A WIRTGEN GROUP COMPANY

WIRTGEN

Maximum performance in large-scale opencast mining.

Surface Miner 4200 SM

Outstanding features of the 4200 SM

DISCHARGE CONVEYOR

Discharge conveyor including raising and slewing function for direct loading onto a transport vehicle.

COUNTERWEIGHT

Movable counterweight for high machine stability and undisturbed operation along the edge of embankments.

10 | POWER UNIT WITH DIESEL ENGINE

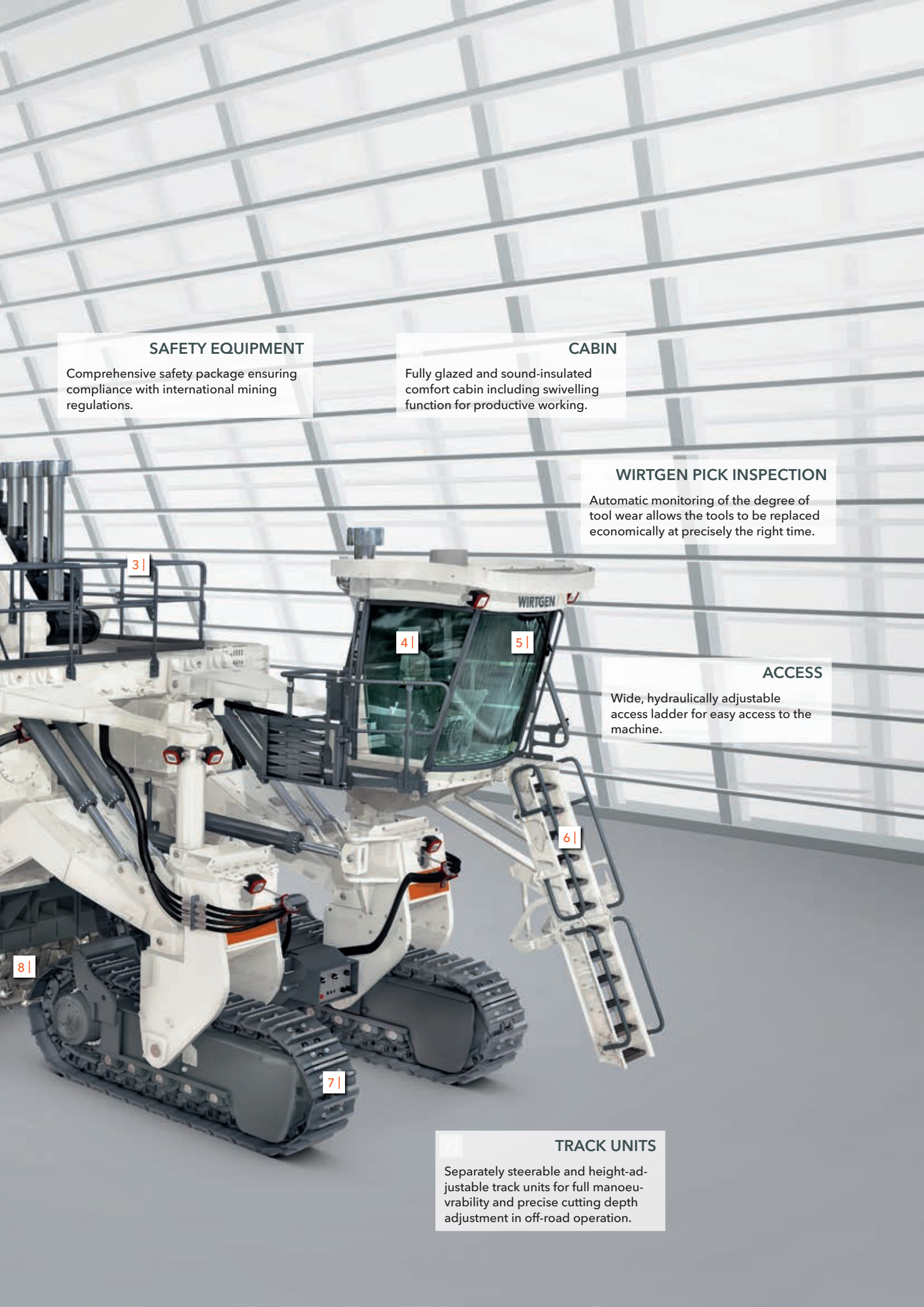
Fuel-efficient, powerful diesel engine paired with a heavy-duty mechanical belt drive for high cutting performance.

9 | DRUM TOOLING

Extra-robust mining tools arranged in a helical pattern for high cutting performance, minimized tool wear and extended durability.

8 | CUTTING DRUM

Mechanically driven, wear-resistant cutting drum working in up-cutting mode for efficient operation.



SAFETY EQUIPMENT

Comprehensive safety package ensuring compliance with international mining regulations.

CABIN

Fully glazed and sound-insulated comfort cabin including swivelling function for productive working.

WIRTGEN PICK INSPECTION

Automatic monitoring of the degree of tool wear allows the tools to be replaced economically at precisely the right time.

3 |

4 |

5 |

ACCESS

Wide, hydraulically adjustable access ladder for easy access to the machine.

6 |

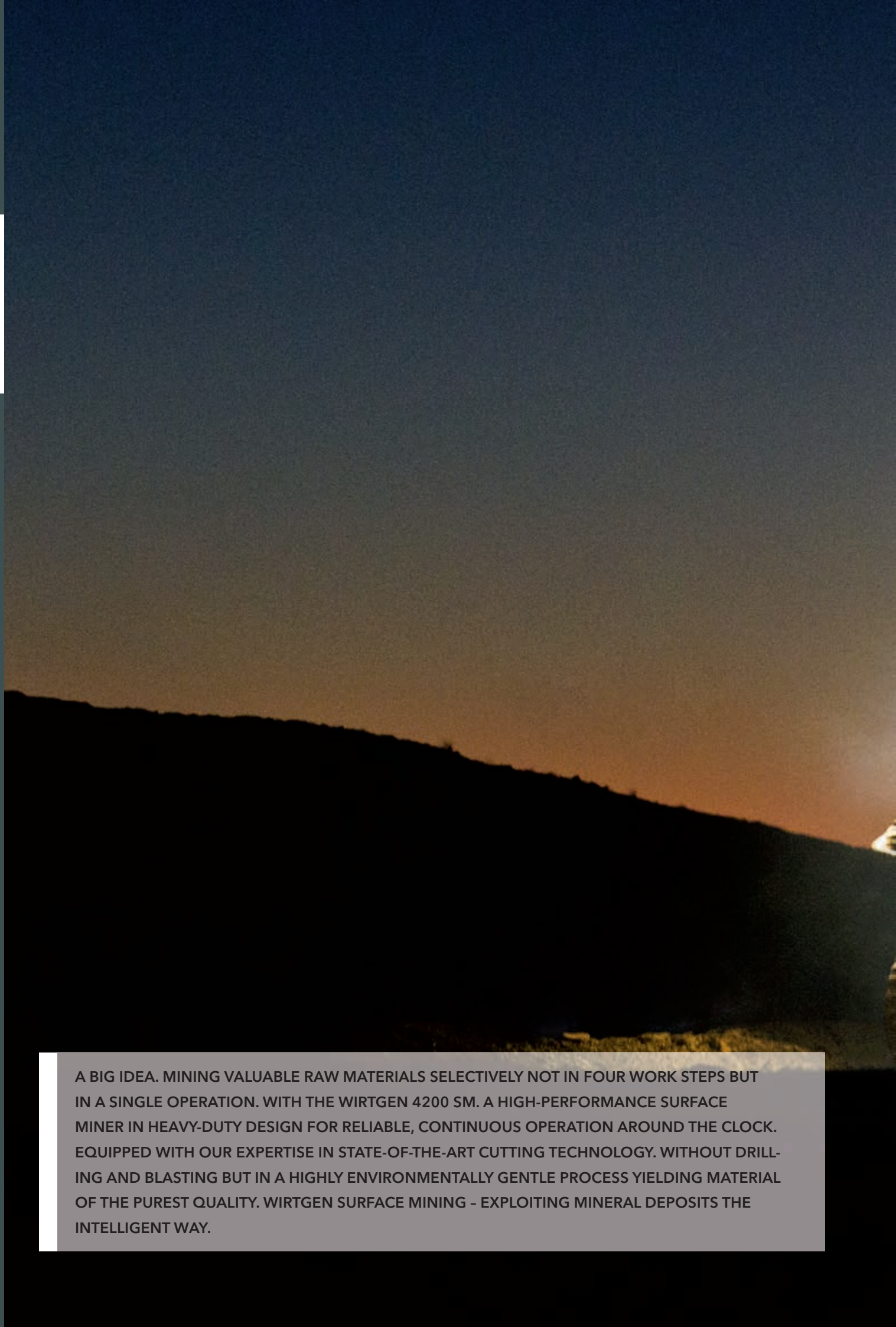
8 |

7 |

TRACK UNITS

7 |

Separately steerable and height-adjustable track units for full manoeuvrability and precise cutting depth adjustment in off-road operation.



A BIG IDEA. MINING VALUABLE RAW MATERIALS SELECTIVELY NOT IN FOUR WORK STEPS BUT IN A SINGLE OPERATION. WITH THE WIRTGEN 4200 SM. A HIGH-PERFORMANCE SURFACE MINER IN HEAVY-DUTY DESIGN FOR RELIABLE, CONTINUOUS OPERATION AROUND THE CLOCK. EQUIPPED WITH OUR EXPERTISE IN STATE-OF-THE-ART CUTTING TECHNOLOGY. WITHOUT DRILLING AND BLASTING BUT IN A HIGHLY ENVIRONMENTALLY GENTLE PROCESS YIELDING MATERIAL OF THE PUREST QUALITY. WIRTGEN SURFACE MINING – EXPLOITING MINERAL DEPOSITS THE INTELLIGENT WAY.


Efficient.

High cutting performance and economic efficiency are hallmarks of the 4200 SM.

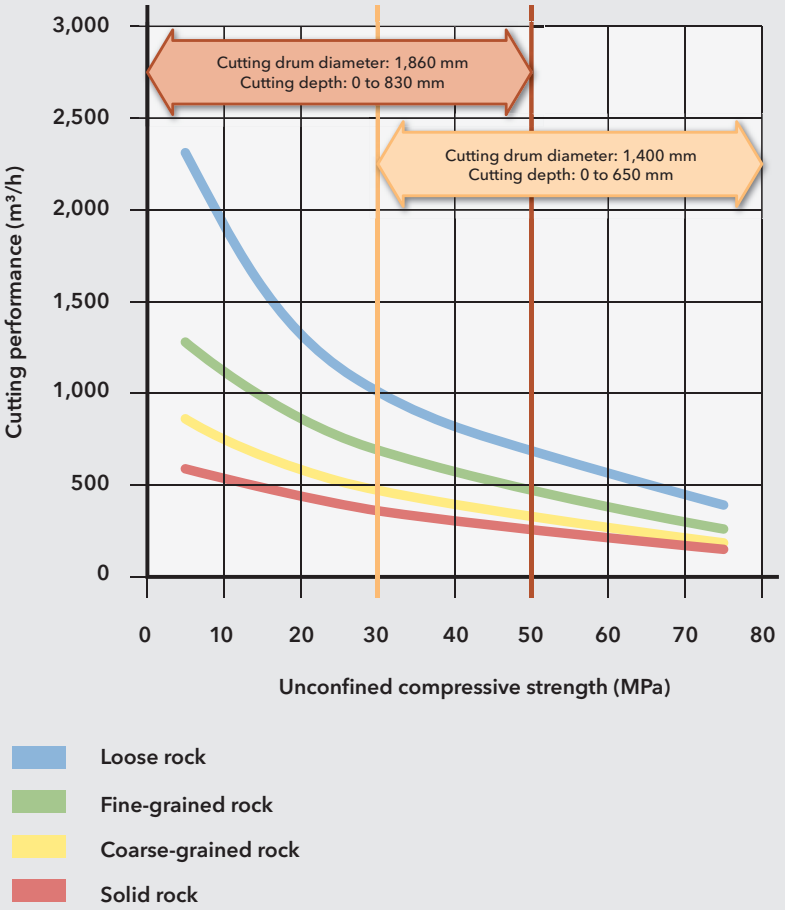
Reaching new performance levels with the 4200 SM

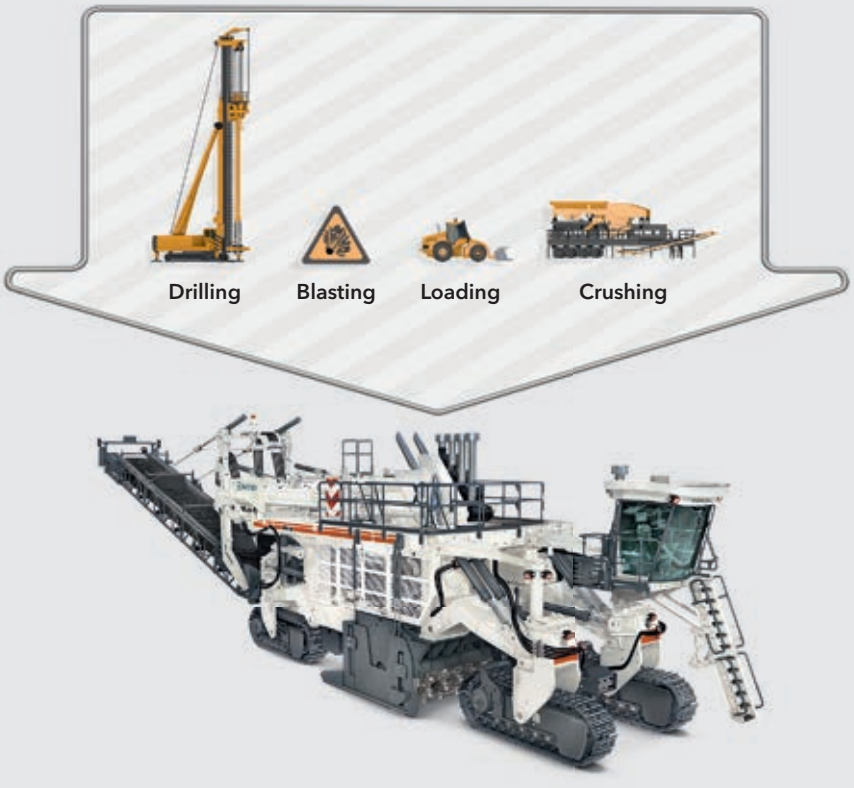
ANNUAL MINING CAPACITY OF UP TO 12 MILLION TONNES

The 4200 SM is the ideal candidate for the mining of hard rock or soft rock on a truly grand scale. Tremendous mining capacity, unmatched economic efficiency and flexible adaptability to most diverse operating conditions and mining regulations count among its outstanding hallmarks. Instead of requiring four operating steps, which is normal for conventional mining methods, up to 3,000 tonnes per hour of material can be mined in a single operation, with a single machine and one operator. The high-performance machine is the prime choice for mine operators in large-scale opencast mining wanting to achieve an annual mining capacity in soft rock of up to 12 million tonnes with a single machine.

Two models are on offer: in soft-rock mining design, the high-performance machine is capable of mining materials with unconfined compressive strengths of up to 50 MPa at a cutting depth of up to 830 mm. In hard-rock mining design, it is possible to mine materials with unconfined compressive strengths of up to 80 MPa at a working depth of up to 650 mm.

CUTTING PERFORMANCE OF THE WIRTGEN 4200 SM SURFACE MINER





A single operation instead of four – with the WIRTGEN 4200 SM surface miner.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Feel the power.

THE TREMENDOUS CUTTING POWER OF WIRTGEN CUTTING DRUMS CANNOT ONLY BE SEEN. IT CAN LITERALLY BE FELT. BECAUSE OF THE HEAVY-DUTY CUTTING DRUM DESIGN TAILORED TO PERFORMANCE REQUIREMENTS. MANUFACTURED FROM EXTREMELY WEAR-RESISTANT MATERIALS. BASED ON SPECIFIC EXPERTISE GAINED IN SEVERAL DECADES OF EXPERIENCE IN CUTTING TECHNOLOGY. COST-OPTIMIZED. SO THAT WE CANNOT ONLY MEET BUT EXCEED YOUR REQUIREMENTS IN EFFICIENCY AND PRODUCTIVITY.

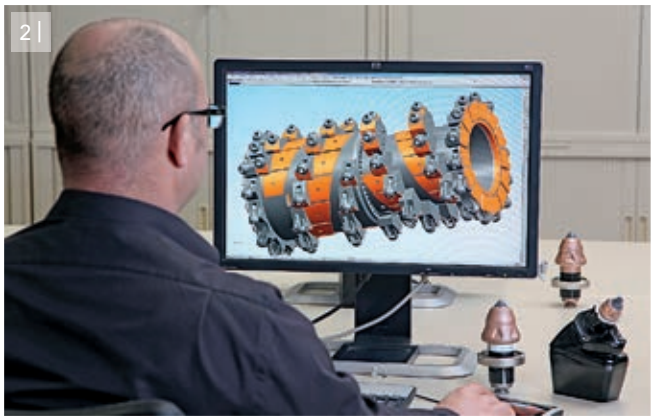
The cutting drum is tailored to application requirements to enable maximum cutting performance.

Cutting drum tailored to performance requirements

APPLICATION-SPECIFIC DRUM DESIGN

Cutting drums for the WIRTGEN 4200 SM are made-to-measure products: they are tailored to the hardness of the material to be mined and to customer-specific requirements. The process of customizing the cutting drum design to application requirements - including the use of most diverse hard-wearing mining tools and toolholder systems – is based on the unmatched expertise gained in several decades of experience in cutting technology. The cutting drum for soft-rock mining has a large diameter which permits the throughput of large material quantities. The cutting drum for the mining of hard rock has a smaller diameter and permits high cutting performance, thus enabling the machine to be used not only in opencast mines but also in rock operations or trench construction.

The cutting drum works in up-cutting mode: the more favourable angle of approach produces a comma-shaped chip that breaks in an upward direction. Energy consumption is thus reduced, vibration levels are kept to a minimum, and the machine works much more efficiently.



1 | *HT15 reduces the time required to replace a single toolholder from 90 minutes to only 15 minutes compared to conventional, welded toolholder systems.*

2 | *Each cutting drum is designed in line with the specific operating conditions it is intended for.*

HT15 QUICK-CHANGE TOOLHOLDER SYSTEM

The innovative HT15 quick-change toolholder system ensures maximum tool utilization while minimizing breaks in operation.

1 | Specially heat-treated holder shank for increased strength

2 | Heavy-duty shank mounting for the use of WIRTGEN point-attack cutting tools

3 | Precise contact surfaces between upper part and bottom part for transfer of the cutting forces

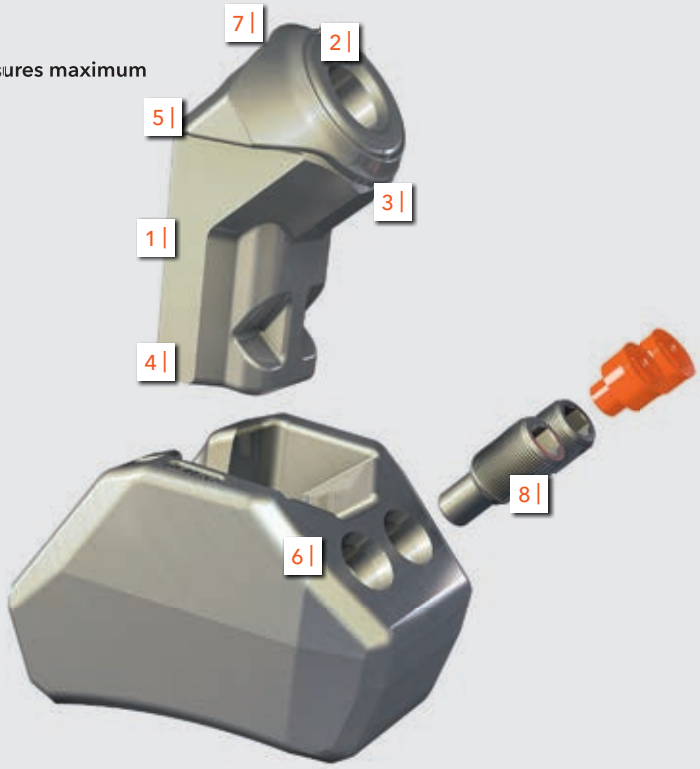
4 | Double prism for optimal seating and supporting action of upper part in bottom part

5 | Material guides to protect the bottom part from abrasive wear

6 | Pronounced recesses in bottom part to protect internal threads and bolts from damage

7 | Large opening in upper part to ensure optimum access during tool replacement

8 | Solid mounting bolts and flexible silicone plugs to protect the fine thread from moisture and dirt



Technically mature loading.

WIRTGEN SURFACE MINERS ARE EXPECTED TO DELIVER TOP PERFORMANCE CONTINUOUSLY AND IN EVERY REGARD. MATERIAL LOADING INCLUDED. THE LOADING CONVEYOR OF THE 4200 SM IS READY TO TAKE ON EVERY CHALLENGE. TO UP TO 2,400 SOLID CUBIC METRES PER HOUR. WITH APPLICATION-SPECIFIC FLEXIBILITY COMING AS A STANDARD FEATURE. THANKS TO TREMENDOUS SLEWING ANGLES, HEIGHT-ADJUSTABLE LOADING CONVEYOR AND VARIABLE CONVEYING SPEED. COMBINING PIONEERING POWER AND TECHNOLOGY – MADE BY WIRTGEN.

The high-performance discharge conveyor allows direct loading into trucks or dumpers.

Filling huge dump trucks in record time

FLEXIBILITY COMES AS A STANDARD FEATURE

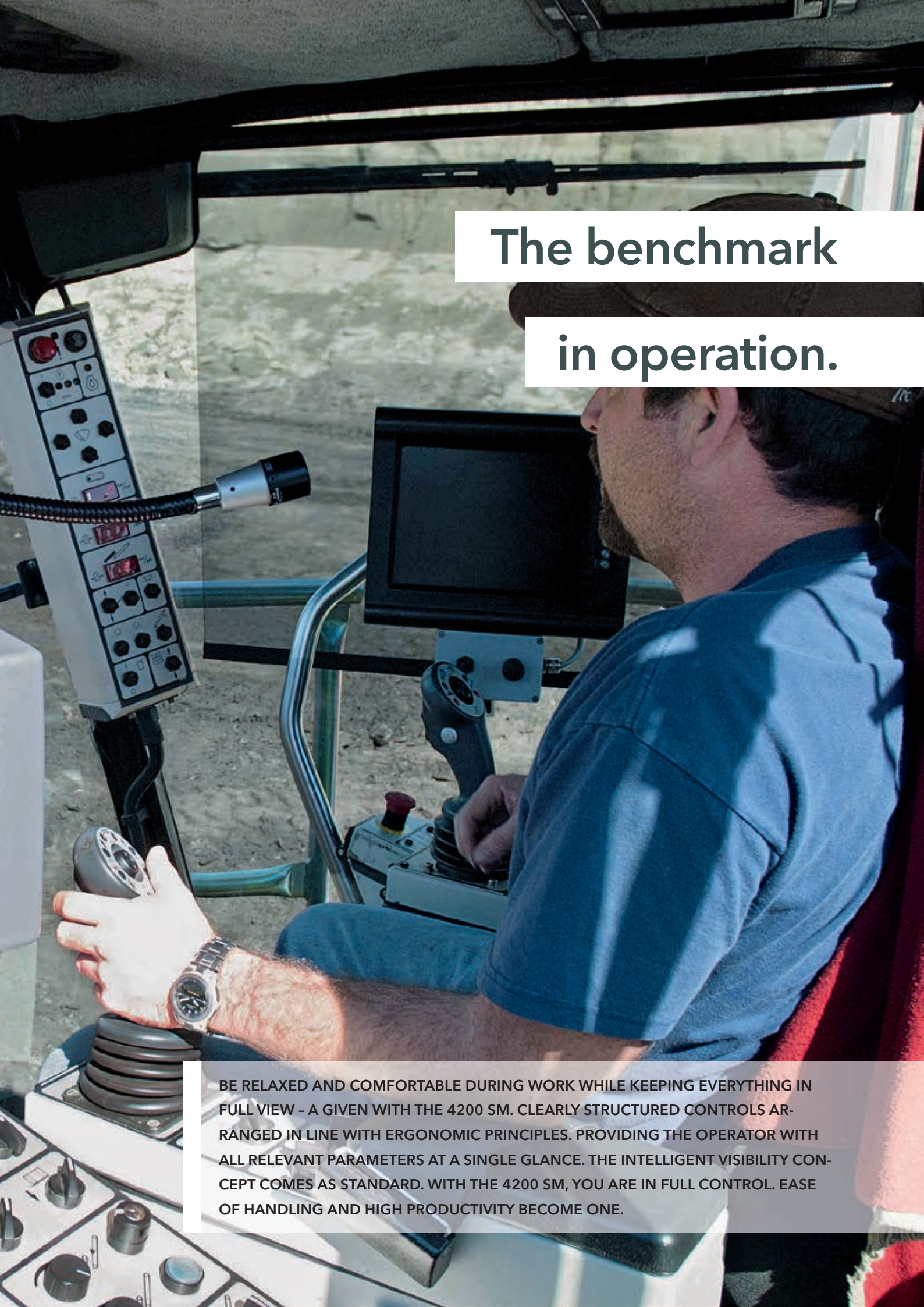
Optimized loading is of vital importance to ensure the economical mining of large mineral deposits. Not only the generous conveying capacity of the 4200 SM's loading conveyor leads by example in this regard, however, but also its outstanding flexibility: a tremendous slewing angle of 180°, height adjustment and continuously adjustable belt speed ensure the smooth loading of large transport trucks even in restricted space conditions. The two-stage conveyor system replaces standard loading equipment – the requirements are met by a single machine.

The primary conveyor transports the material to the discharge conveyor, which is available in two different lengths to ensure optimized loading of different truck sizes in opencast mining. It permits even dump trucks of the 220-t class to be loaded efficiently. The interplay between the steep-incline belt with rugged cleat profile and the conveyor drive with tremendous power reserves ensures consistently high conveying performance even when mining ores of high density.

1 | *Slewing angles of up to 90° to either side allow perfect adjustment to conditions in the mine.*

2 | *Extracted material can also be simply discharged to the side of the miner.*

3 | *The movable counterweight provides stability and is easily retracted when working along steep high slopes.*



The benchmark in operation.

BE RELAXED AND COMFORTABLE DURING WORK WHILE KEEPING EVERYTHING IN FULL VIEW – A GIVEN WITH THE 4200 SM. CLEARLY STRUCTURED CONTROLS ARRANGED IN LINE WITH ERGONOMIC PRINCIPLES. PROVIDING THE OPERATOR WITH ALL RELEVANT PARAMETERS AT A SINGLE GLANCE. THE INTELLIGENT VISIBILITY CONCEPT COMES AS STANDARD. WITH THE 4200 SM, YOU ARE IN FULL CONTROL. EASE OF HANDLING AND HIGH PRODUCTIVITY BECOME ONE.

No cutback on operator comfort

ERGONOMIC DESIGN SUPPORTS THE OPERATOR

Keeping production rates of the 4200 SM at consistently high levels requires an operator who is able to fully focus on his work during the entire work shift. We have therefore made sure that he feels safe and comfortable. The cabin is equipped with air-conditioning and heating systems. It is located above the front left track unit, on the side opposite the slope and away from the cutting drum and engine. It offers full soundproofing and is isolated against vibration.

Four cameras plus screen provide the operator with a full view of the important working areas. The field lighting system comprising fifty LED lights ensures non-tiring and safe operation of the machine even in darkness. The cabin and air-sprung, individually adjustable driver's seat can each be swivelled about large angles to either side, thus providing a perfect view for loading the heavy-duty dump trucks and steering the track units. All controls, such as the two multifunctional joysticks, are integrated into the ergonomically optimized armrests. They include all functions required for the mining operation, thus giving the operator full control of the work process.

1 | *A wide, hydraulically adjustable ladder with separate, battery-operated pump ensures convenient access.*

1 | *The panorama cabin can be swivelled about 45° to either side; to ensure even better visibility, the driver's seat can be rotated about 135°.*


WIRTGEN

More control

in off-road operation.

EXPERIENCE HAS SHOWN THAT THE TERRAIN OF LARGE-SCALE MINING OPERATIONS HOLDS UNEXPECTED DIFFICULTIES, SOME OF THEM PRESENTING A TRUE CHALLENGE. GOOD TO BE PREPARED FOR JUST SUCH A SITUATION. THE WIRTGEN 4200 SM SURFACE MINER FEATURES MANY TECHNICAL INNOVATIONS HELPING YOU TO REACH YOUR GOAL SAFELY AND QUICKLY. MORE TRACTION, MORE MANOEUVRABILITY, MORE GROUND CLEARANCE. GIVING YOU MORE CONTROL AND MORE PRODUCTIVITY.

A small turning circle is achieved by steering the front and rear track units in opposite directions.

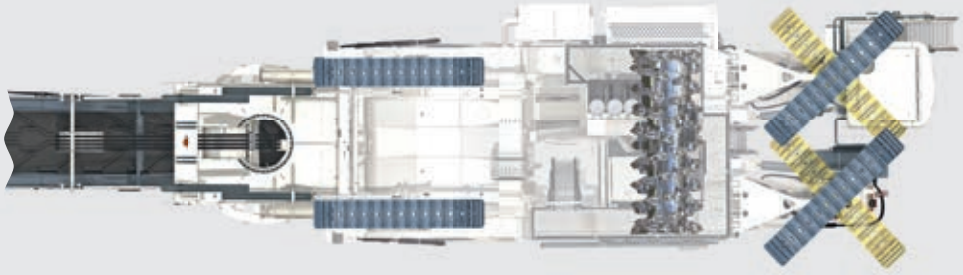
Manoeuvrability – a key efficiency driver

MOVING INTO POSITION WITHOUT LOSING TIME

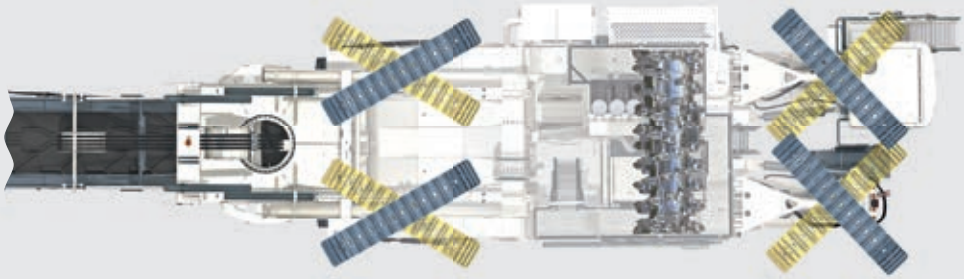
Despite its huge size, the 4200 SM is exceptionally manoeuvrable and easy to handle. This is due to the surface miner's smooth hydraulic all-track steering system which permits large steering angles of all four track units. Two switchable flow dividers act as a differential lock and ensure uniform traction even when working on extremely difficult ground. The system permits three different steering modes: the rear and front tracks are steered in opposite directions when moving into position; the front tracks are steered to produce long, straight cuts; and all four track units are steered in the same direction in crab mode to enable lateral repositioning of the miner.

Effortless turning manoeuvres and modest space requirements increase productivity levels by keeping non-productive times as short as possible. This is enhanced even further by the miner's continuously adjustable advance speed.

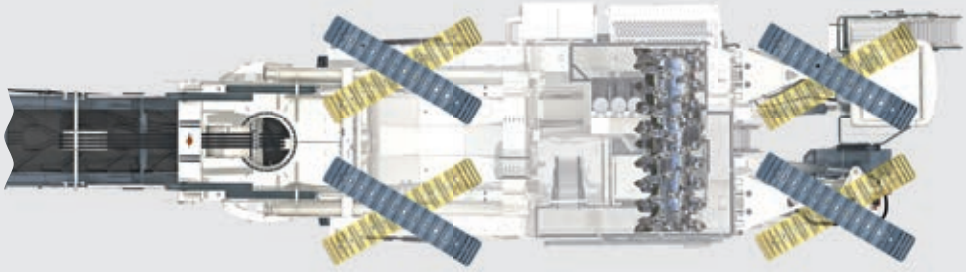
THREE STEERING MODES



Steering the front track units



All-track steering



Crab steering

1 + 2 | *All four track units can be adjusted in height separately via hydraulic cylinders.*

ROBUST DESIGN. EXTENDED SERVICING INTERVALS. INTELLIGENT MAINTENANCE. FEATURES COMBINING INTO ONE HALLMARK OF YOUR 4200 SM: HIGH OPERATIONAL AVAILABILITY. MORE IS REQUIRED, HOWEVER, TO ENSURE EFFICIENT 24/7 OPERATION. OPERATING ON A GLOBAL SCALE, THE WIRTGEN GROUP IS YOUR RELIABLE PARTNER AND ALWAYS AT YOUR SERVICE. PROVIDING CUSTOMER-SPECIFIC SUPPORT AND SUSTAINABLE SERVICE CONCEPTS, WE SUPPORT YOU ON YOUR ROAD TO SUCCESS.


Ready to deliver
full performance – always.

Maintenance procedures are completed in a few simple steps.

Cut costs with minimum maintenance requirements

MAXIMUM MACHINE AVAILABILITY

The 4200 SM requires maintenance after every 500 hours only. In addition, extra big fuel and water tanks ensure extended productive uptimes. In tough opencast mining operations, the miner's mechanical cutting drum drive with multiple power belts is distinctive for its high efficiency and ease of maintenance. The fluid coupling installed upstream of the drive system absorbs vibrations, operates wear-free and requires little maintenance. All points of maintenance are accessible safely and easily via wide, brightly illuminated access ladders and walkways and thanks to wide-opening service panels. The engine compartment inside the machine offers ample room to move during maintenance procedures.

Convenient access to all points of maintenance via safe access ladders and walkways.

It goes without saying that reliable technical support on site and the supply of spare parts and wearing parts are guaranteed: the availability of the 4200 SM on an everyday basis is ensured by our 55 sales and service companies around the globe.

There can be no compromises on safety

STRICT MINING REGULATIONS IN FOCUS

WIRTGEN is first and foremost concerned with the safety of operators and maintenance staff. The grated walkways, access ladders and all of the servicing points are fully illuminated to comply with specific mining regulations. Grated walkways and standardized railings are provided wherever regular checks and servicing work need to be carried out on machine components. Starting the machine by accident during maintenance procedures is prevented by the battery master switch.

Lamps at the track units, cutting drum and discharge conveyor permit safe operation of the surface miner in darkness. The camera system provides the operator with a good view of the areas offering poor visibility at the rear and sides of the machine, as well as of the discharge zone where the material is transferred into the beds of heavy-duty dump trucks. The operator's cabin is arranged at an ample distance from the right-hand edge of the miner, which offers additional safety when working close to steep slopes. Further safety features include numerous emergency stop switches, FOPS or FOPS-ROPS roof, a second emergency descent as well as covers on all rotating parts. Emergency stop switches at the front left, front right, rear left and rear right, in the engine compartment, at the electrical cabinet and in the cabin of the 4200 SM provide quick and easy access. Fireproof walls separate the engine unit from the hydraulic system and drum drive clutch.

Regular procedures – completed in no time at all

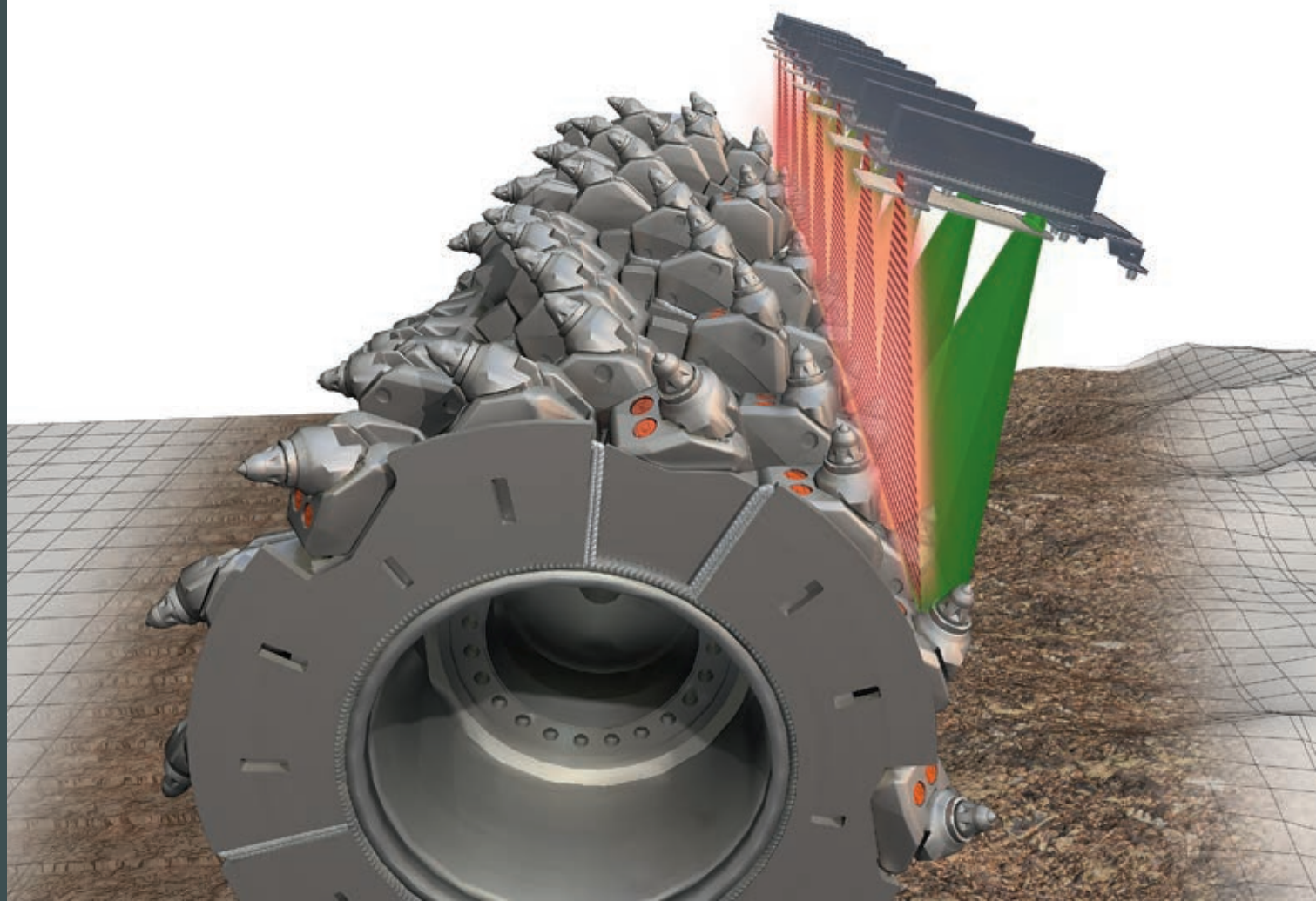
AUTOMATIC TOOL INSPECTION FOR 4200 SM SURFACE MINERS IN HARD ROCK VERSION

WIRTGEN Pick Inspection (WPI) uses camera laser sensors to measure the degree of tool wear automatically, showing the results on a separate, clearly structured screen in the operator's cabin. Handling is quite simple: the entire measuring process is completed fully automatically at the mere push of a button and takes only about half a minute – no longer than it takes for trucks to change.

Worn tools are identified by means of an optical measuring process and then marked in colour on a screen.

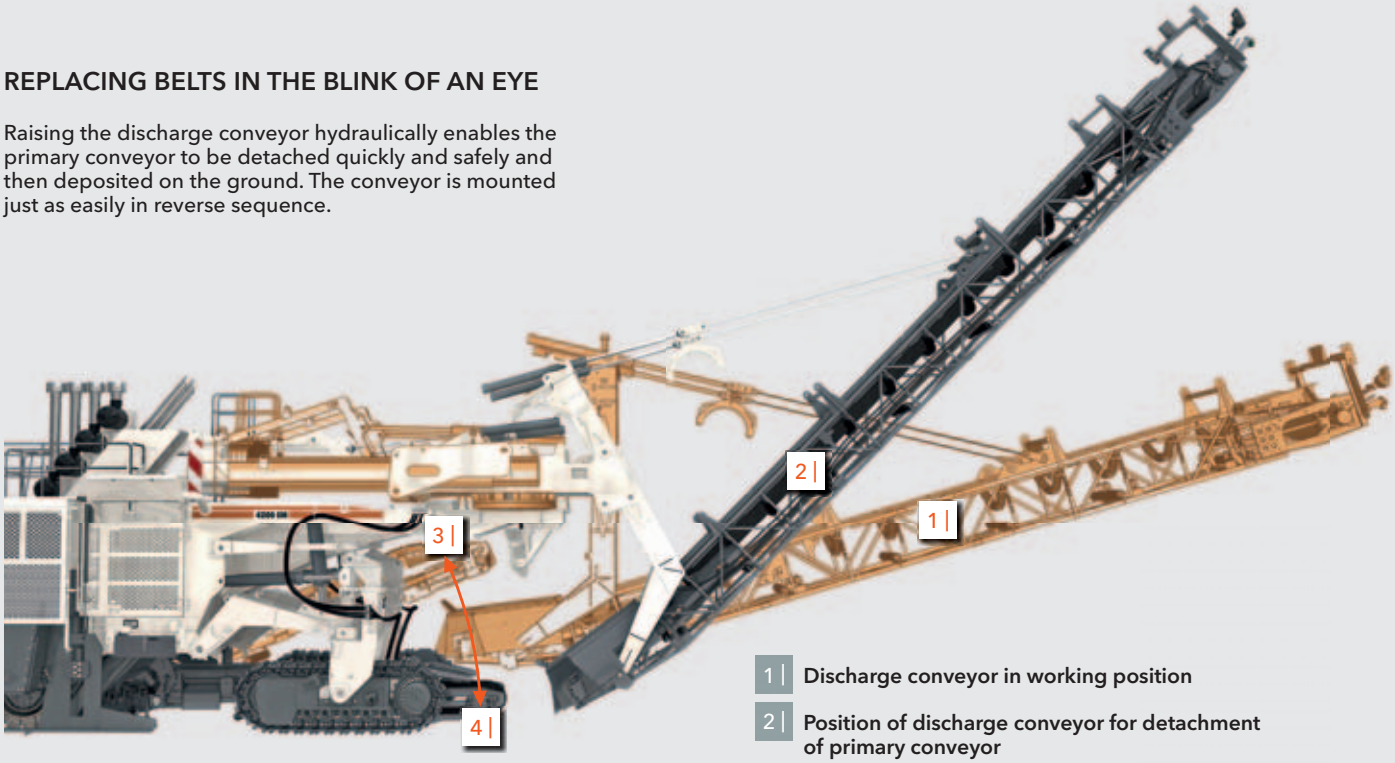
Automatic inspection of the degree of tool wear is a real work and time saver as it dispenses with the previously required frequent manual and visual inspections. In addition, precisely defined wear criteria prevent any misjudgement of the state of wear of individual tools on the part of the operator.

Worn tools can be replaced economically at precisely the right time while simultaneously observing machine availability schedules. The resulting optimized production sequence ensures maximum added value.



REPLACING BELTS IN THE BLINK OF AN EYE

Raising the discharge conveyor hydraulically enables the primary conveyor to be detached quickly and safely and then deposited on the ground. The conveyor is mounted just as easily in reverse sequence.



1 | **Discharge conveyor in working position**

2 | **Position of discharge conveyor for detachment of primary conveyor**

3 | **Primary conveyor in working position**

4 | **Primary conveyor in position for detachment**

1 | *Hydraulically operated cutting tool extractors and a battery-operated cutting drum turning device improve productivity.*

2 | *The filling station is reached quickly and easily from the ground.*

TIME-SAVING FEATURES THAT PAY OFF QUICKLY

It has been one of our priorities in the development of the 4200 SM to make sure that regular procedures during operation can be carried out quickly and easily. High-quality components and design optimizations, such as a larger oil sump, enable the maintenance intervals to be extended from 250 to 500 hours. After opening the service panel at the side of the machine, the filling station enables easy supply with consumables and operating materials. The high lift of the front height adjustment permits convenient, spacious access to the cutting drum for the replacement of cutting tools. The procedure is optimized further by the hydraulic tool extractor and the drum turning device allowing quick positioning of the cutting drum.

Particularly effective: quick and easy detachment of the primary conveyor allows the belt to be replaced in the blink of an eye.

Technical specification

	4200 SM for hard rock	4200 SM for soft rock
Cutting drum		
Cutting width max.	4,200 mm	4,200 mm
Cutting depth *[1]	0–650 mm	0–830 mm
Drum diameter with tools	1,500 mm	1,860 mm
Number of cutting tools	depending on operating conditions	
Engine		
Manufacturer	CUMMINS	
Type	KTA 50	
Cooling	water	
Number of cylinders	16	
Rated power	1,194 KW / 1,600 HP / 1,623 PS	
Fuel consumption, full load	284 l / h	
Fuel consumption in field operation	142 l / h	
Emission standard A (USA / Canada)	Tier 2	
Emission standard B (outside USA / Canada)	Tier 0	
Electrical system		
Electrical power supply	24 V	
Tank capacities		
Fuel tank	2,900 l	
Hydraulic oil tank	800 l	
Water tank	10,000 l	
Driving properties		
Operating speed	0–20 m / min	
Travel speed	0–2.5 km / h	
Theoretical gradeability	20%	
Max. cross slope	8%	
Crawler units		
Crawler units (L x W x H)	3,912 x 600 x 1,271 mm	
Conveyor system		
Belt width of primary conveyor	1,800 mm	
Length of primary conveyor	7,000 mm	
Belt width of discharge conveyor	1,800 mm	
Length of discharge conveyor	16,000 mm	

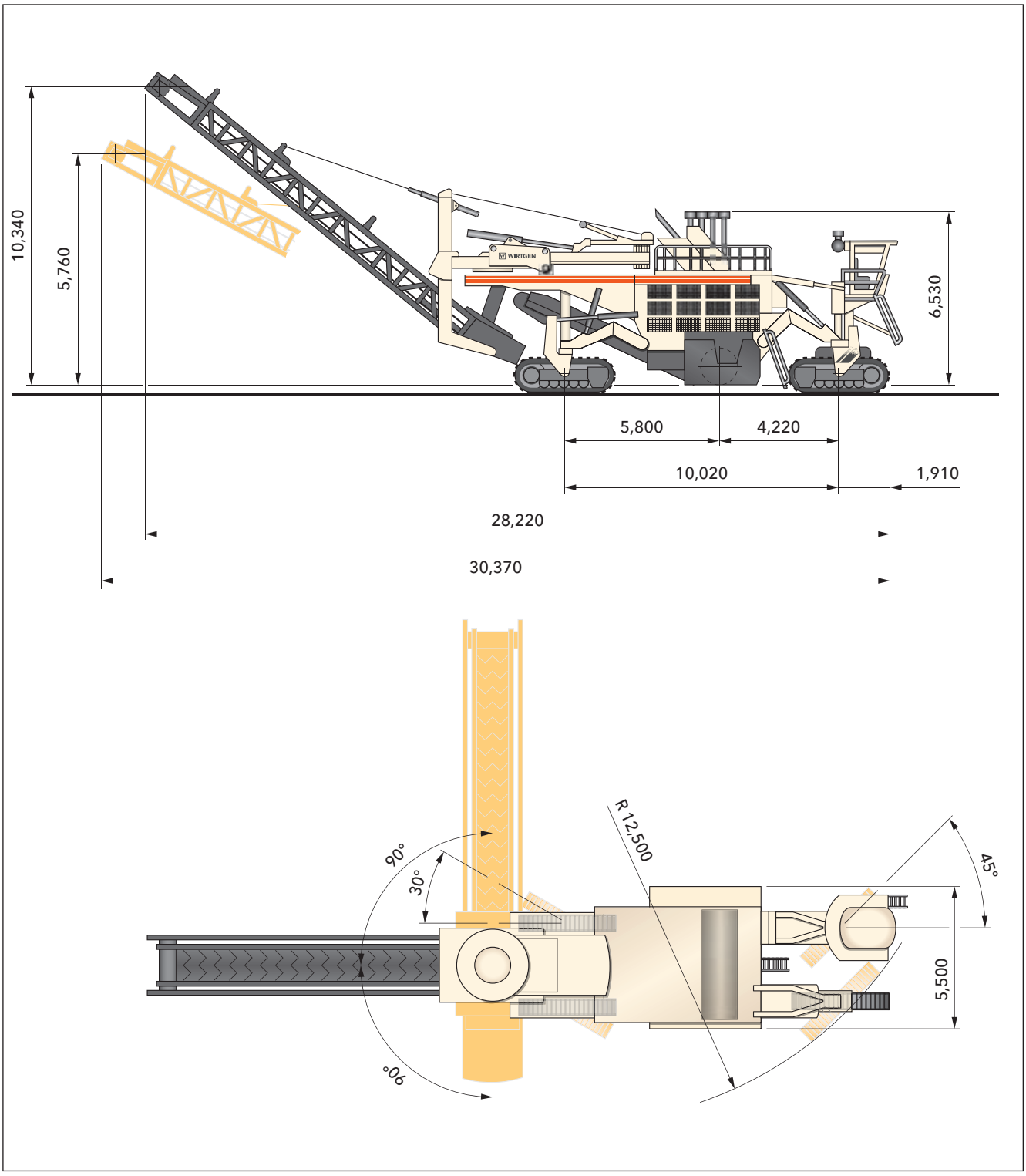
*[1] = The maximum cutting depth may deviate from the value indicated due to tolerances and wear

	4200 SM for hard rock	4200 SM for soft rock
Shipping dimensions		
Basic machine dismantled for transport (L x W x H)	17,140 x 5,430 x 4,100 mm	
Discharge conveyor (L x W x H)	17,650 x 3,080 x 2,020 mm	
Cutting drum unit including cutting drum, drum diameter with tools 1,500 mm (L x W x H)	5,550 x 3,300 x 2,400 mm	
Cutting drum unit including cutting drum, drum diameter with tools 1,860 mm (L x W x H)	5,550 x 3,300 x 2,580 mm	
Conveyor slewing device including counterweight	5,700 x 3,550 x 2,100 mm	
Open-top shipping container, 40' (L x W x H)	12,190 x 2,430 x 2,590 mm	

	4200 SM for hard rock	4200 SM for soft rock
Machine weights		
Empty weight	195,000 kg	198,000 kg
Operating weight, CE*[2]	201,300 kg	204,300 kg
Maximum operating weight, full tanks	208,300 kg	211,300 kg
Transport weights of individual components		
Basic machine dismantled for transport	142,000 kg	
Cutting drum unit including cutting drum, drum diameter with tools 1,500 mm	approx. 34,000 kg*[3]	
Cutting drum unit including cutting drum, drum diameter with tools 1,860 mm	approx. 32,800 kg*[3]	
Discharge conveyor, 16,000 mm long	9,600 kg	
Conveyor slewing device including counterweight	26,300 kg	
Two tool containers, 20'	depending on scope of delivery	
Weights of operating agents		
Water tank filling in kg	10,000 kg	
Diesel tank filling in kg (0.83 kg / l)	2,400 kg	
Optional equipment features increasing / reducing empty weight		
Driver	75 kg	
On-board tools	30 kg	

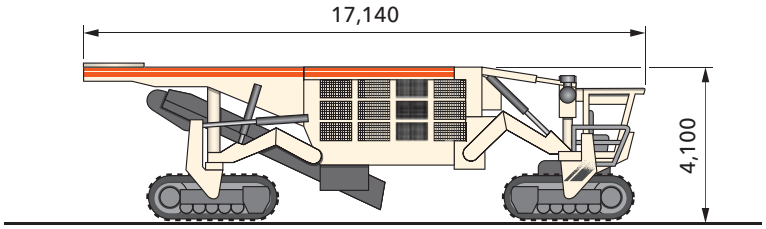
*[2] = Weight of machine, half-full water tank, half-full fuel tank, driver, on-board tools, excluding equipment options
*[3] = Weights depend on type of cutting drum installed in machine

Dimensions

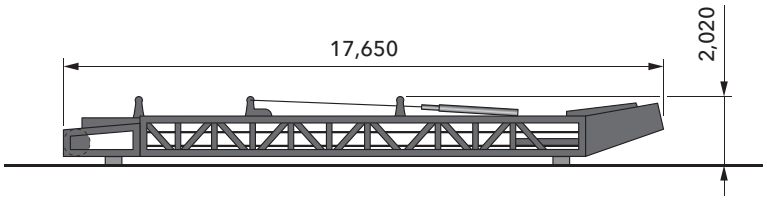


Dimensions in mm

Basic machine

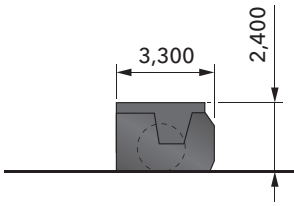


Discharge conveyor

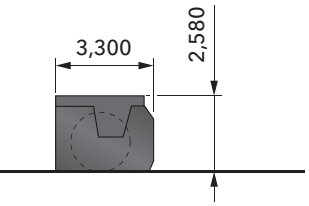


Cutting drum unit

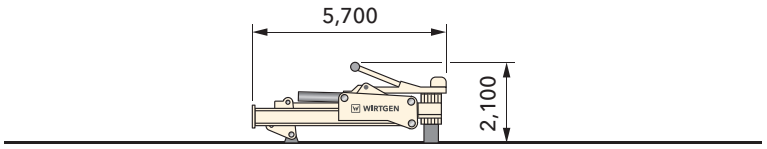
Drum diameter with tools
1,500 mm



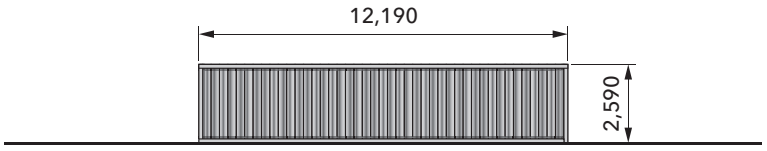
Drum diameter with tools
1,860 mm



Conveyor slewing device
including counterweight



Shipping container



Transport modules of surface miner 4200 SM for sea transport
Dimensions in mm

Standard equipment

Base machine	
Basic machine with engine	■
Separate battery main switch for disconnecting the starter	■
Lubrication points with high-pressure hoses grouped together at easily accessible points	■
Mechanical Cutting drum drive with drive belts	■
Cutting drum unit	
Cutting drum housing FB4200 SK1500	□
Cutting drums	
Cutting drum FB4200 HT14 LA50 SK1500 armoured with picks	□
Material loading	
Two-part discharge conveyor, 16,000 mm long, 1,800 mm wide SK1500	□
Machine control and levelling system	
Four height settings for the entire machine, consisting of two hydraulic cylinders each front and rear, cutting depth display, cutting depth control with a wire-rope sensor on each machine side, transverse slope control	■
Operator's stand	
Operator's stand glazed all round, acoustically insulated	■
Equipped with rotating seat with all important control instruments in the armrests	■
With air conditioner for cooling and heating	■
Footstep to the cabin illuminated	■
Emergency exit with ladder	■
Cabin with roll-over protection system (ROPS) and falling-object protection system (FOPS)	■
Radio preparation incl. aerial and speakers	■

■ = Standard equipment
□ = Standard equipment, replaceable with optional equipment
□ = Optional equipment

Chassis and height adjustment	
Crawler units with particularly robust 2-web track pads in heavy-duty version for mining applications	■
Infinitely variable, hydraulic four-track drive with two speed ranges	■
Four-track steering	■
The following steering types can be preselected: Crab and coordinated steering as well as straight ahead for the rear crawler units	■
Others	
Water spraying system for drum sprinkling	■
Water sprinkling on the conveyor systems and material transfers	■
Water high-pressure cleaner (40 bar) with washing lance	■
Lighting system with 13 xenon spotlights 24V	■
Total of 6 EMERGENCY STOP switches at sensible positions on the machine	■
Lockable tool box with set of tools for maintenance and servicing	■
Paint standard cream white RAL 9001	▢
Lubrication unit manual	□

■ = Standard equipment
▢ = Standard equipment, replaceable with optional equipment
□ = Optional equipment

Optional equipment

Cutting drum unit	
Cutting drum housing FB4200 SK1860	☐
Cutting drums	
Cutting drum FB4200 HT15 LA50 SK1500 armoured with picks	☐
Cutting drum FB4200 HT14 LA90 SK1860 with picks	☐
Cutting drum FB4200 HT15 LA75 SK1500 armoured with picks	☐
Material loading	
Two-part discharge conveyor, 16,000 mm long, 1,800 mm wide SK1860	☐
Equipment for milled material depositing "windrow"	☐
Operator's stand	
Second air conditioner for the cabin	☐
CD radio with Bluetooth hands-free system	☐
Monitor system as manoeuvring aid with 4 cameras and 12" monitor	☐

■ = Standard equipment
▣ = Standard equipment, replaceable with optional equipment
☐ = Optional equipment

Others	
Paint in one special colour (RAL)	☐
Central lubrication system (Conveyor system)	☐
Central lubrication system (windrow)	☐
Area lighting 24 V with 50 LED headlights	☐
Workshop container 20 foot incl. workshop equipment	☐
Workshop equipment – tools	☐
Workshop equipment – hydraulic components	☐
Workshop equipment – auxiliary equipment and consumables	☐
Workshop equipment – metric fastening elements	☐

■ = Standard equipment
▩ = Standard equipment, replaceable with optional equipment
☐ = Optional equipment

WIRTGEN

WIRTGEN GmbH
Reinhard-Wirtgen-Str. 2 · 53578 Windhagen · Germany
Phone: +49 (0)2645/131-0 · Fax: +49 (0)2645/131-392
Internet: www.wirtgen.com · E-Mail: info@wirtgen.com