FAKOOR MEGHNATIS SPADANA

ROLLER SCREEN | FEEDER

A Certain Solution for Sticky & Brittle Material Screening in Pelletizing Plants

Fakoor Meghnatis Spadana Co.

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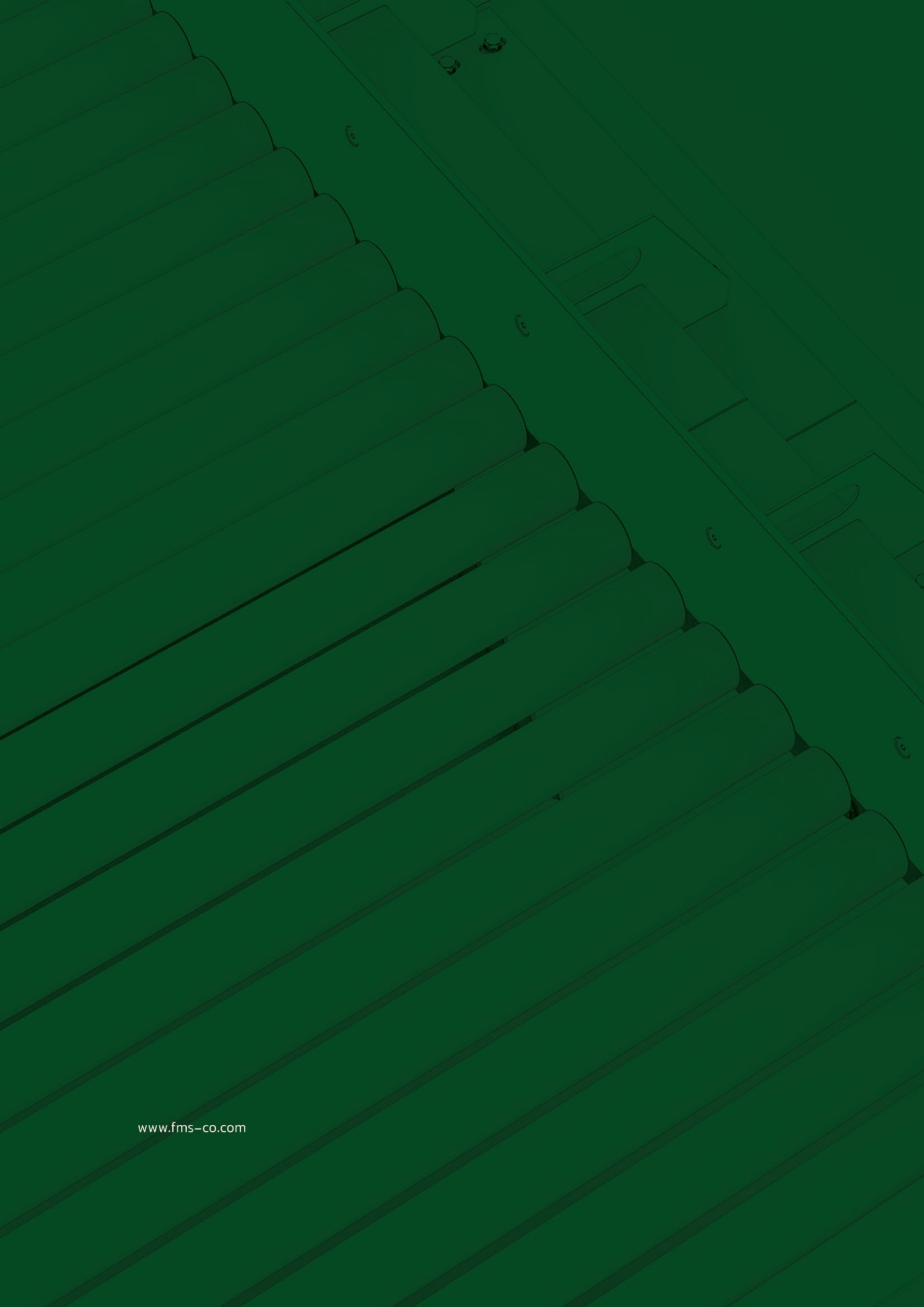

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CONTENT

OUR STORY

WHO WE ARE & WHAT WE DO

Fakoor Meghnatis Spadana (FMS) is an experienced designer, manufacturer, and supplier of mineral processing equipment and material handling systems. Collaborating with experienced and professional engineers, possessing sophisticated and high tech machinery and facilities, multiple workshop spaces, strong financial support and extensive contribution to other companies and manufacturers in the world made it possible for FMS to present itself as an industrial activist in the following fields (design and manufacturing):

- Magnetic separation solutions
- Vibratory sizing and material handling systems
- Flotation cells
- Filtration and dewatering
- Rotating classification and sizing systems including roller screens and roller feeders


FAKOOR MESHINATIS SPADANA

GENERAL DESCRIPTION

The main characteristic of roller screen is its smooth movement and integrity preservation of brittle particles. Roller screen also provides higher performance, slight sound and capability of separating high moisture sticky materials. Roller screens are mainly used in iron ore processing plants for concentrate scalping before HPGR and sizing pellets after the balling disc. Considering the roller screen function, design parameters like inclination, roller coating type, and surface roughness, driving system and sealing system must be chosen accurately.

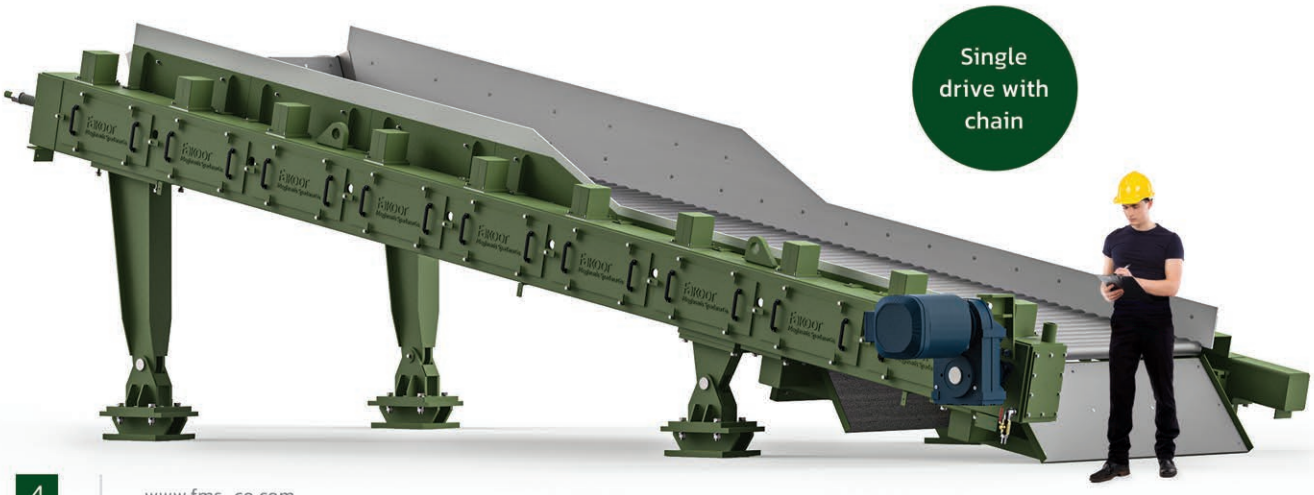
FMS offers different kinds of roller screen to meet the range of needs of its clients:

- single and double deck roller screen for the balling department (Chain driven and multi-drive types)
- single and double deck roller feeder for the grate feeding station (Chain driven and multi-drive types)
- Tramp removal from concentrate
- Compact size & pilot roller screen

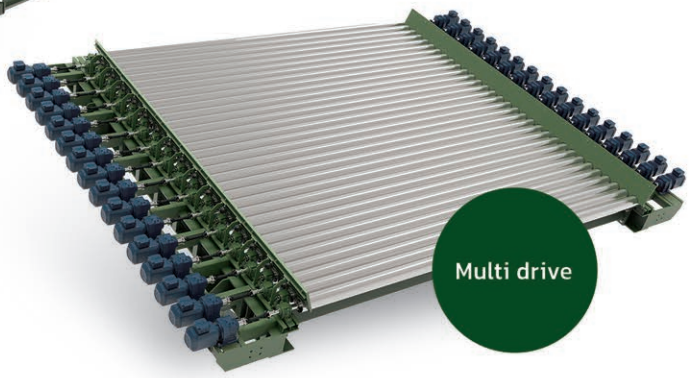
TYPES OF EQUIPMENT

Single deck roller screen for the balling department

Single deck roller screens are found in the balling department and are most often used to screen the undersize in the upper section of the screens, the good products in the second section and the oversize pellets, which fall at the discharge end of the screen. The rejected products (undersize and oversize pellets) fall on a conveyor underneath the screen and are returned to the balling disc. Good products are picked up by another conveyor, which will ultimately feed the roller feeder at the entrance of the furnace.

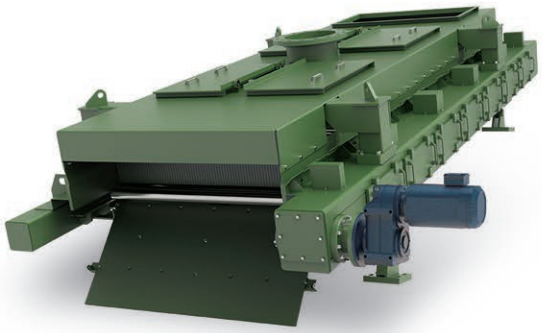


Both chain driven and multi–drive types can be used for pellet sizing. Easy and quick maintenance operations are main priority of multi–drive roller screens while chain driven type is more compact.



Roller feeder for the grate feeding station

The roller feeder is placed at the grate feeding station. Pellets coming from the balling department are discharged on it. One of its purposes is to remove the fines coming from the breakage of pellets on their way to the furnace. Its main function is to distribute evenly the good pellets on the indurations furnace grate. This equipment can be driven with a chain or with individual drives. The roll length can be provided up to 6 meters upon feeding capacity.



Tramp removal from concentrate

The duty of this screen is scalping material before feeding them into the next equipment. This type of roller screen is usually used for ore concentrate with high humidity; while, vibratory screen can not perform properly for sticky material with humidity above 8%. Usual roller gap is about 12 to 30 mm.

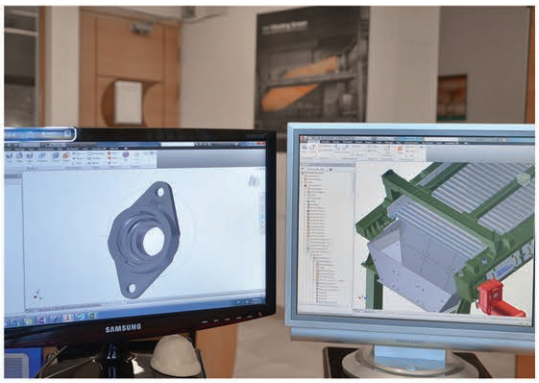
FMS utilizes special UHMW roller coating for tramp removal applications which results in high feed capacity and extra ordinary roller life time.

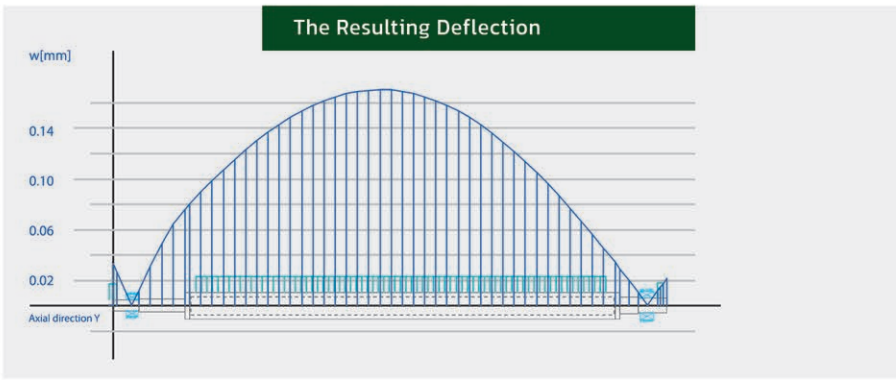
Compact size & pilot roller screen

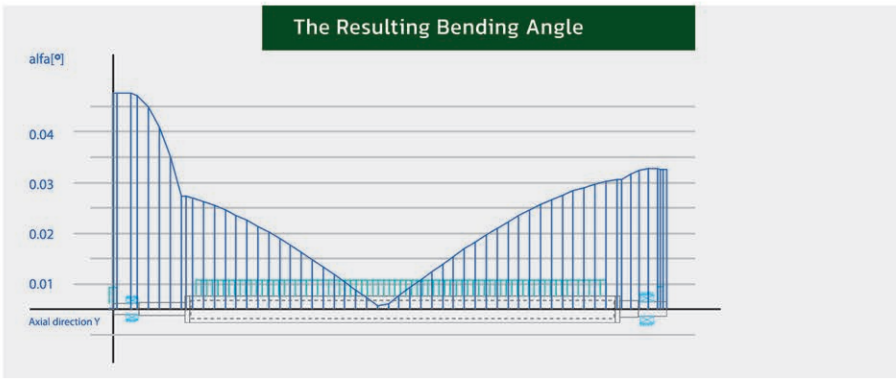
Currently in different plants of worldwide, it is required to increase the capacity of pelletizing plants; while there is no space for addition of a proper roller screen. In such cases, FMS presents compact size roller screen as solution. Compact size roller screen can be designed regarding the available space under balling disks. Removing tramps from concentrate iron ore in the plants with lack of space, has the same story. FMS designs compact roller screens regarding required capacity and available room in client plant. Pilot Roller Screens are also available for experimental research activities.

PROFESSIONAL DESIGN PROCEDURE

In the case of roller diameter design, FMS attempts to select smaller diameter rolls. Smaller rolls provide more screening area resulting in higher capacity for the same size of screen. In addition, smaller rolls make rounder and more compressed green pellets. To have desired linear velocity, smaller rolls should have higher angular velocity, which results in higher performance and better material flow on the screen.







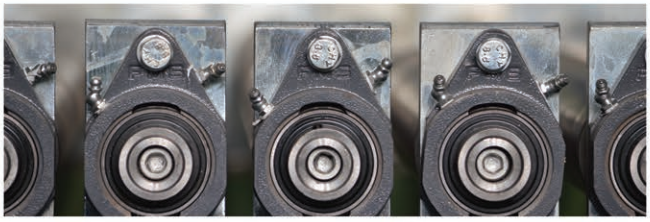
COMPONENT TECHNOLOGY

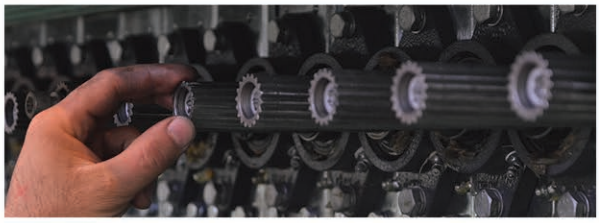
Shaft Connection

- Removable shaft with easy and quick disassembling.
- Overlapping seal plates (inner and outer) preventing dust contamination of the bearings and drive case.

Chain Tensioner System

Two different types of chain tensioner is suggested. Depending on available space around the roller screen/feeder, proper type will be designated.





Sealing and Lubricating System Options

Air sealing: It works by positive air pressure inside the sprocket box. The box doors are equipped to sealing rubbers and an air filter is used in order to prevent dust penetration in balance or negative box pressure.

Automatic grease lubrication system: It is suggested for roller screens/feeders with individual drive for each roll. Both lubrication and grease sealing can be supported automatically with this system.

FMS Triple Seal Housing:
In grease sealing system, a grease chamber is located at the beginning of bearing housing. By feeding grease, dust polluted grease will be replaced by the fresh one. This system can be used in idler side of single motor roller screens and all bearings of multi-drive roller screens. Grease can be fed manually by operator or automatically by automatic grease lubrication system.

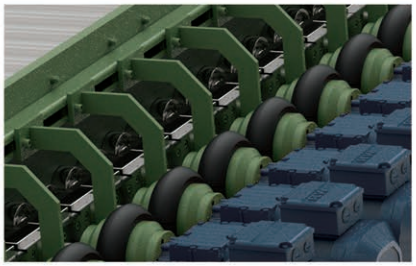
Oil bath lubrication:
It is responsible for lubricating the chain and sprockets. The oil bath is located at the lowest point of the drive case.

Skirting

Skirts are fitted at the end of rolls, above the shafts. Skirt material are UHMW which prevent premature wear and tear caused by the accumulation of abrasive pellets.

Flexible Chain Guide System

Suspension system for chain guides ensures quick adjusting the distance between chain and chain guide.



Flexible Joint

FMS suggests tyre-flex couplings and cardans with universal joints for higher life time of gear-motor bearings in multi-drive roller screens/feeders.
Direct connection between gear motor and rollers, especially for long rollers, damages bearing and sealing system of bearings or gear-motor.

Installation

FMS has successfully experienced complicated large roller screen installation.

ROLLS

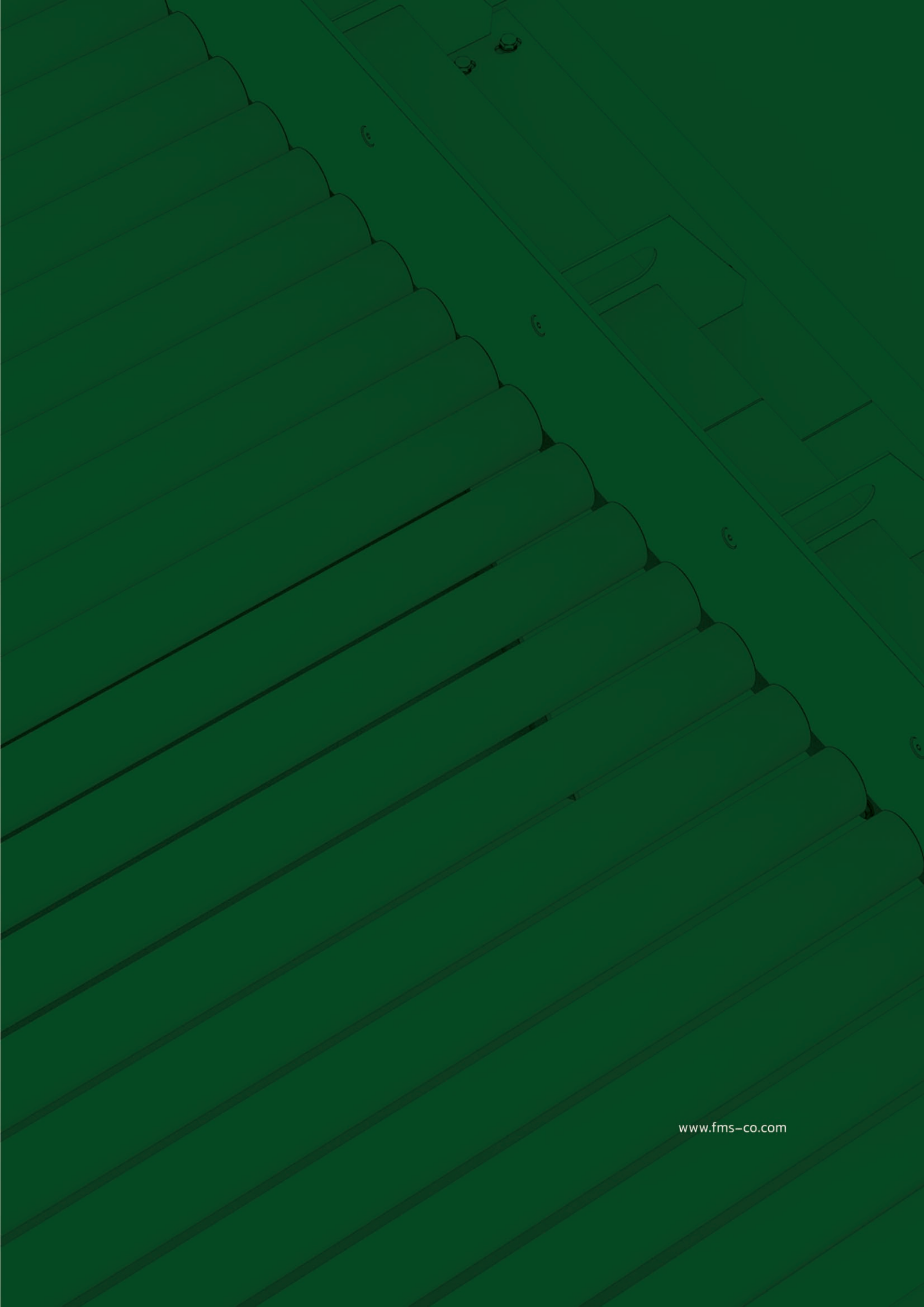
FMS specifically focuses on manufacturing of rollers as the main part of roller screens. Depending of roller screen application, classifying green pellet or scalping iron ore concentrate, particular rolls is designed by FMS. Different rolls and coatings have been tested successfully in real application in plants.

Most common base material and coatings are categorized as follow:

- Stainless steel 304
- Stainless steel CA6NM
- Chrome plated coating
- SF series coating
- AF series coating (High wear and corrosion resistant thermal spray coating)

Stainless steel uncoated rollers have acceptable performance in pellet screening while long time working deforms outer diameter along rolls that affects screening efficiency.
Chrome plated rolls have higher life time comparing uncoated rolls and usually suggested for impact rolls.
FMS new coated rolls known as AF Series (AF190 to AF210) has significantly high wear and corrosion resistance, constant outer diameter and constant surface roughness and re-gapping needless during the working time. Although, exact life time may differ upon feed capacity and properties of pellet composition, estimated life time for AF rolls is expected to be more than 3 years. In case of scalping application, specific SF coating is suggested. The innovative SF coating prevents sticking high humidity material to the rolls; moreover, it dramatically increases rolls life time. Coating can be applied on carbon steel base material which results in reducing manufacturing cost. All rolls coating creates the chance of recycling rolls base material and re-coat it.

- We are beside you from equipment installation to commissioning and optimization.
- Supplying genuine quality of spare and wear parts.
- Providing various roller types upon application requirements.
- Training and engineering services during installation and commissioning.
- Fast and qualified assistance by our engineers for proper selection of roller screen, simulation and process analysis.



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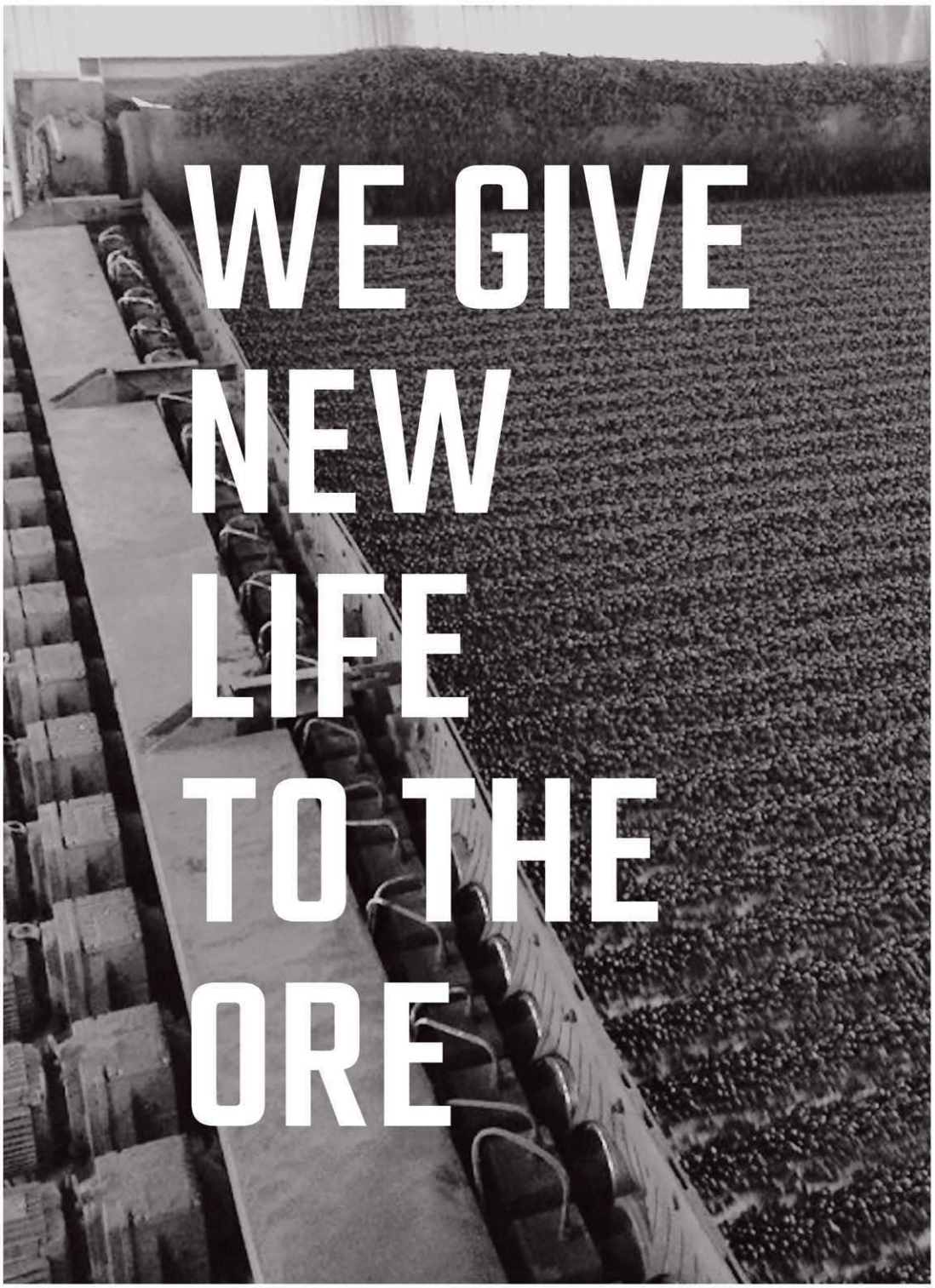

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