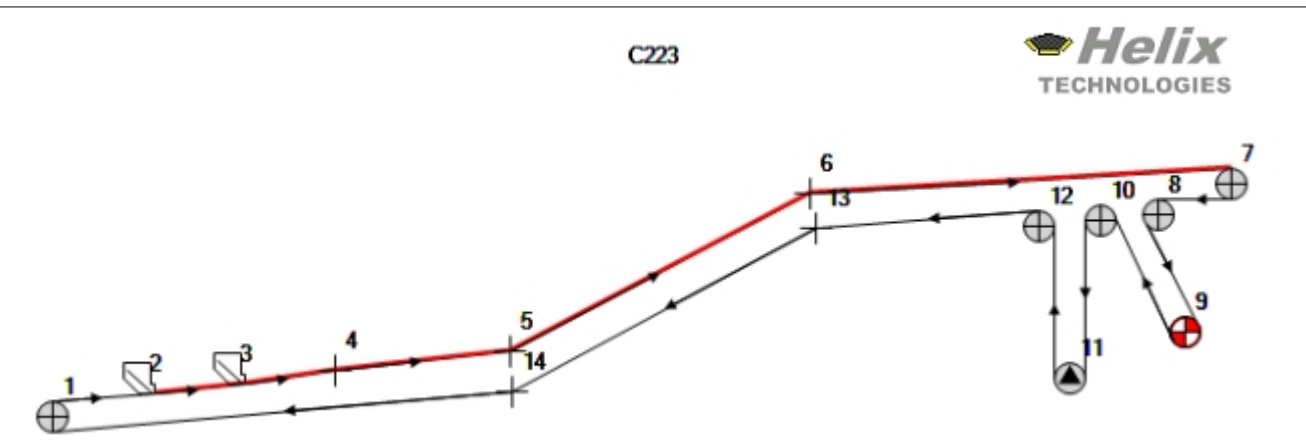


Helix Technologies Pty Ltd

Project	Demo Conveyor High Lift	Client	ABC Iron
Project No.	P9823	Prepared By	Peter Burrow
Conveyor No.	C223	Design Date	14 January 2010



Conveyed Material

Material Description	Iron ore, Lump & Fines Product	Surcharge Angle	15 deg
Low Bulk Density	1860 kg/m3	Angle of Repose	34 deg
High Bulk Density	2400 kg/m3	Material Lump size	31.5 mm

Conveyor Data

Conveying Distance	287.57 m	Design Capacity	9400 tonnes/hr
Nett Lift / Lower (-)	33.44 m	Belt Speed	4.3 m/s

Belt Details

Belt Width Selected	1800 mm	Calculated Belt % Full	90.5 %
Belt Class & Run Safety Factor	ST-1800 7.58	Top Cover Thickness	22 mm
Belt Rated Tension	253 kN/m	Bottom Cover Thickness	7 mm
Belt Total Length	630.7 m	Belt Mass	81.70 kg/m

Belt Tensions and Power Calculations ISO

Effective Tens. Fully Loaded	296.86 kN	Belt Power - Empty Belt	106.35 kW
Maximum Tension Tmax	427.57 kN	Belt Power - Inclines Loaded	1251.24 kW
Minimum Tension Tmin	119.30 kN	Belt Power - Declines Loaded	227.16 kW
Sag Tension 1.1 %	76.78 kN	Belt Power - Fully Loaded	1276.51 kW
Takeup Type	Vertical Gravity	Drive Efficiency	95.0 %
Takeup Mass	26700 kg	Absorbed Power Fully Loaded	1315.94 kW
Takeup Pulley Belt Tension	130.92 kN	Installed Motor Power	1260 kW

Carry and Return Idlers

Carry Idler Trough Angle	35 °	Return Idler Trough Angle	0 °
Carry Idler Spacing	1 m	Return Idler Spacing	3 m
Carry Idler No Rolls x Dia	3 x 152 mm	Return Idler No Rolls x Dia	1 x 152 mm

Dynamics and Miscellaneous Data

Startup Factor - Fully Loaded	122 %	CEMA Temperature Factor Kt	1.00
Startup Factor - Empty	122 %	Total Braking Torque LSS	26.50 kNm
Starting Time - Fully Loaded	25.81 sec	Stop Time - Loaded, Braking	4.26 sec
Starting Time - Empty	2.33 sec	Stop Time - Loaded, Coasting	5.01 sec

Designers Comments

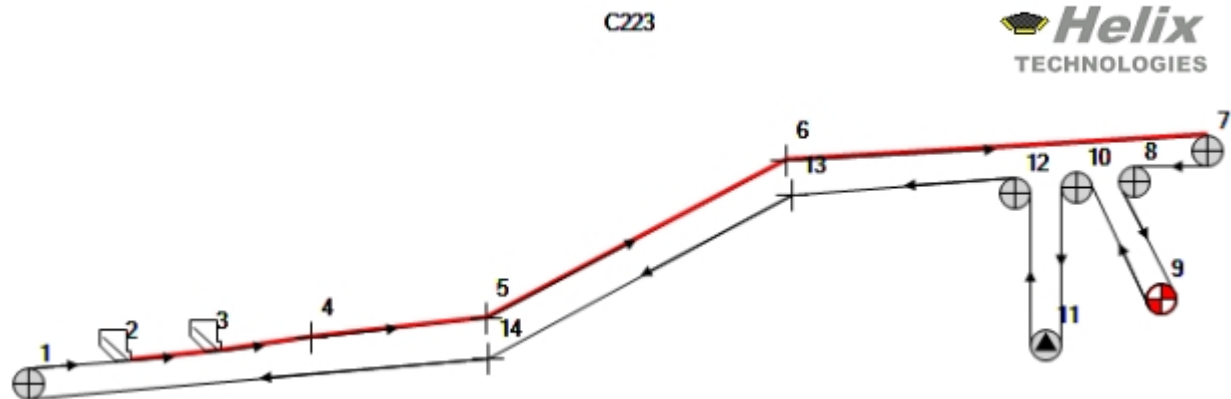
C223 at 9400tph capacity existing case.



Helix Technologies Pty Ltd

Project Demo Conveyor High Lift
 Project No. P9823
 Conveyor No. C223

Client ABC Iron
 Prepared By Peter Burrow
 Design Date 14 January 2010



Station / Section

Station	Description	Section Length m	Section Lift m	X co-ord m	Y co-ord m	Z co-ord m	Capacity tph	Ten Adj. kN	Idler Spacing m	Skirt Length m	No. of Scrapers	Friction Factor Input
1 Tail	Tail	6.85	0.33	0.00	0.00	-10.20	0		1.00			0.0000
2 Hopper		8.16	0.35	6.82	0.00	-9.44	9400		0.45	8.20		0.0000
3 Hopper		10.91	0.30	14.97	0.00	-9.10	9400		0.45	10.90		0.0000
4 Int. Pt		33.74	1.15	25.88	0.00	-8.80	9400		1.50	1.90		0.0000
5 Int. Pt	Mid belt	164.30	26.16	59.60	0.00	-7.65	9400		1.50			0.0000
6 Int. Pt	0	70.46	5.50	221.80	0.00	18.50	9400		1.20			0.0000
7 Head	Head	39.29	-2.10	292.08	0.00	23.50	0		3.00		2	0.0000
8 Bend	HT Bend	10.96	-7.55	252.90	0.00	20.40	0		3.00			0.0000
9 Drive	Drive	12.67	8.63	260.09	0.00	12.19	0		3.00			0.0000
10 Bend	Lt Bend 1	6.97	-6.97	250.11	0.00	20.22	0		3.00			0.0000
11 Takeup	Takeup	6.98	6.98	249.20	0.00	13.25	0		3.00			0.0000
12 Bend	LT Bend 2	26.60	-2.69	248.29	0.00	20.23	0		2.40			0.0000
13 Int. Pt		164.30	-26.16	221.80	0.00	17.97	0		3.00			0.0000
14 Int. Pt		59.64	-2.44	59.60	0.00	-8.19	0		3.00		2	0.0000
Totals:		621.82	1.49					0.00		21.00	4	

Designers Comments

C223 at 9400tph capacity existing case.



Helix Technologies Pty Ltd

Project Demo Conveyor High Lift
 Project No. P9823
 Conveyor No. C223

Client ABC Iron
 Prepared By Peter Burrow
 Design Date 14 January 2010



Drive Torque Start-up Factor Loaded **122 %**

Drive Torque Start-up Factor Empty **122 %**

Takeup Mass **26700 kg**

Drive Number	Running		Starting		Braking	
	Fully Loaded	Empty Belt	Fully Loaded	Empty Belt	Fully Loaded	Empty Belt
Drive No. 1 Drive						
Pulley No. 9 Lagging Type	Ceramic		Ceramic		Ceramic	
Wrap Angle °	180	180	180	180	180	180
Co-efficient of Friction	0.35	0.35	0.45	0.45	0.45	0.45
Drive Factor Cw	0.499	0.499	0.321	0.321	0.321	0.321
Calculated Belt Tension T1 kN	421.65	150.95	462.11	277.01	176.74	120.45
Calculated Belt Tension T2 kN	127.76	127.8	142.09	123.41	133.19	128.77
Minimum Required T2 kN	146.65	11.55	102.73	49.31	13.98	2.67
Surplus T2 Tension (T1-T2) kN	-18.89	116.25	39.36	74.1	119.21	117.78

Additional Takeup Mass Required **3852 kg**

Limiting Case: Running Full

Required Friction Factor **0.38**

Warning: Insufficient Drive Traction

Required Wrap Angle **195.5 °**

Designers Comments

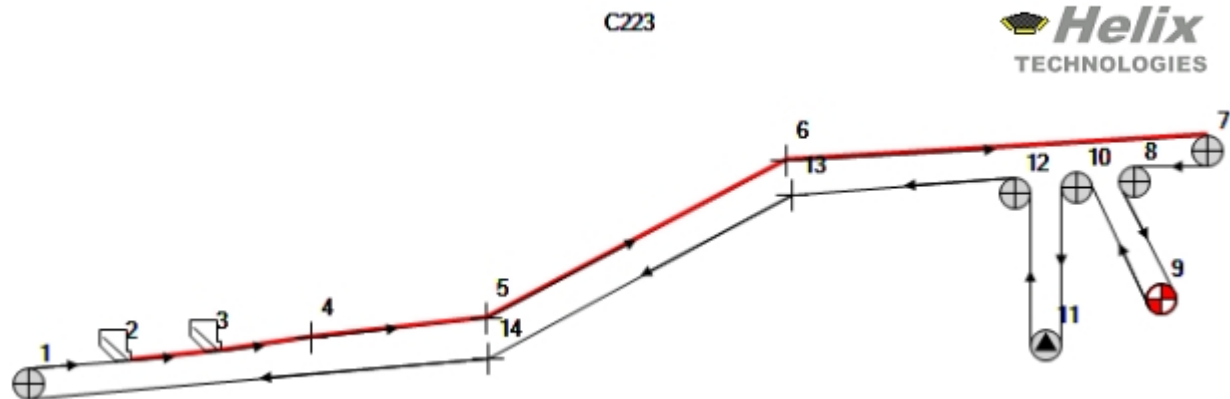
C223 at 9400tph capacity existing case.



Helix Technologies Pty Ltd

Project Demo Conveyor High Lift
 Project No. P9823
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 Prepared By Peter Burrow
 Design Date 14 January 2010



Drive Torque Start-up Factor Loaded 122 %

Drive Torque Start-up Factor Empty 122 %

Takeup Mass 26700 kg

Station No	Running				Starting		Braking		Coasting	
	Fully Loaded Tension kN	Empty Tension kN	Inclines Loaded Tension kN	Declines Loaded Tension kN	Fully Loaded Tension kN	Empty Tension kN	Fully Loaded Tension kN	Empty Tension kN	Fully Loaded Tension kN	Empty Tension kN
1 Tail	119.63	119.63	119.63	119.63	123.97	167.80	93.34	107.97	97.25	115.86
2 Hopper	121.40	121.40	121.40	121.40	126.07	173.17	93.16	108.88	97.35	117.35
3 Hopper	142.78	121.88	142.78	139.75	148.49	176.02	108.24	108.78	113.37	117.65
4 Int. Pt	155.17	122.39	155.19	149.09	162.27	179.70	112.23	108.53	118.60	117.91
5 Int. Pt	169.73	123.86	169.90	152.10	180.83	187.65	102.58	108.43	112.55	118.87
6 Int. Pt	371.50	147.48	372.70	175.72	402.08	243.04	186.39	124.36	213.88	140.01
7 Head	418.40	153.10	420.71	181.34	457.41	263.03	182.30	126.51	217.35	144.50
8 Bend	423.11	155.13	422.74	183.37	463.06	275.55	181.28	125.99	217.18	145.71
9 Drive	421.65	150.95	418.56	179.19	462.11	277.01	176.74	120.45	213.10	141.09
10 Bend	134.83	134.87	134.87	134.87	149.38	132.87	138.95	135.26	140.55	135.84
11 Takeup	130.92	130.92	130.92	130.92	130.92	130.92	130.92	130.92	130.92	130.92
12 Bend	138.09	138.09	138.09	138.09	138.38	141.38	136.29	137.29	136.56	137.83
13 Int. Pt	137.90	137.90	137.90	137.90	138.80	147.87	132.46	135.49	133.27	137.12
14 Int. Pt	119.30	119.30	119.30	119.30	122.72	157.30	98.57	110.11	101.64	116.33
Minimum Ten	119.30	119.30	119.30	119.30	122.72	130.92	93.16	107.97	97.25	115.86
Maximum Ten	423.11	155.13	422.74	183.37	463.06	277.01	186.39	137.29	217.35	145.71
Effective Ten	296.86	24.73	290.99	52.83						
Ave. Belt Ten	222.02	134.26	222.32	149.12	236.79	192.64	135.30	120.13	148.24	129.72
Belt Elong. m	0.262	0.025	0.263	0.065	0.302	0.183	0.028	-0.013	0.063	0.013
T/up Travel m	0.131	0.012	0.132	0.032	0.151	0.092	0.014	-0.006	0.032	0.006

Designers Comments

C223 at 9400tph capacity existing case.



Helix Technologies Pty Ltd

Project	Demo Conveyor High Lift	Client	ABC Iron
Project No.	P9823	Prepared By	Peter Burrow
Conveyor No.	C223	Design Date	14 January 2010



Low BD = 1860kg/m3

High BD = 2400kg/m3

Conveyed Material		Belt Speed & Capacity	
Material Description	Iron ore, Lump & Fines Product	Belt Speed	4.3 m/s
Low Bulk Density	1860 kg/m3	Belt Design Capacity Input	9400 tonnes/hr
High Bulk Density	2400 kg/m3	Section Loading Max Capacity	9400 tonnes/hr
Surcharge Angle	15 deg	Carry Idler Trough Angle	35 °
Angle of Repose	34 deg	Belt Dimensions	
Material Lump size	31.5 mm	Top Cover Thickness	22 mm
Belt Make & Class		Bottom Cover Thickness	7 mm
Belt Category	Bando Steel	Belt Carcass Thickness	4.4 mm
Belt Description	BANDO STEEL CORD	Belt Total Thickness	33.4 mm
Belt Class / Plies	ST-1800 0	Belt Total Belt Length (L)	630.7 m
Belt Reinforcement Fibre	Steel	Time for 1 Revolution	146.7 sec
Belt Width Selected	1800 mm	Belt Load Area and Capacity at 1860kg/m3	
Belt Modulus	129600 kN/m	Minimum Rec. Edge Distance	122 mm
Cord Diameter	4.4 mm	Actual Edge Distance Low BD	150 mm
Cord Pitch	10.0 mm	Load Burden Depth	305 mm
Number of Cords	0	Load Burden Width	1208 mm
Belt Tensions		Belt Load Area at Minimum Recommended Edge Distance	0.3608 m2
Belt Rated Tension / m width	253 kN/m	Belt Load Area Utilised at Low Bulk Density	0.3265 m2
Calculated Tension / m width	237.5 kN/m	Belt Actual % Full at Low BD	90.5 %
Belt Rated Tension for width	455.4 kN	Belt Load Area and Capacity at 2400kg/m3	
Calculated Max Run Tension	427.57 kN	Minimum Rec. Edge Distance	122 mm
Minimum Tension Tmin	119.30 kN	Actual Edge Distance High BD	230 mm
Allowable Tension Rise, Starting	150 %	Belt Load Area Utilised at High Bulk Density	0.253 m2
Allowable Belt Tension, Starting	683.1 kN	Belt Actual % Full at High BD	70.1 %
Actual Belt Tension, Starting	467.84 kN	Flooded Belt Capacity at 2400kg/m3	
Belt and Material Mass		Flooded Belt Load Area at Zero Edge Distance	0.4846 m2
Belt Top Cover Mass	44.7 kg/m	Flooded Belt Capacity	18003 tonnes/hr
Belt Bottom Cover Mass	14.2 kg/m	Flooded Belt Material Mass	1163 kg/m
Belt Carcass Mass	21.1 kg/m		
Belt Mass Wb (per linear m)	81.7 kg/m		
Material Mass Wm	607.2 kg/m		
Total Mass (Wb + Wm)	688.9 kg/m		
Total Belt Mass (Wb x L)	51528 kg		

Designers Comments

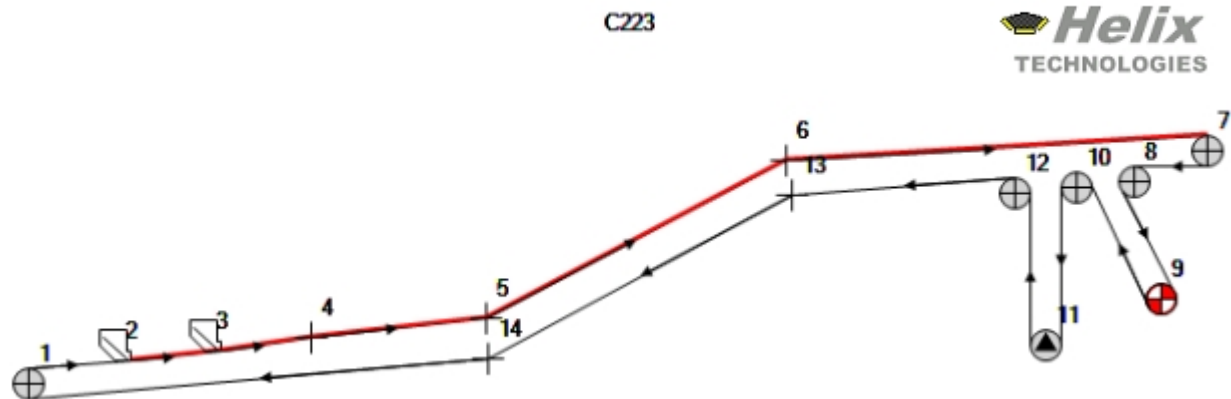
C223 at 9400tph capacity existing case.



Helix Technologies Pty Ltd

Project Demo Conveyor High Lift
 Project No. P9823
 Conveyor No. C223

Client ABC Iron
 Prepared By Peter Burrow
 Design Date 14 January 2010



Allowable Belt Sag % Running 1.1 %

Allowable Belt Sag % Start / Stop 5 %

Takeup Mass 26700 kg

Station No	Running				Starting		Braking		Coasting	
	Fully Loaded Tension kN	Empty Tension kN	Inclines Loaded Tension kN	Declines Loaded Tension kN	Fully Loaded Tension kN	Empty Tension kN	Fully Loaded Tension kN	Empty Tension kN	Fully Loaded Tension kN	Empty Tension kN
1 Tail	119.63	119.63	119.63	119.63	123.97	167.80	93.34	107.97	97.25	115.86
Idler Spacing m	1.00									
Belt Sag %	0.08	0.08	0.08	0.08	0.08	0.06	0.11	0.09	0.1	0.09
2 Hopper	121.40	121.40	121.40	121.40	126.07	173.17	93.16	108.88	97.35	117.35
Idler Spacing m	0.45									
Belt Sag %	0.31	0.04	0.31	0.04	0.3	0.03	0.41	0.04	0.39	0.04
3 Hopper	142.78	121.88	142.78	139.75	148.49	176.02	108.24	108.78	113.37	117.65
Idler Spacing m	0.45									
Belt Sag %	0.27	0.04	0.27	0.03	0.26	0.03	0.35	0.04	0.34	0.04
4 Int. Pt	155.17	122.39	155.19	149.09	162.27	179.70	112.23	108.53	118.60	117.91
Idler Spacing m	1.50									
Belt Sag %	0.82	0.12	0.82	0.1	0.78	0.08	1.13	0.14	1.07	0.13
5 Int. Pt	169.73	123.86	169.90	152.10	180.83	187.65	102.58	108.43	112.55	118.87
Idler Spacing m	1.50									
Belt Sag %	0.75	0.12	0.75	0.1	0.7	0.08	1.23	0.14	1.13	0.13
6 Int. Pt	371.50	147.48	372.70	175.72	402.08	243.04	186.39	124.36	213.88	140.01
Idler Spacing m	1.20									
Belt Sag %	0.27	0.08	0.27	0.07	0.25	0.05	0.54	0.1	0.47	0.09
7 Head	418.40	153.10	420.71	181.34	457.41	263.03	182.30	126.51	217.35	144.50
Idler Spacing m	3.00									
Belt Sag %	0.07	0.2	0.07	0.17	0.07	0.11	0.16	0.24	0.14	0.21
8 Bend	423.11	155.13	422.74	183.37	463.06	275.55	181.28	125.99	217.18	145.71
Idler Spacing m	3.00									
Belt Sag %	0.07	0.19	0.07	0.16	0.06	0.11	0.17	0.24	0.14	0.21
9 Drive	421.65	150.95	418.56	179.19	462.11	277.01	176.74	120.45	213.10	141.09
Idler Spacing m	3.00									
Belt Sag %	0.07	0.2	0.07	0.17	0.07	0.11	0.17	0.25	0.14	0.21
10 Bend	134.83	134.87	134.87	134.87	149.38	132.87	138.95	135.26	140.55	135.84
Idler Spacing m	3.00									
Belt Sag %	0.22	0.22	0.22	0.22	0.2	0.23	0.22	0.22	0.21	0.22



Station No	Running				Starting		Braking		Coasting	
	Fully Loaded Tension kN	Empty Tension kN	Inclines Loaded Tension kN	Declines Loaded Tension kN	Fully Loaded Tension kN	Empty Tension kN	Fully Loaded Tension kN	Empty Tension kN	Fully Loaded Tension kN	Empty Tension kN
11 Takeup	130.92	130.92	130.92	130.92	130.92	130.92	130.92	130.92	130.92	130.92
Idler Spacing m	3.00									
Belt Sag %	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23
12 Bend	138.09	138.09	138.09	138.09	138.38	141.38	136.29	137.29	136.56	137.83
Idler Spacing m	2.40									
Belt Sag %	0.17	0.17	0.17	0.17	0.17	0.17	0.18	0.18	0.18	0.17
13 Int. Pt	137.90	137.90	137.90	137.90	138.80	147.87	132.46	135.49	133.27	137.12
Idler Spacing m	3.00									
Belt Sag %	0.22	0.22	0.22	0.22	0.22	0.2	0.23	0.22	0.23	0.22
14 Int. Pt	119.30	119.30	119.30	119.30	122.72	157.30	98.57	110.11	101.64	116.33
Idler Spacing m	3.00									
Belt Sag %	0.25	0.25	0.25	0.25	0.24	0.19	0.3	0.27	0.3	0.26
Minimum Ten	119.30	119.30	119.30	119.30	122.72	130.92	93.16	107.97	97.25	115.86
Maximum Sag	0.82	0.25	0.82	0.25	0.78	0.23	1.23	0.27	1.13	0.26

Designers Comments

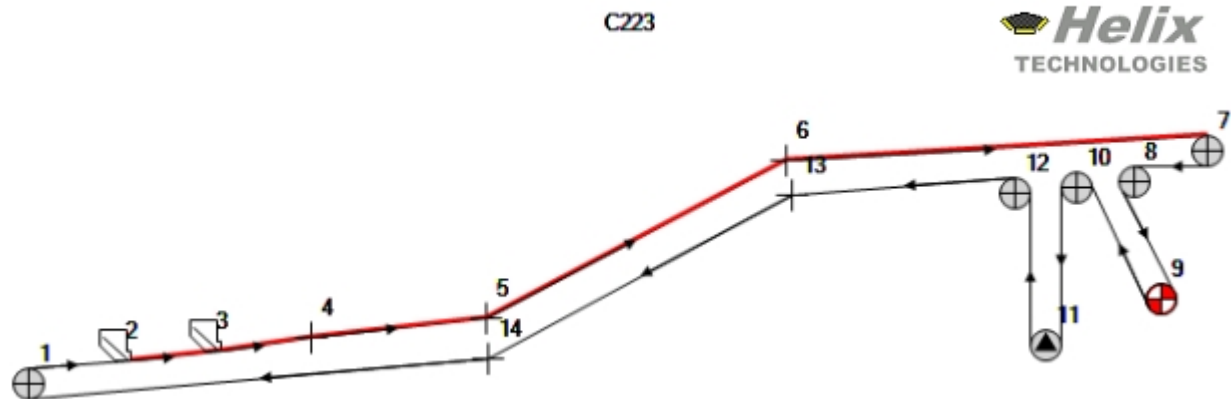
C223 at 9400tph capacity exisitng case.



Helix Technologies Pty Ltd

Project Demo Conveyor High Lift
 Project No. P9823
 Conveyor No. C223

Client ABC Iron
 Prepared By Peter Burrow
 Design Date 14 January 2010



Takeup Mass 26700 kg

Station / Pulley	Section Length m	Section Lift m	Tensions			Drive Te kN	Ten Adj. kN	Material Accel. kN	Skirt Friction kN	Scraper Friction kN	Section Effective Tension	ISO Friction Factor
			T1 Run kN	T2 Run kN	Tp Pulley							
1 Tail	6.85	0.33	119.63	121.01	1.38						0.39	0.016
2 Hopper	8.16	0.35	121.40	121.40				11.23	6.64		3.51	0.0192
3 Hopper	10.91	0.30	142.78	142.78					8.83		3.56	0.0189
4 Int. Pt	33.74	1.15	155.17	155.17					1.54		13.02	0.0224
5 Int. Pt	164.30	26.16	169.73	169.73							201.77	0.0221
6 Int. Pt	70.46	5.50	371.50	371.50							46.90	0.0197
7 Head	39.29	-2.10	418.40	422.81	4.41					1.42	-1.12	0.016
8 Bend	10.96	-7.55	423.11	427.57	4.46						-5.92	0.016
9 Drive	12.67	8.63	421.65	127.76	2.97	293.89					7.07	0.016
10 Bend	6.97	-6.97	134.83	136.43	1.60						-5.51	0.016
11 Takeup	6.98	6.98	130.92	132.42	1.50						5.67	0.016
12 Bend	26.60	-2.69	138.09	139.66	1.57						-1.76	0.016
13 Int. Pt	164.30	-26.16	137.90	137.90							-18.60	0.016
14 Int. Pt	59.64	-2.44	119.30	119.30						1.42	-1.09	0.016
Totals:					17.89	293.9	0.00	11.23	17.01	2.84	247.89	
Maximum Tension			427.57	kN				Total Effective Tension			296.86	kN
Minimum Tension			119.3	kN				Total Belt Power (Te x V)			1276.51	kW
Average Tension Fully Loaded			222.02	kN				Belt Modulus			129600	kN/m
Average Tension Belt Stationary			125.09	kN				Total Belt Length			630.70	m
Average Tension Difference			96.93	kN				Belt Elastic Elongation			0.262	m
								Takeup Movement			0.131	m

Designers Comments

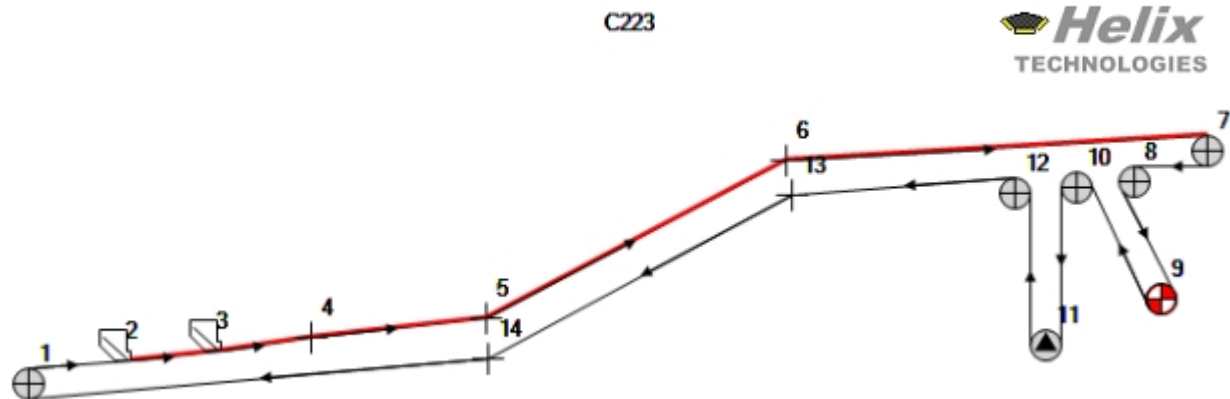
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Station / Pulley			Tensions					Material Accel. kN	Skirt Friction kN	Scraper Friction kN	Section Effective Tension	ISO Friction Factor
Station	Length m	Section Lift m	T1 Run kN	T2 Run kN	Tp Pulley	Drive Te kN	Ten Adj. kN					
1 Tail	6.85	0.33	119.63	121.01	1.38						0.39	0.016
2 Hopper	8.16	0.35	121.40	121.40							0.48	0.0192
3 Hopper	10.91	0.30	121.88	121.88							0.51	0.0189
4 Int. Pt	33.74	1.15	122.39	122.39							1.47	0.0224
5 Int. Pt	164.30	26.16	123.86	123.86							23.62	0.0221
6 Int. Pt	70.46	5.50	147.48	147.48							5.62	0.0197
7 Head	39.29	-2.10	153.10	154.83	1.72					1.42	-1.12	0.016
8 Bend	10.96	-7.55	155.13	156.87	1.74						-5.92	0.016
9 Drive	12.67	8.63	150.95	127.80	1.58	23.15					7.07	0.016
10 Bend	6.97	-6.97	134.87	136.43	1.56						-5.51	0.016
11 Takeup	6.98	6.98	130.92	132.42	1.50						5.67	0.016
12 Bend	26.60	-2.69	138.09	139.66	1.57						-1.76	0.016
13 Int. Pt	164.30	-26.16	137.90	137.90							-18.60	0.016
14 Int. Pt	59.64	-2.44	119.30	119.30						1.42	-1.09	0.016
Totals:					11.06	23.15	0.00			2.84	10.83	
Maximum Tension			156.87	kN				Total Effective Tension			24.73	kN
Minimum Tension			119.3	kN				Total Belt Power (Te x V)			106.35	kW
Average Tension Fully Loaded			134.26	kN				Belt Modulus			129600	kN/m
Average Tension Belt Stationary			125.09	kN				Total Belt Length			630.70	m
Average Tension Difference			9.17	kN				Belt Elastic Elongation			0.025	m
								Takeup Movement			0.012	m

Designers Comments

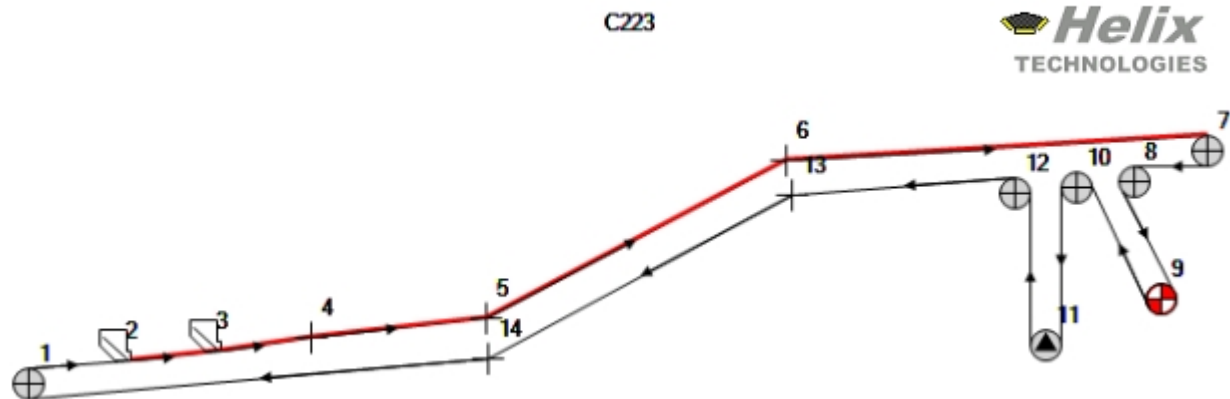
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Station / Pulley			Tensions					Material Accel. kN	Skirt Friction kN	Scraper Friction kN	Section Effective Tension	ISO Friction Factor
Station	Length m	Section Lift m	T1 Run kN	T2 Run kN	Tp Pulley	Drive Te kN	Ten Adj. kN					
1 Tail	6.85	0.33	119.63	121.01	1.38						0.39	0.016
2 Hopper	8.16	0.35	121.40	121.40				11.23	6.64		3.51	0.0192
3 Hopper	10.91	0.30	142.78	142.78					8.83		3.58	0.0191
4 Int. Pt	33.74	1.15	155.19	155.19					1.54		13.17	0.023
5 Int. Pt	164.30	26.16	169.90	169.90							202.80	0.023
6 Int. Pt	70.46	5.50	372.70	372.70							48.01	0.022
7 Head	39.29	-2.10	420.71	422.44	1.72					1.42	-1.12	0.016
8 Bend	10.96	-7.55	422.74	424.48	1.74						-5.92	0.016
9 Drive	12.67	8.63	418.56	127.80	0.23	290.76					7.07	0.016
10 Bend	6.97	-6.97	134.87	136.43	1.56						-5.51	0.016
11 Takeup	6.98	6.98	130.92	132.42	1.50						5.67	0.016
12 Bend	26.60	-2.69	138.09	139.66	1.57						-1.76	0.016
13 Int. Pt	164.30	-26.16	137.90	137.90							-18.60	0.016
14 Int. Pt	59.64	-2.44	119.30	119.30						1.42	-1.09	0.016
Totals:					17.89	293.89	0.00	11.23	17.01	2.84	247.89	
Maximum Tension			424.48	kN				Total Effective Tension			290.99	kN
Minimum Tension			119.3	kN				Total Belt Power (Te x V)			1251.24	kW
Average Tension Inclines Loaded			222.32	kN				Belt Modulus			129600	kN/m
Average Tension Belt Stationary			125.09	kN				Total Belt Length			630.70	m
Average Tension Difference			97.23	kN				Belt Elastic Elongation			0.263	m
								Takeup Movement			0.132	m

Designers Comments

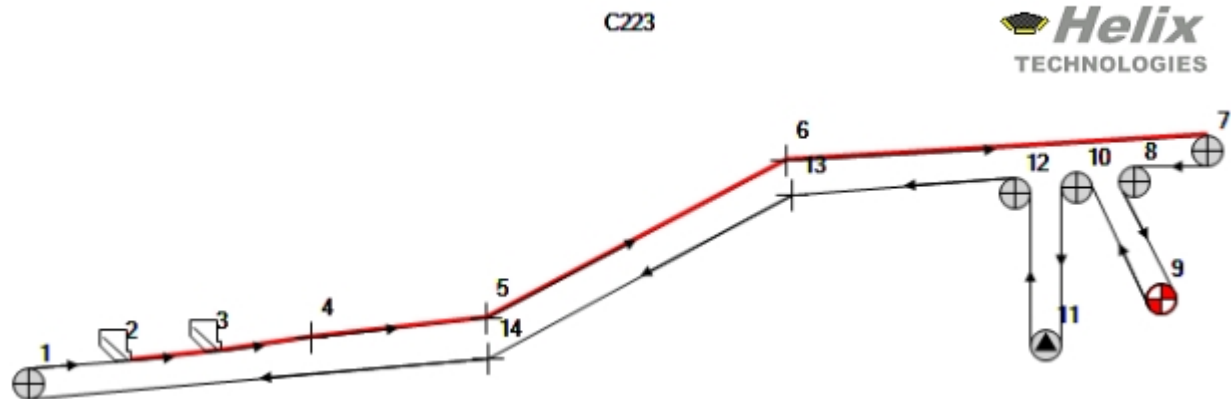
C223 at 9400tph capacity existing case.



Helix Technologies Pty Ltd

Project Demo Conveyor High Lift
 Project No. P9823
 Conveyor No. C223

Client ABC Iron
 Prepared By Peter Burrow
 Design Date 14 January 2010



Station / Pulley		Section Length m	Section Lift m	Tensions			Drive Te kN	Ten Adj. kN	Material Accel. kN	Skirt Friction kN	Scraper Friction kN	Section Effective Tension	ISO Friction Factor
				T1 Run kN	T2 Run kN	Tp Pulley							
1	Tail	6.85	0.33	119.63	121.01	1.38						0.39	0.016
2	Hopper	8.16	0.35	121.40	121.40			11.23		6.64		0.48	0.0192
3	Hopper	10.91	0.30	139.75	139.75					8.83		0.51	0.0189
4	Int. Pt	33.74	1.15	149.09	149.09					1.54		1.47	0.0224
5	Int. Pt	164.30	26.16	152.10	152.10							23.62	0.0221
6	Int. Pt	70.46	5.50	175.72	175.72							5.62	0.0197
7	Head	39.29	-2.10	181.34	183.07	1.72					1.42	-1.12	0.016
8	Bend	10.96	-7.55	183.37	185.11	1.74						-5.92	0.016
9	Drive	12.67	8.63	179.19	127.80	1.44	51.39					7.07	0.016
10	Bend	6.97	-6.97	134.87	136.43	1.56						-5.51	0.016
11	Takeup	6.98	6.98	130.92	132.42	1.50						5.67	0.016
12	Bend	26.60	-2.69	138.09	139.66	1.57						-1.76	0.016
13	Int. Pt	164.30	-26.16	137.90	137.90							-18.60	0.016
14	Int. Pt	59.64	-2.44	119.30	119.30						1.42	-1.09	0.016
Totals:						17.89	293.9	0.00	11.23	17.01	2.84	247.89	
Maximum Tension				185.11	kN	Total Effective Tension				52.83	kN		
Minimum Tension				119.3	kN	Total Belt Power (Te x V)				227.16	kW		
Average Tension Declines Loaded				149.12	kN	Belt Modulus				129600	kN/m		
Average Tension Belt Stationary				125.09	kN	Total Belt Length				630.70	m		
Average Tension Difference				24.03	kN	Belt Elastic Elongation				0.065	m		
						Takeup Movement				0.032	m		

Designers Comments

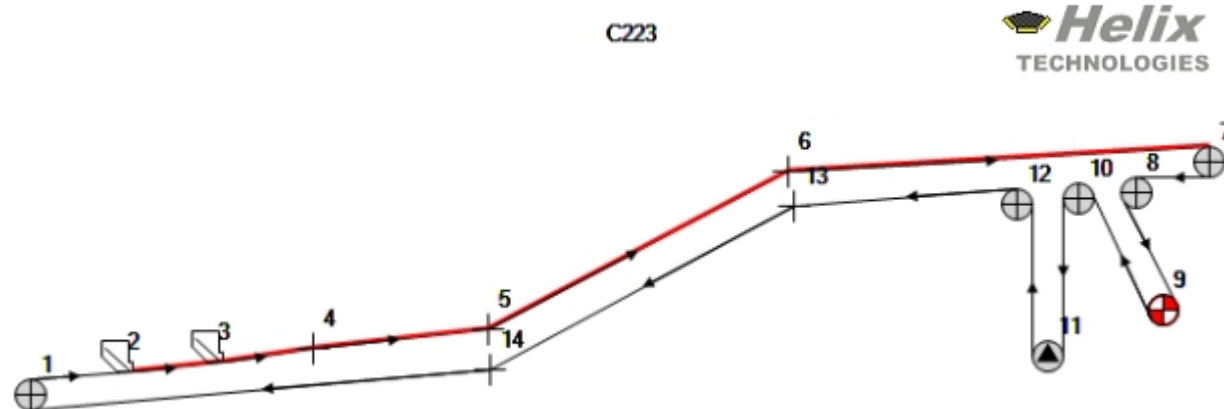
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System Masses

Mass of Belt	51,527 kg
Mass of Material	174,621 kg
Carry Idler Equivalent Mass	8,208 kg
Return Idler Equivalent Mass	3,508 kg
Pulley Equivalent Mass	9,717 kg
Drive Equivalent Mass	98,069 kg
Total System Equivalent Mass	345,650 kg

Tensions and Accelerating Forces

Effective Tens. Fully Loaded	296.86 kN
Effective Tension Empty	24.73 kN
Total Braking Force	51.76 kN
Tension Available to Accelerate Conveyor	
Accelerating Tension - Loaded	57.59 kN
Accelerating Tension - Empty	316.12 kN

Starting Times & Acceleration Rates

Starting Time - Fully Loaded	25.81 sec
Starting Time - Empty	2.33 sec
Acceleration Rate - Loaded	0.17 m/s ²
Accelerating Rate - Empty	1.85 m/s ²

Belt Tension Rise Starting / Braking

Max Belt Tension, Start/Brake	467.84 kN
Belt Width	1800 mm
Maximum Belt Tension / width	259.91 kN/m
Belt Rated Tension / width	253 kN/m
Actual Max Tension, Start/Brake	102.7 %

Input Data

Belt Speed	4.3 m/s
Belt Rated Tension	253 kN/m
Allow. Belt Start Tension Rise	150 %
Drive Inertia	170.428 kg-m ²
Total Braking Torque	26.5 kNm
Start-up Factor - Loaded	122 %
Start-up Factor - Empty	122 %
Installed Power	1260 kW
Drive Efficiency (Average)	95 %

Stopping Times & Deceleration Rates

Stopping Time Loaded Braking	4.26 sec
Stopping Time Loaded Coasting	5.01 sec
Stopping Time Empty Braking	9.61 sec
Stopping Time Empty Coasting	29.73 sec
Deceleration - Loaded Braking	-1.01 m/s ²
Deceleration - Loaded Coasting	-0.86 m/s ²
Deceleration - Empty Braking	-0.45 m/s ²
Deceleration - Empty Coasting	-0.14 m/s ²

Stopping Distances & Discharge Volumes

Stopping Distance Loaded Braking	9.17 m
Stopping Distance Loaded Coasting	10.76 m
Stopping Distance Empty Braking	20.67 m
Stopping Distance Empty Coasting	63.93 m
Discharge Mass, Braking	5566 kg
Discharge Mass, Coasting	6537 kg
Discharge Volume, Braking	2.99 m ³
Discharge Volume, Coasting	3.51 m ³

Designers Comments

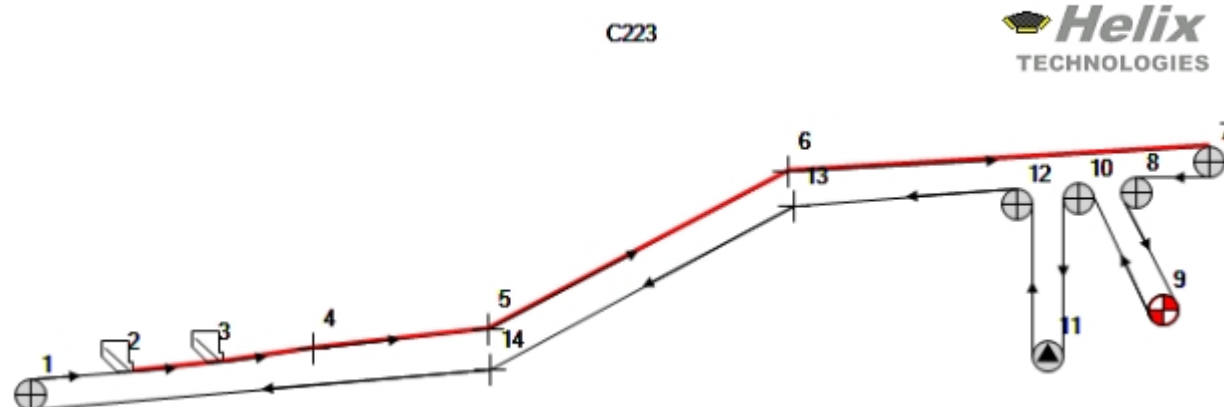
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TECHNOLOGIES

Carry Side Idlers

Return Side Idlers

Idler Category	<i>Prok Carry</i>	<i>Prok Flat Return</i>
Idler Description	Series 55 3 Roll Carry 152 Plain Inline	Series 45 1 Roll Flat Carry 152 Dia
Idler Design Belt Width	1800 mm	1800 mm
Idler Series	55	45
Drawing Number		
Nominal Idler Spacing	1 m	3 m
Total Number of Idlers	240	111
Idler Price	0	0
Troughing Angle	35.0 deg	0.0 deg
Idler Shaft Diameter	45.0 mm	45.0 mm
Idler Bearing Diameter	45.0 mm	35.0 mm
Number of Idler Rolls	3	1
Idler Roll Diameter	152 mm	152 mm
Idler Rotation Speed	540 rpm	540 rpm
Roll Face Width	633 mm	2050 mm
Roll Bearing Centres	535.9 mm	1976.2 mm
Shaft Support Centres	659.5 mm	2078 mm
Idler Support Fixing Width	2200 mm	2200 mm
Idlerset Rotating Mass	34.2 kg	31.6 kg
Idlerset Total Mass	117.4 kg	67.6 kg
Idler Vertical Misalignment Allowance	4.0 mm	36.0 mm
Dynamic Load Factor	1.26	1.40
Belt Deviation Load	667 N	500 N
Total Load on Centre Roll	6,316 N	4,680 N
Type of Bearing	Ball	Ball
Bearing Designation	6309	6307
Bearing Dynamic Load Rating C	52,700 N	33,200 N
Bearing L10h Life	143,377 hrs	88,120 hrs
Allowable Shaft Deflection at Bearing	8.00 min	10.00 min
Actual Shaft Deflection at Bearing	4.25 min	9.57 min

Designers Comments

C223 at 9400tph capacity existing case.

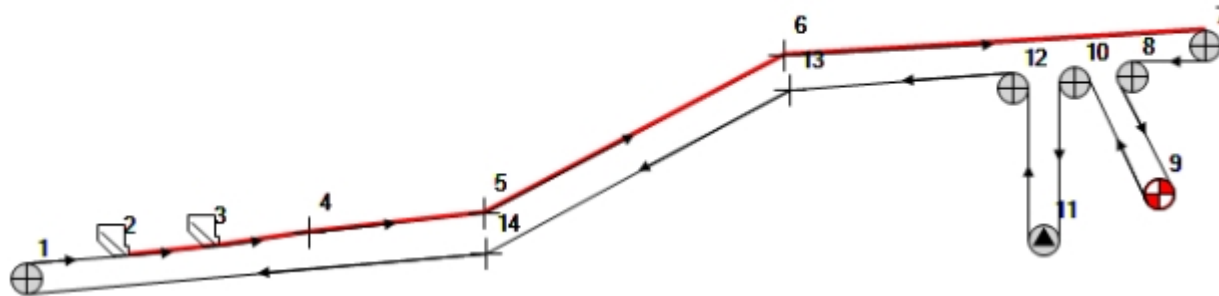


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C223



Belt Width	1800 mm	% Belt Mass for Lift-off Calculation	75 %
Belt Mass - New Belt	81.7 kg/m	Curve Tension Safety Factor	1
Top Cover Mass - New Belt	44.75 kg/m	Average Drive Torque Start-up Factor - Loaded	122 %
Bottom Cover Mass	14.24 kg/m	Average Drive Torque Start-up Factor - Empty	122 %
Worn Belt Mass	61.28 kg/m	Belt Modulus	129600 kN/m
Reduction of Top Cover Mass	45.6 %	Belt Rated Tension	253 kN/m
Conveyed Material Mass	607.24 kg/m	Allowable Edge Tension - Running:	105 % Starting 150 %

Station / Sectio			Design Vertical Curve Radius m	Running				Starting				Braking				Largest Reqd. Radius m
Station	Curve Type	Load Capacity tonnes/hr		Fully Loaded		Empty		Fully Loaded		Empty		Fully Loaded		Empty		
				Tension kN	Radius m	Tension kN	Radius m	Tension kN	Radius m	Tension kN	Radius m	Tension kN	Radius m	Tension kN	Radius m	
1 Tail				119.63		119.63		123.97		167.8		93.34		107.97		
2 Hopper				121.4		121.4		126.07		173.17		93.16		108.88		
3 Hopper				142.78		121.88		148.49		176.02		108.24		108.78		



Belt Width	1800 mm	% Belt Mass for Lift-off Calculation	75 %
Belt Mass - New Belt	81.7 kg/m	Curve Tension Safety Factor	1
Top Cover Mass - New Belt	44.75 kg/m	Average Drive Torque Start-up Factor - Loaded	122 %
Bottom Cover Mass	14.24 kg/m	Average Drive Torque Start-up Factor - Empty	122 %
Worn Belt Mass	61.28 kg/m	Belt Modulus	129600 kN/m
Reduction of Top Cover Mass	45.6 %	Belt Rated Tension	253 kN/m 455.4 kN
Conveyed Material Mass	607.24 kg/m	Allowable Edge Tension - Running:	105 % Starting 150 %

Station / Section		Load Capacity tonnes/hr	Design Vertical Curve Radius m	Running				Starting				Braking				Largest Reqd. Radius m
Station	Curve Type			Fully Loaded Tension kN	Empty Radius m	Fully Loaded Tension kN	Empty Radius m	Fully Loaded Tension kN	Empty Radius m	Fully Loaded Tension kN	Empty Radius m	Fully Loaded Tension kN	Empty Radius m	Fully Loaded Tension kN	Empty Radius m	
4 Int. Pt		9400		155.17		122.39		162.27		179.7		112.23		108.53		
5 Int. Pt	Concave	9400	600	169.73		123.86		180.83		187.65		102.58		108.43		
	Belt Tension at Curve kN			169.73		123.86		180.83		187.65		102.58		108.43		
	Min. Concave Lift Off Radius				282		206		301		312		171		180	
	Min. Edge Tension Radius				118		162		111		107		196		185	
	Max. Centre Tension Radius				87		75		90		92		71		72	
6 Int. Pt	Convex	9400	300	371.5		147.48		402.08		243.04		186.39		124.36		
	Belt Tension at Curve kN			371.5		147.48		402.08		243.04		186.39		124.36		
	Min. Edge Tension Radius				501		162		703		227		183		151	
	Max. Buckling Radius				77		214		70		121		163		263	
	Belt Edge Tension Rise at Curve kN			200.71		200.71		200.71		200.71		200.71		200.71		
	Total Edge Tension at Curve kN and %			572.21	126%	348.19	76%	602.79	132%	443.74	97%	387.1	85%	325.07	71%	
	Centre Tension at Curve kN			304.6		214.39		335.18		176.13		119.49		57.46		
7 Head				418.4		153.1		457.41		263.03		182.3		126.51		
8 Bend				423.11		155.13		463.06		275.55		181.28		125.99		
9 Drive				421.65		150.95		462.11		277.01		176.74		120.45		
10 Bend				134.83		134.87		149.38		132.87		138.95		135.26		



Belt Width	1800	mm	% Belt Mass for Lift-off Calculation	75	%
Belt Mass - New Belt	81.7	kg/m	Curve Tension Safety Factor	1	
Top Cover Mass - New Belt	44.75	kg/m	Average Drive Torque Start-up Factor - Loaded	122	%
Bottom Cover Mass	14.24	kg/m	Average Drive Torque Start-up Factor - Empty	122	%
Worn Belt Mass	61.28	kg/m	Belt Modulus	129600	kN/m
Reduction of Top Cover Mass	45.6	%	Belt Rated Tension	253	kN/m
Conveyed Material Mass	607.24	kg/m	Allowable Edge Tension - Running:	105	% Starting 150 %

Station / Sectio				Running				Starting				Braking				Largest Reqd. Radius m
Station	Curve Type	Load Capacity tonnes/hr	Design Vertical Curve Radius m	Fully Loaded		Empty		Fully Loaded		Empty		Fully Loaded		Empty		
				Tension kN	Radius m	Tension kN	Radius m	Tension kN	Radius m	Tension kN	Radius m	Tension kN	Radius m	Tension kN	Radius m	
11 Takeup				130.92		130.92		130.92		130.92		130.92		130.92		
12 Bend				138.09		138.09		138.38		141.38		136.29		137.29		
13 Int. Pt	Convex		300	137.9		137.9		138.8		147.87		132.46		135.49		0
	Belt Tension at Curve kN			137.9		137.9		138.8		147.87		132.46		135.49		
	Min. Edge Tension Radius															
	Max. Buckling Radius															
	Belt Edge Tension Rise at Curve kN			Flat Belt												
	Total Edge Tension at Curve kN and % Centre Tension at Curve kN															
14 Int. Pt	Concave		600	119.3		119.3		122.72		157.3		98.57		110.11		262
	Belt Tension at Curve kN			119.3		119.3		122.72		157.3		98.57		110.11		
	Min. Concave Lift Off Radius					199		204		262		164		183		
	Min. Edge Tension Radius					168		164		128		204		182		
	Max. Centre Tension Radius															

Designers Comments

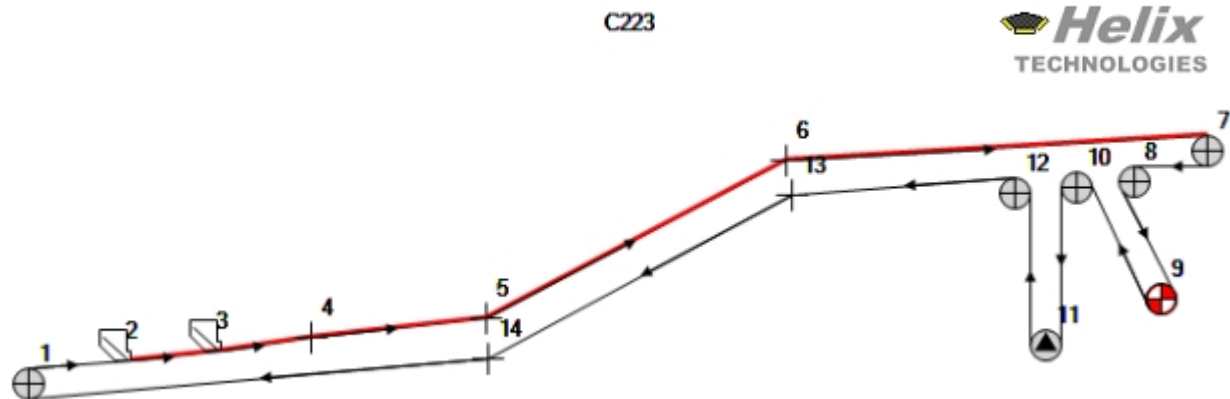
C223 at 9400tph capacity existng case.



Helix Technologies Pty Ltd

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Client ABC Iron
 Prepared By Peter Burrow
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Viscoelastic Calculations Input Data

Belt Rubber Description	Low Loss Rubber	Carry Idler Centre Roll Dia	152 mm
Top Cover Dynamic Modulus E'	4.41 N/mm2	Carry Idler Centre Roll Drag	1.7 N
Top Cover Dynamic Loss Factor Tan(delta)	0.1	Carry Idler Wing Roll Dia	152 mm
Belt Top Cover Temperature	40 deg C	Carry Idler Wing Roll Drag	1.7 N
Bottom Cover Dynamic Modulus E'	4.41 N/mm2	Return Idler Centre Roll Dia	152 mm
Bot Cover Dynamic Loss Factor Tan(delta)	0.1	Return Idler Centre Roll Drag	1.7 N
Belt Bottom Cover Temperature	40 deg C	Return Idler Wing Roll Dia	152 mm
Belt & Material Flexure Adjustment factor	1	Return Idler Wing Roll Drag	1.7 N
<input type="checkbox"/> Belt has Turnover on Return Run		Idlerset Skew Angle	0.1 deg
		Idlerset Forward Tilt angle	0.1 deg

Station / Section			friction factor f (loaded)										Empty	
No	Section Length	Idler Spacing	Total Loaded Friction factor f	Indent factor fi	Indent factor %	Freq uency rad/s	Matl.& Belt Flexure friction fm	Flexure friction %	Idler Drag factor fr	Idler Drag factor %	Idler Skew & Tilt Tilt friction ft	Tilt friction %	Empty Friction factor f	
1	6.85	1.00	0.0160	0.00723	46.2	1530	0.00074	4.7	0.00637	40.7	0.00131	8.4	0.0160	
2	8.16	0.45	0.0192	0.00874	39.4	820	0.01076	48.5	0.00168	7.6	0.00102	4.6	0.0160	
3	10.91	0.45	0.0189	0.00874	40.9	820	0.00996	46.5	0.00168	7.8	0.00102	4.8	0.0160	
4	33.74	1.50	0.0224	0.01306	55.4	549	0.00899	38.1	0.00050	2.1	0.00102	4.3	0.0160	
5	164.30	1.50	0.0221	0.01306	56.9	549	0.00835	36.4	0.00050	2.2	0.00102	4.4	0.0160	
6	70.46	1.20	0.0197	0.01212	63.1	591	0.00544	28.3	0.00063	3.3	0.00102	5.3	0.0160	
7	39.29	3.00	0.0160	0.00721	82.8	770	0.00018	2.1	0.00071	8.1	0.00061	7.0	0.0160	
8	10.96	3.00	0.0160	0.00721	82.9	770	0.00017	2.0	0.00071	8.1	0.00061	7.0	0.0160	
9	12.67	3.00	0.0160	0.00721	82.9	770	0.00017	2.0	0.00071	8.1	0.00061	7.0	0.0160	
10	6.97	3.00	0.0160	0.00721	80.4	770	0.00044	4.9	0.00071	7.9	0.00061	6.8	0.0160	
11	6.98	3.00	0.0160	0.00721	80.4	770	0.00044	4.9	0.00071	7.9	0.00061	6.8	0.0160	
12	26.60	2.40	0.0160	0.00669	77.6	829	0.00044	5.1	0.00088	10.2	0.00061	7.1	0.0160	
13	164.30	3.00	0.0160	0.00721	80.5	770	0.00043	4.8	0.00071	7.9	0.00061	6.8	0.0160	
14	59.64	3.00	0.0160	0.00721	80.2	770	0.00046	5.1	0.00071	7.9	0.00061	6.8	0.0160	
Totals:			621.82	1.49					0.00		21.00	4		

Designers Comments

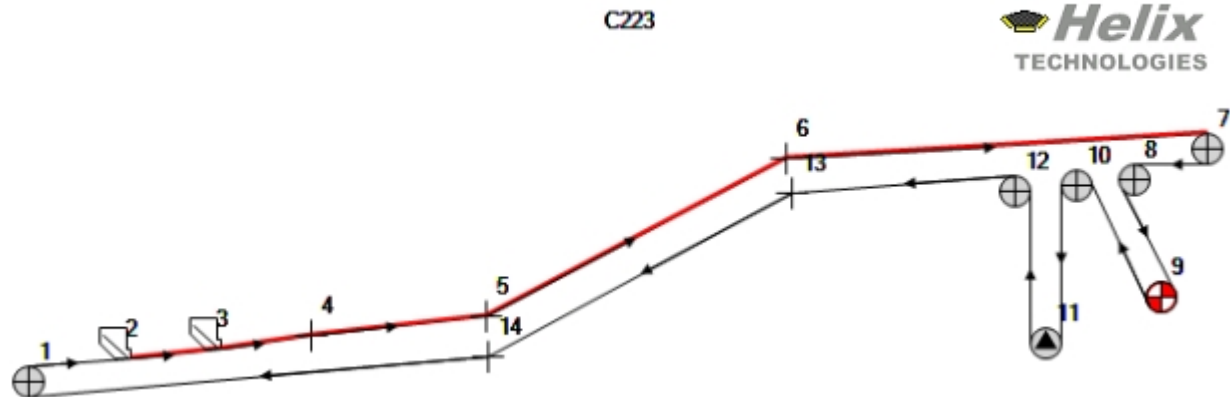
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Carry Roll Diameter 152 mm Belt Speed 4.3 m/s
 Return Roll Diameter 152 mm Takeup Mass 26700 kg

Station / Section		Running Fully Loaded Belt Resonance						Critical Idler Spacing Start m	Critical Idler Spacing End m	Idler Spacing within +/- 10% m	Mode
Station	Description	Start Belt Tension kN	End Belt Tension kN	Belt Transverse Wave Frequency Range Hz	to Hz	Idler Roll Excitation Frequency Hz	Section Idler Spacing m				
1 Tail		121.01	142.78	19	20.68	9	1	2.11	2.3	Caution	1/2
2 Hopper		121.4	155.17	13.2	15.31	9	0.45	0.66	0.76	OK	
3 Hopper		142.78	169.73	14.57	16.13	9	0.45	0.73	0.81	Caution	1/2
4 Int. Pt		155.17	371.5	4.59	7.48	9	1.5	0.76	1.25	Warning	2
5 Int. Pt		169.73	418.4	4.84	7.96	9	1.5	0.81	1.33	Warning	2
6 Int. Pt		371.5	423.11	9.34	10.01	9	1.2	1.25	1.33	Caution	1
7 Head		422.81	421.65	11.95	11.93	9	3	3.98	3.97	OK	
8 Bend		427.57	134.83	12.01	6.69	9	3	4	2.23	OK	
9 Drive		127.76	130.92	6.51	6.59	9	3	2.17	2.2	OK	
10 Bend		136.43	138.09	6.74	6.78	9	3	2.24	2.26	OK	
11 Takeup		132.42	137.9	6.63	6.77	9	3	2.21	2.26	OK	
12 Bend		139.66	119.3	8.52	7.86	9	2.4	2.27	2.09	Caution	1
13 Int. Pt		137.9	119.63	6.77	6.3	9	3	2.26	2.1	OK	
14 Int. Pt		119.3	119.63	6.29	6.3	9	3	2.09	2.1	OK	

Designers Comments

C223 at 9400tph capacity existing case.



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Takeup Travel

Takeup Type **Vertical Gravity**
☐ Auto Calc Takeup Mass

Takeup Mass step increment **500** kg
 Max no. of Calc Increments **100**

Takeup Mass kg (Manual Input) **26700** kg
 Takeup Mass Calculated **26700** kg

Takeup Travel Estimate

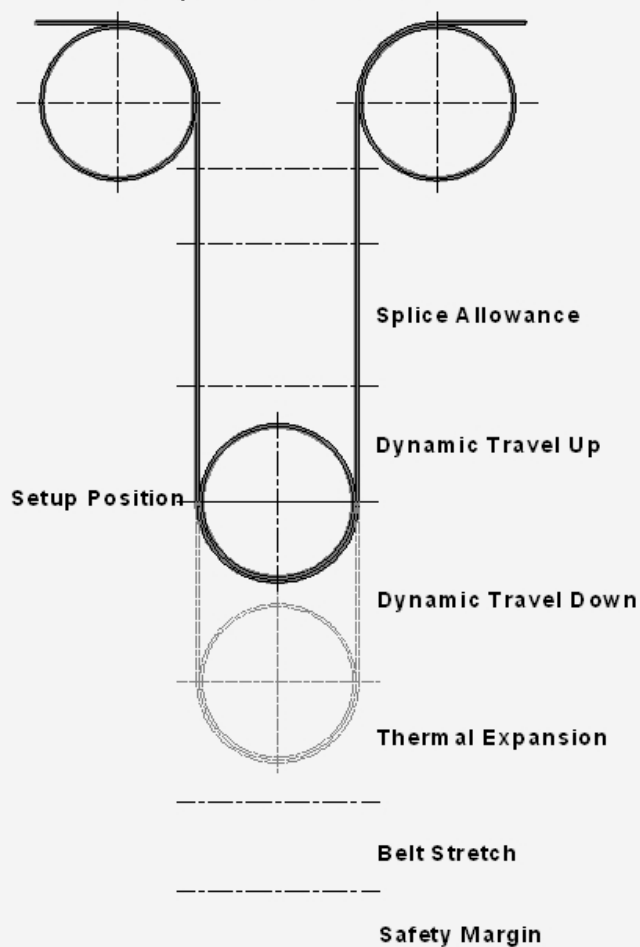
Safety Margin Top + **0.5** m
 Belt Splice Allowance + **1.2** m
 Dynamic Travel Up + **0.4** m
 Dynamic Travel Down + **0.4** m
 Safety Margin Bottom + **0.5** m

Thermal Expansion Distance

Minimum Site Temperature **0** deg
 Maximum Site Temperature **45** deg
 Belt Expansion co-efficient
 m/m per degree C **1.17E-05**
 Total Belt Length **630.7** m
 Thermal Expansion Distance + **0.166** m

Permanent Belt Stretch

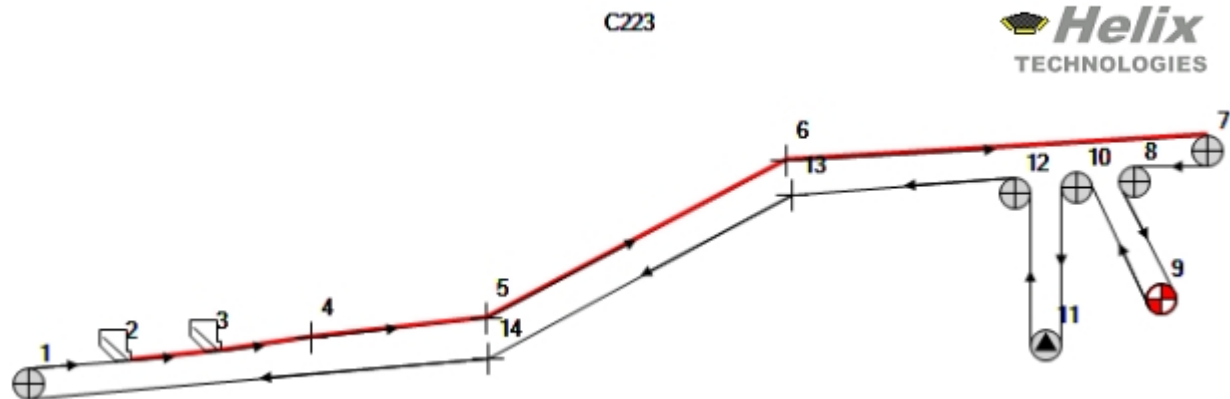
Permanent Stretch co-efficient % of Belt Length **0.15** %
 Permanent Belt Stretch
 Distance + **0.473** m
 Total Takeup Travel Distance **0** m

Takeup Travel Calculation

Helix Technologies Pty Ltd

Project Demo Conveyor High Lift
 Project No. P9823
 Conveyor No. C223

Client ABC Iron
 Prepared By Peter Burrow
 Design Date 14 January 2010



Drive No. 1 Drive

Drive Description	Head
Load Share on Drive Pulley	100 %
Starting Torque Factor, Fully Loaded	122 %
Starting Torque Factor, Empty	122 %
Number of Motors on Drive Pulley	2
Motor Description	Toshiba Wound Rotor TIM
Motor Power Rating	630 kW
Motor Voltage	6600 Volts
Gearbox Description	Falk M505AB2
Drive Efficiency	95 %

Pulley No. 9

Pulley Condition	Moist
Pulley Lagging Type	Ceramic
Belt Wrap Angle	180 °
Coefficient of Friction, Running	0.35
Drive Factor Cw, Running	0.5
Coefficient of Friction, Starting	0.45
Drive Factor Cw, Starting	0.32

Pulley and Shaft Dimensions

Pulley Shell Diameter	1000 mm
Pulley Lagging Thickness	12 mm
Pulley Outside Diameter	1024 mm
Pulley Shaft Diameter at Hub	320 mm
Pulley Shaft Diameter at Brg	240 mm

High Speed Coupling

HS Coupling Make	Falk
HS Coupling Model	1120T35

Low Speed Coupling

LS Coupling Make	Falk
LS Coupling Model	1080 / 505 MCFAS

Brake

Brake Location	High Speed Side
Low Speed Brake Torque Input	26.5 kNm
Equiv HS Brake Torque	2271 Nm

Holdback

Static Analysis Runback Force Fv	199153 kN
Static Analysis Horizontal Force Fh	97707 kN
Calculated Holdback Torque	76953 Nm
Holdback Required (Yes / No)	Yes Fv>Fh/2
Holdback Torque 3 x Motor FLT	450117 Nm

Pulley and Belt Speed

Motor Full Load Speed	985 rpm
Required Gearbox Ratio	12.282 :1
Selected Gearbox Ratio	12.21 :1
Required Pulley Speed	80.2 rpm
Calculated Pulley Speed for Reducer	80.67 rpm
Required Belt Speed	4.3 m/s
Calculated Belt Speed	4.33 m/s

Drive Inertia

Motor Inertia	74.1 kg-m2
High Speed Coupling Inertia	0.514 kg-m2
High Speed Brake Disc Inertia	8.8 kg-m2
Flywheel Inertia	0 kg-m2
Gearbox Inertia (HSS)	1.8 kg-m2
Total Drive Inertia	170.428 kg-m2
Total Drive Equivalent Mass	98069 kg

Designers Comments

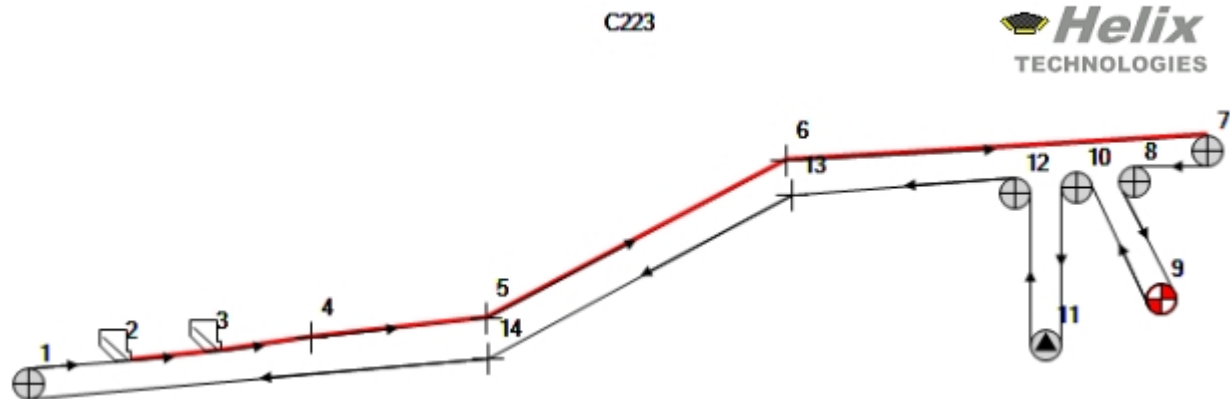
C223 at 9400tph capacity existng case.



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Drive No.	1 Drive	Pulley No.	9
Drive Description	Head	Total Motor Power on Drive	1260 kW
Number of Motors on Drive Pulley	2	Absorbed Power at Pulley	1250.14 kW
Motor Category	Toshiba	Drive Efficiency	95 %
Motor Description	Toshiba Wound Rotor TIM	Absorbed Power at Motor	657.97 kW
Motor Power Rating	630 kW	Motor Full Load Speed	985 rpm
Motor Voltage	6600 Volts	Motor Full Load Torque	6108 Nm
Number of poles	6	Motor Full Load Current	63 Amps
Motor Frame Size	FCKNW500-1250	Motor Efficiency @ Duty Point	95.28 %
Motor Shaft Diameter	0 mm	Motor Power Factor @ Duty Pt	0.92
Motor Shaft Height	0 mm	Mass of Motor	5500 kg
Motor Inertia	74.1 kg-m2		

Designers Comments

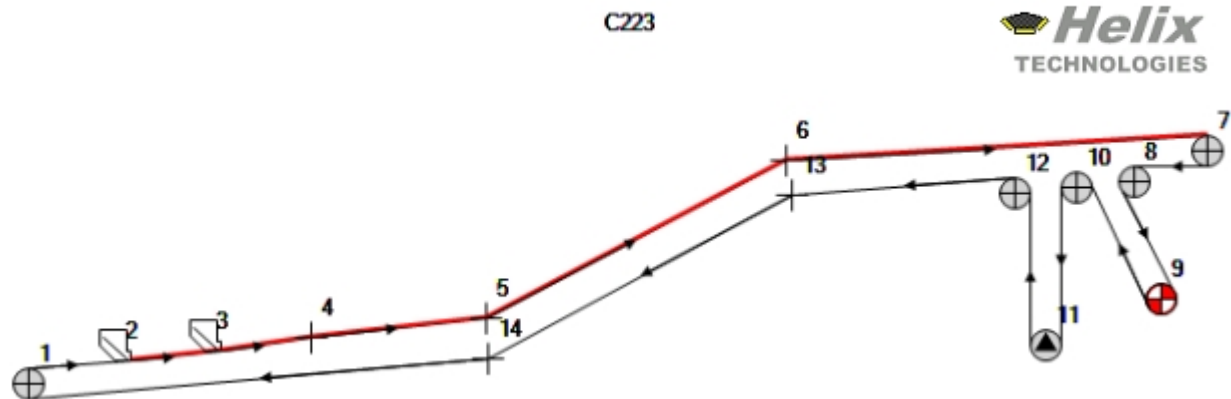
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Drive No. 1 Drive

Pulley No. 9

Drive Description	Head	Coupling Size	
Number of Motors on Drive Pulley	2	Motor Power Rating	630 kW
Selection Mode	Manual	Motor Full Load Speed	985 rpm
Coupling Category	Voith	Coupling Rated Slip	0 %
Coupling Description	No Selection - Direct Drive	Peak Torque %	0 % FLT
Coupling Power Rating	0 kW	Run-up Torque % (2 sec)	0 % FLT
Min. Required Ramping Time	0.69 sec	Coupling Output Speed	985 rpm
Max Starting Time	0 sec	Mass of Coupling	0 kg

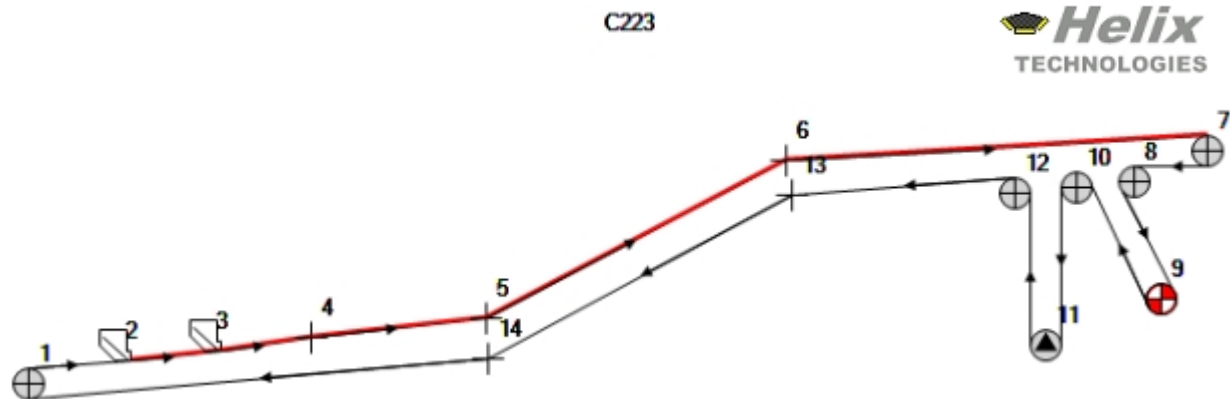
Designers Comments

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Helix Technologies Pty Ltd

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Drive No.	1 Drive	Pulley No.	9
Drive Description	Head	Motor Power Rating	630 kW
Number of Motors on Drive Pulley	2	Motor Full Load Speed	985 rpm
Selection Mode	Manual	Motor Torque @ FL Speed	6108 Nm
Gearbox Category	Falk A-Plus	Motor Torque at Pulley Speed	75019 Nm
Gearbox Description	Falk M505AB2	Gearbox Rated Torque	111500 Nm
Type	Right Angle Shaft	Service Factor Required	1.5
Size	505	Service Factor Calculated	1.49
Code	AB	Plus Speed Selection Tolerance	5 %
Ratio	12.21	Minus Speed Selection Tolerance	5 %
Number of Stages	AB	Fluid Coupling Slip	0 %
Design Efficiency (Input)	95 %	Required Gearbox Ratio	12.282 :1
Gearbox Actual Efficiency	94 %	Selected Gearbox Ratio	12.21 :1
Maximum Input Shaft Speed	1800 rpm	Required Pulley Speed	80.2 rpm
Minimum Input Shaft Speed	580 rpm	Calculated Pulley Speed for Reducer	80.67 rpm
Input Shaft Diameter	235 mm	Required Belt Speed	4.3 m/s
Output Shaft Diameter	95.25 mm	Calculated Belt Speed	4.33 m/s
Gearbox Inertia	1.773 kg-m2	Mass of Gearbox	4500 kg

Designers Comments

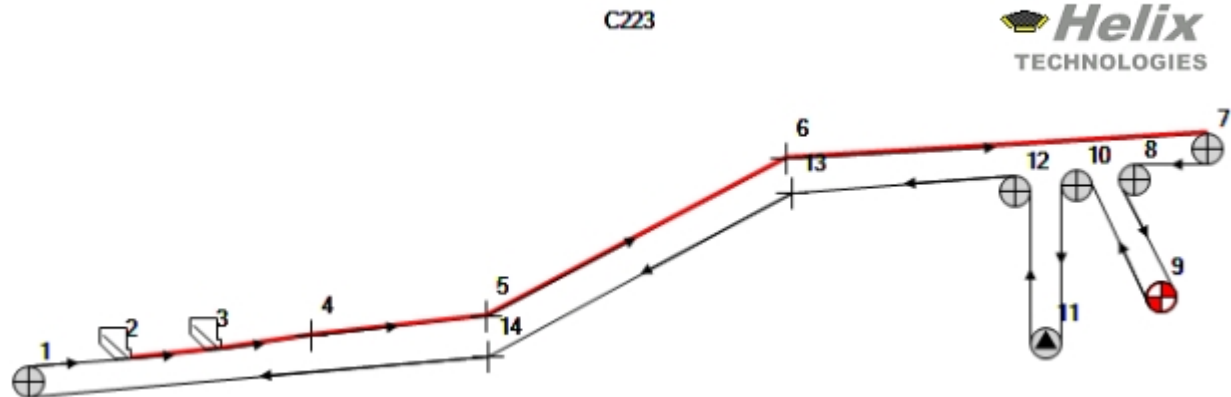
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Drive / Brake No. 1 Drive

Pulley No. 9

Description Head
 Load Share on Drive Pulley 100 %
 Brake Category Svendborg BSFI 200
 Brake Description Svendborg - Simon Hydraulics
 Caliper BSFI 210
 Number of Motors on Drive Pulley 2

Brake Location High Speed Side
 Disc Material Mild Steel
 Disc Diameter 750 mm
 Disc Thickness 30 mm
 Co-eff of Friction (Pad-Disc) 0.4
 Caliper Clamping Force Minimum 10000 N
 Caliper Clamping Force Maximum 11100 N
 Pad offset Width W 70 mm
 Maximum Air Gap 3 mm
Recommended working airgap is 1mm
 Disc Initial Speed 985 rpm
 Disc Moment of Inertia 7.32 kg-m²
 Required Gearbox Ratio 12.282 : 1
 Drive Efficiency 95 %
 Mass of Caliper 18.5 kg
 Brake Caliper Price \$0.00

Brake Selection Input Data

Low Speed Brake Torque Input 26.5 kNm
 Equiv HS Brake Torque 2271 Nm
 Design Braking Torque Input 2350 Nm
 Selected Brake's Torque Rating 2339 Nm
 Design Stopping Time 4.0 sec
 Consecutive No of Stops 3
 Average No of Stops 6
 Ambient Temperature 50 deg C
 Disc Temperature after stops 77 deg C

Designers Comments

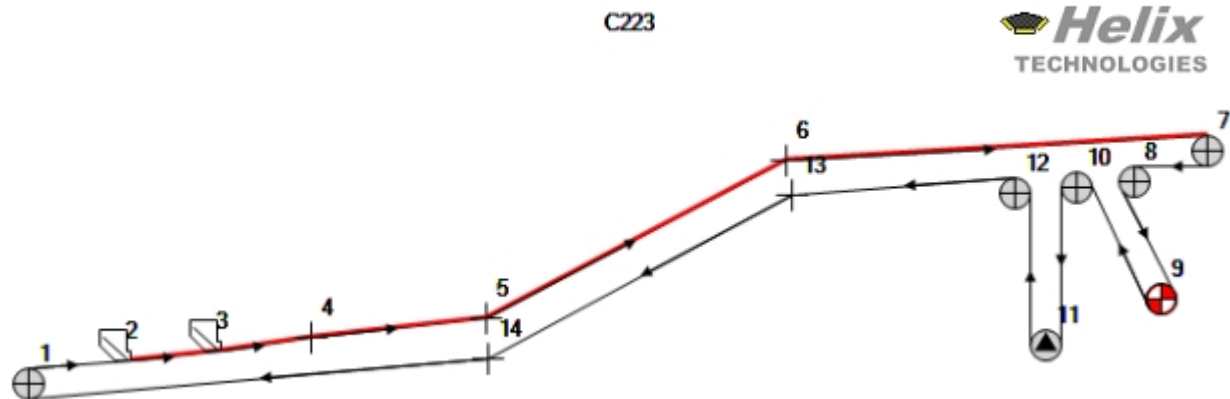
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Drive No. 1 Drive			Pulley No. 9		
Drive Description	Head		Motor Power Rating	630	kW
Load Share on Drive Pulley	100	985	Motor Full Load Speed	985	rpm
Starting Torque Factor, Fully Loaded	122	%	Motor Torque @ FL Speed	6108	Nm
Starting Torque Factor, Empty	122	%	Motor Torque at Pulley Speed	75019	Nm
Number of Motors on Drive Pulley	2		Pulley Shaft Diameter at Brg	240	mm
Drive Efficiency	95	%			
High Speed Coupling			Low Speed Coupling		
HS Coupling Category	Falk SteelFlex Grid		LS Coupling Category	Falk G82	
HS Coupling Make	Falk		LS Coupling Make	Falk	
HS Coupling Model	1120T35		LS Coupling Model	1080 / 505 MCFAS	
Coupling Type	Grid		Coupling Type	Rigid Flanged	
Coupling Torque Rating	13700	Nm	Coupling Torque Rating	445000	Nm
Service Factor Required	1.5		Service Factor Required	1.5	
Service Factor Calculated	1.12		Service Factor Calculated	1.12	
Maximum Shaft Bore	140	mm	Maximum Shaft Bore	336.55	mm
Minimum Shaft Bore	0	mm	Minimum Shaft Bore	101.6	mm
Maximum Rotation Speed	2025	rpm	Maximum Rotation Speed	1750	rpm
High Speed Coupling Inertia	0.514	kg-m2	Low Speed Coupling Inertia	60	kg-m2
Drawing Number	W312-M-921/2		Drawing Number		
High Speed Coupling Mass	139.7	kg	Low Speed Coupling Mass	1130	kg
High Speed Coupling Price	0		Low Speed Coupling Price	0	
Fluid Coupling					
<input checked="" type="checkbox"/> Direct Drive					
Fluid Coupling	No Selection - Direct Drive				
Fluid Coupling Size					

Designers Comments

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Station / Section													
Station	Description	Shaft Length mm	Wrap Angle deg	T1 Run kN	T2 Run kN	Resultant Force kN	T1 Start kN	Calculated Defl. Dia mm	Dt. Dia mm	Selected Shaft Dia mm	Brg Dia mm	Brg Ctrs mm	Shaft Mass kg
1 Tail		3200 *	180.0	119.6	121.0	239.3	124.0	228.6	203.4	280	160	2560	1547
7 Head		3520 *	180.0	418.4	422.8	836.8	457.4	326.1	326.7	380	240	2700	3134
8 Bend		3520 *	128.0	423.1	427.6	760.6	463.1	318.4	316.5	380	240	2700	3134
9 Drive		3460 *	180.0	421.6	127.8	552.6	462.1	293.9	292.2	320	240	2700	2184
10 Bend		3200 *	139.0	134.8	136.4	264.1	149.4	234.3	210.2	280	160	2560	1547
11 Takeup		3200 *	180.0	130.9	132.4	261.8	130.9	233.8	209.6	280	160	2560	1547
12 Bend		3160 *	93.0	138.1	139.7	200.3	138.4	218.6	191.7	280	160	2560	1527

Designers Comments

* Denotes manual pulley shaft dimensions entered

C223 at 9400tph capacity existing case.



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Station / Section

Station	Description	Shell Dia mm	Lagging mm	Face Width mm	Shaft Length mm	Brg Ctrs mm	Shaft Dia mm	Brg Dia mm	Wrap Angle deg	Pulley Speed rpm	Pulley & Shaft Mass kg	Mom of Inertia kgm2
1 Tail		850 *	12	2000	3200	2560	280	160	180.0	94.0	2815	197.9
7 Head		1000 *	12	2000	3520	2700	380	240	180.0	80.2	5464	506.1
8 Bend		1000 *	12	2000	3520	2700	380	240	128.0	80.2	5464	506.1
9 Drive		1000 *	12	2000	3460	2700	320	240	180.0	80.2	4414	448.9
10 Bend		850 *	12	2000	3200	2560	280	160	139.0	94.0	2815	197.9
11 Takeup		850 *	12	2000	3200	2560	280	160	180.0	94.0	2815	197.9
12 Bend		850 *	12	2000	3160	2560	280	160	93.0	94.0	2796	197.7

Designers Comments

* Denotes manual pulley dimensions entered

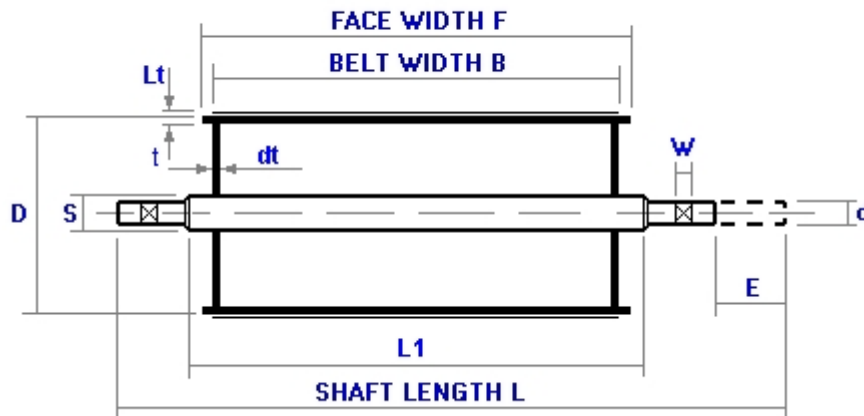
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Station / Section

Station	Description	Shell Dia mm	Lagging mm	OD mm	Face Width mm	Shaft Length mm	Brg Ctrs mm	Shaft Dia mm	Brg Dia mm	Belt Width mm	Pulley & Shaft Mass kg	Mom of Inertia kgm2
1 Tail		850	12	874	2000	3200	2560	280	160	1800	2815	197.9
7 Head		1000	12	1024	2000	3520	2700	380	240	1800	5464	506.1
8 Bend		1000	12	1024	2000	3520	2700	380	240	1800	5464	506.1
9 Drive		1000	12	1024	2000	3460	2700	320	240	1800	4414	448.9
10 Bend		850	12	874	2000	3200	2560	280	160	1800	2815	197.9
11 Takeup		850	12	874	2000	3200	2560	280	160	1800	2815	197.9
12 Bend		850	12	874	2000	3160	2560	280	160	1800	2796	197.7

Designers Comments

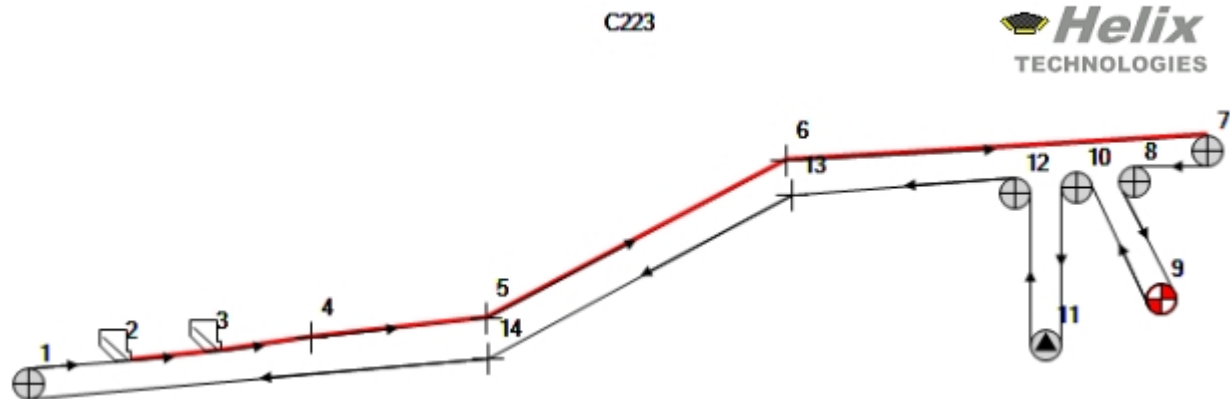
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Station / Section

Station	Description	Shell Dia mm	Lagging mm	Face Width mm	Brg Ctrs mm	Drive Power kW	Wrap Angle deg	Pulley Speed rpm	T1 Run kN	T2 Run kN	T1 Start kN	T2 Start kN
1 Tail		850	12	2000	2560		180.0	94.0	119.63	121.01	167.8	171.1
									Running Full		Starting Empty	
7 Head		1000	12	2000	2700		180.0	80.2	418.4	422.81	457.41	462.14
									Running Full		Starting Full	
8 Bend		1000	12	2000	2700		128.0	80.2	423.11	427.57	463.06	467.84
									Running Full		Starting Full	
9 Drive		1000	12	2000	2700	1260	180.0	80.2	421.65	127.76	462.11	142.09
									Running Full		Starting Full	
10 Bend		850	12	2000	2560		139.0	94.0	134.83	136.43	149.38	151.15
									Running Full		Starting Full	
11 Takeup		850	12	2000	2560		180.0	94.0	130.92	132.42	130.92	134.33
									Running Full		Starting Empty	
12 Bend		850	12	2000	2560		93.0	94.0	138.09	139.66	141.38	144.87
									Running Full		Starting Empty	

Designers Comments

C223 at 9400tph capacity existing case.

