

ROLLS

PELLET SIZING
& CONCENTRATE SCALPING





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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

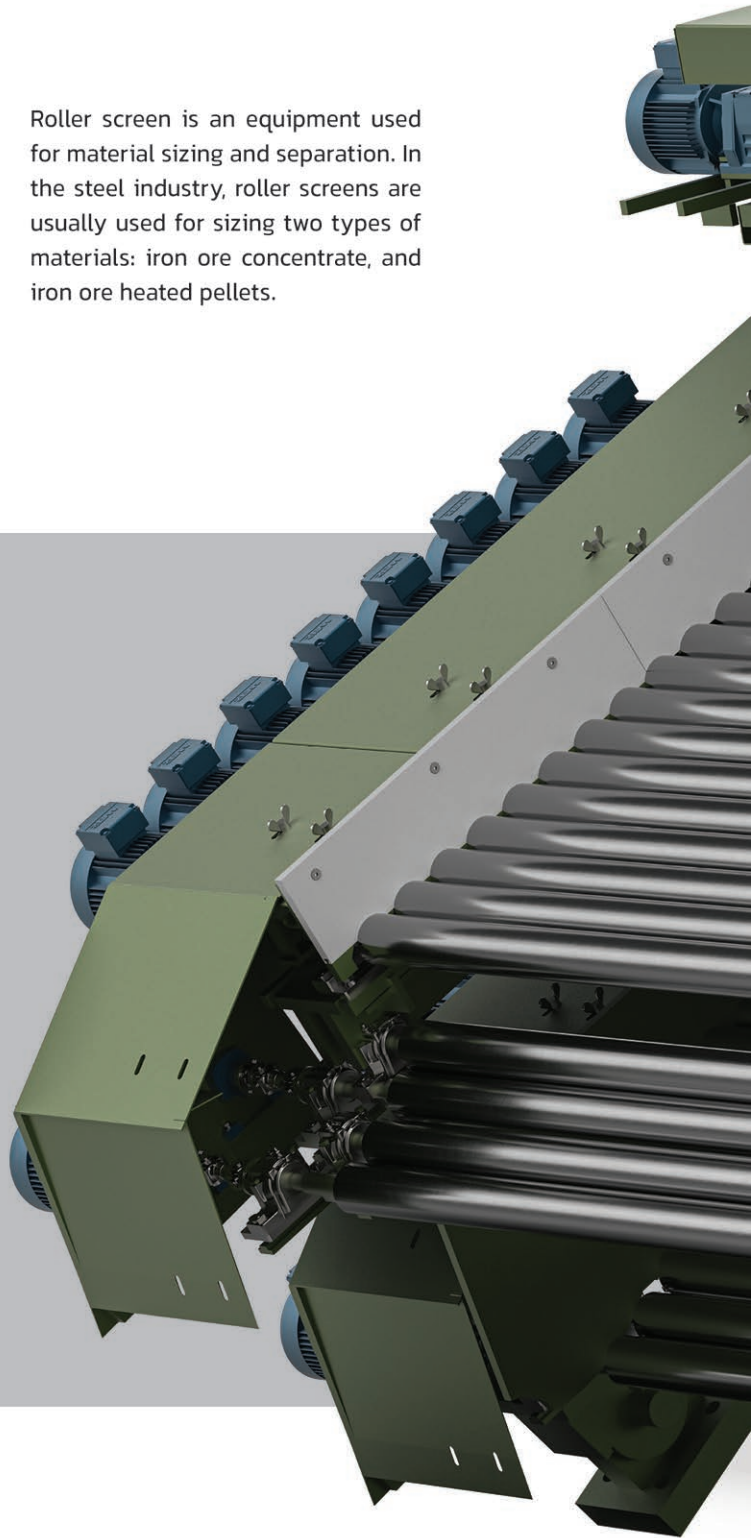
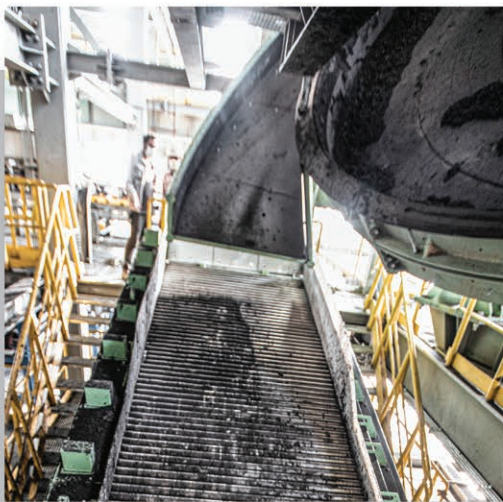


HME
PABLOO MESHINATIS SPADANA

CLASSIFICATION

PELLET SIZING & CONCENTRATE SCALPING

Roller screen is an equipment used for material sizing and separation. In the steel industry, roller screens are usually used for sizing two types of materials: iron ore concentrate, and iron ore heated pellets.



Roller screens have two unique features that distinguish them from vibrating screens:



- 1 Gentle handling of the material due to the use of rotating rolls to make the material flow causing minimum stress to be applied to the material. as a result, it is used for heated iron ore pellets, which are also extremely fragile.

Roller screens used for concentrate are usually placed prior to the HPGR and balling disk to prevent junk and waste materials from passing the flow. This type is called scalping roller screen. Roller screens used for pellets are usually used for two purposes, either they are placed after the balling disk to classify heated pellets, or prior to the furnace to feed the pellets smoothly and it is called roller feeder.

FMS has manufactured roller screen for classification since the mid-2000's. Several roller screens have been supplied by FMS since then for various plants. The roller screens are available in several shapes and usage to meet varying requirement from any plants. Depending on roller screen application, classifying green pellet or scalping iron ore concentrate, particular rolls shall be deployed.

- 2 the ability to separate concentrate with relatively high humidity. The maximum moisture content of the concentrate that can be processed by vibrating screens is about 5%, while by using roller screen, you can handle material with above 11% moisture.

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BASE MATERIAL VS. COATING

Rolls play a significant role in the process of material classification in a roller screen/feeder. The better the roll plays its role, the screen will perform better. Rolls are reviewed from two perspectives: base material, and coating.

FMS provides various base materials and different methods to coat the rolls. The rolls are continuously undergoing remodeling to meet all the ever-increasing requirement of our customers.





Roll general characteristics:

- Up to 5 m length
- Less than 0.2 mm eccentricity
- Up to 67 HRC
- Up to 250 µm thickness of coating

Several types of coating materials such as chrome based materials, nickel based materials, and polymer base materials etc. are used to increase the life of each rolls.

Most common base materials & coatings are categorized as follow:

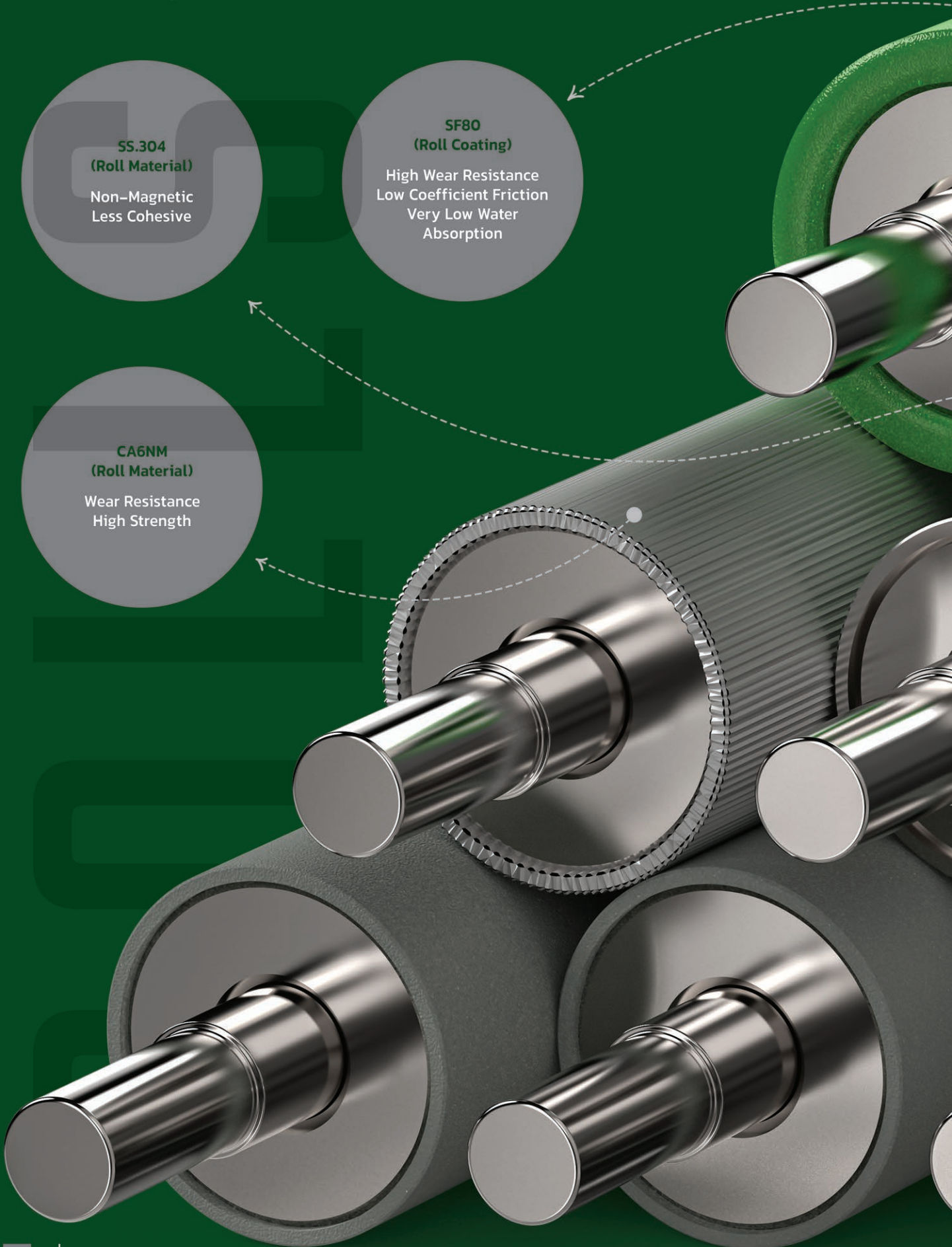
- Stainless steel 304 and CA6NM
- Chrome plated coating
- SF series coating
- AF series coating

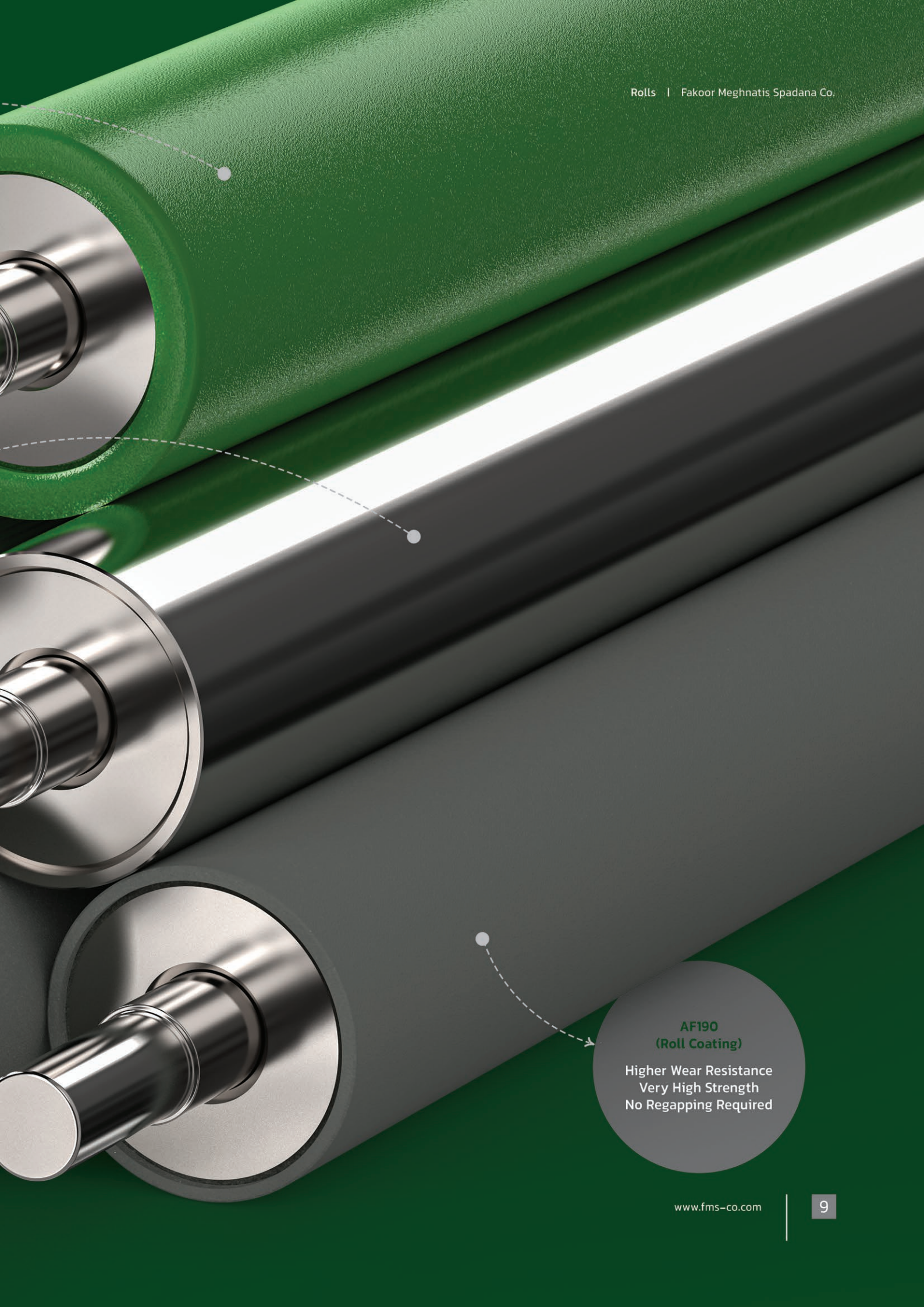
Stainless steel uncoated rolls have acceptable performance in pellet screening while long time working deforms outer diameter along roll that affects screening efficiency. Chrome plated rolls have higher life time comparing uncoated rolls and usually suggested for impact rolls. All roll coating creates the chance of recycling roll base material and recoating.

SS.304
(Roll Material)
Non-Magnetic
Less Cohesive

SF80
(Roll Coating)
High Wear Resistance
Low Coefficient Friction
Very Low Water
Absorption

CA6NM
(Roll Material)
Wear Resistance
High Strength





**AF190
(Roll Coating)**

Higher Wear Resistance
Very High Strength
No Regapping Required

STAINLESS STEEL 304 AND CA6NM

Both of the Stainless Steel 304 and CA6NM are widely used in roll production. Iron ore concentrate and pellets which are classified by the roller screens are wet and sticky. Stainless steel roll, as the name depicts, does not corrode when exposed to moisture. Also, due to the abrasive nature of the concentrate and pellets, rolls with material which is not moisture resistant or paint coated cannot be used. Therefore, stainless steel is the best choice for dealing with these materials.

CA6NM on the other hand, is used where high wear resistance and yield strength are required. SS.304 is used where non-magnetic or low cohesion properties are required.



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Replacing FMS rolls with removable shaft mechanism takes just about 5 minutes

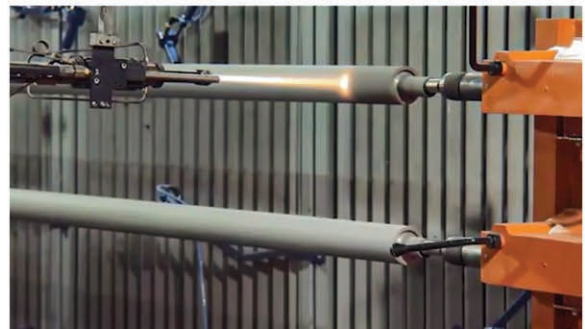
AF190

FMS is among very few companies in the world which specially manufacture wear resistant rolls called AF190. FMS roll production plant manufactures various types of AF series roll based on roll length and feed material specification. AF190 rolls are highly wear resistant due to the special characteristics of the coating material and coating procedure. Also, due to the surface friction special feature, the roll is exclusively suitable for pellet sizing roller screens.



AF190 Roll key advantages:

- Eliminates the regapping of rollers due to its wear;
- Reduces maintenance cost;
- Ensures a long working life;
- Increases production efficiency due to roll gap consistency;
- No regapping cycles;
- Improves pellet diameter uniformity.



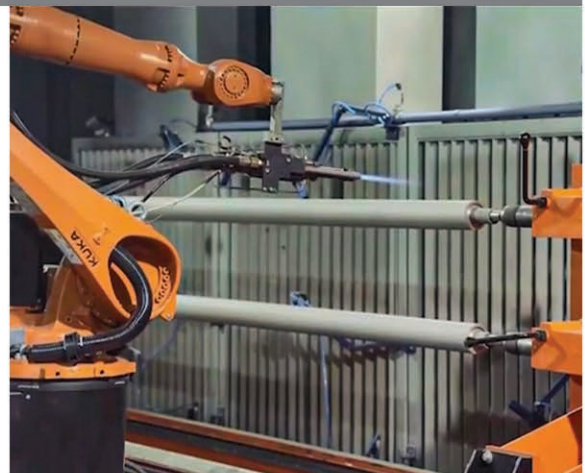
Available +

AF190 makes your roller screen always available +

Coating Procedure:

High Velocity Oxygen Fuel (HVOF) coating process is used to spray micronized anti-wear materials on the roll surface to increase its lifetime drastically. This surface engineering technique is applied by a six degrees of freedom robot. The porosity is about 1–2% volume which is low enough to protect the rolls against corrosion and wear.

Thanks to less induced residual stresses, thicker coating could be applied to rolls. Choosing the best material for HVOF spray is depending on the cohesive strength between the rolls and the anti-wear material.



SF80

While performance of vibratory screens dramatically drops with increase in humidity and even un-functional for above 8% material humidity, FMS scalper screen has successfully utilized over years for scalping iron ore concentrate with 9–13% and capacity to 1000 tph. The innovative SF coating prevents sticking high humidity material to the rolls.

SF80 rolls are designed for scalper roller screens to collect junk and waste materials and protect HPGR (High Pressure Grinding Rolls). SF80 rolls are coated with a special polymer layer. Due to its high wear resistance, it prevents damage to the rolls due to the impact of hard objects and waste materials in the concentrate. Because of very low water absorption, it prevents sticking of wet concentrate that is continuously in contact with the rolls. Moreover low friction coefficient reduces the cohesive strength between the material and the roll surface, and as a result, the concentrate flows smoothly on the rolls and enters the product section.



	Coating Type	Lifetime	Application	Location	Regapping Interval	Surface Hardness
SF 80	Polymer base	+18 months	Protecting HPGR	Concentrate scalping	No regapping required	–
AF190	Carbide base	+36 months	Classifying green pellet	Pelletizing plant	No regapping required	68 HRC
CA6NM	No coating	9–14 months	Classifying green pellet	Pelletizing plant	Every 45 days	40 HRC



WE GIVE NEW LIFE TO THE ORE

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