Crane Components

&

Conveyor Idlers and Components

Crane components

Xtek Solutions in Motion

Xtek Track Wheels/Crane Wheels are:

- Manufactured from fine gain, fully killed, vacuum degassed forged medium carbon steel
- Heat treated using in house processes to provide a uniform contour hardness in the tread and inner flange wear surfaces, while maintaining a ductile core to resist shock loads
- Resistant to flange fracture or wear
- Designed to resist pitting and spalling

Advantages of Xtek forged Track Wheels / Crane Wheels:

- Reduce maintenance cost of your wheels and wheel assemblies
- Improve the life of your rail
- Provide an additional 40% load carrying capability over rim toughened wheels
- Delivery in 6-8 weeks, less when required

Applications:

- Overhead cranes, gantry and portal cranes, transfer cars
- Antennae, stadium roofs, cable cars, horse pulled carriages (and many more)

VAHLE 19 12
ELECTRIFICATION SYSTEMS

Crane Technology

In the field of general crane technology, VAHLE delivers solutions for overhead travelling cranes, bridge cranes and swinging cranes, both for long traverses and also for trolley traverses. From initial planning up to installation, we offer you complete solutions including data transmission via SMG or VAHLE Powercom.

Storage and Sorting Technology

VAHLE also provides several products for storage and sorting technology. Various PVC-enclosed Powerail conductor systems, including VKS 10 with up to 10 conductors in one housing, provide your end devices with current of up to 280 A. Special components simplify assembly and keep the spatial requirements as low as possible.

Automotive/Manufacturing Automation

Electrical monorail systems and push skid systems are essential aids not only to the automotive industry, but also to production. With VAHLE conductor systems and Powerail conductor systems, complex can power complex installations with switch points and curves. Higher travel speeds can also be realised.

People Mover Systems

VAHLE also delivers the right solution in the field of people mover systems, whether for people movers, elevators, or rides in amusement parks. In addition to various installations in German subway operations, VAHLE has also developed and installed power rails for Trans rapid in China.

Other Machine and System Construction

VAHLE products are used in countless applications, from observatories to sewage treatment plants to bitumen testing stations (photo labs).

Contactless Power and Data Transmission

High service quality is playing an important role more and more in today's automation systems. Stoppage times due to maintenance cost the company a lot of money. The contactless power transmission by VAHLE (CPS®) prevents system stoppages due to wear and tear.

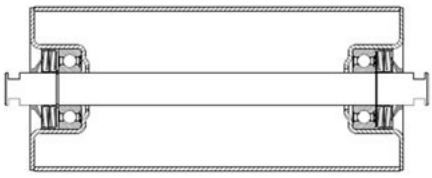
Also, production sites, which must be operated under absolute clean-room conditions, are becoming more and more common in the computer age. Due to the lack of carbon dust, CPS® is ideally suited to such conditions.

The data can also be transmitted in a contactless way by means of either VAHLE Powercom®, CPS®, or else SMG (Slotted Microwave Guide).

Conveyor Idlers and Components

Roller Sizes

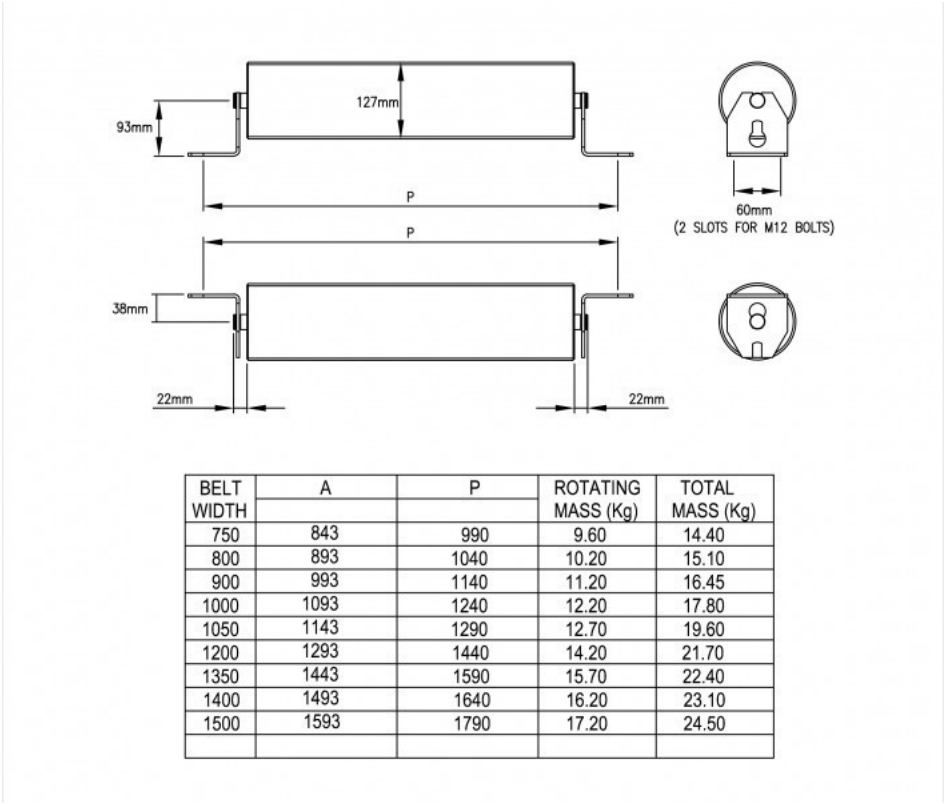
Roller Sizes Available:



- 60mm & 89mm Diameter
- 102mm Diameter
- 114mm Diameter
- 127mm Diameter
- 139mm Diameter
- 152mm Diameter
- Manufacturing possible in most non-standard sizes

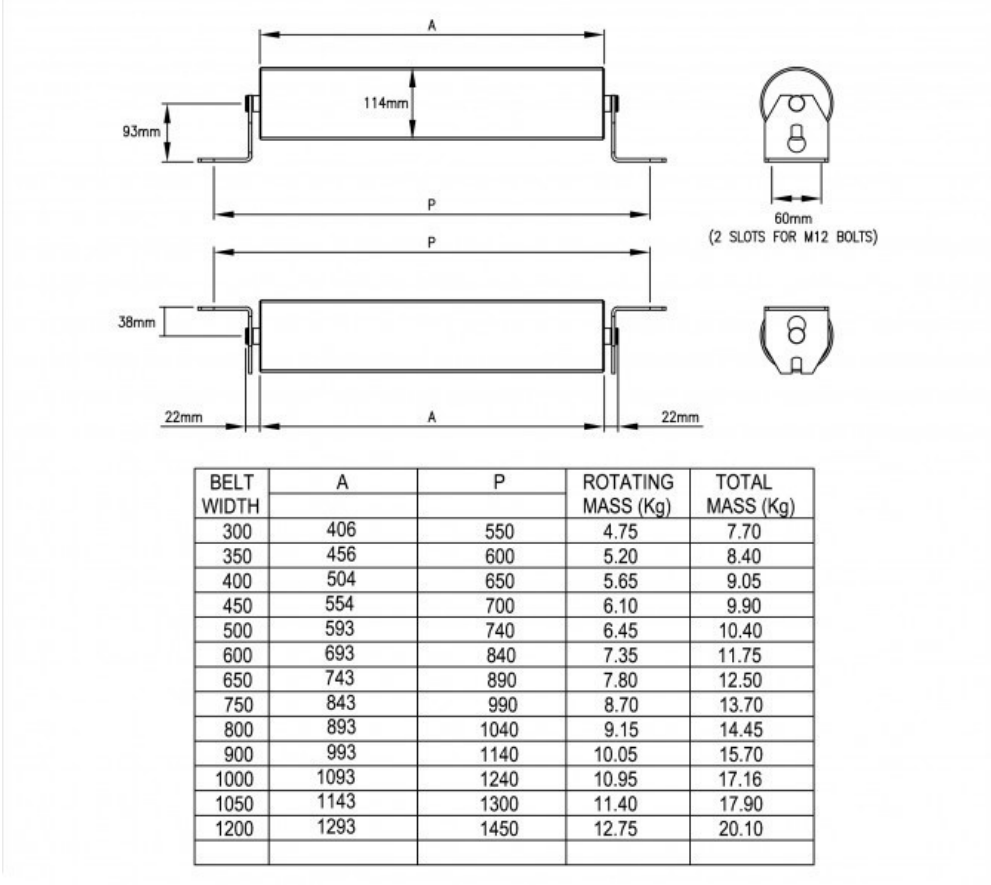
Conveyor Carrying & Return Idlers (Light Duty)

Series 22 - Light duty flat carrying and return idlers 60mm & 89mm diameter
Greased for life
Bearing - 6205Z C=1224 kgf
Maximum belt speed - 3m/s



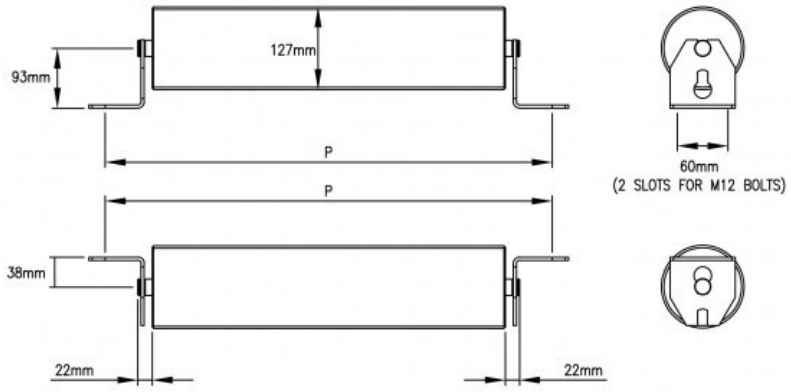
BELT WIDTH	A	P	ROTATING MASS (Kg)	TOTAL MASS (Kg)
750	843	990	9.60	14.40
800	893	1040	10.20	15.10
900	993	1140	11.20	16.45
1000	1093	1240	12.20	17.80
1050	1143	1290	12.70	19.60
1200	1293	1440	14.20	21.70
1350	1443	1590	15.70	22.40
1400	1493	1640	16.20	23.10
1500	1593	1790	17.20	24.50

Series 25 - Medium to heavy duty flat carrying and return idlers 114mm diameter
Greased for life
Bearing - 6205Z C=1428 kgf
Maximum belt speed - 4m/s



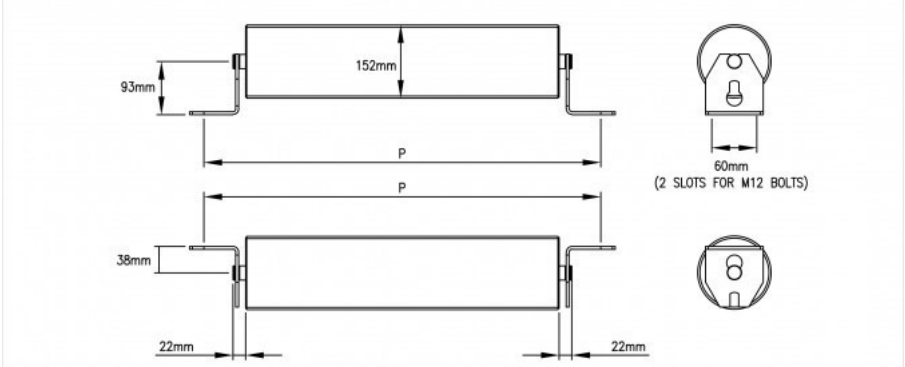
BELT WIDTH	A	P	ROTATING MASS (Kg)	TOTAL MASS (Kg)
300	406	550	4.75	7.70
350	456	600	5.20	8.40
400	504	650	5.65	9.05
450	554	700	6.10	9.90
500	593	740	6.45	10.40
600	693	840	7.35	11.75
650	743	890	7.80	12.50
750	843	990	8.70	13.70
800	893	1040	9.15	14.45
900	993	1140	10.05	15.70
1000	1093	1240	10.95	17.16
1050	1143	1300	11.40	17.90
1200	1293	1450	12.75	20.10

Series 25 - Medium to heavy duty flat carrying and return idlers 127mm diameter
Greased for life
Bearing - 6205Z C=1428 kgf
Maximum belt speed - 5m/s



BELT WIDTH	A	P	ROTATING MASS (Kg)	TOTAL MASS (Kg)
750	843	990	9.60	14.40
800	893	1040	10.20	15.10
900	993	1140	11.20	16.45
1000	1093	1240	12.20	17.80
1050	1143	1290	12.70	19.60
1200	1293	1440	14.20	21.70
1350	1443	1590	15.70	22.40
1400	1493	1640	16.20	23.10
1500	1593	1790	17.20	24.50

Series 26 - Heavy duty flat carrying and return idlers 152mm diameter
Greased for life
Bearing - 6305Z C=2295 kgf
Maximum belt speed - 6m/s

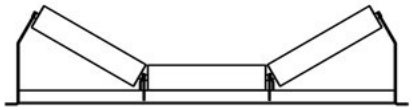


BELT WIDTH	"A"	"P"	MASS ROTATING PARTS k.g.	TOTAL MASS k.g.
750	849	990	13.84	17.41
800	899	1040	14.45	18.31
900	999	1140	15.94	20.11
1000	1099	1240	17.34	21.91
1050	1149	1300	18.04	22.81
1200	1299	1450	20.14	25.51
1350	1449	1600	22.24	28.21
1400	1449	1650	22.94	29.11
1500	1599	1800	24.34	30.97
1600	1699	1900	25.74	32.71
1800	1899	2100	28.54	36.31
2000	2099	2300	31.34	39.91

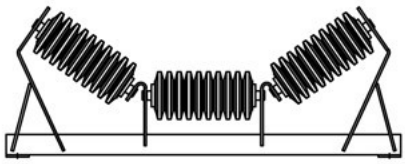
Other troughing angles available to special order.
Mason Engineers reserve the right to change any dimensions at any time without notice.

Conveyor Frames & Rollers

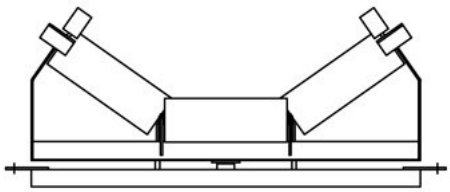
Troughing Frames
30, 35 and 45 degrees. Series 22, 25 and 26.
114mm, 127mm and 152mm diameter.
3 equal roll end supported offset troughing idlers.



Impact Idler Frames
30, 35 and 45 degrees. Series 25 and 26.
127mm and 152mm diameter.
3 equal roll end supported offset impact troughing idlers.

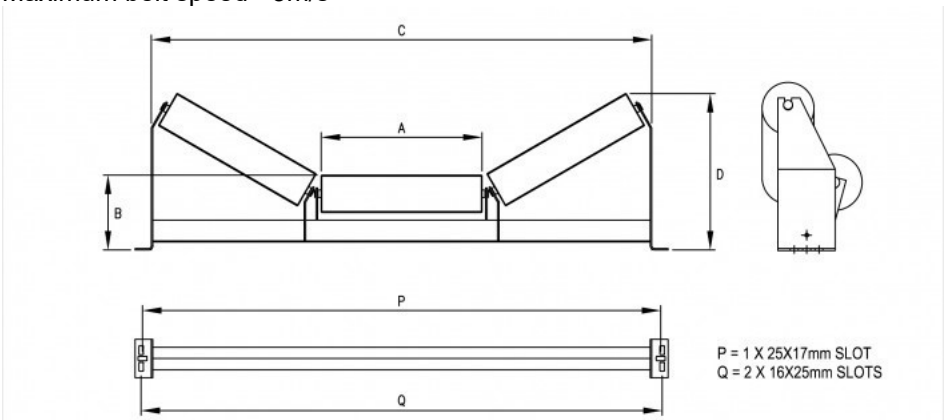


Steering Trough Frames
30, 35 and 45 degrees. Series 22, 25 and 26.
114mm, 127mm and 152mm diameter.
3 equal roll offset steering troughing idlers.



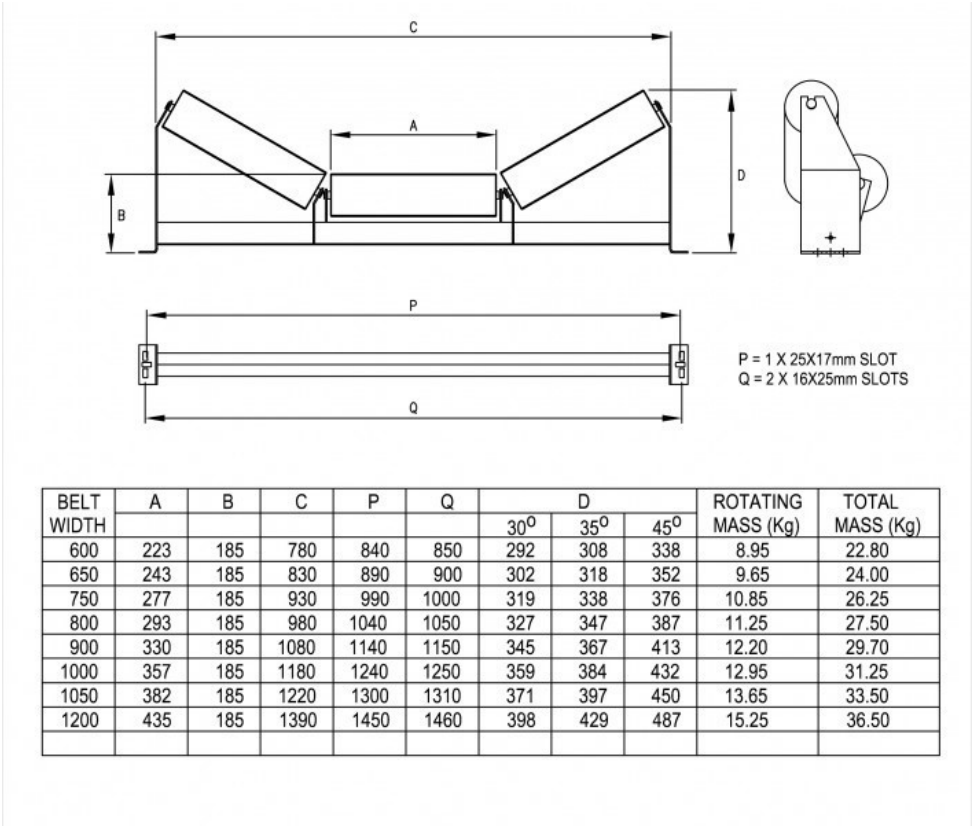
Steering Return Frames
Series 22, 25 and 26.
114mm, 127mm and 152mm diameter.
Standard steel shell steering return idelers.
Also available in self-cleaning rubber disc type.

Conveyor Trough Frames - Series 25, Medium Duty, 114mm Diameter Offset
Greased for life
Bearing - 6205Z C=1428 kgf
Maximum belt speed - 5m/s



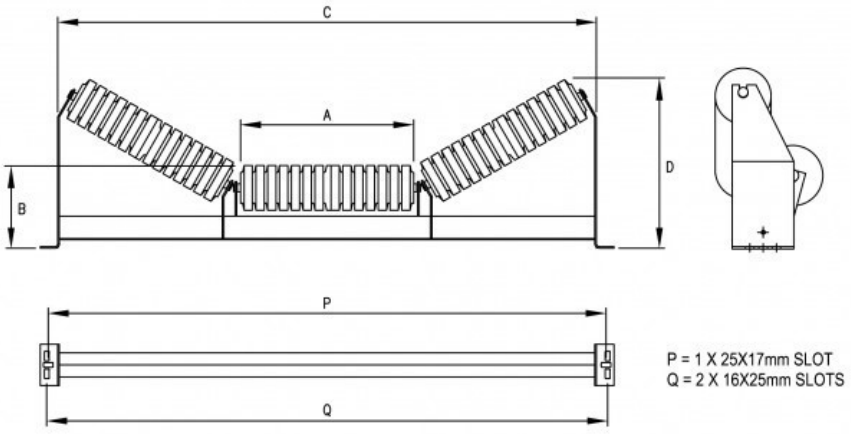
BELT WIDTH	A	B	C	P	Q	D			ROTATING MASS (Kg)	TOTAL MASS (Kg)
						30^0	35^0	45^0		
450	173	178	630	690	700	260	271	295	6.45	19.00
500	188	178	680	740	750	267	279	306	6.90	20.00
600	223	178	780	840	850	285	300	331	7.95	22.30
650	243	178	830	890	900	295	311	345	8.55	23.50
750	277	178	930	990	1000	312	331	369	9.65	25.75
800	293	178	980	1040	1050	320	340	380	10.05	27.00
900	330	178	1080	1140	1150	338	361	406	11.15	29.20
1000	357	178	1180	1240	1250	352	376	425	11.55	31.75
1050	382	178	1220	1300	1310	364	391	443	12.25	33.00
1200	435	178	1390	1450	1460	391	420	480	13.55	36.00

Conveyor Trough Frames - Series 25, Medium to Heavy Duty, 127mm Diameter Offset
Greased for life
Bearing - 6205Z C=1420 kgf
Maximum belt speed - 5m/s



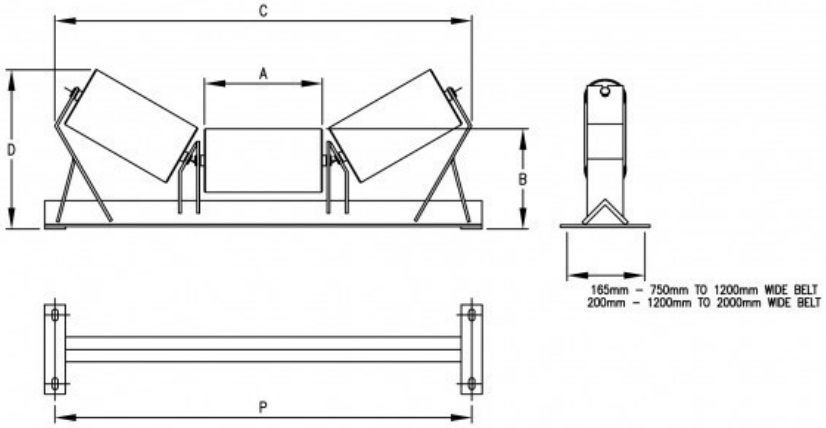
BELT WIDTH	A	B	C	P	Q	D			ROTATING MASS (Kg)	TOTAL MASS (Kg)
						30^{o}	35^{o}	45^{o}		
600	223	185	780	840	850	292	308	338	8.95	22.80
650	243	185	830	890	900	302	318	352	9.65	24.00
750	277	185	930	990	1000	319	338	376	10.85	26.25
800	293	185	980	1040	1050	327	347	387	11.25	27.50
900	330	185	1080	1140	1150	345	367	413	12.20	29.70
1000	357	185	1180	1240	1250	359	384	432	12.95	31.25
1050	382	185	1220	1300	1310	371	397	450	13.65	33.50
1200	435	185	1390	1450	1460	398	429	487	15.25	36.50

Conveyor Impact Trough Frames - Series 25, Medium Duty, 127mm Diameter Offset
Greased for life
Bearing - 6205Z C=1428 kgf
Maximum belt speed - 5m/s



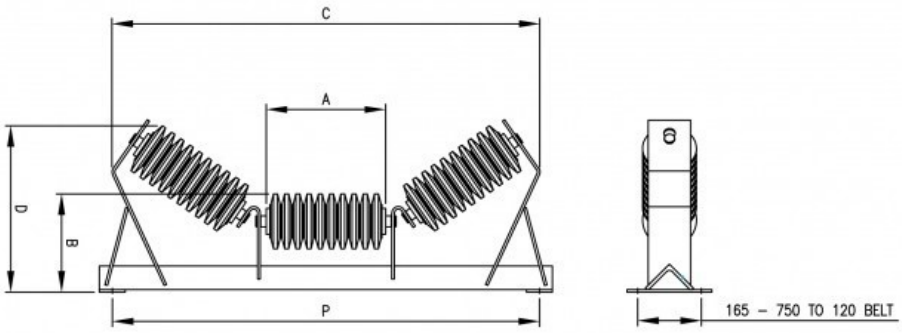
BELT WIDTH	A	B	C	P	Q	D			ROTATING MASS (Kg)	TOTAL MASS (Kg)
						30^{o}	35^{o}	45^{o}		
450	173	185	630	690	700	267	279	302	6.45	18.70
500	188	185	680	740	750	274	286	313	9.15	19.90
600	223	185	780	840	850	292	308	338	10.75	22.30
650	243	185	830	890	900	302	318	352	11.60	23.60
750	277	185	930	990	1000	319	338	376	13.20	26.10
800	293	185	980	1040	1050	327	347	387	13.85	27.40
900	330	185	1080	1140	1150	345	367	413	15.60	29.60
1000	357	185	1180	1240	1250	359	384	432	16.85	32.10
1050	382	185	1220	1300	1310	371	397	450	17.95	33.50
1200	435	185	1390	1450	1460	398	429	487	20.40	37.30

Conveyor Troughing Frames - Series 26, Heavy Duty, 152mm Inline
Greased for life
Bearing - 6205Z C=2295 kgf
Maximum belt speed - 6m/s



BELT WIDTH	A	B	C	P	D			ROTATING MASS (Kg)	TOTAL MASS (Kg)
					30^{o}	35^{o}	45^{o}		
750	283	245	980	990	386	407	440	17.74	37.23
800	299	245	1024	1040	394	416	451	18.41	38.59
900	336	245	1125	1140	413	437	477	19.96	41.52
1000	363	245	1199	1240	426	452	496	21.10	43.87
1050	288	245	1267	1300	439	467	514	22.15	45.71
1200	441	245	1412	1450	465	497	551	24.37	52.87
1350	493	245	1554	1600	501	537	598	26.56	57.66
1400	499	245	1570	1650	504	540	602	26.81	58.54
1500	546	245	1699	1800	528	567	636	28.78	66.41
1600	566	245	1753	1900	537	578	649	29.62	69.31
1800	633	245	1936	2100	570	616	696	32.44	75.57
2000	700	245	2155	2300	604	655	744	35.25	93.22

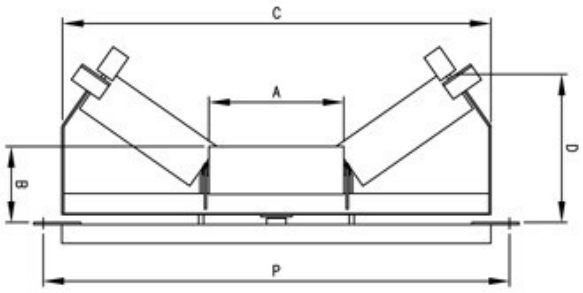
Conveyor Troughing Impact Frames - Series 26, Heavy Duty
Greased for life
Bearing - 6205Z C=2295 kgf
Maximum belt speed - 6m/s



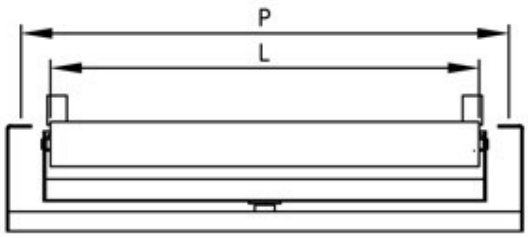
BELT WIDTH	A	B	C	D 30°	D 35°	D 45°	P	ROTATING MASS(Kg)	TOTAL MASS (Kg)
750	283	245	980	386	407	440	990	19.23	37.73
800	299	245	1024	394	416	451	1040	20.46	40.63
900	336	245	1125	413	437	477	1140	22.17	43.73
1000	363	245	1199	426	452	496	1240	23.61	46.38
1050	388	245	1267	439	467	514	1300	24.21	47.77
1200	441	245	1412	465	497	551	1450	27.15	55.65
1350	493	254	1554	501	537	598	1600	30.03	61.13
1400	499	254	1570	504	540	602	1650	30.18	61.90
1500	546	254	1699	528	567	636	1800	32.97	70.60
1600	566	254	1753	537	578	649	1900	33.45	73.14
1800	633	254	1936	570	616	696	2100	36.72	79.85
2000	700	254	2155	604	655	744	2300	40.80	98.77

Conveyor Steering Troughing Frames

Training trough idlers - available in all series and troughing angles, dimensions "A", "B", "D" and "P" as standard troughing idler series.

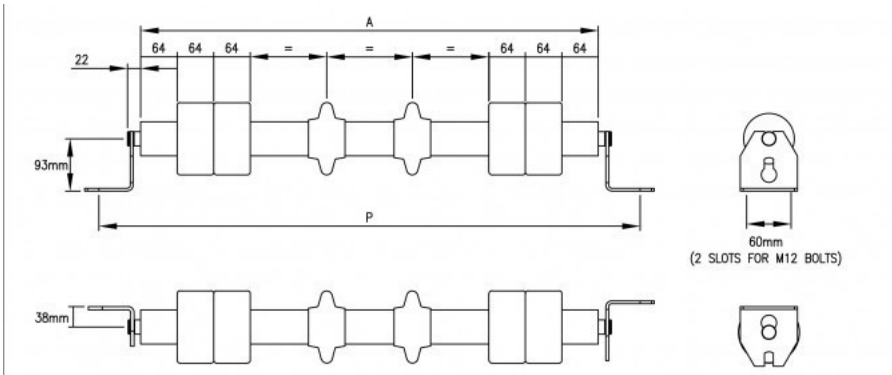


Training return idlers sets - available in all series dimensions "L" and "P" as standard return idlers.



Conveyor Carring & Return Disc Idlers (Medium Duty)

127mm diameter offset
Greased for life
Bearing - 6205Z C=1428 kgf
Maximum belt speed - 5m/s



BELT WIDTH	DISC AMOUNT	A	P	MASS ROTATING PARTS k.g.	TOTAL MASS k.g.
450	5	554	690	6.00	9.00
500	5	593	740	6.45	9.60
600	6	693	840	7.35	10.90
650	6	743	890	7.80	11.50
750	7	843	990	8.70	13.50
800	8	893	1040	9.15	14.30
900	8	993	1140	10.05	16.30
1000	9	1093	1240	19.95	17.80
1050	9	1143	1300	11.40	18.60
1200	10	1293	1450	12.75	21.30

Mason Engineers reserve the right to change any dimensions at any time without notice.

Quick Reference Charts

Mason idler series numbers 22, 24 and 25 relate to the bearing capacity**.**
The following table gives the maximum load ratings for troughing idler sets and flat, belt carrying or return idlers in our standard manufacture range based on a nominal bearing life of 50,000 hours, a maximum shaft deflection limit of 10 minutes, belt speeds not exceeding 5 meters per second and standard transom sizes for the troughing sets. It should be noted that in most cases it

is the size of the idler set transom and the shaft size between bearings, for flat carrying or return idlers that are the limiting factors.
Heavier transoms and larger shaft to increase load carrying capacities can be supplied to special order and Masons will provide or check idler selection data for specific applications, other B10 lifes and belt speeds.

BELT	3 ROLL TROUGHING IDLER SETS			FLAT CARRYING OR RETURN IDLERS		
WIDTH	22	25	26	22	25	26
300				130	294	
350				113	256	
400				100	227	
450	221	331		90	203	
500	205	309		83	187	
600	179	271		68	156	
650	169	256		63	143	
750	149	227	445	53	123	251
800	217	337	442	50	115	235
900	196	306	383	44	100	206
1000	175	277	536		90	182
1050	166	263	520		84	172
1200	144	231	451		71	147
1350			400			265
1400			384			253
1500			339			233
1600			427			200
1800			376			174
2000			321			152

Load Capacity - Quick Reference Chart (Common Material)

PEAK LOAD					TONNES/HR CARRIED BY 3 EQUAL ROLLERS 30° TROUGHING IDLERS CONTINUOUSLY LOADED FOR 45 DEGREES MULTIPLY BY 1.15					
BELT WIDTH (mm)					450	600	750	900	1050	1200
SECTIONAL AREA m^2 25°SURCHARGE					0.020	0.038	0.063	0.092	0.133	0.174
MAXIUM LUMP			UNIFORM		100	125	150	175	200	300
SIZE (mm)			WITH FINES		150	200	300	325	375	450
MATERIAL DENSITY -Kg PER CUBIC METRE					BELT SPEED					
400	800	1200	1600	2000	METRES PER SECOND					
CAPACITY MTPH										
5	10	15	20	25	0.17					
10	20	30	40	50	0.33					
20	40	60	80	100	0.66	0.35				
30	60	90	120	150	0.99	0.53	0.32			
40	80	120	160	200	1.32	0.71	0.43			
50	100	150	200	250	1.65	0.89	0.54	0.37		
60	120	180	240	300	1.98	1.07	0.65	0.44		
70	140	210	280	350	2.31	1.25	0.76	0.52	0.37	
80	160	240	320	400	2.65	1.43	0.87	0.59	0.43	
90	180	270	360	450		1.60	0.98	0.66	0.48	
100	200	300	400	500		1.78	1.08	0.74	0.53	0.40
110	220	330	440	550		1.96	1.19	0.81	0.59	0.44
120	240	360	480	600		2.14	1.30	0.89	0.64	0.48
130	260	390	520	650		2.32	1.41	0.96	0.69	0.52
140	280	420	560	700		2.49	1.52	1.03	0.75	0.56
150	300	450	600	750		2.67	1.63	1.11	0.80	0.61
160	320	480	640	800		2.85	1.74	1.18	0.85	0.65
180	360	540	720	900		3.20	1.95	1.33	0.96	0.73
200	400	600	800	1000			2.17	1.48	1.07	0.81
225	450	675	900	1125			2.44	1.66	1.20	0.91
250	500	750	1000	1250			2.71	1.85	1.34	1.01
275	550	825	1100	1375			2.98	2.03	1.47	1.11
300	600	900	1200	1500			3.25	2.21	1.60	1.21
325	650	975	1300	1625			3.53	2.40	1.74	1.31
350	700	1050	1400	1750			3.80	2.58	1.87	1.41
400	800	1200	1600	2000				2.95	2.14	1.61
450	900	1350	1800	2250				3.32	2.40	1.82
500	1000	1500	2000	2500				3.69	2.67	2.02
550	1100	1650	2200	2750				4.06	2.94	2.22
600	1200	1800	2400	3000					3.20	2.42
650	1300	1950	2600	3250					3.47	2.62
700	1400	2100	2800	3500					3.74	2.83
750	1500	2250	3000	3750					4.01	3.03
800	1600	2400	3200	4000					4.27	3.23
1000	2000	3000	4000	5000						4.04

Material Characteristics

The design of the belt conveyor should begin with an accurate assessment of the characteristics of the material to be handled. The following data covers some important considerations and give information on normal characteristics of the more common materials conveyed.

FLOWABILITY

FLOWABILITY ANGLE OF SURCHARGE - ANGLE OF REPOSE

VERY FREE FLOWING	FREE FLOWING	AVERAGE FLOWING		SLUGGISH	PROFILE ON FLAT BELT
ANGLE OF SURCHARGE	ANGLE OF SURCHARGE	ANGLE OF SURCHARGE	ANGLE OF SURCHARGE	ANGLE OF SURCHARGE	ANGLE OF SURCHARGE
0 - 30 ANGLE OF REPOSE	20 - 30 ANGLE OF REPOSE	30 - 35 ANGLE OF REPOSE	35 - 45 ANGLE OF REPOSE	40 UP ANGLE OF REPOSE	OTHER ANGLES OF REPOSE
MATERIAL CHARACTERISTICS					
UNIFORM SIZE. VERY SMALL ROUNDED PARTICLE EITHER VERY WET OR VERY DRY. SUCH AS DRY SILICA SAND, CEMENT, WET CONCRETE ETC.	ROUNDED, DRY, POLISHED PARTICLES OF MEDIUM MASS. SUCH AS WHOLE GRAIN OR BEANS.	IRREGULAR GRANULAR OR LUMPY MATERIALS OF MEDIUM MASS. SUCH AS ANTHRACITE., COAL, COTTONSEED., MEAL, CLAY ETEC.	TYPICAL COMMON MATERIALS SUCH AS BITUMINOUS COAL, STONE, MOIST ORES ETC.	IRREGULAR STRINGY FIBROUS INTERLOCKING MATERIAL SUCH AS WOOD CHIPS, BAGASSE, TEMPERED FOUNDRY SAND ETC.	MAY INCLUDE ANY CHARACTERISTIC SHOWN IN OTHER COLUMNS.

MAXIMUM CONVEYING SLOPE

MATERIAL	MAXIMUM SLOPE ANGLE	MATERIAL	MAXIMUM SLOPE ANGLE
BITUMINOUS COAL - R.O.M.	18°	GRAVEL AND SAND - WET	10°- 12°
BITUMINOUS COAL - SIZED	15°- 16°	GYPSUM - POWERED	20°- 22°
BITUMINOUS COAL - SLACK	20°	LIME - POWERED	22°
BROWN COAL - R.O.M.	18°	ORES - FINES ONLY	20°
CEMENT, PORTLAND - LOOSE	20°	ORES - MIXED LUMPS AND FINES	18°
CLAY - FINE AND DRY	22°	ORES - SIZED	16°
CLAY - WET LUMP	18°	ROCK - FINES ONLY	20°
COKE - SCREENED	15°- 16°	ROCK - MIXED LUMPS AND FINES	18°
COKE - BREEZE	20°	ROCK - SIZED	16°
CONCRETE - NORMAL	15°	SAND - DUMP	18°- 20°
CONCRETE - WET	10°- 12°	SAND - DRY	15°
EARTH - LOOSE AND DRY	18°- 20°	SULPHUR - POWERED	22°
GRAINS	15°	WOOD CHIPS	23° - 25°
GRAVEL - WASHED	12°- 15°		
GRAVEL AND SAND	18°- 20°		

RECOMMENDED MAXIMUM LUMP SIZE - VARIOUS BELT WIDTHS

BELT WIDTH mm	IF UNIFORM LUMPS mm	IF MIXED WITH APPROX. 80%FINES mm
450	100	150
500	100	175
600	125	200
750	150	300
800	150	300
900	175	325
1000	200	375

BELT WIDTH mm	IF UNIFORM LUMPS mm	IF MIXED WITH APPROX. 80%FINES mm
1050	200	375
1200	300	450
1400	300	600
1500	350	600
1600	375	600
1800	450	600
2000	450	600

MATERIAL WEIGHTS - CHARACTERISTICS

MATERIAL	Kg/m³	ANGLE OF REPOSE	CONVEYOR SURCHANGE ANGLE
ACID PHOSPHATE	1540	"	"
ALUMINA	800 TO 960	22	5
ALUM - LUMP	800 TO 960	27	"
PULVERISED	720 TO 800	35	"
ASBESTOS	320 TO 400	45 TO 48	25
SHREDDED ORE	1300		
ASHES, BOILER HOUSE - DRY LOOSE	560 TO 690	38 TO 45	25
ASHPHALT	1280 TO 1360	"	"
BAGASSE - FRESH, MOIST	120	"	25
DRY, LOOSE	80	"	25
BARYTES 50 TO 75mm LUMPS	2320 TO 1360	30	25
38 TO 50mm LUMPS	2080 TO 2400	30	20
DUST	1760 TO 2080	30	15
BASALT 50 TO 76mm LUMPS	1680 TO 1760	"	25
13mm SCREENINGS	2080 TO 2320	"	20
DUST	1760 TO 2080	"	15
BAUXITE - CRUSHED	1200 TO 1360	30 TO 35	5 TO 15
BORAX SOLID 50 TO 101mm LUMPS	960 TO 1040	40	"
38 TO 50mm LUMPS	880 TO 960	30 TO 45	"
BREWERS GRAIN - DRY	400 TO 480	45	"
WET	880 TO 960	45	"
BRICK - HARD	2000	30 TO 45	"
SOFT	1600	30 TO 45	"
CARBON BLACK - POWDER	80	"	"
PELLETS	400	40	"
CEMENT, PORTLAND - LOOSE	1200 TO 1360	40	20
CLINKER	1280 TO 1520	33	25
SLURRY	1440	"	5
CHALK - 50 TO 76mm LUMPS	1280 TO 1360	45	"
38 TO 50mm LUMPS	1200 TO 1280	40 TO 45	"
CHAR - SUGAR REFINERY	720	"	"
CHIPS, PAPER MILL - SOFTWOOD	190 TO 480	"	25
YELLOW PINE	320 TO 400	"	25
CLAY - DRY, LOOSE	1010 TO 1440	24 TO 45	15 TO 25
BRICK, GROUND FINE	1760	35	25
COAL - 152mm DOMESTIC SIZES	830 TO 900	"	25
RUN OF MINE	720 TO 880	35	25
SLACK	690 TO 800	37	25
PULVERISED FOR COKING	480 TO 590	"	10
LIGNITE, BROKEN	720 TO 880	"	25
COCOA	480 TO 560		
COKE - RUN OF OVEN	400 TO 480	30	25
BREEZE	380 TO 560	30 TO 45	20
CONCRETE, WET OR CONVEYOR	1760 TO 2400	"	5
COPPER ORES, CRUSHED	2080 TO 2400	"	25
COPRA	350	"	"
CORN GRITS	670	"	"
CRYOLITE - 50 TO 76mm LUMPS	1600 TO 1680	"	20
13mm SCREENINGS	1440 TO 1600	"	15
DUST	1200 TO 1400	"	5
DOLOMITE - LUMP	1440 TO 1600	SEE LIMSTONE	"
EARTH - AS EXCAVATED, DRY	1120 TO 1280	30 TO 45	20 TO 25
WET, MUD	1600 TO 1760	"	5
FOUNDRY REFUSE, OLD SAND CORES	960 TO 1280	"	15
GARBAGE - HOUSEHOLD	800	"	"
GLASS - BATCH	1680	"	"
BROKEN	1280 TO 1600	"	"
GRANITE - 38 TO 50mm LUMPS	1360 TO 1440	25	"
13mm SCREENINGS	1360 TO 1440	"	"
BROKEN	1280 TO 1400	"	"

MATERIAL WEIGHTS - CHARACTERISTICS

MATERIAL	Kg/m³	ANGLE OF REPOSE	CONVEYOR SURCHANGE ANGLE
GRAVEL - DRY, SHARP	1520 TO 1600	30 TO 40	25
WET	1600 TO 1920	32	25
GUTTA PERCHA	960	*	*
GYPSUM - 60 TO 76mm SCREENINGS	1120 TO 1280	30	20
13mm SCREENINGS	1120 TO 1280	40	15
DUST	960 TO 1120	42	5
HOPS - BREWERY & MOIST	560	30 TO 45	*
ICE CRUSHED	640	*	*
IRON BORINGS - MACHINE SHOP	2000	*	*
IRON ORES, DEPENDS ON IRON %	1600 TO 3200	35	25
IRON PYRITES - 50 TO 76mm LUMPS	21560 TO 2320	*	20
13mm SCREENINGS	1920 TO 2160	*	15
DUST	1680 TO 1920	*	5
LEAD ORES, DEPENDS ON LEAD %	3200 TO 4320	30	15
LIME STONE - 50 TO 70mm LUMPS	1440 TO 1520	30 TO 40	25
13mm SCREENINGS	1280 TO 1440	*	15
DUST	12090 TO 1280	*	5
LINESEED CAKE - CRUSHED	760 TO 780	*	*
MANGANESE ORE	2000 TO 2240	39	*
MALT MEAL	570 TO 640	*	*
MEAL	700	*	*
PAPER PULP	640 TO 960	*	5
PETROCHEM COKE	560 TO 640		
PHOSPHATE ROCK	1360	*	*
PITCH	1150	*	*
QUARTZ, SOLID - 50 TO 76mm LUMPS	1440 TO 1520	35	*
38 TO 50mm	1440 TO 1520	35	*
DUST	1360 TO 1440	40	*
ROCK, SOFT, EXCAVATED BY SHOVEL	1120 TO 1280	*	20
RUBBER	1600 TO 1760	*	*
RUBBER - RECLAIM	930	*	*
SALT - COARSE	930	*	25
FINES	640 TO 900	45	5
LUMP FOR STOCK	720	*	25
SAND - BEACH OR RIVER, WET	1600	15 TO 30	5 TO 15
DRY	1600 TO 2080	30 TO 45	15
FOUNDRY, LOOSE	1440 TO 1600	*	15
FOUNDRY, RAMMED LUMPS	1280 TO 1440	*	10
SANDSTONE	1600 TO 1760	*	*
SAWDUST	1360 TO 1660	35	5
SHALE - BROKEN	160 TO 200	*	*
CRUSHED	1360 T0 1440	39	*
SLAG - BALST FURNACE, CRUSHED	1280 TO 1440	25	25
GRANULATED, DRY	960 TO 1040	25	10
GRANULATED, WET	1440 TO 1600	45	10
SLATE - 38 TO 75mm LUMPS	1360 TO 1520		
13mm SCREENINGS	1280 TO 1440	28	*
SODA ASH	800 TO 1040	32	*
SUGAR CRANE STALKS	400	*	*
SUGAR - RAW	880	37 TO 45	
REFINED	880	*	*
SULPHUR - 50 TO 76mm LUMPS	1360 TO 1440	35	25
13mm SCREENINGS	1200 TO 1350	*	15
TALC - SOLID	2640	*	*
50 TO 76mm LUMPS	1440 TO 1520	*	*
DUST	1220 TO 1280	*	*
TURF - DRY	480	*	*
WHEAT	720 TO 770	28	10
ZINC ORES - CRUSHED	2400 TO 2560	38	20
ZINC OXIDE - LIGHT	160 TO 480	*	10
HEAVY	480 TO 560	*	10

Cross Section Areas

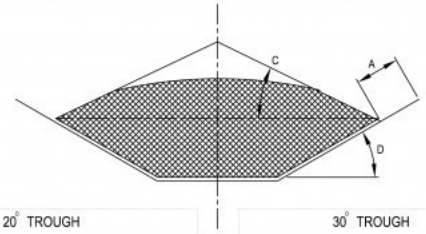
Cross sectional areas (CSA) tabulated below are given in square meters, for various surcharge angles. They take into account commonly experienced load fluctuations and are based on a standard edge distance.

"A" = 0.055 "B" + 22.5 where "B" is the belt width.

A = Standard Edge Distance = 0.055 "B" +22.5

C = Surcharge Angle

D = Trough Angle



20° TROUGH

BELT WIDTH	SURCHARGE ANGLE					
	0°	5°	10°	15°	20°	25°
450	0.007	0.010	0.011	0.013	0.014	0.016
500	0.010	0.012	0.014	0.016	0.018	0.020
600	0.015	0.018	0.021	0.025	0.028	0.031
750	0.250	0.030	0.035	0.040	0.045	0.051
800	0.290	0.034	0.041	0.046	0.053	0.060
900	0.380	0.044	0.052	0.061	0.068	0.076
1000	0.480	0.056	0.066	0.076	0.086	0.096
1050	0.520	0.063	0.074	0.084	0.095	0.106
1200	0.690	0.083	0.097	0.112	0.126	0.141
1400	0.960	0.116	0.136	0.154	0.175	0.192
1500	0.112	0.133	0.156	0.179	0.202	0.225
1600	0.129	0.153	0.179	0.204	0.230	0.257
1800	0.165	0.196	0.229	0.262	0.294	0.329
2000	0.205	0.244	0.284	0.325	0.366	0.408

30° TROUGH

BELT WIDTH	SURCHARGE ANGLE					
	0°	5°	10°	15°	20°	25°
450	0.011	0.012	0.014	0.016	0.018	0.020
500	0.014	0.017	0.018	0.021	0.023	0.026
600	0.021	0.025	0.028	0.031	0.035	0.038
750	0.036	0.041	0.045	0.052	0.057	0.063
800	0.042	0.048	0.053	0.060	0.066	0.073
900	0.052	0.060	0.068	0.076	0.084	0.092
1000	0.068	0.079	0.086	0.098	0.108	0.118
1050	0.078	0.089	0.095	0.111	0.122	0.133
1200	0.101	0.115	0.126	0.144	0.159	0.174
1400	0.141	0.162	0.175	0.200	0.221	0.243
1500	0.160	0.183	0.202	0.228	0.252	0.275
1600	0.184	0.210	0.230	0.262	0.289	0.316
1800	0.235	0.269	0.294	0.335	0.369	0.404
2000	0.294	0.336	0.366	0.417	0.459	0.503

35° TROUGH

BELT WIDTH	SURCHARGE ANGLE					
	0°	5°	10°	15°	20°	25°
450	0.012	0.014	0.015	0.017	0.019	0.021
500	0.016	0.018	0.020	0.022	0.024	0.027
600	0.024	0.028	0.031	0.034	0.037	0.041
750	0.040	0.046	0.051	0.056	0.062	0.068
800	0.047	0.053	0.059	0.065	0.072	0.078
900	0.061	0.069	0.076	0.084	0.092	0.101
1000	0.077	0.088	0.097	0.106	0.116	0.127
1050	0.097	0.108	0.119	0.130	0.141	0.152
1200	0.113	0.128	0.142	0.156	0.171	0.180
1400	0.159	0.180	0.199	0.221	0.246	0.261
1500	0.180	0.203	0.225	0.248	0.272	0.296
1600	0.207	0.233	0.259	0.285	0.312	0.339
1800	0.650	0.299	0.331	0.364	0.398	0.433
2000	0.330	0.373	0.412	0.453	0.496	0.539

45° TROUGH

BELT WIDTH	SURCHARGE ANGLE					
	0°	5°	10°	15°	20°	25°
450	0.014	0.061	0.018	0.020	0.022	0.024
500	0.019	0.021	0.023	0.025	0.027	0.030
600	0.029	0.033	0.036	0.039	0.042	0.046
750	0.048	0.063	0.058	0.064	0.069	0.075
800	0.055	0.062	0.068	0.074	0.080	0.086
900	0.071	0.080	0.087	0.095	0.103	0.111
1000	0.090	0.101	0.110	0.120	0.130	0.144
1050	0.100	0.111	0.122	0.133	0.144	0.155
1200	0.133	0.148	0.162	0.176	0.191	0.206
1400	0.186	0.207	0.226	0.250	0.274	0.288
1500	0.211	0.234	0.256	0.790	0.303	0.327
1600	0.242	0.269	0.294	0.320	0.347	0.375
1800	0.310	0.344	0.377	0.410	0.444	0.479
2000	0.387	0.429	0.469	0.510	0.552	0.596

THE TABLE GIVEN ON THE PRECEDING PAGE CAN BE USED AS FOLLOWS:
"A" TO FIND TONNES/HOUR
T/Hr = 3.6XBELT SPEED (M/SEC) X CSA (M) X MATERIAL DENSITY (Kg/M)

"B" TO FIND BELT SPEED - METERS PER SECOND

$$M/s = \frac{\text{TONNES /HOUR}}{3.6 \times CSA(M^2) \times \text{MATERIAL DENSITY } (Kg/m^3)}$$

"C" TO FIND BELT WIDTH "B" - TAKE THE FOLLOWING STEPS:

1) CALCULATE REQUIRED CROSS-SECTIONAL AREA

$$CSA = \frac{\text{TONNES PER HOUR}}{3.6 \times \text{BELT SPEED (M/S)} \times \text{MATERIAL DENSITY } (Kg/M^3)}$$

2) DECIDE TROUGHING ANGLE TO BE USED

3) ASCERTAIN SURCHARGE ANGLE FOR MATERIAL TO BE CONVEYED.

4) REFER TO APPROPRIATE CSA TABLE - LOOK DOWN SELECTED SURCHARGE ANGLE COLUMN FOR THE CSA CALCULATED ABOVE IN STEP 1 AND THEN HORIZONTALLY OPPOSITE THIS VALUE IS THE REQUIRED BELT WIDTH.

NOTE: IT MAYBE NECESSARY TO SELECT A BELT WIDER THAN FOUND FROM STEP 2 WHERE OTHER FACTORS SUCH AS CONVEYOR SLOP LUMP SIZES TO BE CONVEYED OR IDLER SPACING CAN INFLUENCE CHOICE. GENERALLY PRACTICAL INFORMATION ON THESE FACTORS ARE GIVEN ELSEWHERE IN THIS CATALOGUE. IF IN DOUBT PLEASE CONSULT US.

POWER REQUIREMENTS FOR CONVEYOR DRIVES:
TODAY'S TREND TO LONGER, WIDER, FASTER CONVEYORS CARRYING VERY MUCH GREATER LOADS COUPLED WITH THE SIGNIFICANT ADVANCES MADE IN THE DESIGN OF CONVEYOR COMPONENTS CAN MAKE THE CORRECT CHOICE OF MOTOR POWER REQUIREMENT A MUCH COMPLEX DECISION.

FREQUENTLY A STRICTLY MATHEMATICAL SOLUTION IS NOT POSSIBLE AND WHILE WE GIVE BELOW A POWER CALCULATION FORMULA TO QUICKLY CALCULATE THE "BASIC POWER" REQUIREMENT" THIS FORMULA SHOULD ONLY BE USED FOR THE MORE STRAIGHTFORWARD INSTALLATIONS AS IT APPLIES AN AVERAGE FRICTIONAL RESISTANCE FACTOR AND DOES NOT TAKE INTO ACCOUNT ACCESSORIES SUCH AS SKIRTS,, PLOUGHS, SCRAPERS AND TRIPPERS ETC. ALSO THIS FORMULA IS NOT RECOMMENDED FOR CONVEYORS BELOW 20 METERS IN LENGTH WHERE MORE ACCURATE ASSESSMENT OF INDIVIDUAL RESISTANCE'S AND FRICTION IS REQUIRED, AND DOES NOT INCLUDE AN ALLOWANCE FRO TRANSMISSION LOSSES IN THE DRIVE UNIT COMPONENTS

THE FORMULA IS:

$$Kw = \frac{0.0225\,(L + Tf)\,(W + 3.6\,S)}{367} + \frac{WH}{367}$$

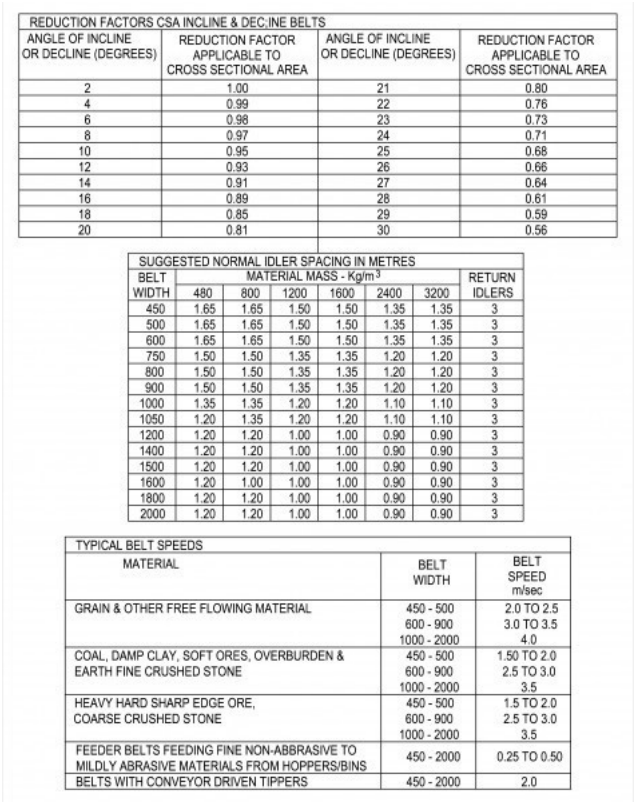
WHERE:
kW = NET POWER INPUT AT DRIVING DRUM IN KILOWATTS
L = CONVEYOR HORIZONTAL CENTRES IN METRES
Tf = TERMINAL FRICTION FACTOR

L =		
	0 TO 300	Tf=60
	300 TO 1200	Tf =45
	1200 TO 1800	Tf=30
	>1800	Tf=0

S = BELT SPEED IN METRES PER SECOND
H = VERTICAL LIFT OR DROP IN METRES
W = WEIGHT OF MATERIAL TO BE CONVEYED IN TONNES PER HOUR

- AS AN ADDED SERICE MASON ENGINEERS WILL PROVIDE OR CHECK POWER REQUIREMENTS FOR YOU
- PLEASE DO NOT HESITATE TO CONTACT US.

Reduction Factors CSA Incline & Decline Belts



REDUCTION FACTORS CSA INCLINE & DEC;INE BELTS

ANGLE OF INCLINE OR DECLINE (DEGREES)	REDUCTION FACTOR APPLICABLE TO CROSS SECTIONAL AREA	ANGLE OF INCLINE OR DECLINE (DEGREES)	REDUCTION FACTOR APPLICABLE TO CROSS SECTIONAL AREA
2	1.00	21	0.80
4	0.99	22	0.76
6	0.98	23	0.73
8	0.97	24	0.71
10	0.95	25	0.68
12	0.93	26	0.66
14	0.91	27	0.64
16	0.89	28	0.61
18	0.85	29	0.59
20	0.81	30	0.56

SUGGESTED NORMAL IDLER SPACING IN METRES

BELT WIDTH	MATERIAL MASS - Kg/m³						RETURN IDLERS
	480	800	1200	1600	2400	3200	
450	1.65	1.65	1.50	1.50	1.35	1.35	3
500	1.65	1.65	1.50	1.50	1.35	1.35	3
600	1.65	1.65	1.50	1.50	1.35	1.35	3
750	1.50	1.50	1.35	1.35	1.20	1.20	3
800	1.50	1.50	1.35	1.35	1.20	1.20	3
900	1.50	1.50	1.35	1.35	1.20	1.20	3
1000	1.35	1.35	1.20	1.20	1.10	1.10	3
1050	1.20	1.35	1.20	1.20	1.10	1.10	3
1200	1.20	1.20	1.00	1.00	0.90	0.90	3
1400	1.20	1.20	1.00	1.00	0.90	0.90	3
1500	1.20	1.20	1.00	1.00	0.90	0.90	3
1600	1.20	1.00	1.00	1.00	0.90	0.90	3
1800	1.20	1.20	1.00	1.00	0.90	0.90	3
2000	1.20	1.20	1.00	1.00	0.90	0.90	3

TYPICAL BELT SPEEDS

MATERIAL	BELT WIDTH	BELT SPEED m/sec
GRAIN & OTHER FREE FLOWING MATERIAL	450 - 500 600 - 900 1000 - 2000	2.0 TO 2.5 3.0 TO 3.5 4.0
COAL, DAMP CLAY, SOFT ORES, OVERBURDEN & EARTH FINE CRUSHED STONE	450 - 500 600 - 900 1000 - 2000	1.50 TO 2.0 2.5 TO 3.0 3.5
HEAVY HARD SHARP EDGE ORE, COARSE CRUSHED STONE	450 - 500 600 - 900 1000 - 2000	1.5 TO 2.0 2.5 TO 3.0 3.5
FEEDER BELTS FEEDING FINE NON-ABBRASIVE TO MILDLY ABRASIVE MATERIALS FROM HOPPERS/BINS	450 - 2000	0.25 TO 0.50
BELTS WITH CONVEYOR DRIVEN TIPPERS	450 - 2000	2.0

Crane and Lifting Equipment Servicing

Mason Engineers offer qualified Service Technicians, proficient in both electrical and mechanical disciplines, with vast experience in service / repair work on many makes of overhead cranes and smaller rope and chain hoists. Masons are also able to provide Load Testing Services.

Mason Engineers are also able to provide lifting equipment inspections to a wide range of gear.
All Inspection work is comprehensively recorded using our documentation, which a copy is kept by the Client.