DSI PIPE CONVEYOR TECHNOLOGY

BACKGROUND

J.A. Dos Santos, throughout his career, and Dos Santos International LLC, since its founding in 1997, has developed the conveying technologies that were considered innovative at the time and ultimately became industry standards. This has included joint and cooperative developments with other notable innovators of the industry. Much more is accomplished when we develop what needs developing and not when we re-develop "me-too" technologies. Some of these technologies include:

1. Sandwich Belt High Angle Conveyors
2. Long Conventional Overland Conveyors with complex profiles including:
    a. Horizontal and compound curves
    b. Booster (intermediate) drives of various types:
        i. Belt on belt type
        ii. Rubber tire pinch type
        iii. Tripper type
    c. Two way conveying (conveying materials on both belt strands in opposite directions)
3. Enclosed conveyors including:
    a. Pipe Conveyors
    b. The Square Belt / Square Conveyor

4. Cable Belt/Multi Rope Belt Conveyors
5. ***DSI ExConTec*** complete conveyor analysis program

The ***DSI ExConTec*** unifies all of the above technologies because it breaks down all of the power and tension equations into their basic parts allowing the correct compilation for each conveying system. Appendix-A provides the background writings and installations lists that support the Dos Santos record including cooperative developments.

PIPE CONVEYORS BY TEAM DOS SANTOS INTERNATIONAL & LOEFFLER ENGINEERING

Like many past innovations Pipe Conveyors are now a mature technology that is well understood with its equipment well standardized. The belt's pipe forming and load support characteristics are well understood and tabulated by the belt manufacturers. Hex idlers and mounting plenums are standard products of the idler manufacturers. Pursuant to the CEMA (Conveyor Equipment Manufacturers Association) guidelines the ***DSI ExConTec*** is ideally suited for the complex power and tension analysis of the pipe conveyor belt line. It breaks down the components of the travel resistances into their very basic parts and reconstitutes them into aggregate resistances that reflect the increased number of bearings and seals, the imprint and shearing resistances that add the pipe forming (crowding) roll loads to the radial loads around the profile and horizontal curves and to the gravitational loads.

Following our policy of cooperation with notable innovators and, our long standing relationship, we have teamed up with Loeffler Engineering of Lago Vista, Texas, USA, in offering the engineering and supply of Pipe Conveyor overland conveying systems. Loeffler Engineering contributes to the team unparalleled experience and expertise in the Pipe Conveyor technology, dating back to its early development.

Armed with a deep understanding of the conveyor technology, unparalleled in-house analytical tools and the support of the belting and equipment manufacturers the Dos Santos International and Loeffler Engineering Team has offered and continues to offer both high-tech engineering and consulting services and the engineering and supply of the most complex pipe conveyors to the industry.

DOS SANTOS
INTERNATIONAL

DSI ExConTec PROJECTS:

	Company / Location	System	Material/ Rate (t/h)	Belt Wdth/ Speed (mm)/(m/s)	Length (m)	Net Lift (m)	Max Lift (m)	Drives/ Brakes (kW)/ (kN)	Year
1	US Steel Mining /AL, USA	OL Conveyor 3-Flight System. Each Flight has Dual Pulley Drive, Head End, Remote							1999
		Flt 1	Coal / 1270	914 / 3.8	2812	23.5	73.1	298+224 / ---	
		Flt 2		914 / 3.8	2628	19.2	52.4	298+224/ ---	
		Flt 3		914 / 3.8	2751	23.5	37.8	298+224/ ---	
					8191			**1566 kW**	
2	Troy Belt / NY, USA	OL Conveyor, U-Profile, with Single Pulley Remote Drive, Tail Pulley Brake							1999
			Stone / 1134	1219 / 1.8	1180	- 3.1	- 35.4	149/ 35.6	
3	Acadia Equip / Ont, CN	OL Conveyor with 2-Horiz Curves, Dual Pulley Drive, Head End, Remote							2000
			Slag / 2722	1219 / 3.1	1363	4.0	4.0	2@224/ ---	
4	AIMCOR/ TX, USA	OL Pipe Conv, Dual Hd Dr, Tail Take-Up, Auto Hyd Winch, 3 Horiz Curves							2000
			Coke / 500	Ø305/ 4.3	914	6.7	6.7	280/ ---	
5	Acadia Equip / Ont, CN	Underground Slope Conveyor, Single Head Pulley Drive							2001
			Ore / 1451	1067 / 2.7	579	105.4	105.4	597/ ---	
6	Cherry Hill Construction / MD, USA	OL Conveyor 5-Flight System. Each has Single Pulley Drive, Head End, Remote							2002
		Flt 1	Soil / 1592	914 / 3.9	549	10.4	10.4	187/ ---	
		Flt 2		914 / 3.7	626	1.2	1.2	149/ ---	
		Flt 3		914 / 3.8	938	1.2	1.2	187/ ---	
		Flt 4		914 / 3.2	789	1.2	4.6	187/ ---	
		Flt 5		914 / 3.1	359	1.2	1.2	112/ ---	
					3261			**822 kW**	
7	BMH Systems / Ont, CN	Underground Load-out Conveyor, Dual Pulley Drive, Head End, Remote							2002
			Ore / 703	1067 / 2.5	709	127.3	127.3	2@224/ ---	
8	Continental Conveyor and Machine Works / Que, CN	Two-Way OL Conveyor, Horizontally Curving (9 horiz curves compounded by numerous vertical curves), with Smart and Natural Booster (Intermediate) Drives at Carrying and Return, Carrying Limestone from Quarry to Cement Plant #1, Returning Clinker to Cement Plants #2 & #3							2003
		Carry Return	Stone / 1320 Clinker/ 420	1067 / 3.4	2752	46.8	57.8	298 Smart Booster 298+149 Dual Hd 149 Dumb Booster	
								894 kW	
9	BMH Systems / Ont, CN	Underground Load-out Conveyor, Single Pulley Head Drive							2003
			Ore / 200	1067 / 1.6	1216	180	180	187/ ---	

Office: +1 770 423 9895 • Toll free: +1 833 DOS INTL • info@dossantosintl.com
DosSantosIntl.com • 531 Roselane St - Suite 810 • Marietta, GA 30060

DOS SANTOS
INTERNATIONAL

DSI ExConTec PROJECTS:

	Company / Location	System	Material/ Rate (t/h)	Belt Wdth/ Speed (mm)/(m/s)	Length (m)	Net Lift (m)	Max Lift (m)	Drives/ Brakes (kW)/ (kN)	Year
10	TECO Terminal / LA, USA	Tripped Dock Conveyor to Shiploader, Dual Pulley Remote Drive							2003
			Coal / 6845	1829 / 4.5	430	8	8	522/ ---	
11	Bonem Corp / Ont CN	Reclaim Conveyor with Single-Head Pulley Drive, Tail Take-Up, Horizontal Gravity							2004
			Ni-Cu /2550	1067 / 2.6	342	9.9	9.9	186 / ---	
12	Bonem Corp / Ont CN	Tripper Conveyor, with Single-Head Pulley Drive, Gravity Take-Up, Remote							2004
			Ni-Cu / 400	762 / 1.4	414	23.4	23.4	75/---	
13	Energy Assoc/ NJ, USA	OL Pipe Conv, Dual Hd Dr.+Single Tail Drive, Tail Take-Up, Horiz. Gravity, 2 Horiz Curves							2004
			Alum / 800	Ø440 / 2.6	1800	-25	-25	3@ 150/ ---	
14	Pinnoak /AL, USA	Underground Slope Conveyor, Single Head Pulley Drive, Tail Take-Up, Horizontal Gravity							2005
			Coal / 2413	1524 / 3.4	1194	361	361	2@1865/ ---	
15	Bonem Corp / Ont CN	Underground Slope Conveyor, Dual Pulley Drive at Head, Tail Take-Up, Horizontal Gravity							2005
			Sulfide /703	1067 / 2.5	710	127.3	127.3	2@224 / ---	
16	Goldcorp, Los Filos Gold Mine/ Mezcala, MX	8-Flight Overland Conveyor System, 6-Downhill-Regen, 3/w Horizontal Curves							2009
		Flt 1	Au Ore/1043	914 / 2.3	41.2	5.5	5.5	44.7 / ---	
		Flt 2		914 / 2.3	248	26.5	26.5	149 / ---	
		Flt 3		1219 / 1.2	213	-20.9	-20.9	Regen 44.7 / 17.9	
		Flt 4		914 / 2.3	243	-24.6	-24.6	Regen 74.6 / 34.5	
		Flt 5		914 / 2.3	476	-43.7	-43.7	Regen 149 / 63.7	
		Flt 6		914 / 2.3	201	-14.3	-14.3	Regen 44.7 / 21.4	
		Flt 7		914 / 2.3	84.5	-9.8	-9.8	Regen 44.7 / 13.3	
		Flt 8		914 / 2.3	148	-4.1	-4.1	Regen 44.7 / 8.3	
					1655			**596 kW**	
17	HSGP Project Abu Dhabi, UAE	9-Flight Conveyor System							2012
		5010CV0101/0201	Sulphur/840	1000 / 2.7	219.7	9.0	9.0	110 / ---	
		5010CV0102/0202	Sulphur/4000	2200 / 2.5	653.2	26.8	26.8	710 / ---	
		5015CV1001	Sulphur/4000	2200 / 2.5	238.7	20.3	20.3	400 / ---	
		5015CV0101/0201	Sulphur/2000	2200 / 0.9	13.4	0	0	110 / ---	
		7015CV1100/1200	Sulphur/2000	2200 / 0.9	17.7	0	0	110 / ---	
					2047			**2480 kW**	

DSI ExConTec PROJECTS:

	Company / Location	System	Material/ Rate (t/h)	Belt Wdth/ Speed (mm)/(m/s)	Length (m)	Net Lift (m)	Max Lift (m)	Drives/ Brakes (kW)/ (kN)	Year
18	SHAH Project Abu Dhabi, UAE	7-Flight Conveyor System							2013
		7010CV1100	Sulphur/720	1000 / 2.4	218.1	7.2	7.2	110 / ---	
		7010CV1200	Sulphur/720	1000 / 2.4	216.3	7.3	7.3	110 / ---	
		7010CV2100	Sulphur/4000	2200 / 2.5	706.4	26.8	26.8	710 / ---	
		7010CV2200	Sulphur/4000	2200 / 2.5	687.6	26.3	26.3	710 / ---	
		7015CV1100/1200	Sulphur/2000	2200 / 0.9	13.4	0	0	110 / ---	
		7015CV1300	Sulphur/4000	2200 / 2.5	238.7	20.4	20.4	500 / ---	
					2094			**2360 kW**	
19	Newcrest Mining, Dome Mine, WA, Australia	2-Flight Underground Collecting Conveyor System, Flight 2 with Trip Type Booster							2013
		Flt 1	Au Ore/2000	1200 / 2.5	785.5	37.0	37.0	355 / ---	
		Flt 2		1200 / 3.0	1974.8	371.9	371.9	2600 / ---	
					2760			**2955 kW**	
20	Ma'aden Gold, Kuwait	2-Flight Underground Collecting Conveyor System, Flight 2 with Trip Type Booster							2013
		CV002	Au Ore/451	900 / 1.0	2042	44.8	44.8	110 / ---	
		CV003		900 / 1.0	19.3	0	0	7.5 / ---	
					2061			**117.5 kW**	
21	Hansen Aggregates at Lindisfarne Quarry, Hobart, Tasmania	4-Flight Downhill-Regen Conveyor System							2013
		Flt 1	Dolomite/ 450	900 / 1.2	135	-30.2	-30.2	37 / ---	
		Flt 2		900 / 1.2	352	-62.8	-62.8	75 / ---	
		Flt 3		900 / 1.2	185	-30.9	-30.9	37 / ---	
		Flt 4		900 / 1.2	158	-0.2	-0.2	22 / ---	
					830			**171 kW**	