

DISC SCREEN BROCHURE

Henan Excellent Machinery Co.,Ltd.

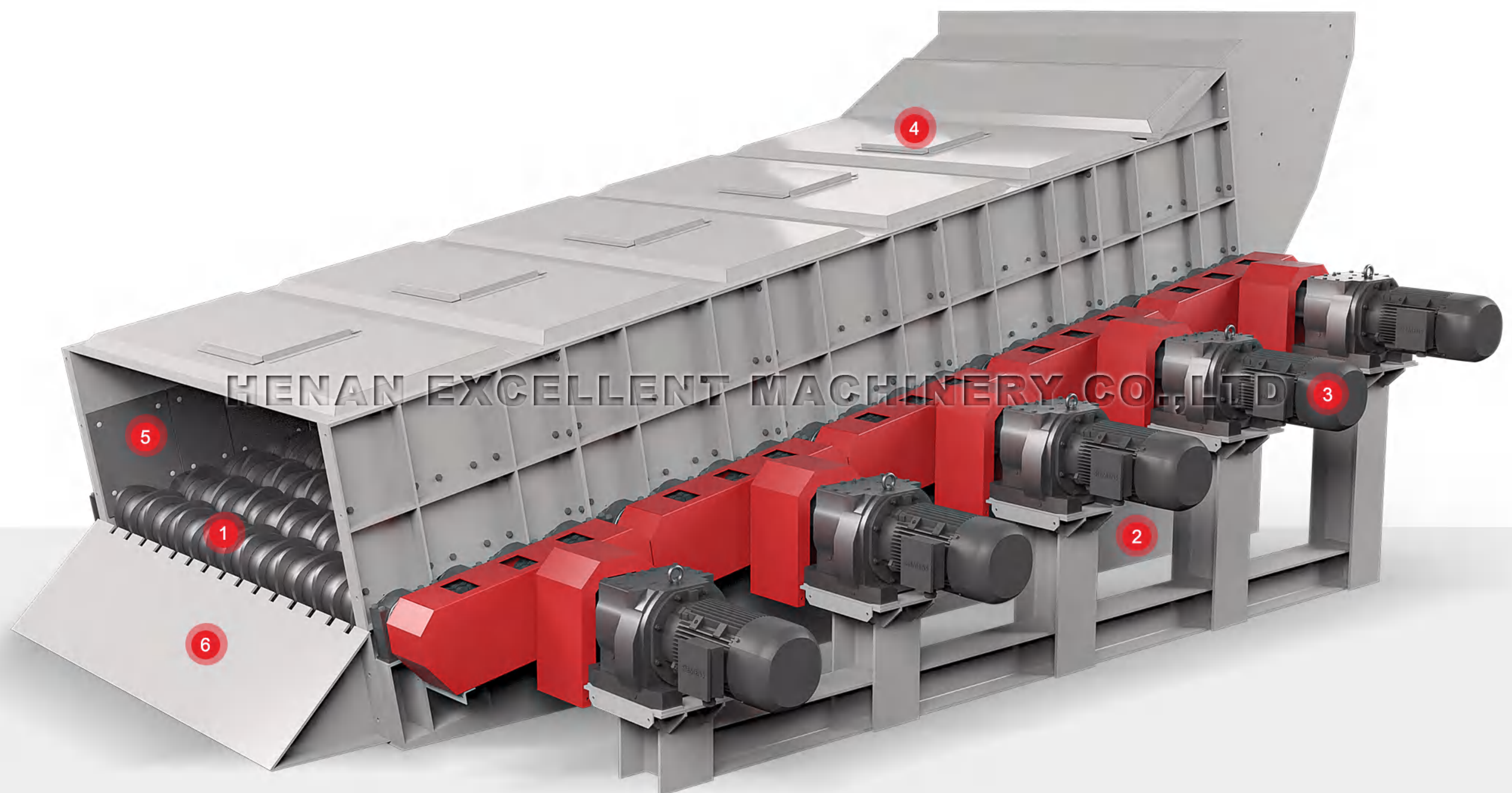
DISC SCREEN INTRODUCTION

Disc screen, also known as roller screens and wobble feeders, is an efficient screening equipment, the screening area is composed of the main bearing of each roll rotating in the same direction, which can achieve feeding and screen in one operation. Disc screen are very suitable for bulk materials that are difficult to screen, including wet and sticky materials.

The Screen surface of Roller Screen is composed of several parallel arranged screen shafts equipped with shaped screen discs, and the screen shafts are driven by the Drive Device to rotate in the same direction at the same speed, forming a rolling screen surface.

When the material flows on the screen surface, it can form a material flow of equal thickness and with a certain acceleration.

The gap between the screen shaft and the screen disc forms the screen hole, the material less than the screen hole is subjected to its own gravity and the rotating force of the screen shaft, and becomes the material under the screen through the screen holes. Material larger than the screen holes continues to enter along the screen surface under the action of the rotating screen disc, becoming the material on the screen, and finally achieving the classification of the material.



1 Screen Shaft Assembly

2 Screen Body

3 Driving Device

4 Protective Housing

5 Lining Plate

6 Self-cleaning Device



Screen Shaft Assembly

Disc screen disc is cast with wear-resistant manganese chromium alloy steel, which has good wear resistance and can cope with the impact and wear of large materials without any deformation or fracture.

Disc screen disc is designed as a parabolic screen disc, and is rounded to eliminate sharp corners, so that the rotating resistance of the screen is minimized.

The Parabolic shape of the screen disc can maximize the disturbance ability of the roller screen to the material flow and improve the screening rate.

The design of the screen shaft is reasonable and safe, which can effectively avoid the phenomenon of bending and breaking of the roller shaft.

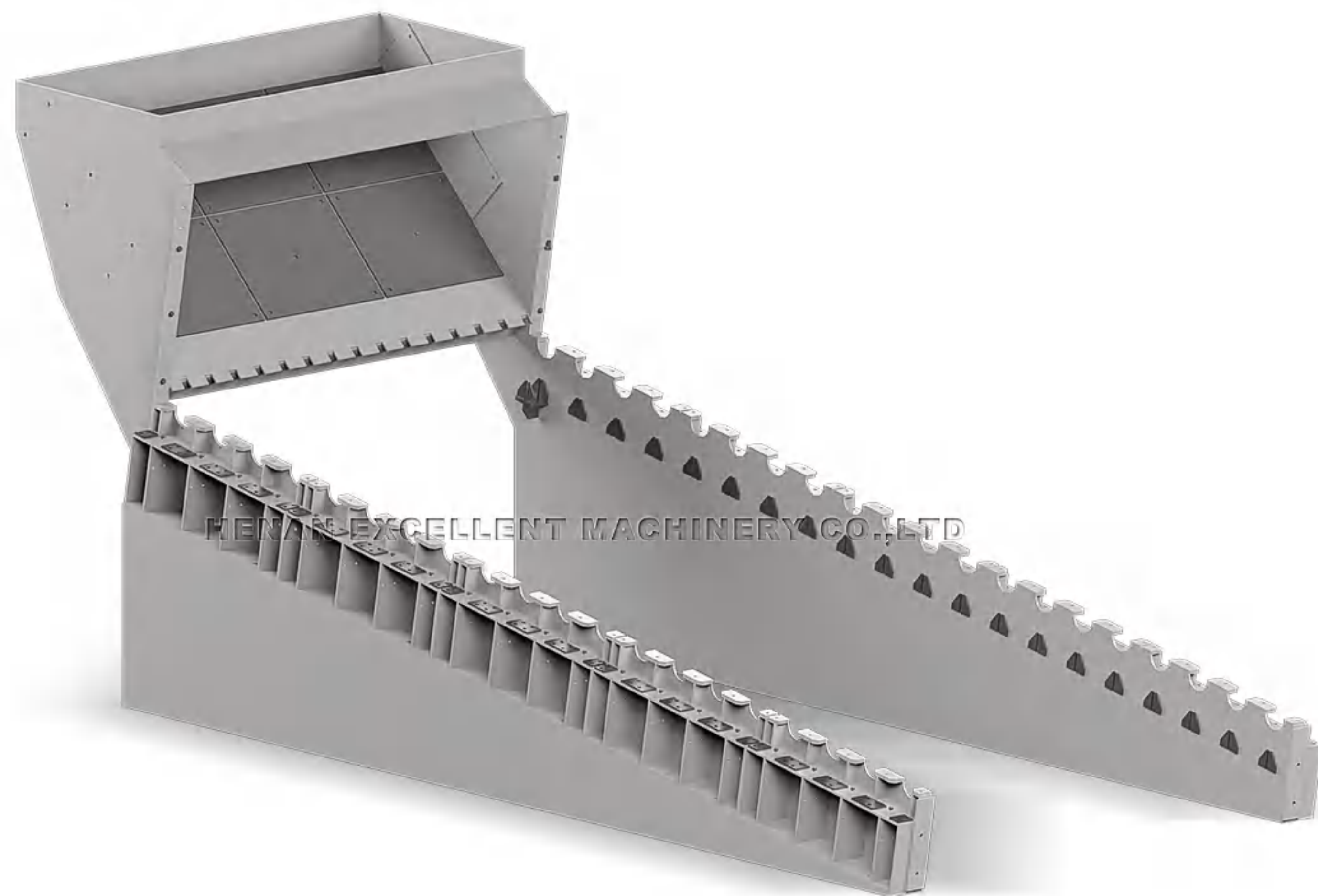
When any group of screen shafts fails, the material can continue to move forward under the push of previous screen shaft, and the screening can operate as usual.

The screen shaft bearing seat is installed on the outside of the screen box side plate for easy disassembly.



Screen Body

The main body of the roller screen is welded with low-alloy high-strength structural steel. All screen shaft assemblies are fixed to the machine body through connecting bolts. Wear-resistant lining plates are installed on the side of the machine body to avoid direct contact between materials and the box, greatly extending the service life of the equipment. And the wear-resistant lining plate and the screen box are connected by bolts, which is easy to replace.

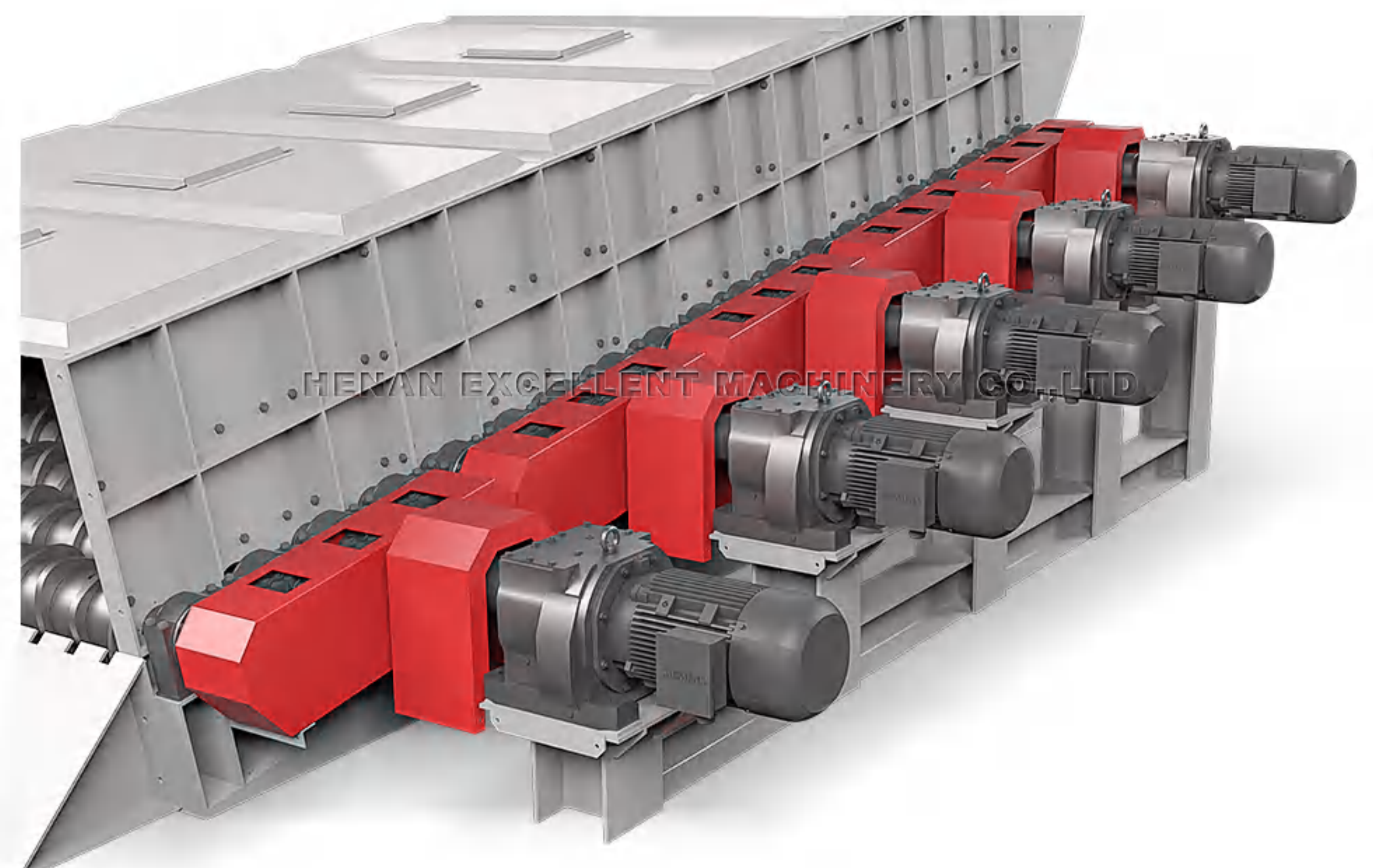


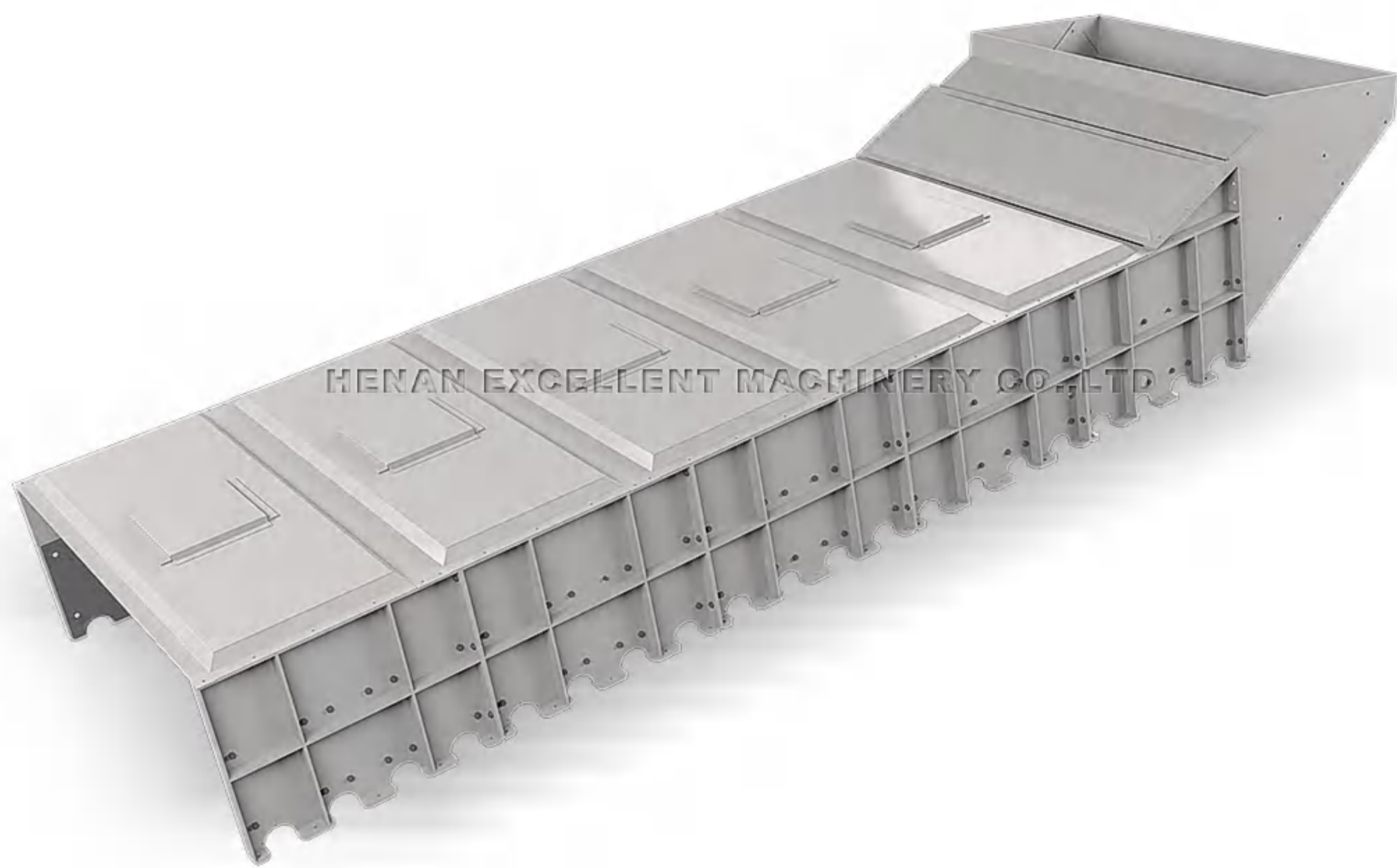
Driving Device

Disc screen adopts single-axis single-motor drive or multi-axis chain combination transmission mode, reasonable power configuration to evenly distribute the material in the screen and ensure smooth operation.

The design structure of the driving device is simple, easy to install and disassemble, and the connected screen shaft is not moved when disassembling.

The driving device is compact in size, light in weight, long in life and low in maintenance cost.





04 Protective Housing

The protective housing of the disc screen is welded with NM500 wear-resistant alloy steel plate, sprayed with anti-rust and anti-corrosion paint, and connected with the hopper and the outlet housing at the front and back.

The protective housing plays a sealing role, and the closed screen box can prevent materials from falling, prevent rain and snow weather from affecting the operation of the equipment, and protect the safety of personnel.

The overall sealing of the screen box can effectively prevent dust pollution, reduce the impact on the environment, and meet the requirements of green construction.

The protective housing is provided with an observation window to facilitate the observation of the operation of the machine.

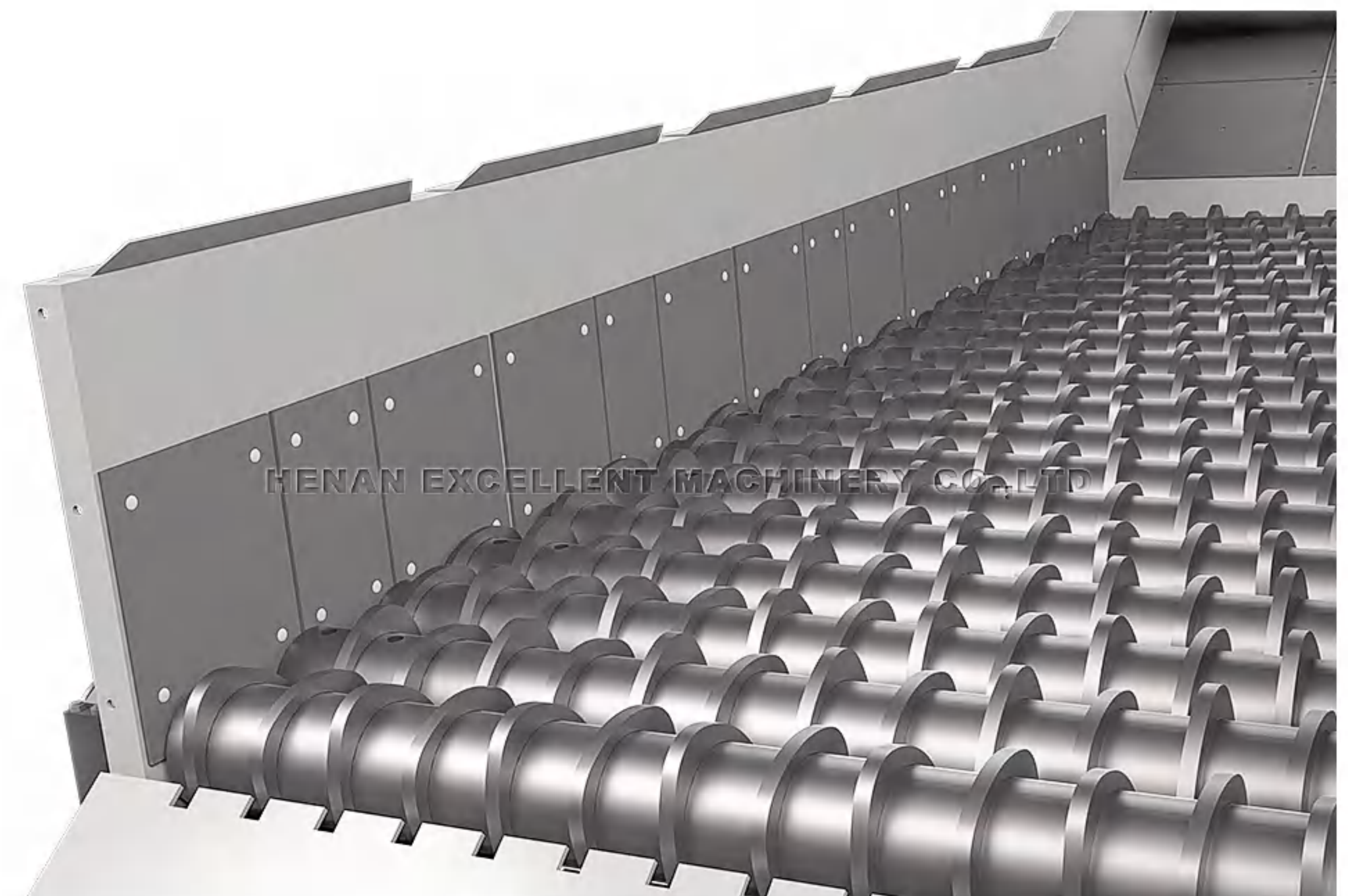
05 Lining Plate

The lining plate is made of wear-resistant alloy material, which has a long service life and strong wear resistance, toughness and impact resistance.

The inside of the screen body and the contact surface between the feeding inlet and the material are provided with wear-resistant lining plates, which can protect the screen body and increase the life of the feeding inlet.

The end of the screen shaft adopts a wear-resistant liner wrapped disc structure, which completely solves the problem of large blocks stuck on both sides of the screen box and the screen disc, ensuring the normal operation of the equipment.

The lining plate is fixed together with the mother plate by bolts, the replacement is convenient, and reduced maintenance time.



06 Self-cleaning Device

The self-cleaning device of the disc screen is made of wear-resistant steel and is equipped with a cutting edge, which is inclined to the lower part of the screen shaft. Some fibrous debris and sticky materials attached to the screen will be automatically cleaned off by the cleaning device to solve the blockage of the screen surface.

TECHNICAL COOPERATION AND **ACHIEVEMENTS**

In 2022, in cooperation with China University of Mining and Technology and Xinjiang Tianchi Energy Co., LTD., the virtual screening technology was applied to the screening process simulation and jam analysis of the industrial roller sieve, the significant influencing factors of screening efficiency and movement speed were summarized, and the compression-shear critical crushing analysis method of the stuck material under the occluding state of the roller sieve was proposed. The force characteristics of roller and screen are obtained, and the problem of parameter setting of overload control system is solved effectively.



GZS series large and efficient roller screen has been successfully used in Jining Mining Group, Henan Province Academy of Science Application Physics Institute Limited Company, Xinjiang Tianchi Energy, Qitai County Yindu Construction Engineering Co., LTD. Since the roller screen has been put into operation, the recovery efficiency of lump coal has reached more than 95%, and the environmental protection, safety and health indicators meet the national standards. The equipment has the advantages of stable operation, high reliability, low noise, low bearing temperature, uniform screen surface material distribution, small screen disc wear, and all indicators have reached the advanced level of similar equipment at home and abroad.

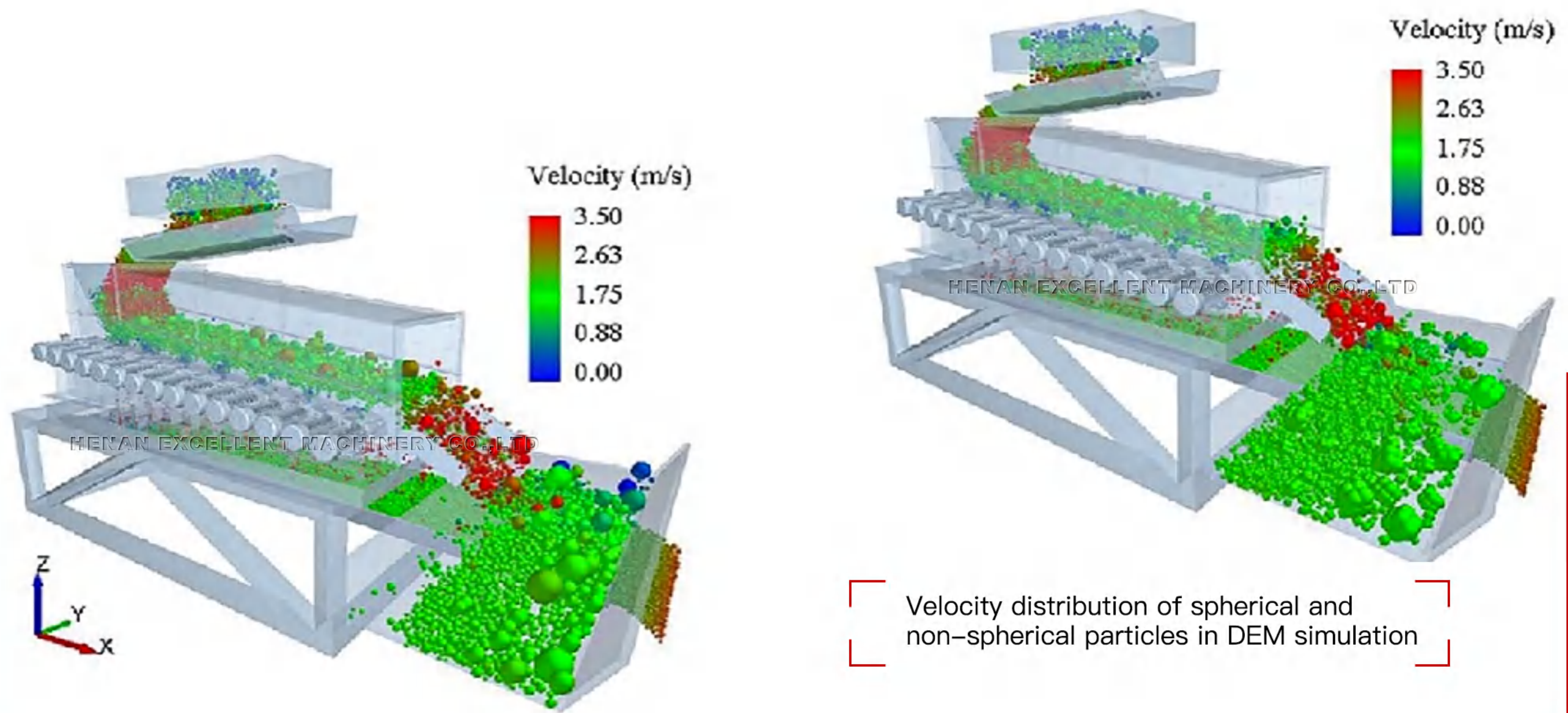


● Accurate Virtual Screening Test

Screening efficiency is an important index to evaluate the performance of screening equipment.

The speed and residence time of the particles on the screen surface are also important factors affecting the screening process, which not only affects the processing capacity of the screening equipment, but also affects the screening efficiency.

Therefore, in order to study the effect of actual working conditions on the screening performance of the disc screen, a series of parametric studies were carried out on different feed rates, screen shaft rotational speed, screen surface inclination and bonding force, ensure the rationality of selection.

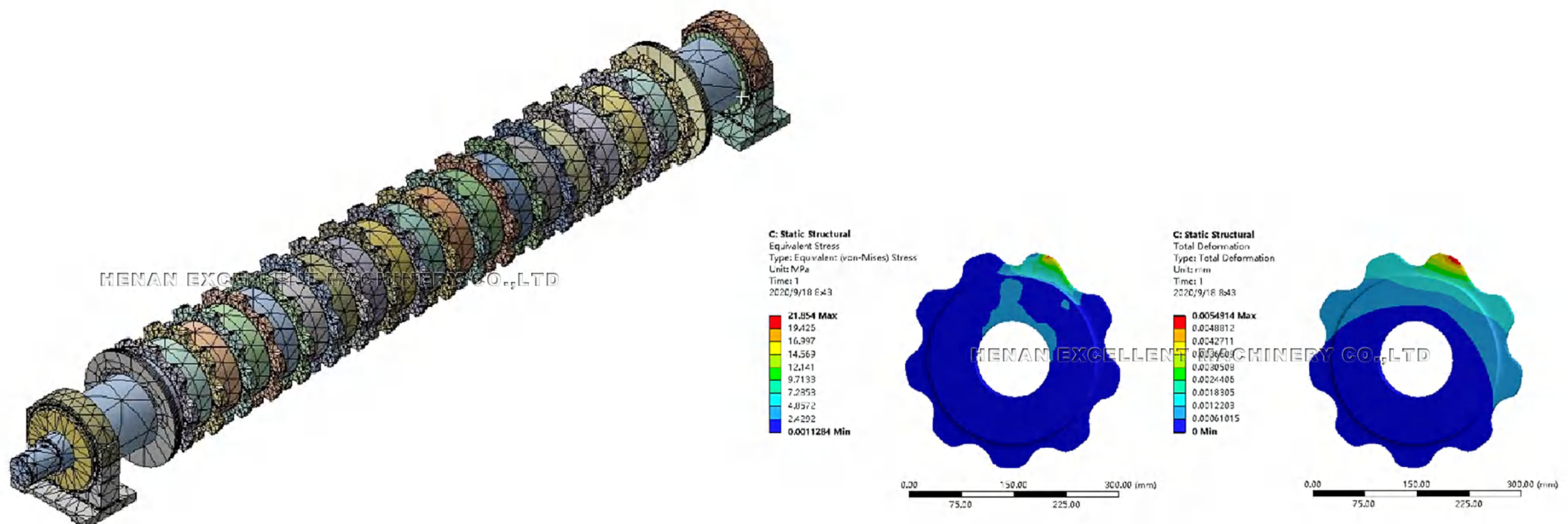


● Finite Element Force Analysis On The Screen Shaft

In the static coupling simulation, EDEM mainly provides the stress information of key components during operation for the finite element analysis of Workbench.

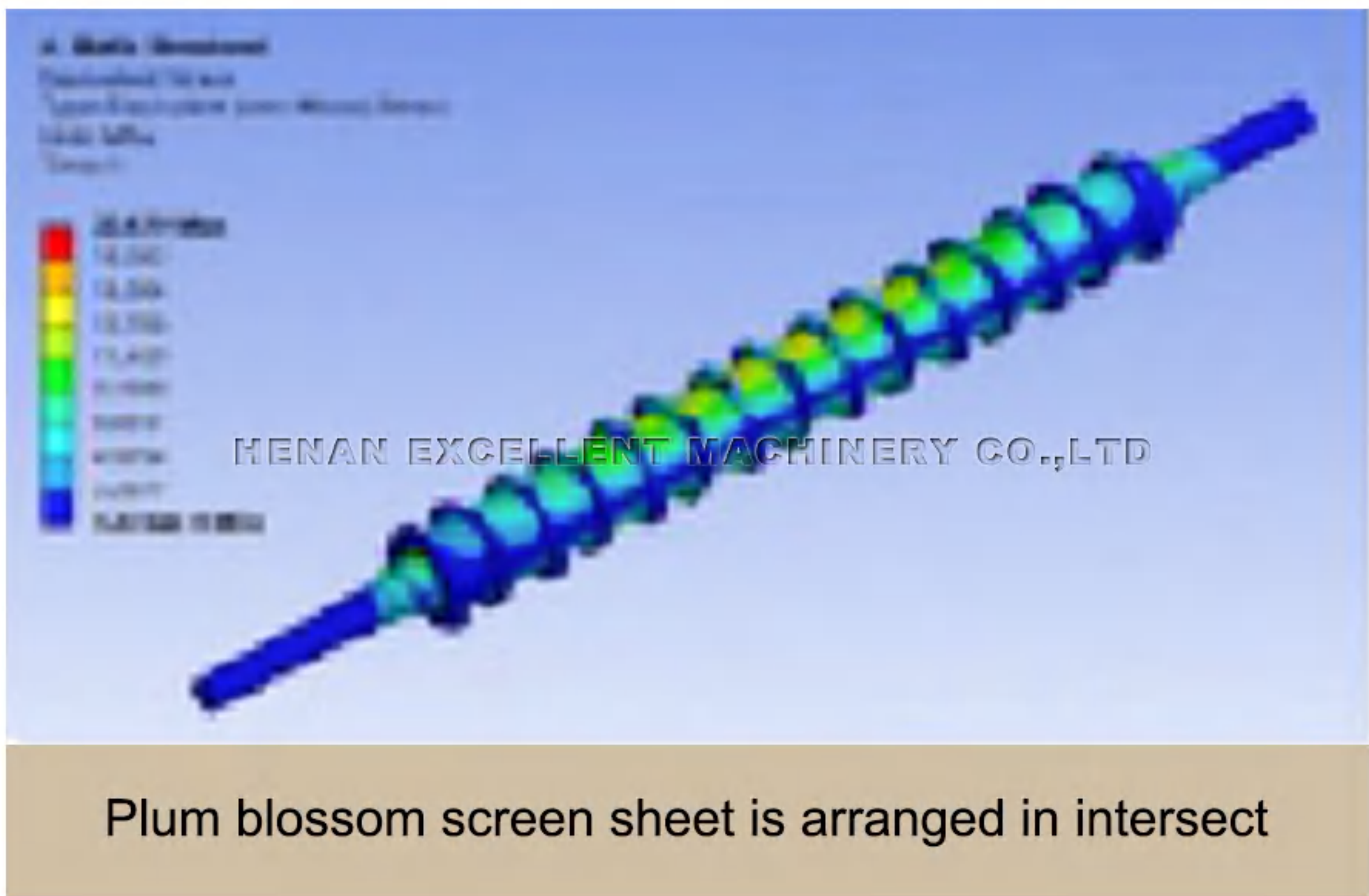
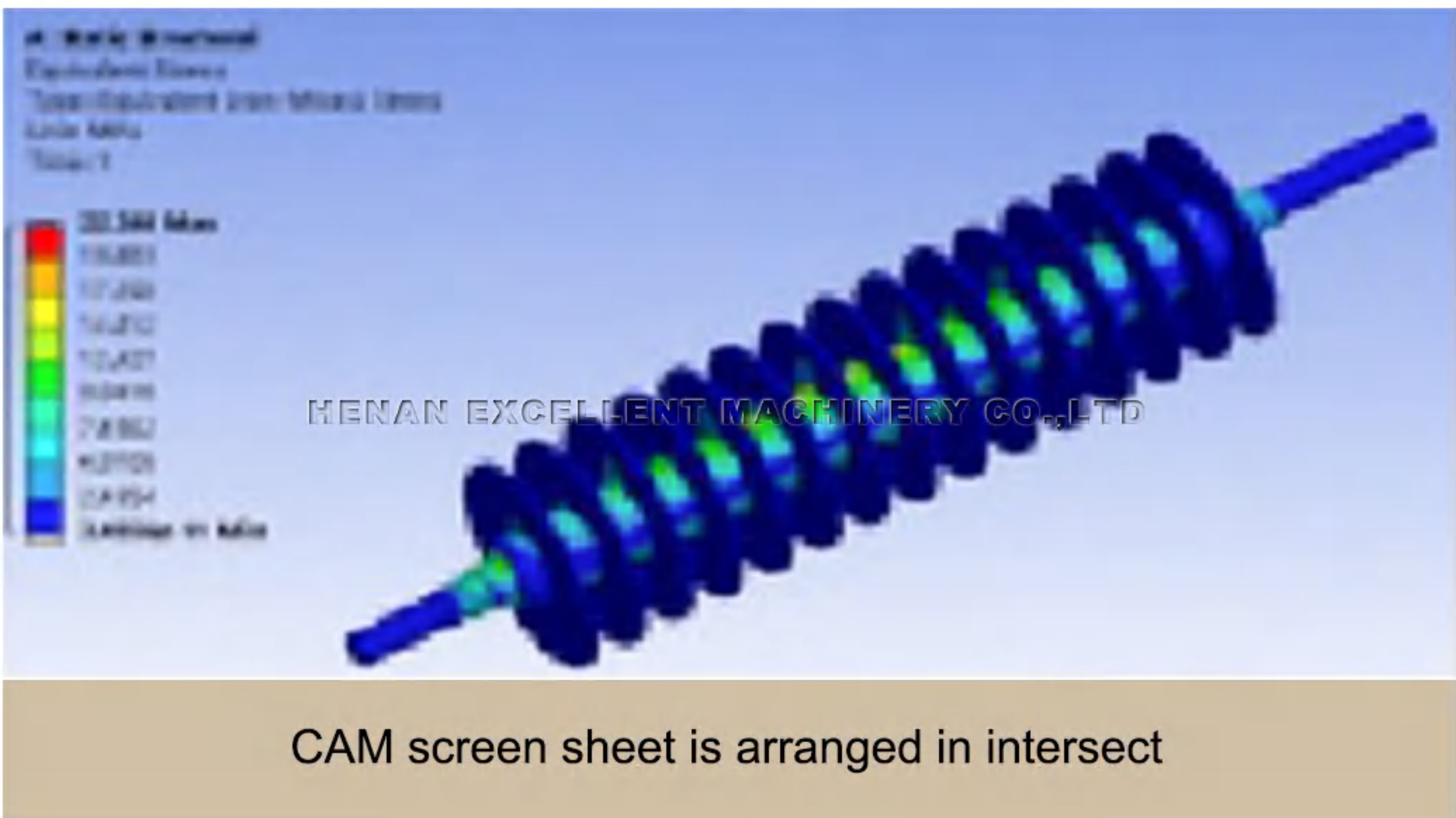
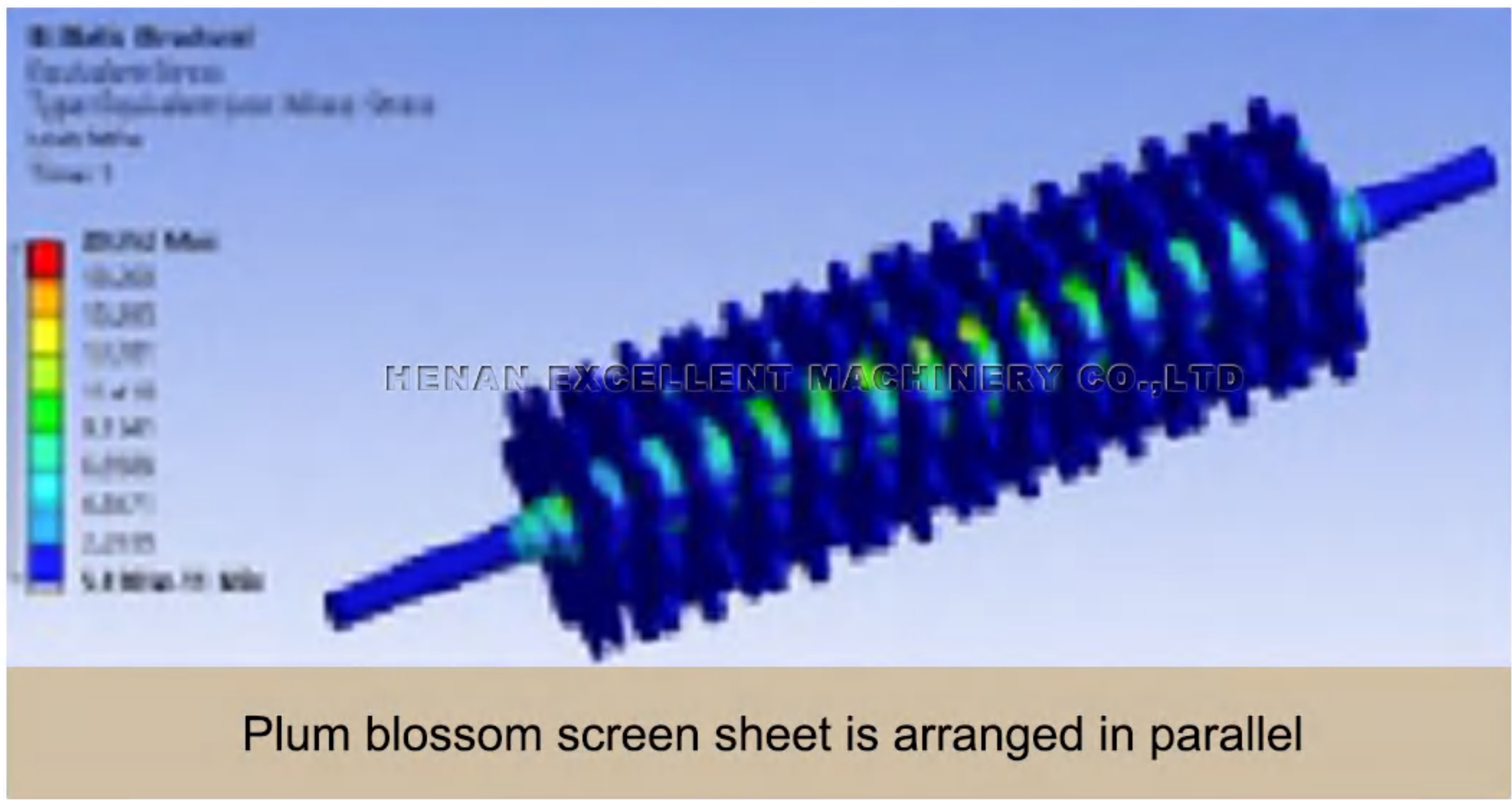
To realize the coupling simulation between EDEM and Workbench, two pieces of software need to be associated together in Workbench.

The EDEM module is added to Workbench through the interface program, and the EDEM module is associated with the mechanical analysis module in Workbench, and then the force information of the roller obtained from EDEM is imported into the discrete element module in Workbench.



Scientific Screen Disc Selection

On the basis of the existing finite element checking process, we further simulate the existing screen shaft of other screen disc shapes to explore the influence of screen disc shapes on the stress distribution of the shaft body. In addition to the existing quince-shaped screen disc, we conduct 3D modeling of CAM and sheet shaped disc screen, and carry out finite element check under the same load condition, and select the blade form according to the results.



☑ Torx screen disc
parallel distribution



☑ Torx screen disc
staggered tooth arrangement



☑ CAM screen disc
staggered tooth distribution

LETTERS OF PATENT



SCIENTIFIC AND TECHNOLOGICAL
ACHIEVEMENTS

APPRAISAL CERTIFICATE

成果	登记号	
登记	批准日期	

科学技术成果鉴定证书

中煤科鉴字[2022]第 HS3 号

成果名称: GZS 系列大型高效滚轴筛

完成单位: 中国矿业大学

新疆天池能源有限责任公司

河南省振源科技有限公司

鉴定形式: 函审鉴定

组织鉴定单位: 中国煤炭工业协会

鉴定日期: 2022 年 8 月 8 日

鉴定批准日期: 2022 年 8 月 8 日

中华人民共和国科学技术部

二〇〇五年制

ROLLER SCREEN

FEATURES

✓ **High Screening Accuracy**

High screening accuracy, high efficiency. the handling capacity is 4 times that of the traditional trommel screen of the same volume,the screening efficiency is 1.5 times that of the trommel screen, and the single production capacity can be as high as 1000t/h or so.

✓ **Run Continuously**

The equipment can run continuously,and it can play the functions of conveying, separating, screening and so on under different mines, which can achieve the multi-purpose into one machine.

✓ **Environmental Protection**

The whole machine adopts completely closed structure, no vibration, effectively avoid dust spillover, low noise, energy saving and environmental protection.

✓ **Smooth Operation**

Adopts single-shaft drive or multi-shafts chain combination drive mode, motor, reducer, bearing with high-quality brand,reasonable power configuration and screen surface structure, so that the material load inside the screen evenly distributed to ensure smooth operation.

✓ **Modular Assembly**

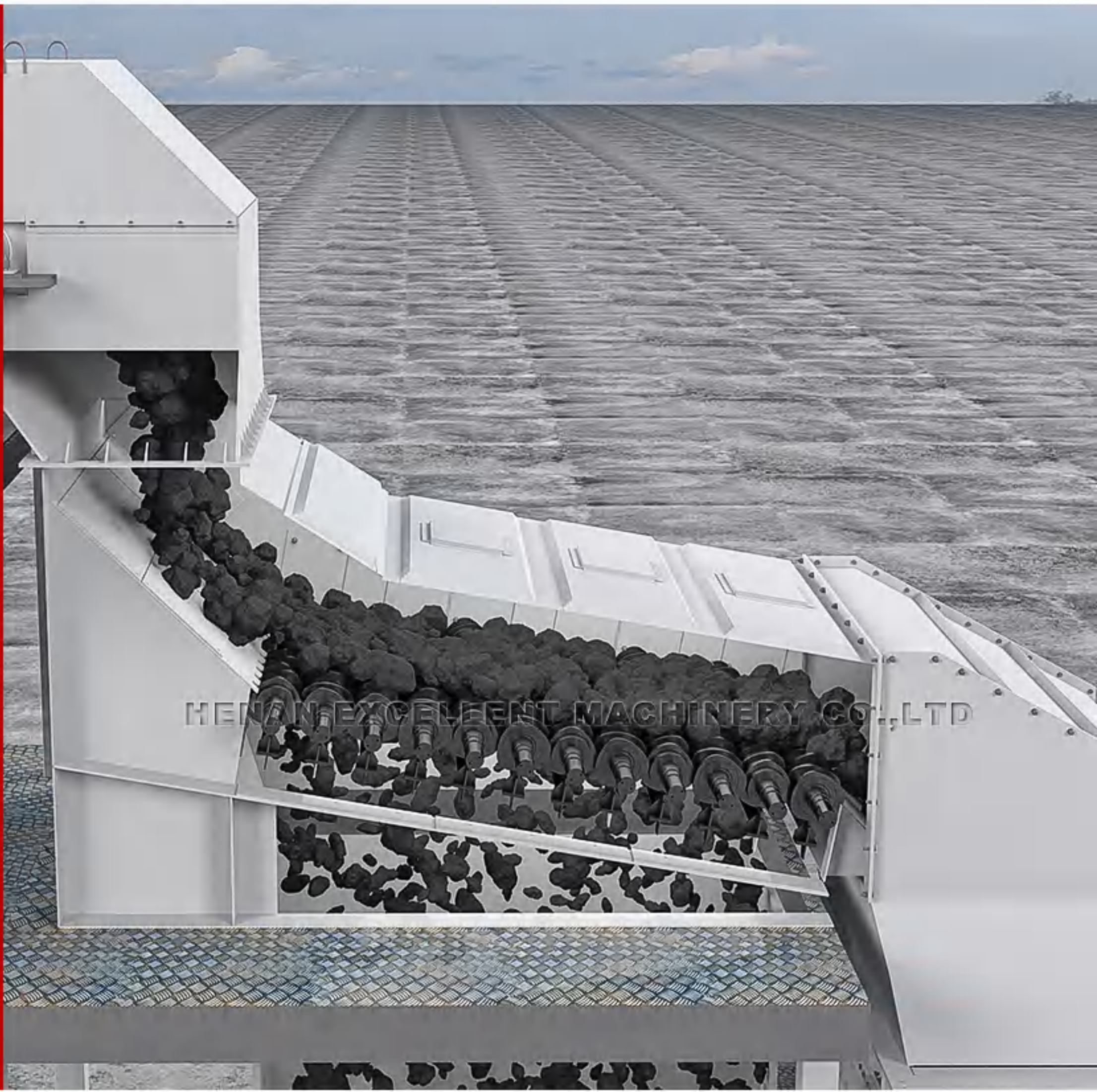
Modular assembly, can be lengthened or shortened according to material conditions, easy maintenance and structural adjustment.

✓ **Manual/Automatic Control**

The whole machine adopts electrical and mechanical dual protection, with interlock protection function, can achieve manual control and automatic control.

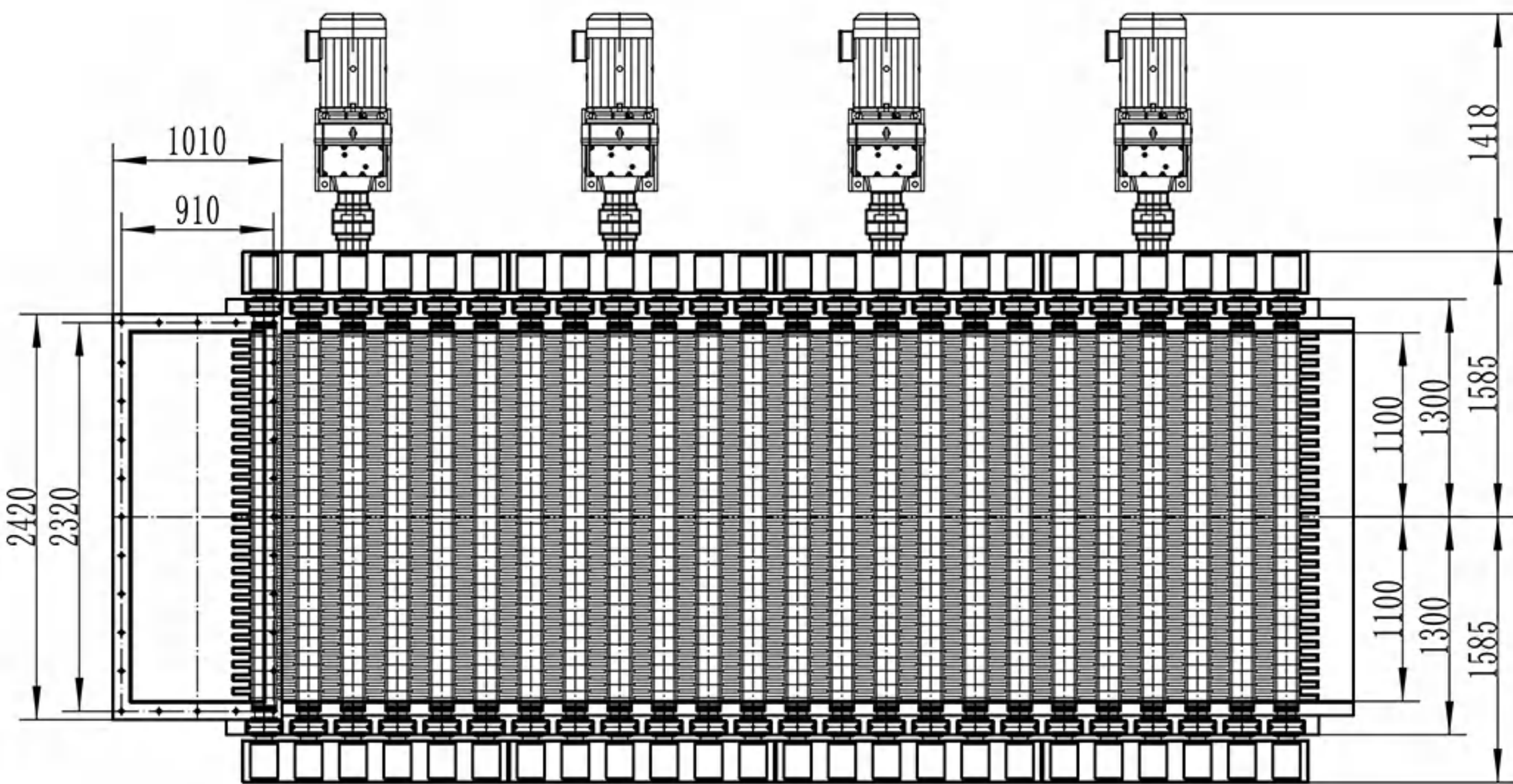
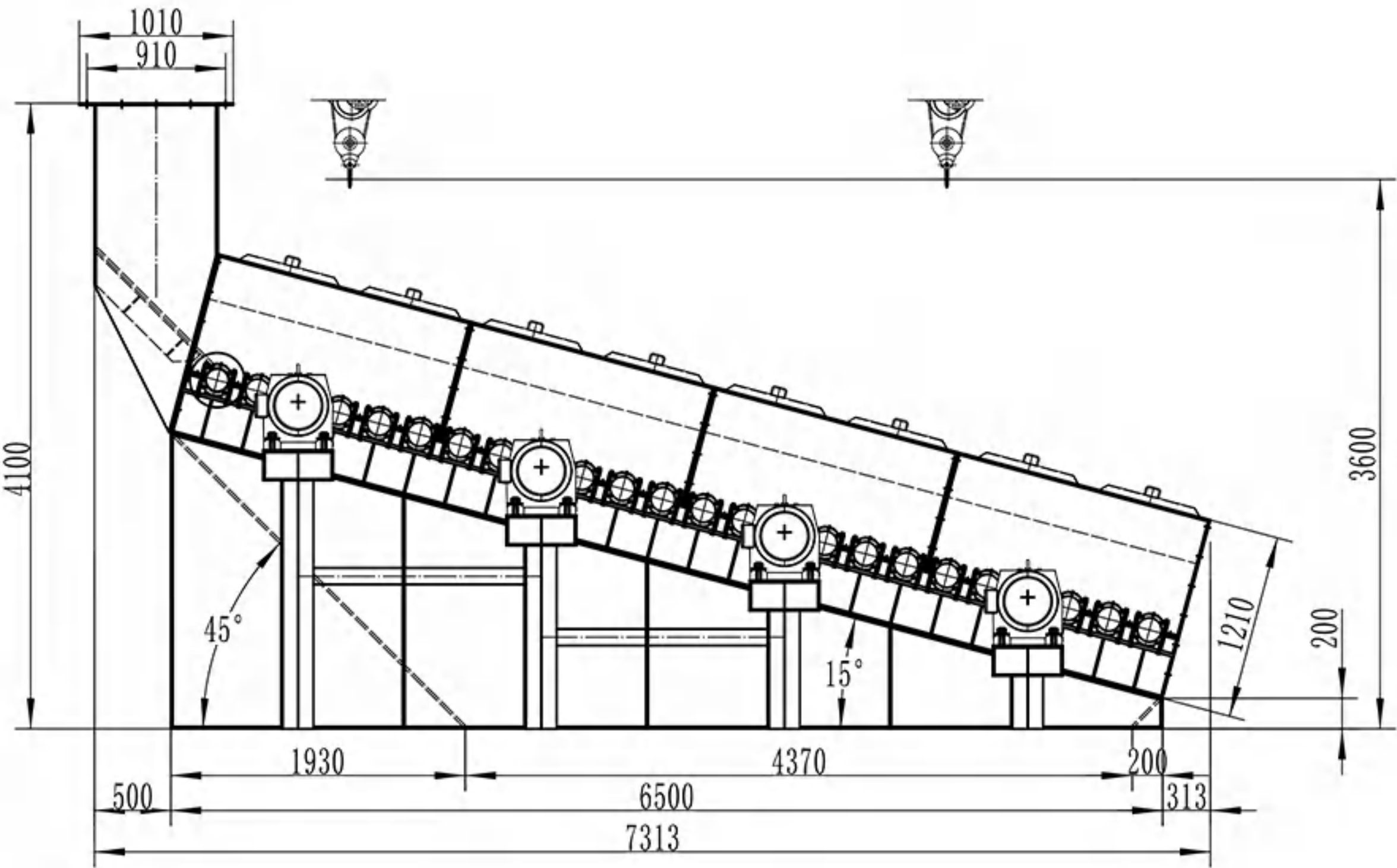
APPLICATION

- | | |
|--------------------|---------------------------|
| ➤ Feeding | ➤ Electric Power |
| ➤ Mining | ➤ Coal Fired Power Plants |
| ➤ Screening/Sizing | ➤ Cement |
| ➤ Aggregates | ➤ Sand Aggregate |
| ➤ Coal | ➤ Solid Waste |
| ➤ Metallurgy | ➤ Limestone |
| ➤ Clay | ➤ Gold Ore |
| ➤ Argil | ➤ Granite |
| ➤ Salt | ➤ Ilmenite |
| ➤ Gypsum | ➤ Iron Ore |
| ➤ Bauxite | ➤ Kaolin |
| ➤ Copper Ore | ➤ Laterite Ore |



DISC SCREEN

TECHNICAL SPECIFICATIONS



Model	Screen Width (mm)	Controlled Axis/Base	Graded Particle Size (mm)	Drive Power (km)	Handling Capacity (t/h)
GZS1208	1200	8	10–100	15	150–300
GZS1412	1 400	12	10–100	2x15	200–500
GZS1618	1600	18	10–100	3x18.5	400–800
GZS1824	1 800	24	10–100	4x22	600– 1000
GZ S2024	2000	24	10–100	4x30	800–1200
GZ S2430	2400	30	10–100	5x37	1000–1800

* The number of rolls can be customized according to customer requirements.



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