GAINWELL™
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GHWM300M

HIGHWALL MINING SYSTEM

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Extracting Coal affordably and safely

THE HIGHWALL MINING METHOD

Linking underground and surface mining operations, the Gainwell Highwall Mining system is a testament to versatile mining equipment. It offers a safe and innovative method for extracting coal from exposed seams in a multitude of applications.

WEIGHT (WITHOUT CUTTER MODULE)		
Machine Weight	**225 000 KG**	**495,665 LB**

MINE MODE DIMENSIONS (WITHOUT CUTTER MODULE)		
Width	**10.3 M**	**33.8 FT**
Height	**8.2 M**	**26.9 FT**
Length*	**23.3 M**	**76.4 FT**

*Actual length dependant upon model configuration.

OPERATING SPECIFICATION		
Maximum Penetration Capability	**300 M**	**984 FT**

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Highwall Miner

BRIDGING THE GAP

What is Highwall Mining?

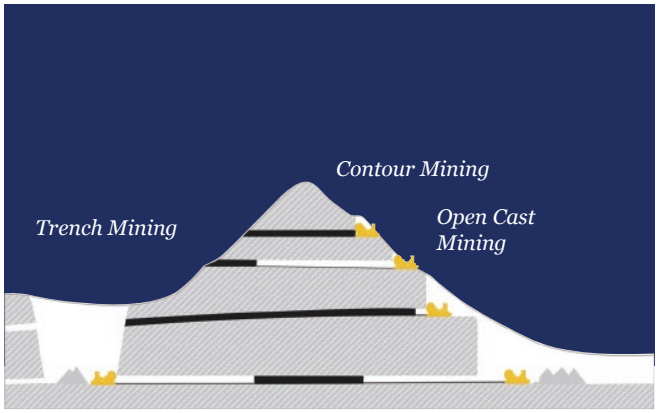
The GHWM300M produces high volumes of coal at very low costs. More importantly, it is safer than traditional underground mining, as it sends no one underground, and it works economically with a small crew and very little support equipment. It's versatile in its mobility and application, and it produces large quantities of coal at inherent ash levels. When you need to improve the recovery of your coal reserves, consider the Highwall Miner – consider the GHWM300M.

The Gainwell Highwall Mining system offers an innovative and efficient method for extracting coal from exposed seams in a multitude of applications.

The GHWM300M works on the pit floor or bench directly in front of the exposed seam. Up to 300m (984 ft) long parallel rectangular "drives" are cut into the coal seam by means of the cutter head module and push beams (unmanned coal-conveying elements).

These push beams transport the cut coal internally via two counter rotating spiral / screw conveyors (augers) back to the entry of the drive and then onto a stockpile.

The whole mining cycle is completed by a 5-6 men crew with no personnel ever going underground.



Whether you're operating a trench, open cast or contour mine, the Gainwell highwall mining system can extract coal affordably and safely.

- **Open cast:** Highwall mining is used to mine coal from underneath the final highwall, when the strip limit is reached due to economic reasons or surface conditions.
- **Contour mining:** In a mountainous area, the Gainwell highwall mining system can follow a coal seam along the side of the hill.
- **Trench mining:** The unit mines coal from both sides of a purpose-prepared trench; this mining method is used when an open pit is not an option.

Cutter Modules

PROVEN TECHNOLOGY FOR ACCURATE CUTS

Cutter modules name

Extra Low Seam

Cutter modules name

Low to Mid Seam

Cutter modules name

High Seam

VERSATILITY

Through appropriate Cutter Module selection the GHWM300M can be tailored to mine coal seams as low as 762mm (30in) or as high as 5000mm (197in).

CUTTER MODULES

Gainwell offers three electric cutter modules: low seam, mid-seam and high seam. The cutter modules are interchangeable and quickly attached to the highwall mining system.

The cutting cycle is fully automated, yet allows the operator to manually adjust the machine function using an ampere reading as the coal seam varies. This proven technology allows the cutter module to accurately follow the coal seam and produce a product near inherent ash levels.

ADVANCED TECHNOLOGY

Fiber optic, gyro based navigation and steering is also available as an option on the GHWM300M. This provides operators with very precise cutter module location data in real time for enhanced cutter module steering and control of pillar width.

IGBT based PWM inverter control for all major drives, is a sophisticated protection system for electrical and electronic components. Industrial profinite based IO communication for faster response. Profibus communication technology for error-free communication and remote control of cutter module from base machine.

User interface between touchscreen HMI and machine operation through PLC control. Online real-time conditional monitoring system. Advanced instrumental detection of Hydraulic fluid and coolant leakage. Safety staff mechanism based on Methane sensing technology.

Altitude detection and cross-correction of cutter module in coal gallery based on fibre-optic Giro Compass. Automated Wi-Fi monitoring up to 100 ft.

The advanced Auto Lubrication system for major joints and rotating parts to overcome unpredictable failure occuring from lac of lubrication. Saves valuable time and manpower during maintenance.

Highwall Miner Specifications

GHWM300M

ENVIRONMENTAL AND OPERATIONAL CONDITIONS

The Gainwell GHWM300M is designed for following environmental and operating conditions:

Mine Application	Trench Application Open Pit Mining Contour Mining
Ambient Temperature	–30° C to +40° C Arctic and Tropical Packages are optional
Pit Floor Gradient	8 degrees nominal in any direction, 10 degrees maximum in any direction for traveling
Maximum Seam Gradient	8 degrees down dip relative to horizontal (Level side-to-side, pit floor prepared at 3 degrees)

POWER FOR THE MINER

The highwall miner can be powered directly by mine power, or by a self contained generator system where connections to the utility grid is not practical.

POWER AND CONSUMPTION

Electric Power (Installed) 1100/440 VAC, 50 / 60 Hz Mid/High Seam Cutter Module and Right Angle Discharge Configuration:

Function	Power (ea)			
	Qty	Volts	kW (unit 1)	kW (total)
LS Cutting Motors – 50/60 Hz	2	1140	110	220
HS Cutting Motors – 50/60 Hz	2	995	149	298
LS Gathering Motors –50/60 Hz	2	1140	30	60
HS Gathering Motor – 50/60 Hz	2	995	41	82
Power Head Auger Motors	2	1100	373	746
Hydraulic Pump Motor	1	950	224	224
Base Frame Conveyor Motor	1	950	75	75
Right Angle Conveyor Motor	1	1100	75	75
Stacking Conveyor Motor (Maximum) (Customer Equipment)	1	1100	75	75
Cooling Fan Motors	6	415	1.5	9
Water Circulating Pump Motor	1	415	7	7
Hydraulic Oil Circulating Pump Motor	1	415	11	11
Water Spray Pump Motor	1	415	6	6
Total Connected Power – Low Seam Module	18			1508
Total Connected Power – High Seam Module	19			1608

WATER CONSUMPTION

A closed loop cooling system, alleviates the need for water to cool the machine. In applications where water is necessary for cutting, a cutter module spray option is available. Water consumption during the mining operation is an average of 1000 L (264 gal) per hour (estimate).

GENERAL SPECIFICATIONS

The Gainwell GHWM300M is designed for following environmental and operating conditions:

General Specifications	All dimensions and weights are approximate and depending on final specification.
Machine Dimensions while Mining	Width **: 10.37 m** Height **: 8.4 m** Length**: 23.3 m**
Machine Dimensions while Tramming	Width **: 9.4 m Track Width** Height **: 8.1 m** Length **: 23.33 m** Minimum road width for overhanging structure **: 9.2 m**
Weight	HWM without cutter head**:** **225 000 kg (495,665 lb)** Pushbeam Weight**: 5330 kg 54 pieces**

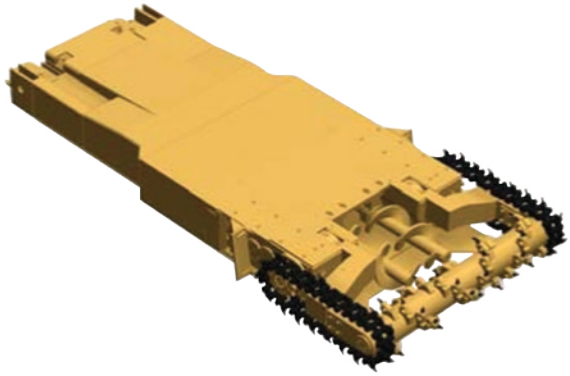
NOTE:

- For Low Seam Chain and Mid Seam Modules contact your representative.
- 990/995V and 460V motors with 60Hz supply frequency are available as option for certain applications. For details, contact your representatives.

Cutter Module Specifications

GHWM300M

LOW PROFILE CUTTER MODULE (LPCM)

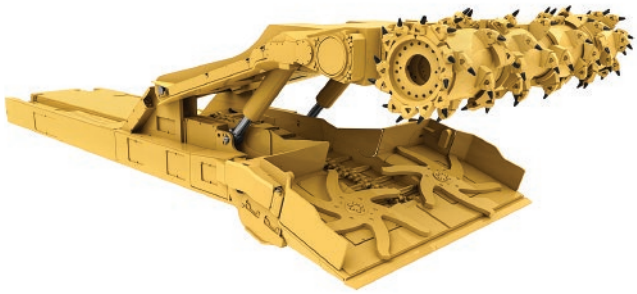


Approximate Weight	25.5 mt	56,218 lb
Drum Diameter	648 mm	25.50 in
Cutting Width	2946 mm	116.00 in
Cutting Height Above Grade	1549 mm	61.00 in
Cutting Height Below Grade	190.5mm	7.50 in
Minimum Recommended Seam Height	800 mm	30.00 in

LOW TO MID-SEAM CUTTER MODULE

Approximate Weight	33.4 mt	73,634 lb
Drum Diameter	762 mm	30.00 in
Cutting Width	3505 mm	138.00 in
Cutting Height Above Grade	3053 mm	120.19 in
Cutting Height Below Grade	146 mm	5.74 in
Minimum Recommended Seam Height	1200 mm	47.24 in

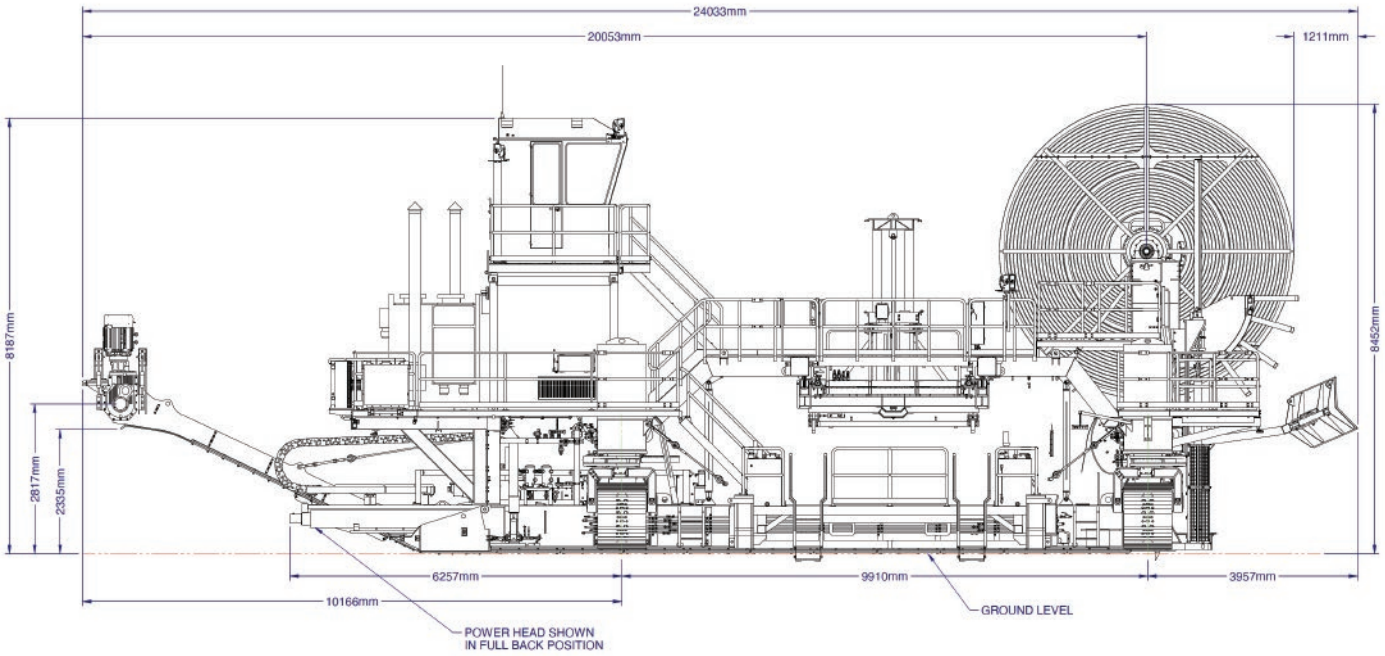
HIGH-SEAM CUTTER MODULE



Approximate Weight	50.24 mt	110,760 lb
Drum Diameter	965 mm	38.00 in
Cutting Width	3505 mm	138.00 in
Cutting Height Above Grade	5027 mm	198.00 in
Cutting Height Below Grade	207 mm	8.14 in
Minimum Recommended Seam Height	2400 mm	94.48 in

Machine Views

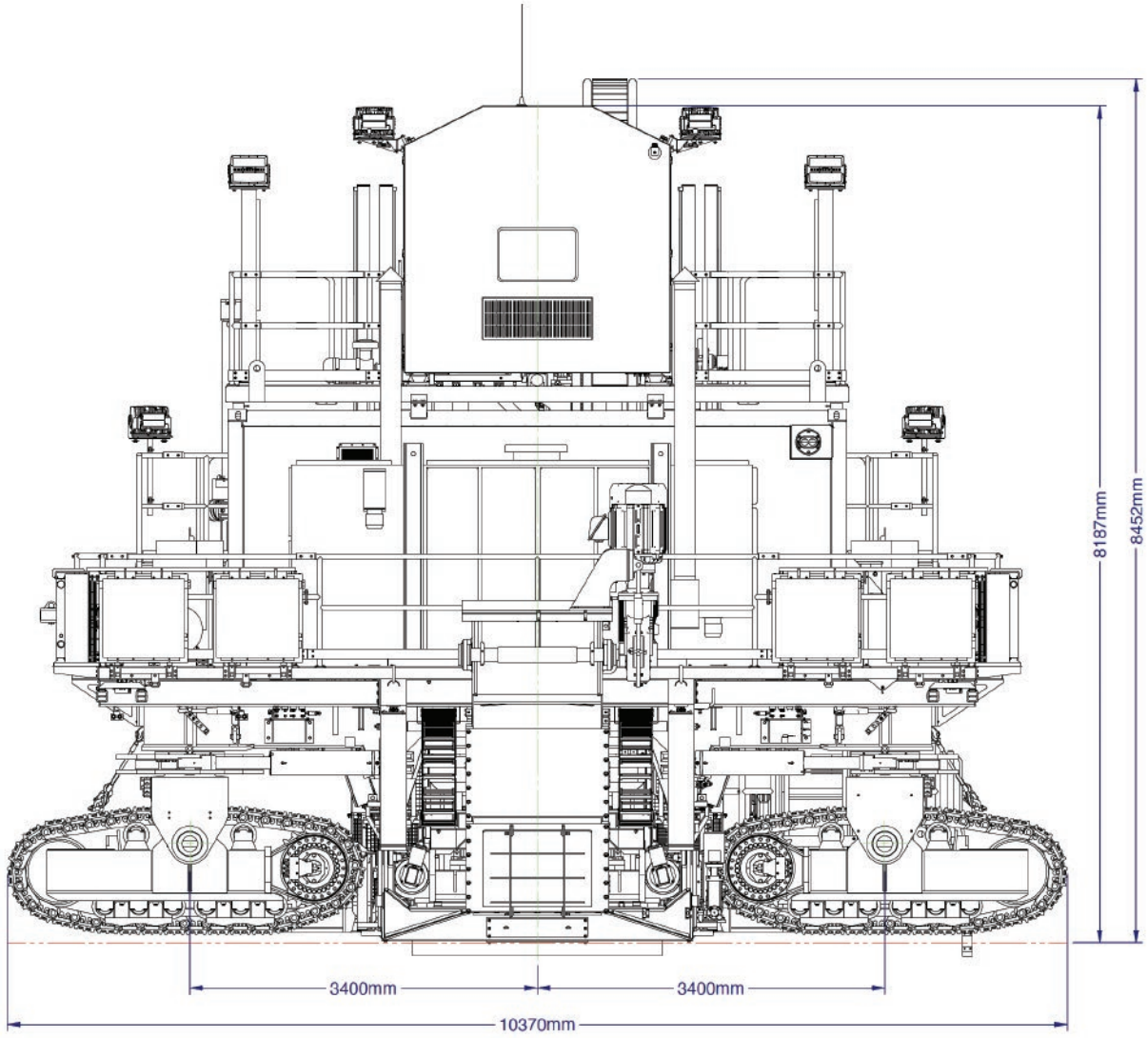
GHWM300M - RIGHT SIDE VIEW: MINE MODE



MACHINE DIMENSION DETAILS	Size (mm)	Size (feet)
1. Overall Length	**24,033 mm**	**78.85 ft**
2. Overall Height	**8,452 mm**	**27.73 ft**
3. Hose Reel Height	**8452 mm**	**25.73 ft**
4a. Track Width (mining mode)	**10,370 mm**	**34.02 ft**
4b. Track Width (tram mode)	**7,700 mm**	**25.26 ft**
5. Overall Width	**9,489 mm**	**31.13 ft**
6. Half Track Width (mining mode)	**5,185 mm**	**17.01 ft**

Machine Views

GHWM300M - REAR VIEW: MINE MODE



OPTIONAL EQUIPMENT

GAMMA DETECTION SYSTEM

Used to assist the operator as the cutter module is guided through the coal seam, leaving predetermined amounts of coal in the roof and floor.

This system also allows the mining of coal in soft roof and/or soft floor situations.

RIGHT-ANGLE DISCHARGE

This feature discharges coal to the right or left of the machine.

GENERATOR SET

A self-contained generator system is an option that can be sourced from the local Gainwell branch or retail store. It provides electrical power to the highwall mining system in remote locations where connection to a utility grid is not practical.

ARCTIC PACKAGE

For extreme-cold climates.

PUSH BEAM GRAPPLE

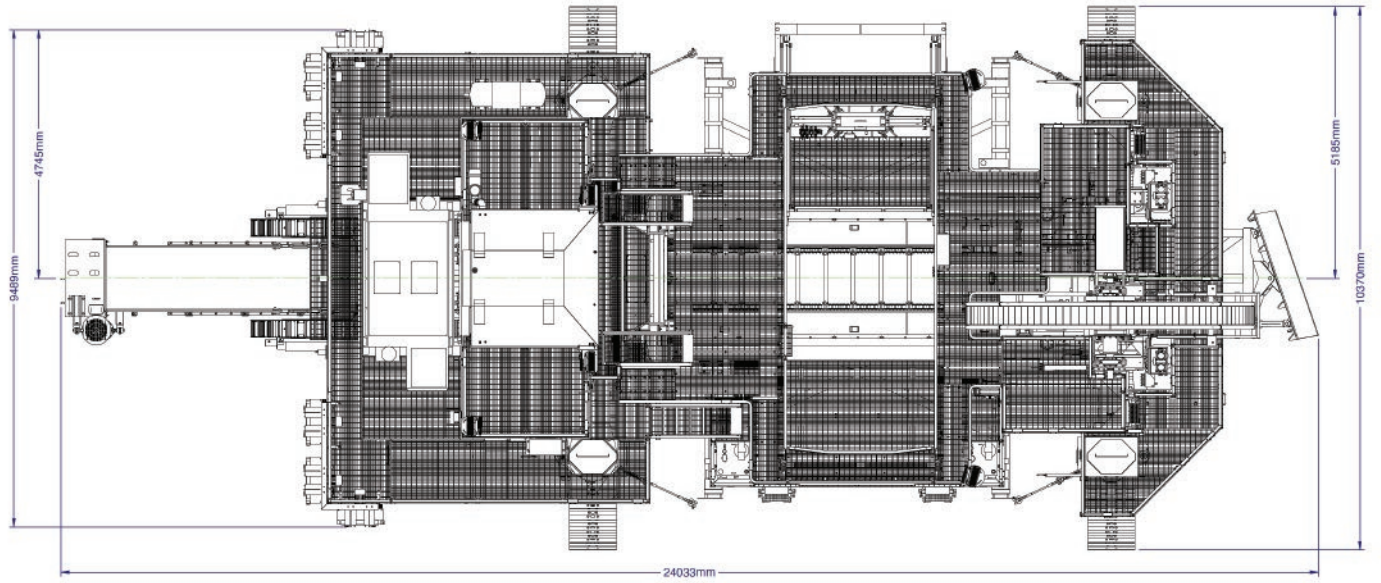
This tool is available from the Gainwell branch/retail store and mounts to the front of a wheel loader to provide safe and efficient transportation of push beams to and from the highwall mining system.

Optional equipment may vary. Consult your Gainwell representative for details.

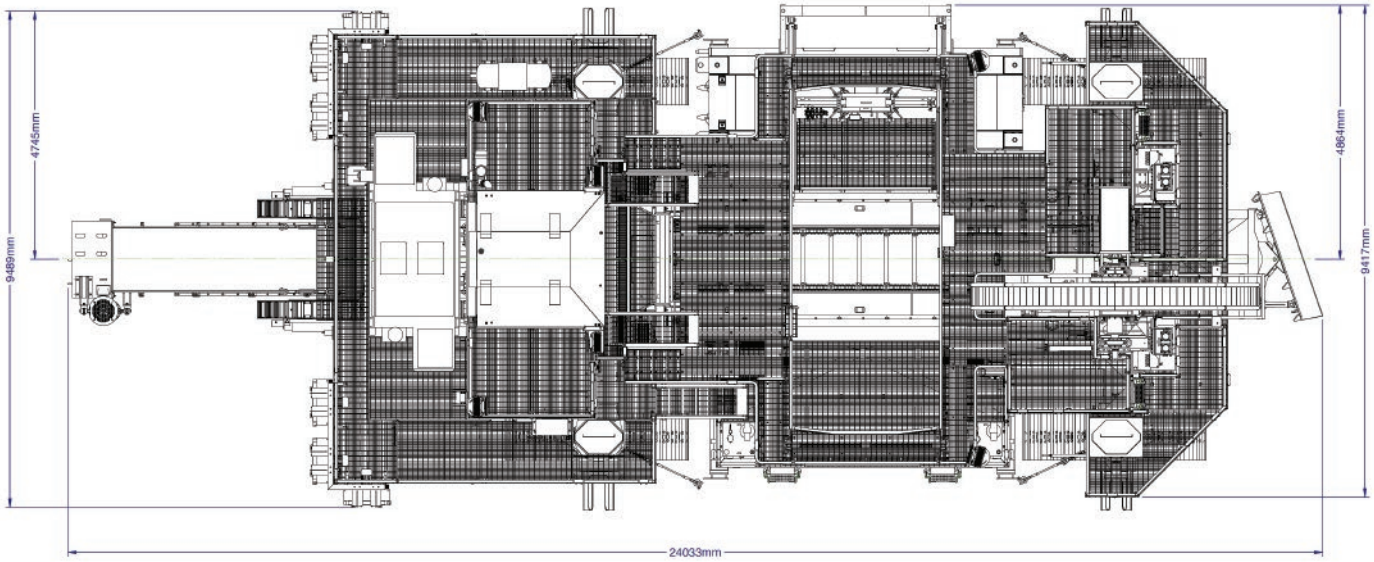
Machine Views

GHWM300M - TOP VIEW: MINE AND TRAM MODE

TOP VIEW - MINE MODE



TOP VIEW - TRAM MODE



Services to

KEEP YOUR EQUIPMENT PRODUCTIVE

PRODUCT SUPPORT AND MAINTENANCE

Parts and service support for the GHWM300M are never far away with the well connected Gainwell Network. You can count on our experts' skill and knowledge for quality maintenance. Gainwell Engineering representatives and our specialist associates are always ready to help evaluate any potential mine site and its coal seam.

Gainwell can arrange operational and technical training which covers every aspect of the GHWM300M Highwall Miner. A two-week training program is offered to new customers and to existing customers as a refresher.

A site-evaluation tool is available on www.gainwellengineering.com to help classify the geology before considering this mining system.

WAREHOUSE FACILITY

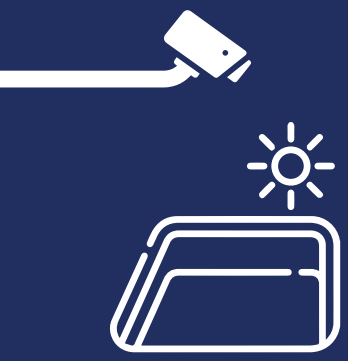
- GEPL has a storage capacity is of 20,000 line items.
- Various types to storage facilities are available, from smallest items to 30ft long.
- Temperature controlled warehouse to control contamination.
- Warehouse layout is as per standard industrial category.
- State-of-the-art, equipped with modern material handling equipment and trained manpower.

FINANCING

Whatever your needs are, Gainwell has the financing solution that will help you expedite your purchase and get your equipment on the job, fast. We offer quick and easy financing, with customized payment plans.

Our First Priority

SAFETY



We've Built Important Safety Features into the GHWM300M

- Machine mounted lighting covers the entire machine and the surrounding work area.
- Exterior cab mounted cameras.
- Laminated, tinted safety glass that reduces glare and prevents shattering.

Everywhere You Look…
the Gainwell GHWM300M Highwall Miner is Built for Safety

- Seat is adjustable on three axis points for comfort and ergonomics.
- Strong and extensive work platforms and hand rails.
- Lockable gates restrict access to the hose reel area.
- Walk areas and steps have serrated grating for traction.
- "Pendant" controls operate the second generation push beam transfer mechanism (PTM-2) providing space and limiting engagement with moving equipment. Crew never works below suspended push beams.
- When moving heavy push beams, positive lock lift hooks are used to securely hold the load. Beams are joined with two simple pins. No high-voltage or fluid connections required. An ergonomically- designed extraction tool helps remove the pins and keeps the crew from excessive bending and lifting throughout the shift.
- The GHWM300M is designed for immediate shut down by means of emergency stop switches (also called e-stops) strategically located around the machine.
- An Uninterruptable Power Supply (UPS) ensures the machine stops safely, that important data is stored and emergency lighting is activated to help the team safely evacuate if needed. Lights can also be timed in non-emergency situations to stay on for a set period after machine shut down - providing a well-lit exit.
- The GHWM300M has dust suppression at the power head, the coal discharge and along chain conveyor transition points. The hydraulic compartment helps with air flow and venting.
- The extra low seam cutter module grease take up cylinders – reduce the effort, time and equipment needed to adjust and tension the chain.
- Blowback guard on machine front provides protection in the unlikely event of a methane explosion underground.
- Overhead structure enhances safety for those working at the front of the machine.
- Automatic fire suppression for electrical controls and hydraulics installed in the housing compartment.

Our Presence

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A PARTNERSHIP THAT EXTENDS WELL BEYOND THE IRON

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FOR COMPLETE INFORMATION

On Gainwell products, services, and industry solutions, visit us on the web at:

www.gainwellengineering.com

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