

Maximum Performance in Large-Scale Opencast Mining. Surface Miner 4200 SM/4200 SMi



At a Glance: Outstanding Features of the 4200 SM/4200 SMi

DISCHARGE **CONVEYOR**

Discharge conveyor with raising and slewing feature for direct loading into transport vehicles.

COUNTERWEIGHT

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

10 WITH DIESEL ENGINE

High-powered, fuel-efficient diesel engine paired with a heavy-duty mechanical belt drive for high cutting performance.



DRUM TOOLING

Extremely durable mining picks arranged in a helical pattern for high cutting performance, minimized wear and extended pick life.

POWER UNIT

CUTTING DRUM

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

SAFETY **OPERATOR'S CABIN** PACKAGE Fully glazed, sound-insulated, swivelling comfort cabin for productive operation. Comprehensive safety package for compliance with international mining regulations. 5| WIRTGEN PICK **INSPECTION** Automatic inspection of pick wear allowing picks to be replaced costefficiently at precisely the right time. ACCESS LADDER Wide, hydraulically adjustable access ladder for easy access to the machine. **TRACK UNITS** Separately height-adjustable and steerable

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

Economical.

A big idea. Selective mining of valuable primary resources not in four separate steps but in a single operation: with the WIRTGEN surface miner 4200 SM/4200 SMi. The sturdy top performer for reliable continuous operation around the clock. Equipped with WIRTGEN expertise in state-of-the-art cutting technology. Without drilling and blasting but in an environmentally sustainable process yielding material of the purest quality. WIRTGEN surface mining – exploiting mineral deposits the intelligent way.





Scaling New Heights with the 4200 SM/4200 SMi

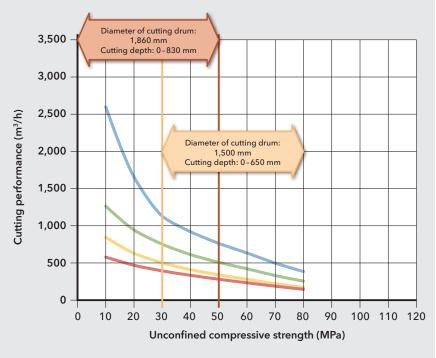
ANNUAL MINING CAPACITY OF UP TO 12 MILLION TONNES

The 4200 SM/4200 SMi is the ideal candidate for mining hard or soft rock on a truly grand scale. The miner's hallmarks include tremendous mining capacity, unmatched economic efficiency and flexible adjustment to field operating conditions and mining regulations. In contrast to conventional mining methods, which require four separate steps, up to 3,000 tonnes per hour can be mined in a single operation, with a single machine and a single operator. The high-performance machine is the prime choice for mine operators in large-scale opencast mining striving to achieve an annual mining capacity in soft rock of up to 12 million tonnes with a single machine.

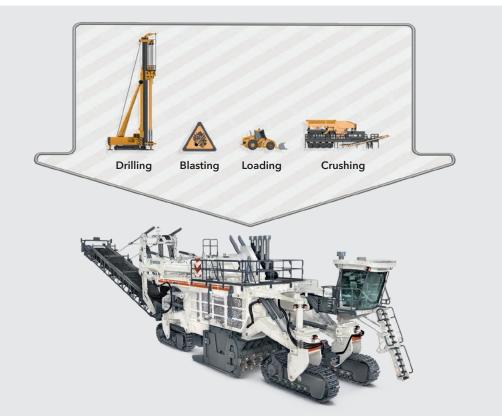
Two different models are on offer: in soft-rock design, the high-performance machine is capable of mining rock with an unconfined compressive strength of up to 50 MPa at a cutting depth of up to 830 mm. In hardrock design, materials with an unconfined compressive strength of up to 80 MPa can be mined at a working depth of up to 650 mm.

CUTTING PERFORMANCE OF THE WIRTGEN 4200 SM/4200 SMi SURFACE MINER





- Conveyor loading, loose rock
- Conveyor loading, fine-jointed rock
- Conveyor loading, coarse-jointed rock
- Conveyor loading, solid rock



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

2 A single operation instead of four separate steps - with the WIRTGEN 4200 SM/4200 SMi surface miner.



Feel the Power.

High cutting power is a feature of WIRTGEN cutting drums that can not only be seen. It can literally be felt. Because the heavy-duty cutting drums are designed in line with performance requirements. Made of extremely wear-resistant materials. Based on specialized expertise gained in several decades of experience in cutting technology. Cost-optimized. So that we not only meet but exceed your requirements in efficiency and productivity.



Cutting Drum Design in Line with Performance Requirements

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

2 The HT15 quickchange toolholder system with replaceable upper toolholder part reduces the time required to replace a single toolholder from approx. 90 min to no more than 15 min compared to the fully welded HT14 toolholder system.

APPLICATION-SPECIFIC DESIGN

The cutting drums for the WIRTGEN 4200 SM/4200 SMi are made-to-measure products: they are fully tailored to the hardness of the material to be mined and to additional customer-specific requirements. The application-specific design of the cutting drum - including the use of a wide variety of different hard-wearing mining picks and toolholder systems - is based on unmatched expertise gained in several decades of experience in cutting technology. The cutting drum for mining soft rock has a large cutting diameter, for example, permitting the throughput of large amounts of material. The cutting drum for mining hard rock has a smaller diameter, generating high cutting forces which permit the miner to be used in opencast mining as well as in rock and trench construction.

In addition, the cutting drum operates in upcut mode: the more favourable pressure angle produces a comma chip which separates from the bottom up. This reduces energy consumption, minimizes vibrations and improves the overall efficiency of the machine.





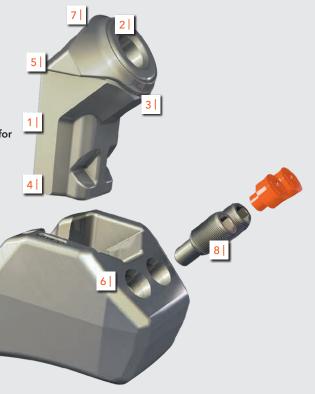


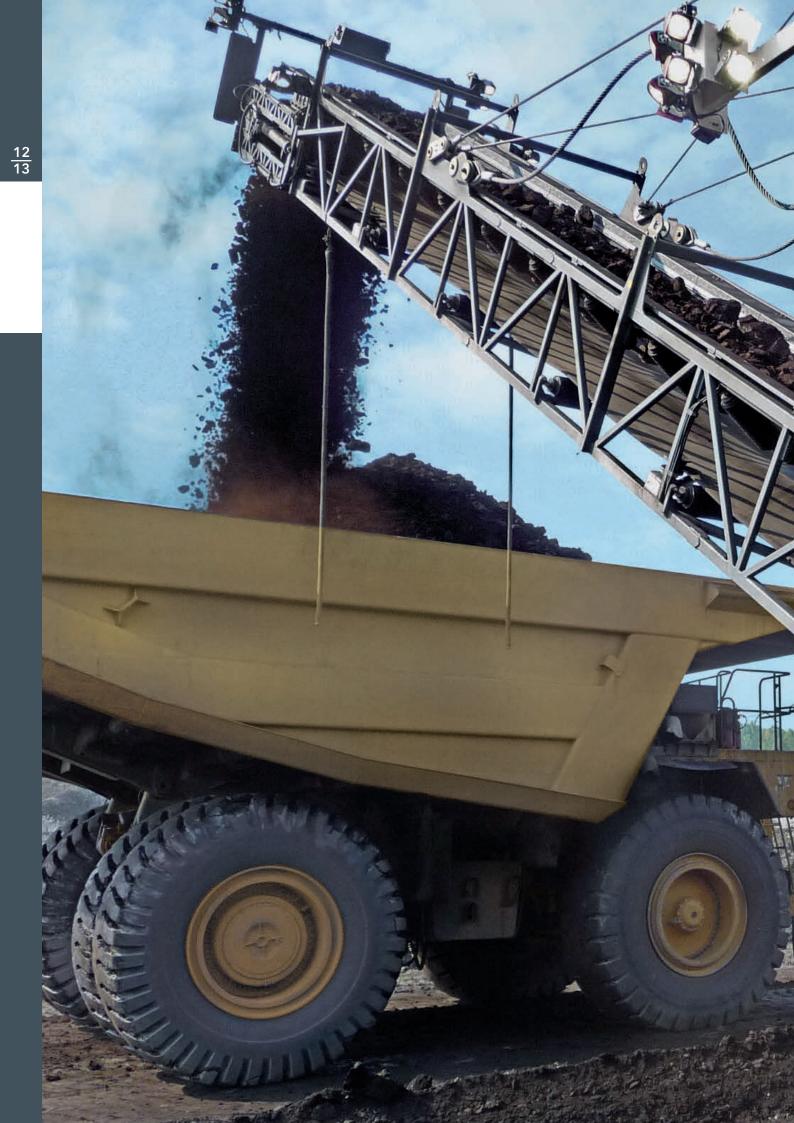
3 Every single cutting drum is designed in line with the specific application requirements.

HT15 QUICK-CHANGE TOOLHOLDER SYSTEM

The innovative HT15 quick-change toolholder system maximizes pick utilization while minimizing breaks in operation.

- 1 | Holder shank heat-treated in a special process for increased strength
- 2 | Heavy-duty shank mounting for the use of WIRTGEN picks
- 3 | Precise contact surfaces between upper part and bottom part for deflecting the cutting forces
- 4 | Double prism for optimum fit and support of the upper part in the bottom part
- 5 | Material deflectors for protecting the bottom part against abrasive wear
- 6 | Pronounced recesses in the bottom part for preventing damage to the internal threads and bolts
- 7 | Large opening on upper part for optimum access during pick replacement
- 8 | Solid mounting bolts and flexible silicone plugs for protecting the fine-pitch thread from moisture and dirt





Perfectly Engineered

Loading Process.

WIRTGEN surface miners are expected to deliver top performance continuously and in every regard. Material loading included. The conveyor system installed in the 4200 SM/4200 SMi takes on every challenge. 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 adjustable conveying speed. A ground-breaking combination of power and technology - made by WIRTGEN.

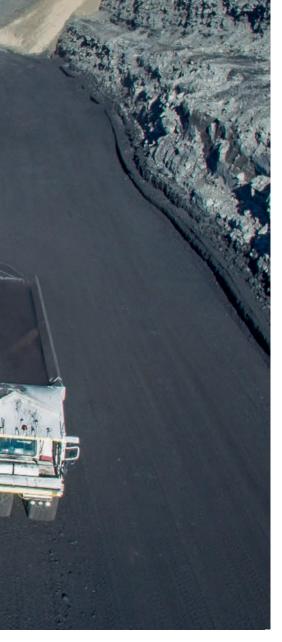


1 The high-capacity discharge conveyor permits direct loading into trucks or dumpers.

Loading Huge Dump Trucks in Record Time

FLEXIBILITY IS STANDARD

Optimum loading of the mining material is essential for the efficient mining of large mineral deposits. The conveyor system of the 4200 SM/4200 SMi impressively meets this requirement with high conveying capacity and outstanding flexibility: a tremendous slewing angle of 180°, height adjustment feature and continuously variable belt speed cater to the smooth and easy loading of large transport trucks even in restricted space conditions. The two-stage conveyor system replaces the usual loading equipment – a single device meets the requirements. The primary conveyor transfers the material to the discharge conveyor which is available in two different lengths to ensure optimum loading of different truck sizes in opencast mining. Heavy-duty 220-t haul trucks can be loaded quickly and efficiently. The combination of steep-incline belt with rugged cleat profile and conveyor drive with tremendous power reserves ensures consistently high conveying performance even when mining ores of high density.





2 | Slewing angles of up to 90° to the left and right allow full adjustment to conditions in the mine.

3 The mining material can also be simply discharged to the side of the miner.





4 The movable counterweight provides stability and can be easily retracted when working along steep high slopes.

The Benchmark

in Operation.



Sus

Be relaxed and comfortable during work while keeping everything in full view - a given with the 4200 SM/4200 SMi. Clearly structured controls arranged with ergonomic principles in mind. Providing the operator with all the relevant information at a single glance. The intelligent visibility concept comes as a standard feature. With the 4200 SM/4200 SMi, you are in full control. Ease of operation and high productivity become one.

- Jaxine



No Compromise on Operator Comfort

THE OPERATOR IS IN FULL CONTROL

Keeping the productivity of the 4200 SM/ 4200 SMi at consistently high levels requires the operator to fully focus on his work throughout his shift. We have therefore made every effort to ensure that he feels safe and well. The operator's cabin is equipped with air-conditioning and heating systems. The soundproof, vibration-isolated cabin is mounted above the front left track unit, on the side facing away from the slope, far from the cutting drum and engine. Four cameras plus screen provide the operator with a full view of important areas of the operation. The miner's field lighting system with 50 LED working lights ensures non-tiring and safe operation even in darkness. Both the cabin and the individually adjustable, air-sprung driver's seat can be rotated about large angles to either side, providing perfect visibility for loading heavy-duty haul trucks and for steering the track units. All controls, including the two multifunctional joysticks, are integrated into the seat's armrests in line with ergonomic principles. They include all the functions required for the mining operation, giving the operator full control of the process at all times.







1 A wide, hydraulically adjustable access ladder with separate, battery-operated pump offers convenient access to the machine.

2 The panorama cabin can be rotated about 45° and the driver's seat about 135° to either side to provide even better visibility.

More Control in Off-Road Operation.





Experience has shown that the terrain of large-scale opencast mining operations often holds unexpected difficulties, some of which present a true challenge. Good to be prepared for just such a situation. The WIRTGEN 4200 SM/4200 SMi surface miner features numerous technical innovations helping you to reach your goal quickly and without fail. More traction, more manoeuvrability, more ground clearance. Giving you more control and more productivity.



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

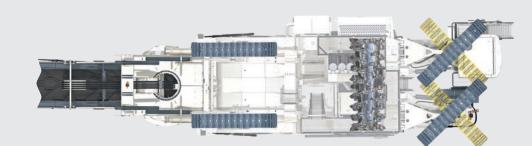
Manoeuvrability – A Key Efficiency Driver

MOVING INTO POSITION WITHOUT LOSING TIME

All-track steering makes the 4200 SM/ 4200 SMi surface miner extremely manoeuvrable despite being a huge machine. The smooth hydraulic steering system allows the four track units to be steered at large steering angles. Two selectable flow dividers additionally act as differential lock, ensuring uniform traction even in extremely difficult ground conditions. Three different steering modes can be selected: the front and rear track units are steered in opposite directions for positioning, the front track units 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.

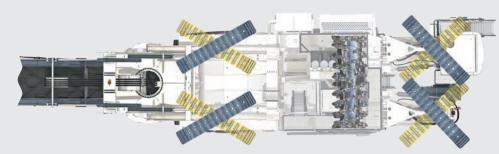
Effortless turning manoeuvres requiring only little space keep non-productive times short, which increases the machine's overall productivity. This is promoted further by the miner's continuously adjustable advance speed.



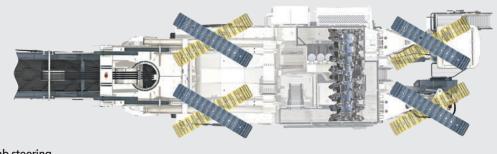


Steering the front track units

THREE STEERING MODES



All-track steering



Crab steering





2 + 3 All four track units can be adjusted in height separately via hydraulic cylinders.



Heavy-duty design. Extended service intervals. Intelligent maintenance. Features combining into one hallmark of the 4200 SM/4200 SMi: 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 - always at your service. Providing customer-specific support and sustainable service concepts. This is how we support you on your road to success.

Ready to Deliver

Full Performance – Always.



1 | WIRTGEN service experts provide local "justin-time" support around the globe.

Cut Costs with Minimum Maintenance Requirements

MAXIMUM MACHINE AVAILABILITY

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

Reliable support on site and the supply of spare parts and wearing parts are guaranteed: the operational availability of the 4200 SM/4200 SMi on an everyday basis is ensured by our network of around 55 sales and service companies around the globe.

No Compromises on Safety

STRICT MINING REGULATIONS IN FOCUS

WIRTGEN is first and foremost concerned with the safety of operators and maintenance staff: the miner's grated walkways and access ladders are fully illuminated, as are all of the service points, to comply with specific mining regulations. Grated catwalks and railings complying with applicable standards are provided wherever regular inspections and service work need to be carried out on machine components. The battery master switch prevents the machine from being started up inadvertently during maintenance procedures.

Lights on the track units, cutting drum and discharge conveyor permit safe operation of the surface miner in darkness. The camera system provides the operator with information on the areas outside his direct view at the rear and sides of the machine, as well as on the point of discharge of the mining material into the heavy-duty haul trucks. The cabin is mounted at a large distance from the outer edge of the machine on the right, which offers additional safety when operating close to steep slopes. Further safety features include numerous emergency stop switches, FOPS and ROPS cabin, a second emergency exit as well as covers on all rotating parts. Emergency stop switches at the front left, front right, rear left and rear right of the 4200 SM/4200 SMi, in the engine compartment, on the electrical cabinet and in the operator's cabin provide quick and easy access. Fireproof walls separate the engine from the hydraulic unit and drum drive clutch.

> 1 Central logout station: inadvertent start-up of the machine is prevented from the ground by means of a mechanical lock.



Recurring Work Completed in no Time at All

AUTOMATIC PICK INSPECTION FOR THE 4200 SM/4200 SMi IN HARD-ROCK DESIGN

WIRTGEN Pick Inspection (WPI) uses camera laser sensors to measure the degree of pick wear automatically, displaying the results on a separate, clearly structured screen in the operator's cabin. Handling of the system is quite simple: the entire measuring procedure



is completed fully automatically at the mere push of a button, taking only about half a minute - no longer than it takes for dump trucks to change.

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

Worn picks can be replaced cost-efficiently at precisely the right time while observing machine availability schedules. The optimized production process ensures maximum added value.

1 Worn picks are identified by means of an optical measuring process and then marked in color on a screen.



REPLACING BELTS QUICKLY

The primary conveyor can be detached and placed on the ground quickly and safely after hydraulically raising the discharge conveyor. The conveyor is mounted again just as easily in reverse sequence.

- 1 | Discharge conveyor in operating position
- 2 | Position of discharge conveyor for detachment of primary conveyor
- 3 | Primary conveyor in operating position
- 4 | Position of primary conveyor after detachment





TIME SAVERS THAT PAY OFF QUICKLY

It has been one of our priorities in the development of the 4200 SM/4200 SMi to ensure that recurring procedures can be completed quickly and easily during operation. High-quality components and design improvements such as a larger oil sump have enabled the miner's maintenance intervals to be extended from 250 to 500 hours. After opening the service panel on the side of the miner, operating materials and consumables can be refilled easily via a filling station. The length of stroke of the front height adjustment unit offers convenient, spacious access to the cutting drum for pick replacement. Quick positioning with the drum rotation device and the use of a hydraulic pick extractor optimize the process.

Particularly effective: quick and easy detachment of the primary conveyor allows the belt to be replaced in no time at all.

2 Hydraulically operated pick extractors and the battery-operated cutting drum rotation device increase productivity.

3 The filling station can be accessed quickly and easily from the ground.

Technical Specification 4200 SM | 4200 SMi

	4200 SM for hard rock	4200 SM for soft rock	4200 SMi for hard rock	4200 SMi for soft rock
Cutting drum				
Cutting width max.	4,200 mm			
Cutting depth*1	0 to 650 mm	0 to 830 mm	0 to 650 mm	0 to 830 mm
Cutting diameter	1,500 mm	1,860 mm	1,500 mm	1,860 mm
Number of picks	depending on operating conditions			
Engine				
Exhaust emission standards	no EU regulation/US EPA Tier 2 no EU regulation/US EPA Tier 4f			n/US EPA Tier 4f
Manufacturer	CUMMINS CUMMINS		IMINS	
Туре	QSK 50		QSK 50	
Number of cylinders	16 16		6	
Power	1,194 kW/1,600 HP/1,623 PS			
Fuel consumption, full load	2891/h 3081/h		31/h	
Fuel consumption, field operation	145 l/h		154 l/h	
Electrical system				
Voltage supply	24 V			
Filling capacities				
Fuel		2,9	00	
Adblue®/DEF*2	-	_	300 I	
Hydraulic oil	800 I			
Water	10,000			
Driving performance				
Operating speed (no EU regulation/US EPA Tier 2)	0to27 m/min			
Travel speed	0 to 2.5 km/h			
Theoretical gradeability	20%			
Max. cross slope	8%			

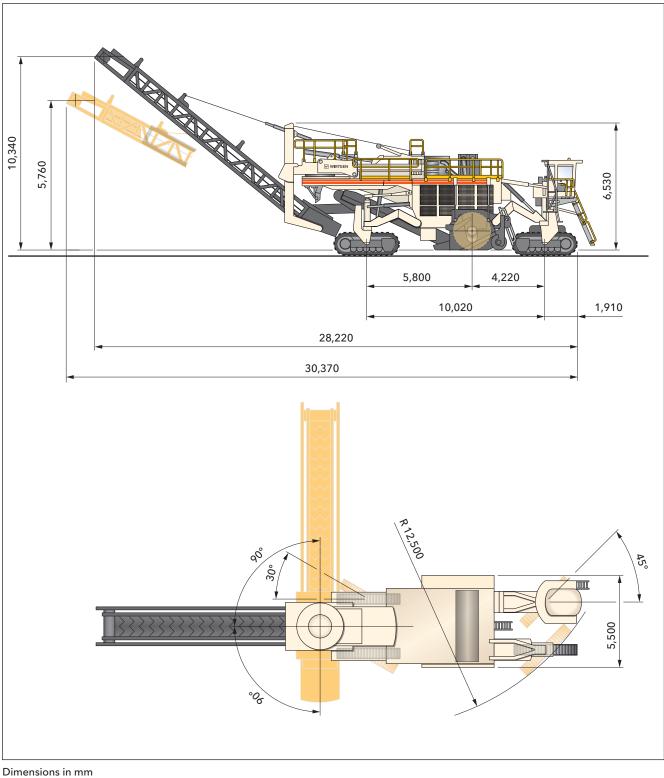
*1 = The maximum cutting depth may deviate from the value indicated due to tolerances and wear
*2 = AdBlue® is a registered trademark of the Association of the Automotive Industry (Verband der Automobilindustrie e. V.; VDA)

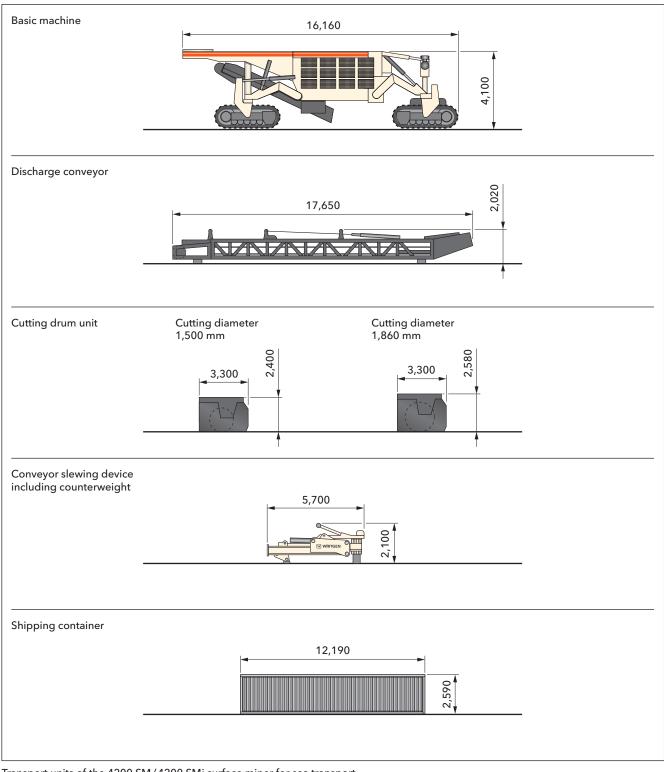
	4200 SM for hard rock	4200 SM for soft rock	4200 SMi for hard rock	4200 SMi for soft rock
Track units				
Dimensions (L x W x H)	3,912 x 600 x 1,271 mm			
Conveyor system				
Belt width of primary conveyor	1,800 mm			
Length of primary conveyor	7,000 mm			
Belt width of discharge conveyor	1,800 mm			
Length of discharge conveyor	16,000 mm			
Shipping dimensions				
Basic machine dismantled for transport $(L \times W \times H)$		17,140 x 5,43	0 x 4,100 mm	
Discharge conveyor (L x W x H)	17,650 x 3,080 x 2,020 mm			
Cutting drum unit with cutting drum cutting diameter 1,500 mm (L x W x H)	5,550 x 3,300 x 2,400 mm			
Cutting drum unit with cutting drum cutting diameter 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	4200 SMi for hard rock	4200 SMi for soft rock
Machine weights				
Empty weight	195,000 kg	198,000 kg	195,000 kg	198,000 kg
Operating weight, CE*3	201,300 kg	204,300 kg	201,300 kg	204,300 kg
Maximum operating weight, full tanks	208,300 kg	211,300 kg	208,300 kg	211,300 kg
Transport weights of single components				
Basic machine dismantled for transport	142,000 kg			
Cutting drum unit with cutting drum cutting diameter 1,500 mm	approx. 34,000 kg *4			
Cutting drum unit with cutting drum cutting diameter 1,860 mm	approx. 32,800 kg *4			
Discharge conveyor, 16,000 mm long	9,600 kg			
Conveyor slewing device including counterweight	26,300 kg			
Two containers 20'	depending on scope of delivery			
Weights of operating materials				
Water	10,000 kg			
Fuel (0.83 kg/l)	2,400 kg			
AdBlue®/DEF*2(1.1 kg/l)	— 330 kg			
Additional add-on weights				
Machine operator and tools				
Machine operator	75 kg			
On-board tools	30 kg			

*³ = Weight of machine, half weight of all operating materials, on-board tools, machine operator, no optional equipment features
*⁴ = Weights depend on the type of cutting drum

Dimensions 4200 SM | 4200 SMi





Transport units of the 4200 SM/4200 SMi surface miner for sea transport Dimensions in $\rm mm$

Standard Equipment 4200 SM | 4200 SMi

Basic Machine	
Base machine with engine	
Lubrication points with high-pressure hoses grouped together at easily accessible points	•
Mechanical cutting drum drive via high-power V-belts	
Separate battery master switch for disconnecting the starter	•
Cutting Drum Unit	
Cutting drum housing FB4200 SK1500 for hard rock	
Cutting drum housing FB4200 SK1860 for soft rock	
Cutting Drums	
Cutting drum FB4200 HT14 LA50 SK1500 in armored design with 104 picks for hard rock	
Cutting drum FB4200 HT14 LA90 SK1860 with 62 picks for soft rock	
Loading of the Mining Material	
Discharge conveyor 16,000 mm long, 1,800 mm wide, SK1500 for hard rock	
Discharge conveyor 16,000 mm long, 1,800 mm wide, SK1860 for soft rock	
Machine Control and Leveling System	
Four height adjustment units for the entire machine comprising two hydraulic cylinders each front and rear, cutting depth indicator, cutting depth control including one wire-rope sensor each left and right, cross slope control	•
Operator's Cabin	
Fully glazed, anti-vibration mounted, high-quality comfort cabin	
Equipped with rotating driver's seat and all important controls integrated into the seat's armrests	•
Powerful air-conditioning system and separate heating system with automatic temperature control	
Cabin with rollover protection system (ROPS) and falling object protection system (FOPS)	
Emergency exit with ladder	
Pre-fitting for radio installation including aerial and speakers	

= Optional equipment

Chassis and Height Adjustment	
Track units with exceptionally sturdy double-grouser track pads in heavy-duty design for mining applications	
Continuously adjustable, hydraulic four-track drive with two speed ranges	
The following steering modes can be pre-selected: crab steering and all-track steering, as well as straight-ahead travel for the rear track units	•
Miscellaneous	
Electrohydraulically driven cutting drum rotation device for quick and safe pick replacement; an electrohydraulic unit permits operation with the diesel engine switched off	
Water spray bar on the cutting drum unit	•
Water spray system on the conveyor and material transfer systems	•
High-pressure water cleaner (40 bar and a large quantity of water) with washing lance for cleaning the machine	
LED working lights, 24 V, with magnetic base	
EMERGENCY STOP switches in appropriate positions on the machine	
Lockable toolbox with toolkit for maintenance and servicing	
Pre-fitting for installing the WITOS FleetView control unit	•
Standard painting in RAL 9001 (cream)	
WITOS FleetView - professional telematics solution for machine operation and service optimization	
Manual lubrication system	

Optional Equipment 4200 SM | 4200 SMi

Cutting Drum Unit	
Cutting drum housing FB4200 SK1860 for soft rock	
Cutting drum housing FB4200 SK1500 for hard rock including WPI system	
Cutting Drums	
Cutting drum FB4200 HT15 LA50 SK1500 armored with 98 picks	
Cutting drum FB4200 HT14 LA90 SK1860 with 62 picks for soft rock	
Cutting drum FB4200 HT15 LA75 SK1500 in armored design with 74 picks for hard rock	
Loading of the Mining Material	
Discharge conveyor 16,000 mm long, 1,800 mm wide, SK1860 for soft rock	
Equipment for depositing the mining material using the windrowing process	
Operator´s Cabin	
Second air-conditioning system for operator's cabin	
CD radio with Bluetooth hands-free system	
Monitor system including four cameras and 12" monitor for maneuvering assistance	
Monitor system displaying the separating layers behind the scraper	

Miscellaneous	
Painting in one special color (RAL)	
Model without WITOS FleetView	
Central lubrication system (Conveyor system)	
Central lubrication system (windrow)	
Winter package for engine and hydraulic system	
Hydraulic pick ejector	
Wiggins fast-fill system for diesel refueling	
Wiggins fast-fill system for AdBlue® refilling (4200 SMi only)	
Field lighting system, 24 V, including 50 LED working lights	
Workshop container 20' including workshop equipment	
Workshop equipment - tools	
Workshop equipment - auxiliary equipment and consumables	
Workshop equipment - metric fastening elements	
Workshop equipment - electrical repairs	
Workshop equipment - hydraulic components	
Workshop equipment - hydraulic press	
Workshop equipment - hoses for emergency repairs	







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





All specifications, illustrations and texts are non-binding and may include optional equipment features. Technical details are subject to change without notice Actual performance may vary depending on operating conditions. © WIRTGEN GmbH 2019. Printed in Germany. No. 2478302 EN-04/19 - V2 (04/2020)