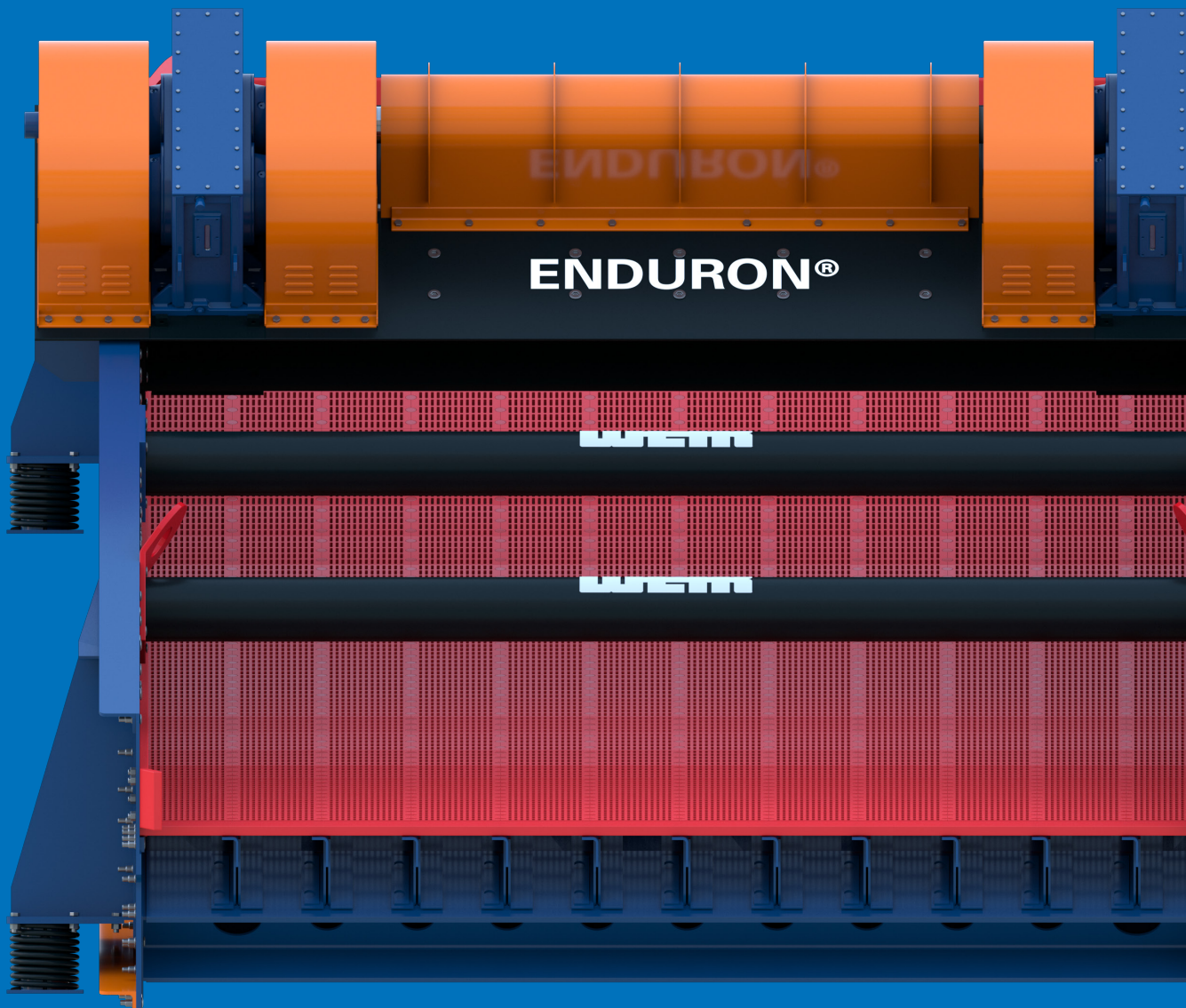


WEHR

Enduron® HPGR Screens



Enduron®

Engineered to order

Efficient

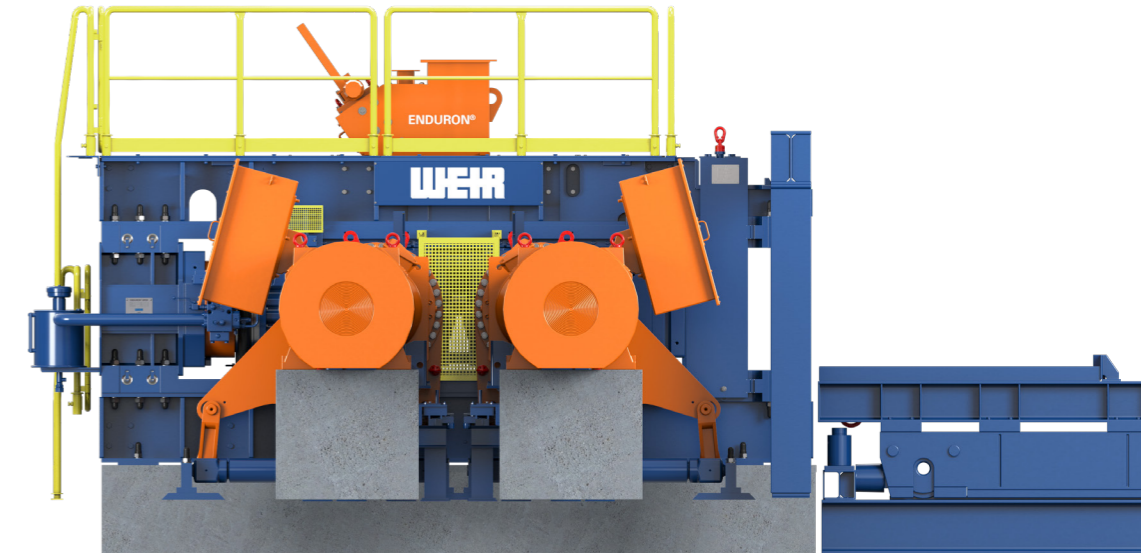
Innovative

Underpinning the design and manufacture of all of our Enduron® products is a commitment to innovation and quality.

By combining our latest technologies and advanced wear resistant materials, we deliver custom-made solutions precisely designed to fit your unique requirements.

And all of our products are fully supported by our Weir Minerals service network offering unrivalled service, support and local expertise right across the globe.

Enduron® HPGR and screens are innovative solutions, engineered for your particular needs.



HPGR benefits at a glance

Enduron® High Pressure Grinding Rolls (HPGR) are increasingly being utilised in the mining and minerals processing industry and for good reason.

- Low energy consumption (0.8–2.2kWh/t)
- High machine availability >95% with low maintenance requirements - this compares very favourably to traditional crushers that typically provide only circa 80% availability
- Flexible comminution solution with the operational bandwidth to process changing ore bodies throughout the life of mine
- Improved downstream grindability
- Enhanced downstream mineral recovery
- Substantial savings from reduced grinding media consumption:
 - lower costs
 - 40% lower carbon footprint compared to traditional grinding circuits
 - less contamination and downtime in the recovery process

Exclusive to Enduron® HPGR

For high availability and operational stability, there's no better choice than our internationally renowned Enduron® HPGRs.

Enhanced Roller Surface Technology

This unique feature of our Enduron® HPGR, combined with spring loaded lateral walls, delivers optimal product quality with minimal wear and power consumption.

Protective Bearing Arrangement

This arrangement (yet another unique feature of our Enduron® HPGR) has been designed to protect against premature failure and reduce the number of peak loads which can be transferred to the bearings.

Controlled Roller Skewing

Skewing ensures that the pressure is distributed across the full width of the tyre, minimising recirculation. This is particularly applicable in segregated feed conditions which are typical in mineral processing applications. Enduron® HPGR can dynamically accommodate these changing feed conditions through skewing.

Unique Roll Length:Diameter Ratio

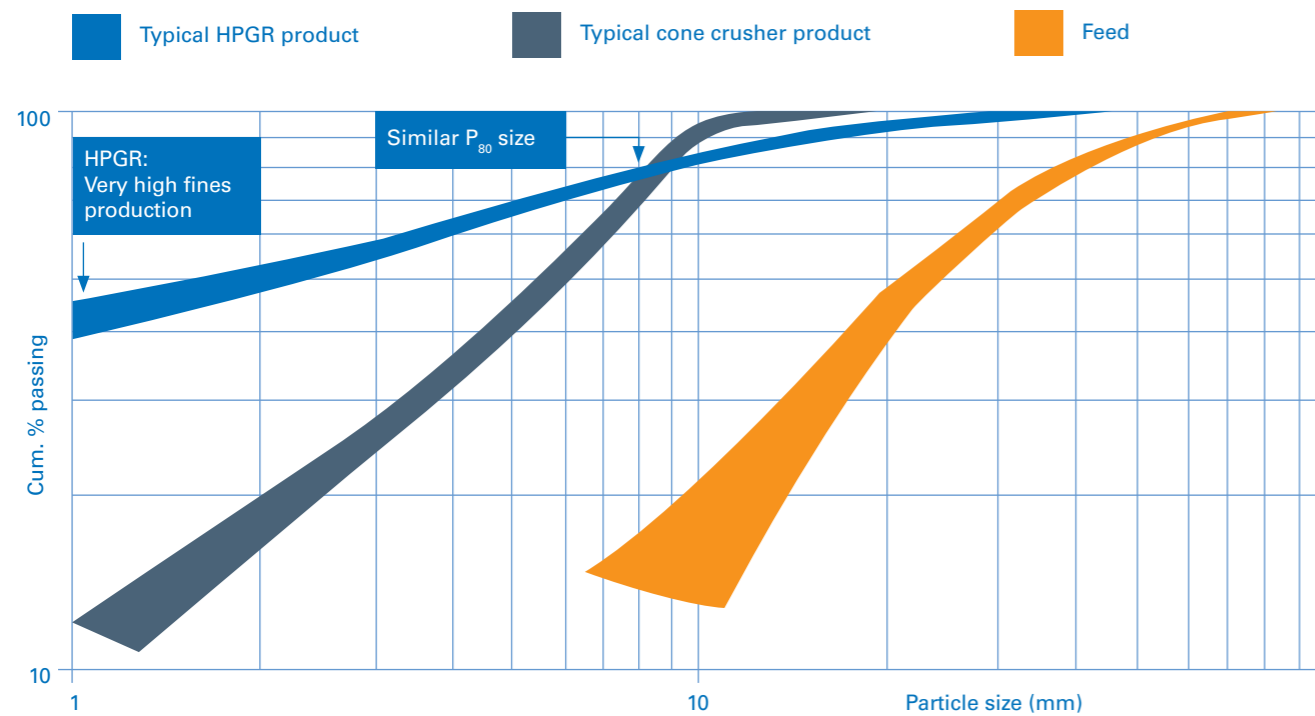
This feature delivers the highest product quality, minimising recirculation and reducing operational costs. The Enduron® HPGR L:D ratio enables smaller tyre diameters for a given tonnage relative to all competitors. This optimises the operating gap ensuring full pressure across the full tyre length, exceeding the ore's compressive strength. The superior L:D ratio of our Enduron® HPGR and its compact cylindrical bearing arrangement means that users enjoy significantly reduced infrastructure costs as the required civil structural height is kept to a minimum.

Greater percentage of fines

HPGRs utilise inter-particle grinding. This highly efficient method of comminution is characterised by the high generation of fines that is produced.

When compared to traditional tertiary crushers, the HPGRs discharge consists of a wider particle size distribution (PSD). The characteristics of this output must be considered in the design of the screens which succeed the HPGR in the flowsheet.

With a typical grinding circuit being limited to around 200% recirculation loads, it is critical that the screens are designed to separate the fines as efficiently as possible. High bed-depths must also be considered due to the high tonnage rates these screens are required to process. Dilution and spray-bars may be required at finer cut sizes. The addition of water must be carefully calculated while considering the deck-map, cross-dams, and other ancillaries needed to control flow across the entire length of the screen.



Comparison of particle size distribution: High Pressure Grinding Roll v. Cone Crusher

Why are banana screens best suited to screening HPGR discharge?

A banana screen will typically achieve a 30% higher throughput when compared to other screen types with similar deck sizes. This is due to the rapid stratification of fine material which occurs in the first third of the screen deck. The added efficiency offered by the multi-slope design can be attributed to the screen's ability to facilitate an overall thinner material bed-depth when compared to typical horizontal screens.

Size

Screening HPGR discharge material often requires a large screen. A typical HPGR circuit operates with up to a 200% recirculation load, resulting in high screen feed rates.

The cut size of a typical HPGR screen range from 1 - 4mm. This requires much larger screens than those used in typical mining applications or attributed to other screen profiles.

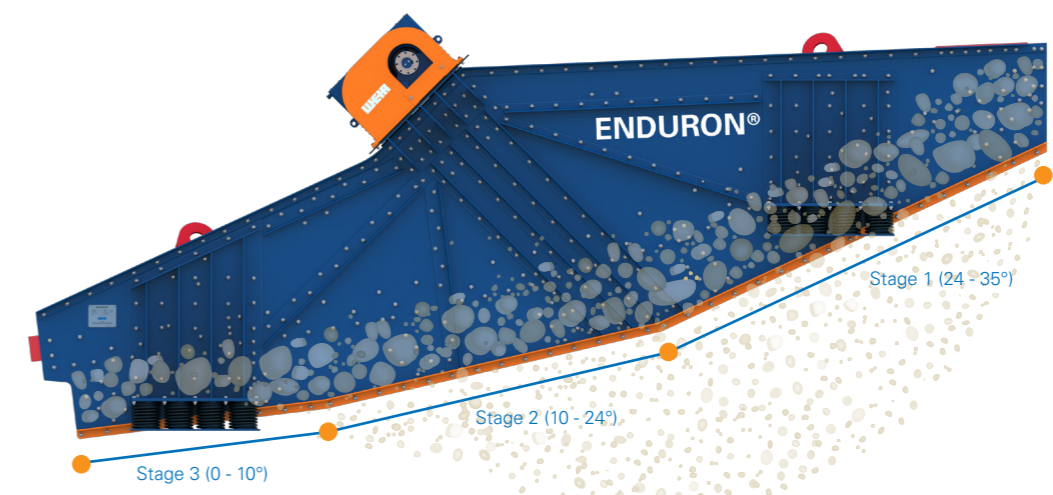
Shape

The shape of a banana screen is perfectly suited to screening the conglomerated fines created by the HPGR. The aggressive slope of 24 - 35°, which is located at the feed-end (stage 1), means that a banana screen can rapidly stratify the fine material.

The varying slope angles featured within the screen's design mean that although a banana screen consistently operates at a typical 45 - 50° angle of throw (as measured to the horizontal), the feed material is subjected to varying angles of throw throughout its journey along the deck.

The rapid stratification at the feed-end of the screen ensures that interparticle space is created quickly. The interparticle space within the material layer allows the fine material to easily reach the deck surface and stratify through the screen media panel apertures.

A typical banana screen will separate the majority of p50 material within the first third of the deck (stage 1). The second third removes the p80 material (stage 2), while the last third is used for near-sized screening which concentrates on the material closest to the cut-size - p90 and above (stage 3).





Enduron® HPGR banana screens

The range of Enduron® banana screens offer exceptionally high throughput per deck.

Each screen is expertly designed following in-depth material testing and review of the application's particle size distribution (PSD).

Fully understanding the HPGR discharge material ensures each screen's geometry, inclination and dynamics is perfectly suited to deliver optimum stratification of the material bed.

Enduron® HPGR banana screens are installed at a steeper inclination compared to regular banana screens. The steep entry slope enhances fine material removal through rapid material bed stratification.

Accurate estimates of the screen's oversize are possible. This allows us to predict the recirculation load on the HPGR.

Water is often required at finer cut-sizes. Our team of application specialists can calculate the correct amount of dilution and spray water needed for accurate classification. This includes laying out the deck-map, cross-dams, and other ancillaries required to control the flow across the entire screen.

All Enduron® banana screens are engineered-to-order, meaning that they fit perfectly, and are fully equipped to perform in each specific application.

- Engineered up to 4.27m in width and 9.76m in length
- Capable of working in a closed-circuit with a HPGR
- Offers high capacity and low bed depth
- Suited for the rapid stratification of fines
- Designed to operate between 4.5-5gs of acceleration – this high acceleration, linear-motion screening is perfectly suited for screening of feed material containing a high amount of fines as the high acceleration assists in breaking up the agglomerated fines
- All-bolted construction using locking bolts to ensure structural integrity
- Features Linatex® premium rubber installed to protect the machinery during highly corrosive applications and lower the total cost of ownership
- Supplied featuring our proprietary range of exciters, the largest exciters in the world producing up to 1.2MN of centrifugal force per exciter

Our solutions-focused approach

When it comes to the design of an efficient comminution circuit, individual products should not be considered in isolation. The performance of each component is interlinked, and contributes to the effectiveness of the subsequent processing stage and overarching control philosophy.

Not only are Enduron® HPGR and vibrating screens designed to complement each other, both products have also proven themselves onsite in terms of performance and total cost of ownership.

The design and selection of both of our Enduron® products is based on extensive in-house laboratory testing with proven scale-up methodologies to deliver optimal performance.

Integrating and linking Weir Minerals products across the flowsheet de-risks the operation for our customers. This solutions-focused approach ensures that you benefit from fully optimised circuits, built for their specific needs and designed to deliver what we promise - solutions delivered on time, on budget, and with ongoing process and maintenance support.

At Weir Minerals we offer leading expertise across both wet and dry processes and we are committed to partnering with you throughout the life of our products and solutions.





Minerals

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