

We Help Our Customers Make Gem out of the Soil



We are beside you in:

- Equipment installation to commissioning.
- Supplying genuine quality of spare and wear parts.
- Providing various belt types upon application requirements.
- Training and engineering services during installation and commissioning.
- Fast and qualified assistance by our engineers for proper selection of conveyor, simulation and process analysis.

www.fms-co.com

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FMS Bulk Handling System Belt Conveyors

- Optimal solution to connect mine site to beneficiation plant



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ABOUT FMS

Fakoor Meghnatis Spadana Co. (FMS) is comprised of a number of specialized and highly motivated groups which embarked on designing and manufacturing of magnetic and material handling equipment since 1992. Having engaged efficiently over two decades in designing and manufacturing of magnetic and vibrating equipment, FMS has been in close cooperation with various mines and industries nationwide.

Considering experiences of Fakoor San'at Tehran Co. (FST), and enjoying specialized and qualified groups in design, quality control, planning, manufacturing, R&D, and extensive after-sales services, FMS has acted successfully in providing beneficiation facilities as well as iron ore concentrate essential equipment.

Considering the mission of FMS in designing and supplying suitable equipment for industry and mining fields, this company has been involved in optimization of designing and manufacturing structures of material handling lines since 2016 and has achieved a great success in optimizing the design and production methods by creating innovations. Nowadays, by developing complete engineering, machining, fabrication, and manufacturing departments to design and manufacture customized conveyor project, we have been the Iranian leading manufacturer of high-strength conveyor belts to meet demanding conditions of use.



Belt Conveyors

Material handling is one of the major processes in most of factories and production lines. Among all material handling methods, belt conveyors are the most commonly used in transportation of bulk materials due to such inherent advantages as their economy, reliability and practically unlimited range of capacity.

Material handling equipment, despite the fact that, at first glance, is not considered as the main equipment of high-tech manufacturing process, plays a main roll in production process, and any form of damage to its operation results in heavy financial losses. So, it is necessary to apply state of the art technologies in designing and constructing processes.

Our company is the major specialist for constructing and producing conveyor belts of all types. Our conveyor belts are supplied in various types, textile insert and steel cord, and although most common belt widths are between 650 and 2000 mm, smaller and wider belt widths are also available depending on material and conveying capacity.

All conveyors' components such as drive units, rolls and pulleys are supplied and manufactured to handle the toughest applications and work environments, while maintaining high levels. Dust emission and spillage from conveyors is a major concern to many operations. Our conveyors are designed to eliminate these problems using high quality belt scrapers, robust skirt mountings and rubber skirting as well as properly engineered feed and encapsulated discharge chute work. Various types of sealing and belt cleaning systems can also be utilized in our customized conveyors lines.

Our covers of conveyors are produced with a special design for considerably lower weight and higher production rate in comparison with conventional ones. Furthermore, they have the advantage of easier erection and maintenance process. These conveyor covers can be manufactured in all conveyor widths and fitted easily to existing conveyor structures. Continuous production line is used for manufacturing conveyor parts which equipped with special machineries such as automated laser cutting and automated press brake. as a result, our belt conveyors are produced with high accuracy and minimum production time.

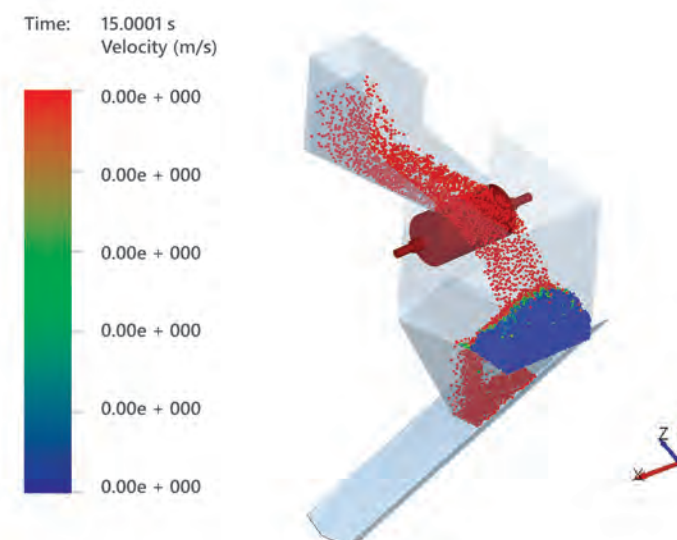
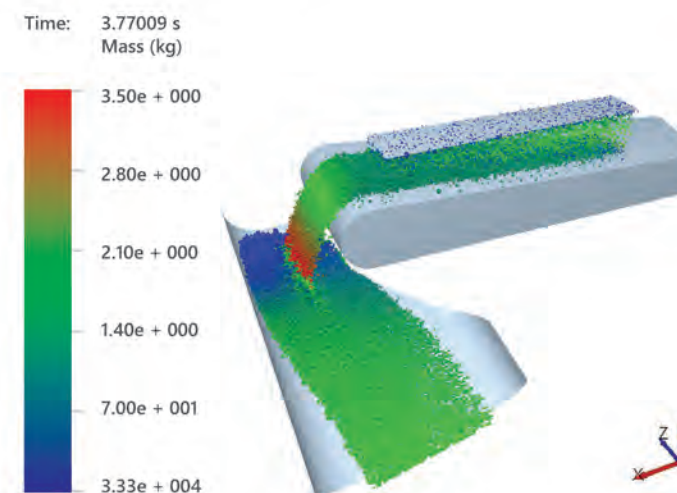
Engineering

All conveyor parts will be fully analyzed and optimized by state-of-the-art technical methods in our design department. These methods embrace finite elements methods for static and dynamic analysis and discrete elements methods for dynamically simulates application condition.

FMS design department experts are advising about detailed matters during the planning of conveyor belt systems. They thus contribute to ensuring that the belt complies with the operating conditions, that the belts technological aspects are considered, and that a customized belt construction is achieved for use.

Our design and analyses are done base on the following codes and standards:

- CEMA Universal 7th Edition
- ISO 5049: Mobile Equipment for Continues Handling of Bulk Material
- AWS D1.1: Structural Welding Code
- ACI 318: Building Code Requirements for Structural Concrete and Commentary
- MSHA: Mining Safety and Health Administration
- AISC: Manual of Steel Construction
- NFPA70: National Electrical Code
- DIN for General Parts Design



INPUT DATA

Location of use	Location of use		-	Outdoors-Open
	Ambient Temperature	max	TA (max)	45
		min	TA (min)	35
Relative Air Humidity			3	
Material Handeled & Conditional	Designation		-	Clinker
	Temperature	max	TM (min)	35
		min	TM (max)	30
	Material Size Type		-	mixed
	Lumpsize			mm 100
	Bulk Density			Kg/m ³ 1000
	Repose Angle			deg 10
	Surcharge Angle			deg 10
	Corrosive or Abrasive			Very
	Wet			Mildly
Sharp Edge			Very	
Material Flow	Working Time			holiday Over 16
	Conveying Speed (if exist)		V	m/s 1
	Roll Diameter		Droller	mm 89
	Belt Width (if exist)		BW	mm 800
	Mass Flow (Operation)		Iv	ton/hr 105
	Volume Flow		Im	m ³ /hr 105
	Length		L	m 85
	Height		H	m 8.6
	Gradient of the system			deg
	incline			Up Hill
Conveying Flight	Curve		-	Non-Curved
	Feeding Direction		-	longitudinal
	Feeding		-	most irregular
	Upstream Device		-	Chute
	Hopper Opening Length		Lt	m 0
	Hopper Opening Width		Bt	m 0
	Material Discharge			Head pulley
	Cross Section Profile			Flat
	Pitch of Carrying sets		ac	m 35
	Pitch of Impact sets		ai	m 0
Pitch of Return sets		ar	m 0	
Pitch of Transition sets		at	m 0	
Material Feed	Insert		-	EP
	Breaking Force		N/mm	400
	Top Cover Thickness		mm	6
	Bottom Cover Thickness		mm	2
	Carcass			4
	Grade			X
	Efficiency of the reduction gear		h	0.7
	Hopper friction Factor		δθ	0.40

OUTPUT DATA

Belt width	BW	mm	800
Velocity	V	m/s	1
Conveyor Used Capacity			0.58
section of area		m ²	0.037
Mass Flow (Design)	Iv	ton/hr	180
Pitch of Carrying sets	ac	m	1.5
Pitch of Impact sets	ai	m	0.75
Pitch of Return sets	ar	m	3
Roll Diameter	Droller	mm	89
Minimum Driving Power	Pmin	kW	7.4
Belt Specification	EP400/462Grade X		
Motorised Pulley Diameter	Dp	mm	400
Return Pulley Diameter	Dr	mm	315
Direction Change Pulley Diameter	Dc	mm	No Need

Inputs

Width: 1200 mm

Speed: 4.00 m/sec

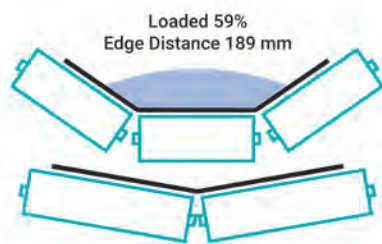
Load: 2000 tph

Ambient Temp: 25 °C

Starting: TimeSec: Torque: 120.0 40 NARELT

Stopping: TimeSec: Torque: 40.0 40 NARELT

Dr. Decel: 20 1000.0 N/m



81.9%	91%
Total Power 1200 kW	Friction Coefficient f CEMA 7th
33.0%	f = 0.0120



FMS Conveyor Frames

FMS conveyor frames are made up of standard modules with lengths of 6 meters, 3 meters and 1 meter. In these modules, instead of using profiles with standard sections, all elements are formed by bended plates and bolt fasteners are used for connecting them, instead of welding.

All static and dynamic analyses are done on these modules according to ISO5049 by FMS design department and correspondingly the optimum design is developed.

1

Ability of Designing

As mentioned above, all FMS Frame's elements are formed from bended plates; consequently, there is no need to choose their figure from standard profile and due to this fact, each section can be designed precisely based on their calculated safety factors. So over-designing can be prevented and optimal design of the frame design can be developed.

2

Frames Weight Reduction

In view of the ability to design an optimal frame, as mentioned above, the FMS weight of conveyors' frames are reduced about 30% to 50% in comparison with conventional types. As a result, in addition to material cost reduction, the costs of manufacturing, shipment and erection are also reduced. Likewise, the towers and relative structures and foundations are down-sized.

3

Reliability Increase

Standardizing all of the frame's modules and using the automated precise CNC machineries in our continuous production line will lead to produce more reliable products. Likewise, frame's modules are made from high qualified plates, instead of conventional standard profiles and making use of bolting fasteners considerably reduces welding operations. Having considered all, the better mechanical properties and more reliability of FMS frames, in comparison with the conventional ones, will be firmly ensured.



4

Production Time Reduction

Due to the following reason, FMS frames' production time is reduced by approximately 70% comparing to conventional ones.

- Standardizing and uniformity of all frame modules
- Reducing shop drawing process
- Using high speed cutting and bending CNC machines
- Eliminating the drilling and deburring operations
- Faster quality control Process
- Reducing welding process and welding inspection

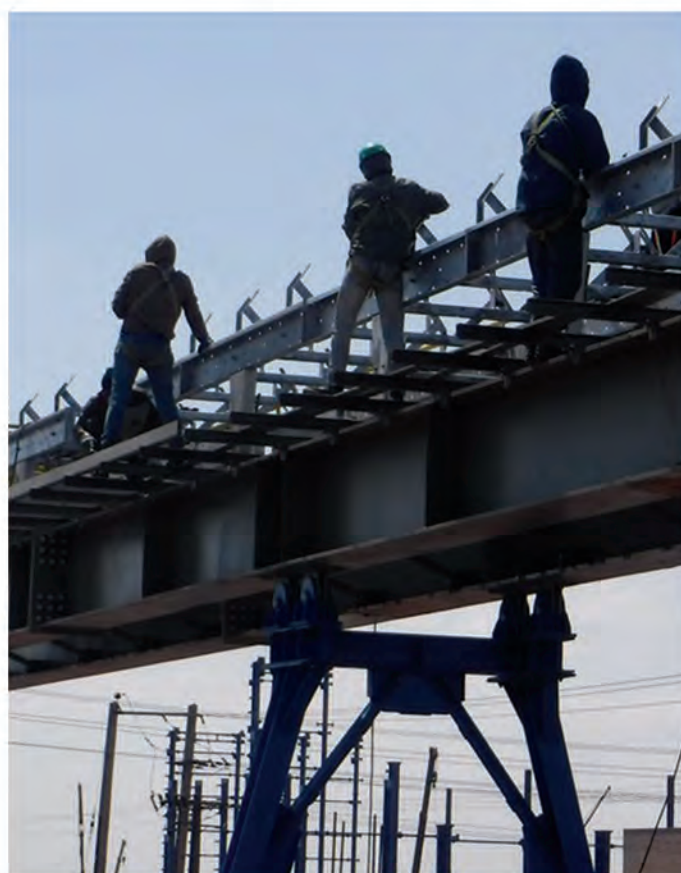


5

Erection Cost and Time Reduction

Modularity and uniformity of frame's parts decrease the erection time. Also, they reduce the erection cost due to the reduced weight of the parts and enabling us to use smaller cranes. Faster storage, easily identifying the parts and eliminating touch up operation are the other reasons of erection cost and time reduction.

According to our experiments, more than 100 meters conveyor frames could be erected easily by just 6 technicians.



6

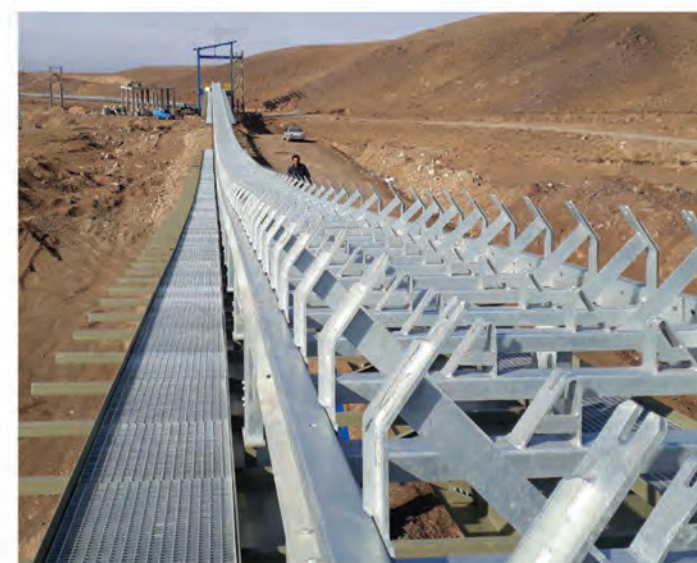
Considerable Reduction of Welding

Reduction of welding operations results in reducing cost, increasing production rates and reliability as well. Similarly, by eliminating the welding process, inspection and NDT are eliminated and due to decreasing HAZ zone, the mechanical properties of frames' elements significantly increase.

7

Surfaces Galvanizing

Because of being bolted the modules' elements and painted separately, all of the modules' surfaces can be galvanized and, as a result, the quality and lifetime of frames could be increased accordingly. Also, the need of yearly painting will be eliminated.



8

Increase of Shipment Capacity

Since all of the modules' elements are transported separately and could be packed compactly, the Shipment capacity would be increased about 100% comparing with the conventional ones. Therefore, loading and unloading speed, transporting cost and unloading cost decrease significantly.



9

Easy Installation

There are many holes on each module so auxiliary elements such as rain covers, electrical elements stand and eyebolts can be installed easily without extra cutting and welding at site even during conveyor operation.

