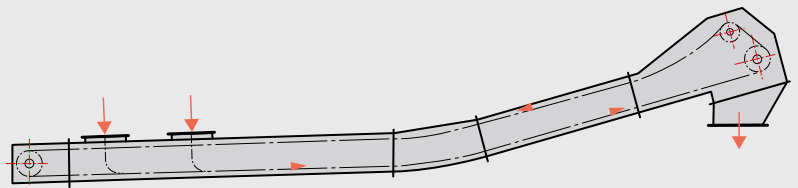
1. Totally enclosed casing.
2. Integral or independently mounted drives.
3. Safety choke detector.
4. Single or Multiple outlets.
5. King high strength forged conveyor chain.
6. Single or multiple inlets.
7. Underspeed safety control unit.
8. Rotation sensor [optional].
9. Blockage sensor [optional].

## Popular BulkMaster Conveyor arrangements.



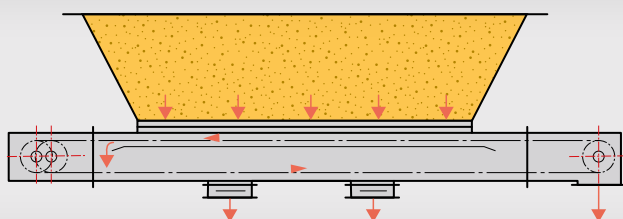
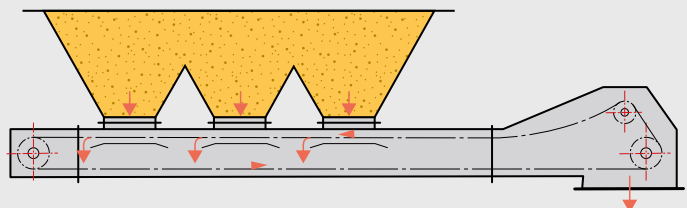
Standard straight running conveyor. Tensioning at the drive end as illustrated or option of conventional tail shaft tensioning.

Standard straight running conveyor with horizontal to inclined sections. Tensioning at the drive end or option of conventional tail shaft tensioning.



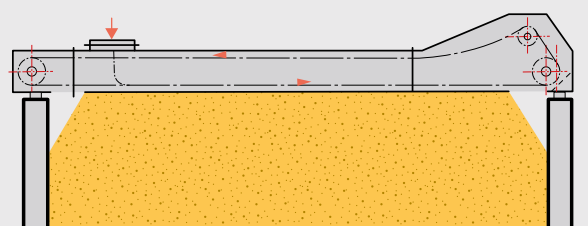
Two way conveyor with material delivery from a single hopper. Material conveyed on a closed top deck to enable delivery to the bottom strand in a controlled manner. Single outlet at drive end. Conventional tail shaft tensioning as illustrated or option of tensioning at drive end.

Standard straight running conveyor with delivery from multiple inlets directly to the bottom strand. Baffle plates allow for controlled feed. Single outlet at drive end. Tensioning at the drive end as illustrated or option of conventional tail shaft tensioning.



Two way conveyor with material delivery from a single hopper. Material conveyed on a closed top deck to enable delivery to the bottom strand in a controlled manner. Multiple outlets along conveyor length. Conventional tail shaft tensioning as illustrated or option of tensioning at drive end.

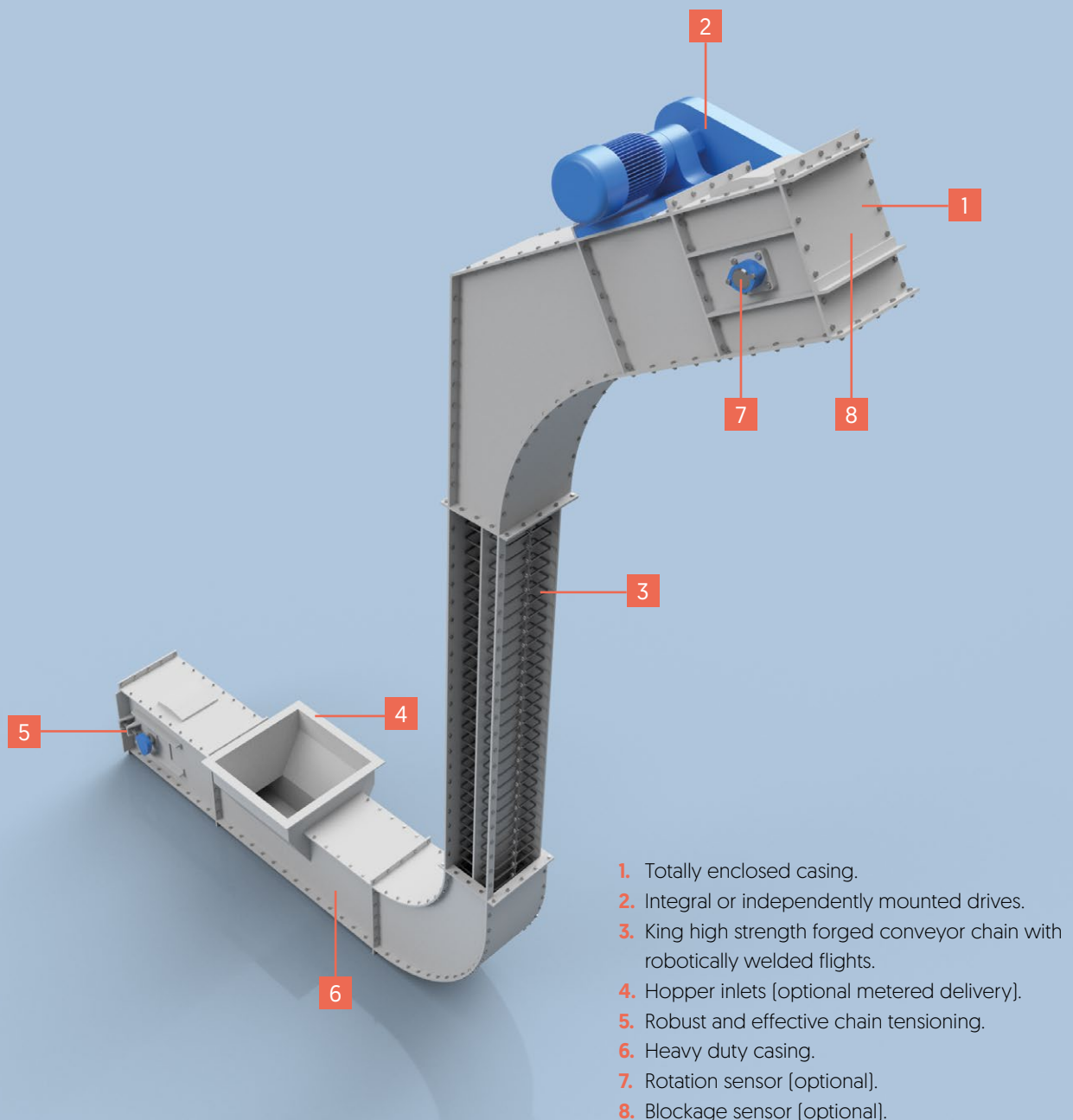
Horizontal conveyor with open bottom deck for material leveling. Tensioning at the drive end as illustrated or option of conventional tail shaft tensioning.



# King BulkMaster Elevating.

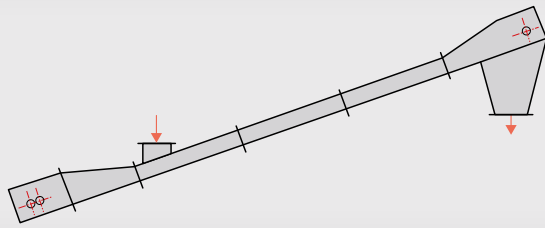
**BulkMaster elevators** employ the principal of en masse. The chain flight in its skeletal form is of a design that when immersed in the material will induce the whole mass of material to flow forward at the same speed in a solid, placid column within the casing of the conveyor. Elevator design allows the material to be moved in the horizontal then vertically or inclined plane or a combination of the two in a swan neck configuration.

**King BulkMaster Elevators** are manufactured in a standard range of sizes from 200 mm wide upwards enabling every customer requirement to be met.



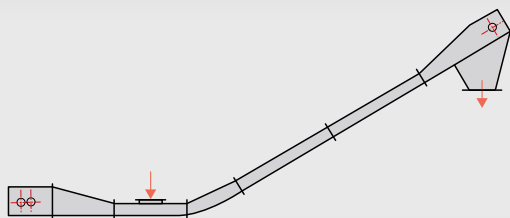
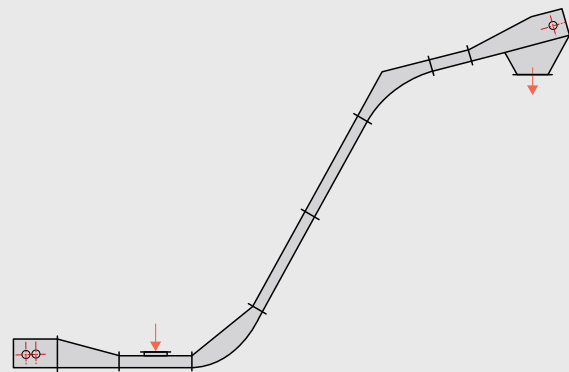


## Popular BulkMaster Elevator arrangements.



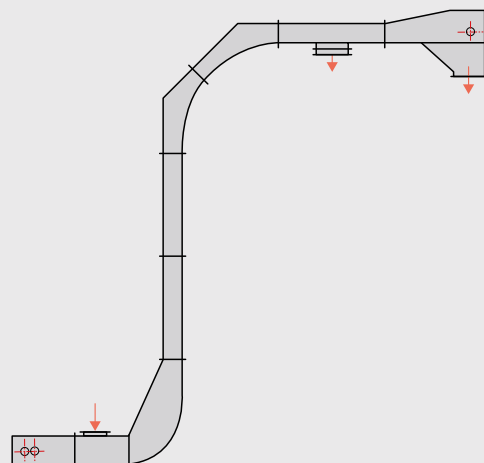
Standard straight running inclined elevator. Conventional tail shaft tensioning.

Swan neck elevator with loading on the horizontal section, a steep incline and final swan neck delivery section. Conventional tail shaft tensioning.



Elevator with single bend. Loading on the horizontal section with discharge hopper at the head of the inclined section. Conventional tail shaft tensioning.

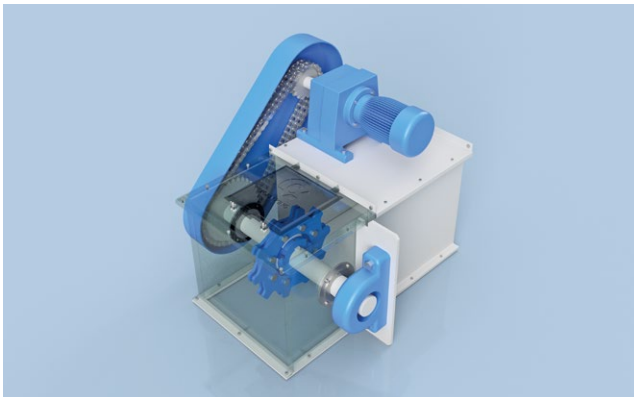
Double bend conveyor. Loading on the horizontal section with 90 degree elevating section and final horizontal section with discharge at both intermediate and terminal positions. Conventional tail shaft tensioning.



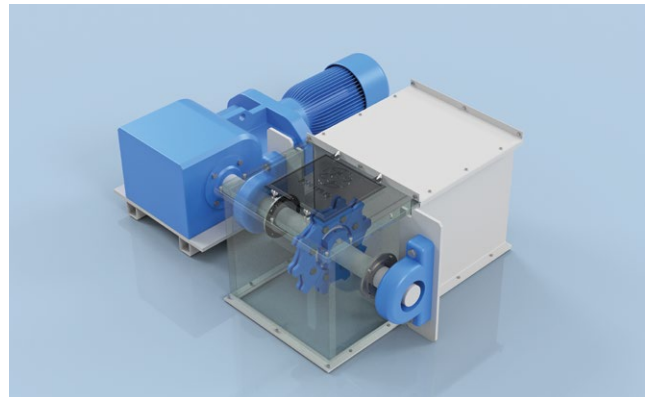
# King BulkMaster Conveyor and Elevator construction.

## Drive arrangements.

Two principal options are available. Firstly an integrally mounted geared motor unit driving the sprocket shaft through a totally enclosed chain drive incorporating a King design shear pin overload device. Secondly on large drives we employ a motor coupled to a gear unit through a coupling and mounted on an independent base.



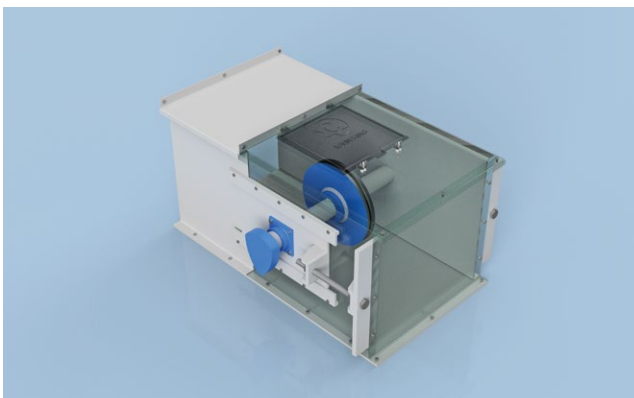
**Drive station with chain transmission**



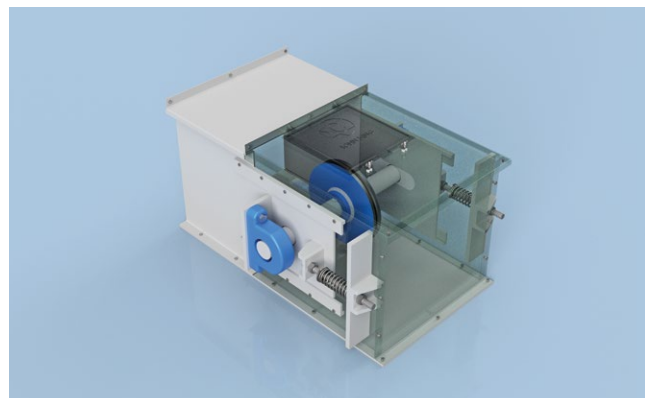
**Direct drive through a coupling**

## Drive and Tension terminals.

Shafts from best quality materials mounted on self-aligning ball and roller bearings. Shaft sealing affected with special high integrity packers. Sprockets with hardened and replaceable flanges for easy replacement. Panels over head and tail shafts allows for easy and safe inspection.



**Tension terminal with screw takeup**



**Tension terminal with spring loaded "live" tensioning**

## Conveyor and Elevator casing.

Conveyor and Elevator sections manufactured from hot rolled strip mill steel. Standard recommendation for forged chain wear rail is high manganese steel offering unique work hardening properties. Modern manufacturing techniques ensure a high degree of accuracy ensuring perfect alignment between mating faces, outlets and ports.

Special features – For handling hot, wet, abrasive and or corrosive product special considerations to materials can be applied for casing materials, liners and chain components.

# 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 hard- ening depth
		DIN	AISI				
STANDARD QUALITIES							
20CrMnTn	TN	1.8401	A29/A29M	CASE HARDENING	CH	58-62 HRC	0,8-1,0 mm
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/mm²	
42CrMo4	CD	1.7225	4140	HARDENING AND TEMPERING	TH	1100-1300 N/mm²	
CORROSION AND ACID RESISTANT MATERIAL							
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	
HEAT – RESISTANT MATERIAL							
				HEAT RESISTANCE IN AIR			
X10CrAlSi7	JK HK	1.4713		800° C MAX		420-620 N/mm²	
X15CrNiSi 20-12	JK HH	1.4828	309	1000°C MAX		500-750 N/mm²	
Chain pins							
Material reference	JK Reference	Material No		Standard Hardening	JK Heat Treatment Designation	Standard hardening value	Standard hard- ening depth
		DIN	AISI				
STANDARD QUALITIES							
	BS970 1991						
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	
CORROSION AND ACID RESISTANT MATERIAL							
X46Cr13	420S29	1.4034	420	HARDENING AND TEMPERING	TH	50-52 HRC	
X105CrMo17	440S49	1.4125	440	HARDENING AND TEMPERING	TH	50-55 HRC	
Circlips							
Material reference	JK Reference	Material No		Standard Hardening	JK Heat Treatment Designation	Standard hardening value	Standard hard- ening depth
		DIN	AISI				
STANDARD QUALITIES							
DD12	P12	1.0398	621				
Ferritic – Cromweld 3Cr12	SS410	1.4003	410				
Austenitic	SS304	1.4301	303				

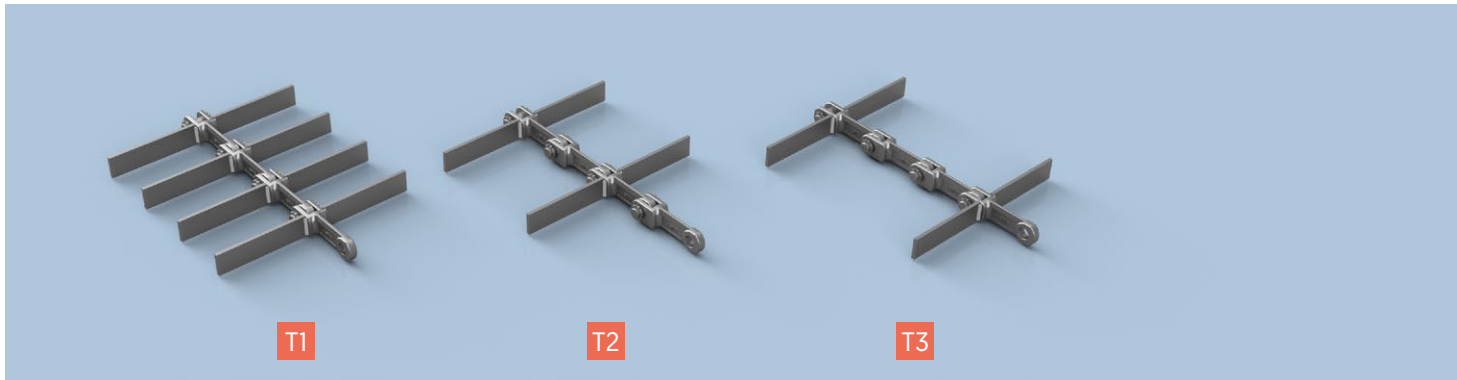
Flights are robotically welded in one of three manufacturing facilities in the UK, Poland and the USA. The integrity of the welding is fundamental to best performance.

The configuration will vary dependent on the style of machine.

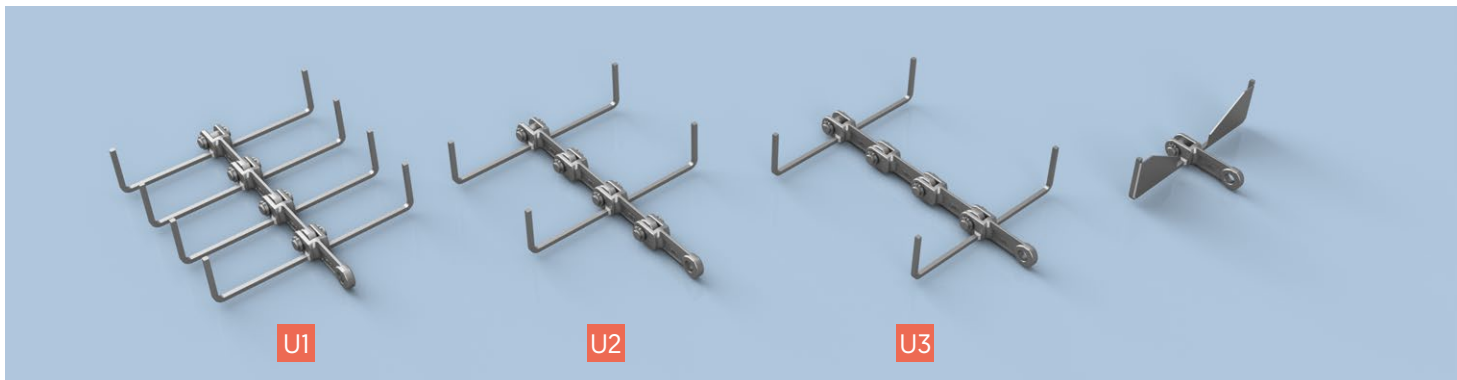


# Flight attachment options

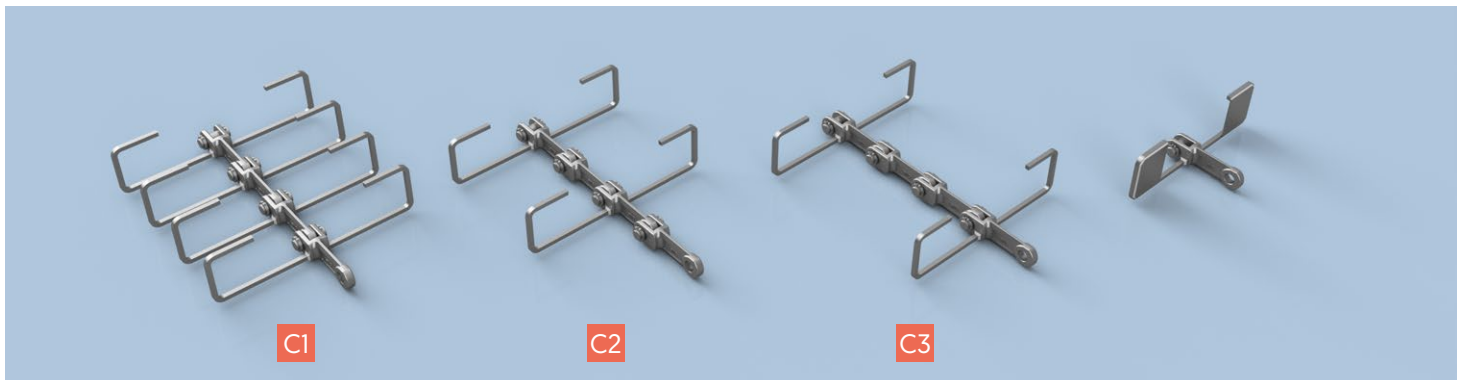
## T Type Attachments for Horizontal and Slightly Inclined Conveying



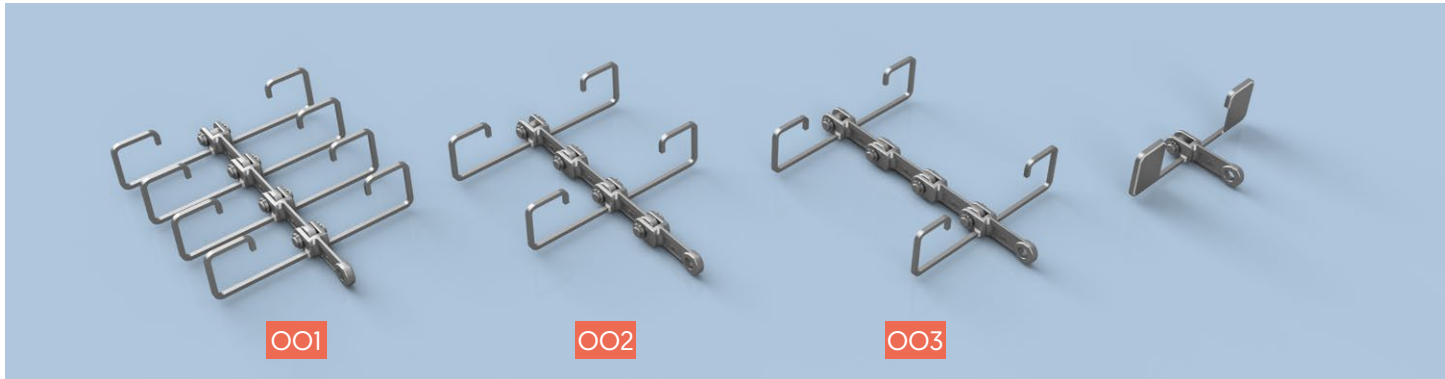
## U Type Attachments for Horizontal and Inclined Conveying (with or without blanking plate)



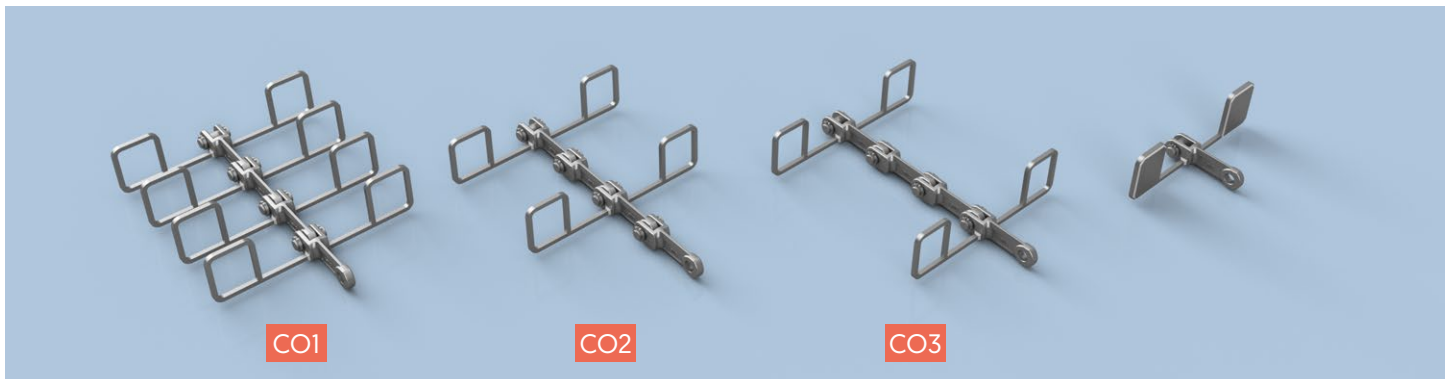
## C Type Attachments for Horizontal, Inclined and Vertical Conveying (with or without blanking plate)



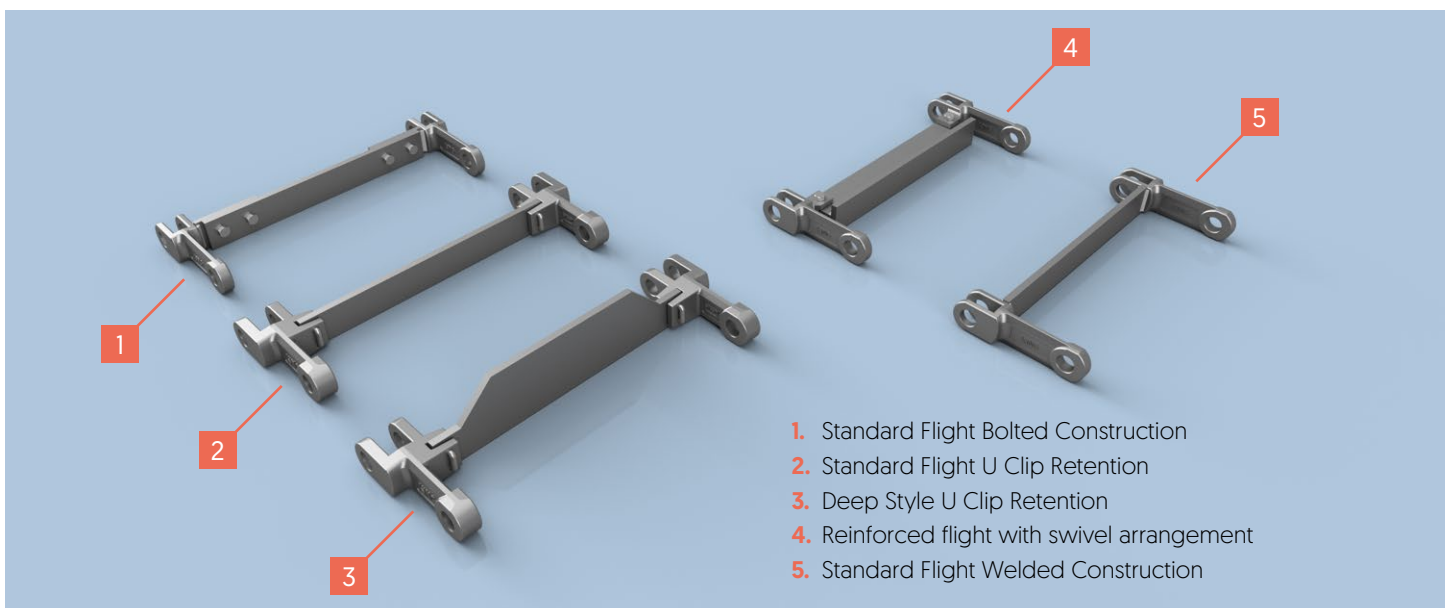
## OO Type Attachments for Horizontal and Inclined Conveying (with or without blanking plate)



## CO Type Attachments for Horizontal and Inclined Conveying (with or without blanking plate)



## Double Series Flight Options I Format



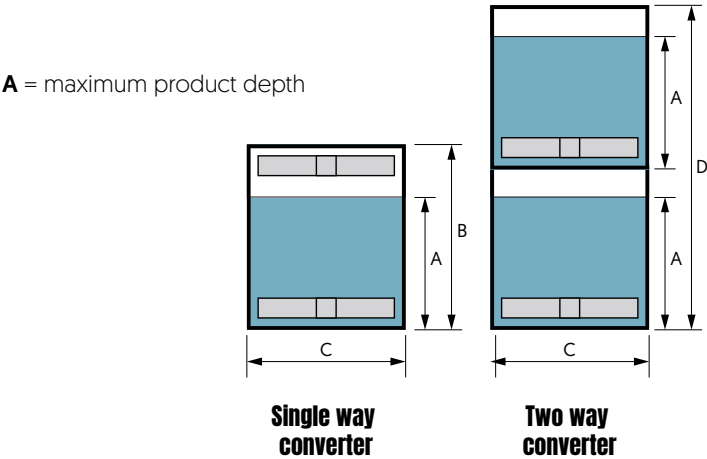
# Typical dimensions and capacities.

Machine selection is based on long experience of the nature of the material to be conveyed which influences casing size, chain configuration and speed. Simple machines handling free flowing product will accept a higher speed and resultant throughput as compared to similar capacity machines with bends handling sticky and or abrasive products.

For guidance purposes only the tables provide outline machine dimensions ad typical maximum duties for two products Grain and Coal with differing handling characteristics.

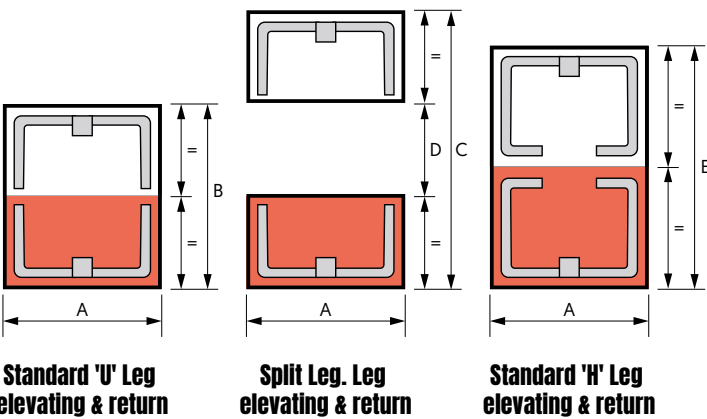
For specific requirements John King technical will be pleased to assist.

## BulkMaster Conveyors



MACHINE SIZE	A	B	C	D
200	200	375	200	495
250	248	375	250	543
315	288	414	315	624
400/250	248	375	400	543
400/315	288	414	400	624
400	380	534	400	811
500/250	248	375	500	543
500/400	380	534	500	811
500	480	606	500	1007
630/400	376	536	630	813
630/500	476	606	630	1007
800/500	476	606	800	1007
1000/500	476	606	1000	1007

## BulkMaster Elevators



MACHINE SIZE	A	B	C	D	E
200	200	273	835	555	413
250	250	323	970	640	513
315	315	363	1060	690	643
355	355	415	1160	740	725
400	400	475	1310	830	815
500	500	637	1582	938	1017



FM 77342  
ISO 9001



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