

KGHM ZANAM

Polish Contribution
to the EU Raw
Materials Initiative

Speaking:
Marek Walczuk
Senior Sales Specialist



ABOUT US

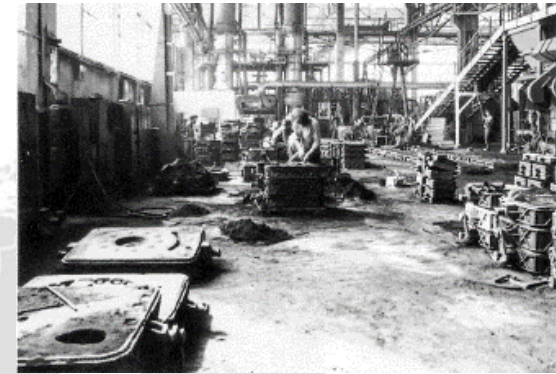
Company: KGHM ZANAM S.A. (founded in 1966). a merger of DM ZANAM and ZM LEGMET in 2003

Owner: 100% subsidiary of KGHM Polska Miedź S.A.

Employment: ~ 2,600 people

Sales revenue: ~ PLN 1000 mln in 2016
(~ USD 350 mln)

Activities: Manufacturing underground self-propeller mining machines and machinery for hard rock mining.
Repair and maintain services, mining and blasting services, transport services, investment services.



ISO STANDARDS

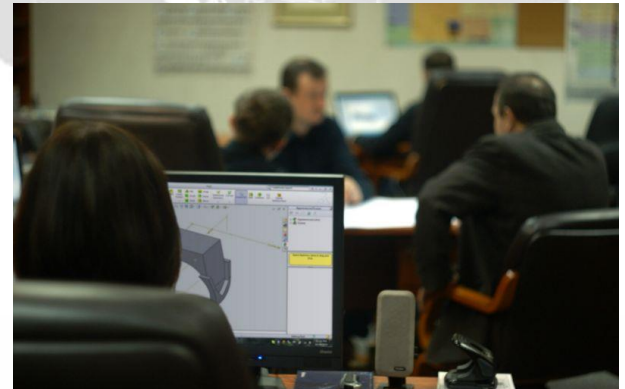
Integrated Management System:

- **Quality**
- **Health and Safety**
- **Environmental Protection**
- **IT Security.**

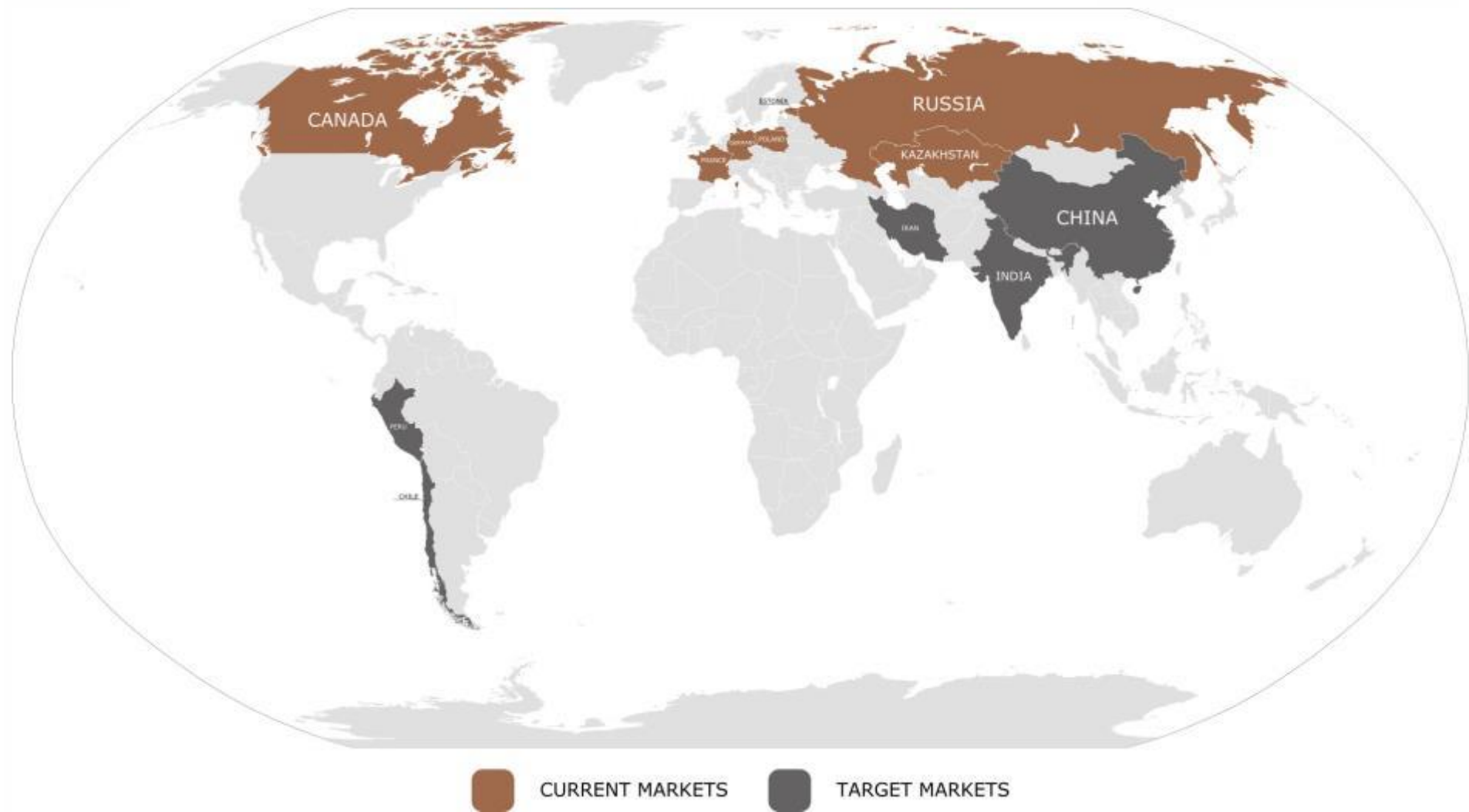


EXPERIENCE AND CAPABILITIES

- Excellent technological capabilities
- Experienced constructors and designers
- Qualified labour staff
- Constant development



INTERNATIONAL ACTIVITIES



PRODUCTS



SELF-PROPELLED MINING MACHINES

LOADERS



Types:

- LKP-0301
- LKP-0301A
- LKP-0403C
- LKP-0403D
- LK-1M
- LKP-0404M
- LKP-0405
- LKP-0701
- LKP-0805C
- LKP-0806A
- LKP-0900B
- LKP-0903
- LKP-1601B
- LKP-1601M

HAUL TRUCKS



Types:

- CB4-20TB
- CB4-24TB
- CB4P-24K
- CB4PCK
- WKPL-28

DRILLING-BOLTING RIGS



Types:

- KOT-170
- SWK-1HS
- SWKN-1/1A
- SWKN-1/1A
- SWW-1HS RT1
- SWW-1/1H
- SWW-1HS RRW
- SWWK-2L
- WIR-170

SELF-PROPELLED MINING MACHINES

BLAST TRUCKS



Types:

- WS-170
- WS-151
- WS-171
- WS-172

AUXILIARY TRUCKS



Types:

- SPK-806A
- SWB2CD
- SWB2N/Z
- SWB-900B
- SWKS-1
- SWKS-5
- SWON
- SWOZN-1
- SWPS-3
- SWPS-4A
- SWPS-5
- WSAD-405

TRANSPORT TRUCKS



Types:

- SWT-3
- SWT-30
- SWT-3D
- SWT-3K
- SWT-3MW
- SWT-3S
- SWT-3S/A
- SWT-3T
- SWT ZANAM-14
ROBUST B

SERVICES PROVIDED



REPAIRS AND MANTENENCE OF ORE ENRICHMENT INSTALATIONS

KGHM ZANAM S.A. provides mainteneace services for machinery and equipement instalations involved in the crusching, griding and flotation processes.

REPAIRS AND MAINTENANCE OF FURNACES AND METALLURGICAL EQUIPMENT



We provide comprehensive repair services, disassembling and assembling metallurgical furnaces and metallurgical equipment, along with related installations (Stationary and Rotary Anode Furnaces, Converter Furnaces, Shaft Furnaces, ovens, Rotary-Shuttle Furnaces).

INVESTMENT PROJECTS IN MODERNISATION OF COOPER SMELTER IN GLOGOW


Our recent achievements include:

- performing periodic repair and modernisation of the Electric Furnace at the Głogów Copper Smelter,
- modernising the Sulphuric Acid Plant within the implemented Pyrometallurgy Modernisation Programme for KGHM Polska Miedź S.A.
- building slag pouring and casting installation with infrastructure for the Głogów Copper Smelter.

INVESTMENT PROJECTS IN FLOTATION INSTALATIONS

Expertise and extensive experience result from the implementation of a number of investment projects:

- delivering, assembling, and installing flotation machines for KGHM Polska Miedź S.A.,
- constructing a water plant installation in the KGHM Polska Miedź S.A .Ore Enrichment Plants,
- modernising a flotation tailings pump station in the KGHM Polska Miedź S.A .Ore Enrichment Plants,
- designing and constructing the Facility for Thickening and Segregation of Tailings at the Żelazny Most Tailings Disposal Facility.

A detailed 3D CAD model of a mining plant. The model features a complex network of yellow structural beams, blue pipes, and various cylindrical tanks. A yellow locomotive is positioned on a track in the lower-left foreground. The background shows a hazy, greyish landscape. A semi-transparent grey box is overlaid on the center of the image, containing the main title and a smaller version of the same text.

New constructions and technical solutions implemented in mining machines in 2016-2017

2016-2017



X: 5,592 m Y: -46,304 m Z: 39,733 m

AREAS OF IMPROVEMENT



**Solutions for
safer working
conditions**



**Solutions for
friendlier working
environment**



**Solutions for
increased
productivity**

WORKERS



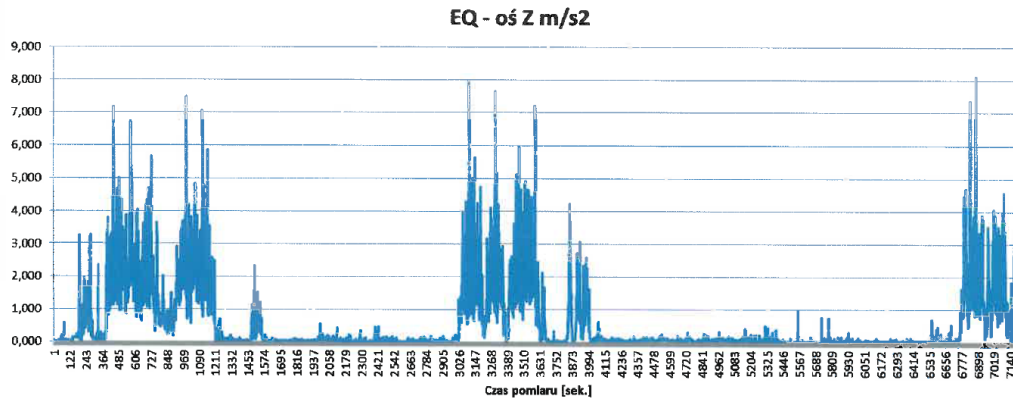
1. Operator's space.
2. Microclimate.
3. Air filtration.

ENGINEERY



1. Drive and brake systems.
2. Exhaust systems.
3. Firefighting and electrical installation.

Operator's working place - seat



Safety seat belts and ergonomic seat base for comfortable work.



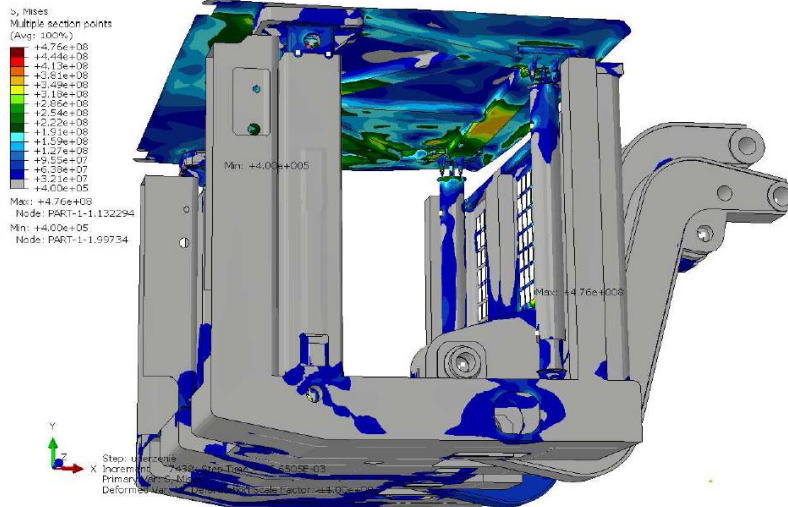
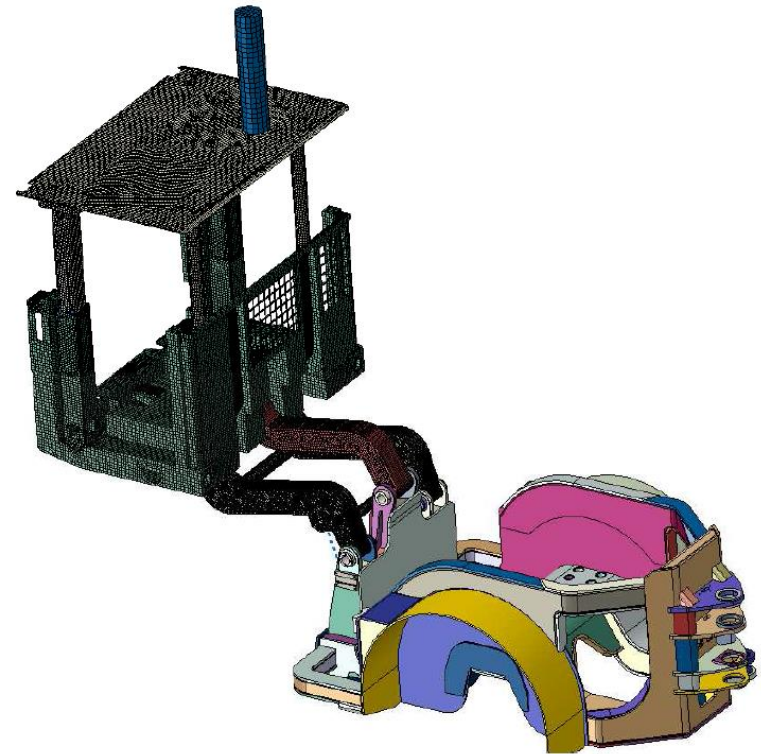
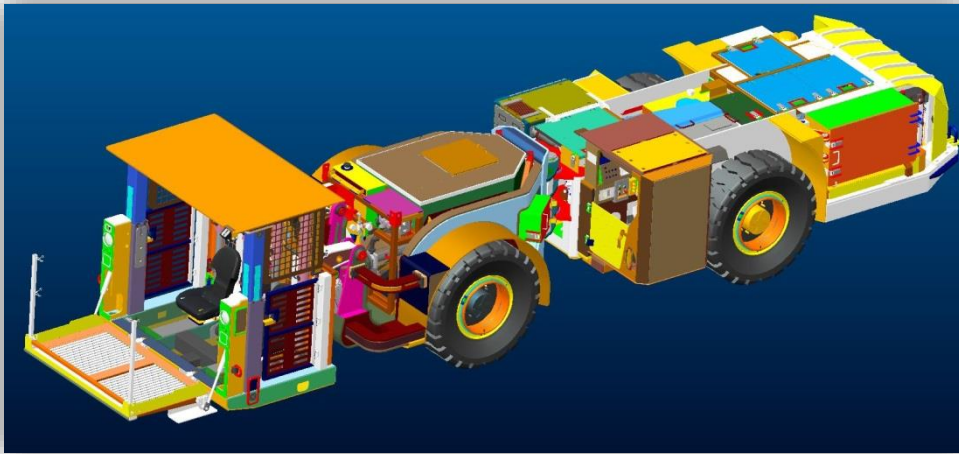
Standard type.



Pneumatic type.



Operator's working space - cabin



**More space in the cabin -
more comfort for the operator.**

Operator's working environment

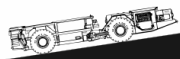
– air filtration system



**For dusty and
unpleasant
working conditions
underground.**

New drive systems for higher inclinations

CB4-PCK CB4P-24K



do 8°

Standard front drive only.

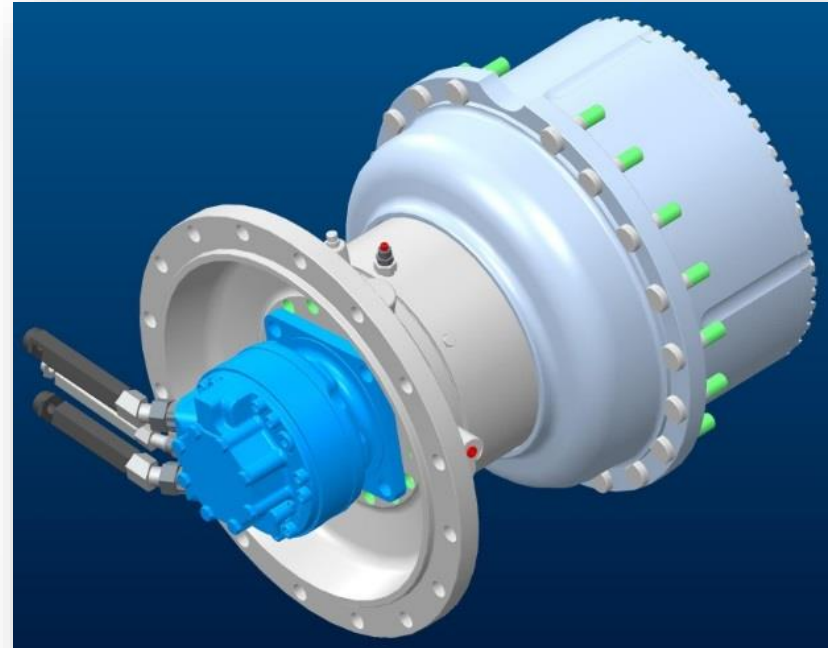
CB4-20TB CB4-24TB



do 15°

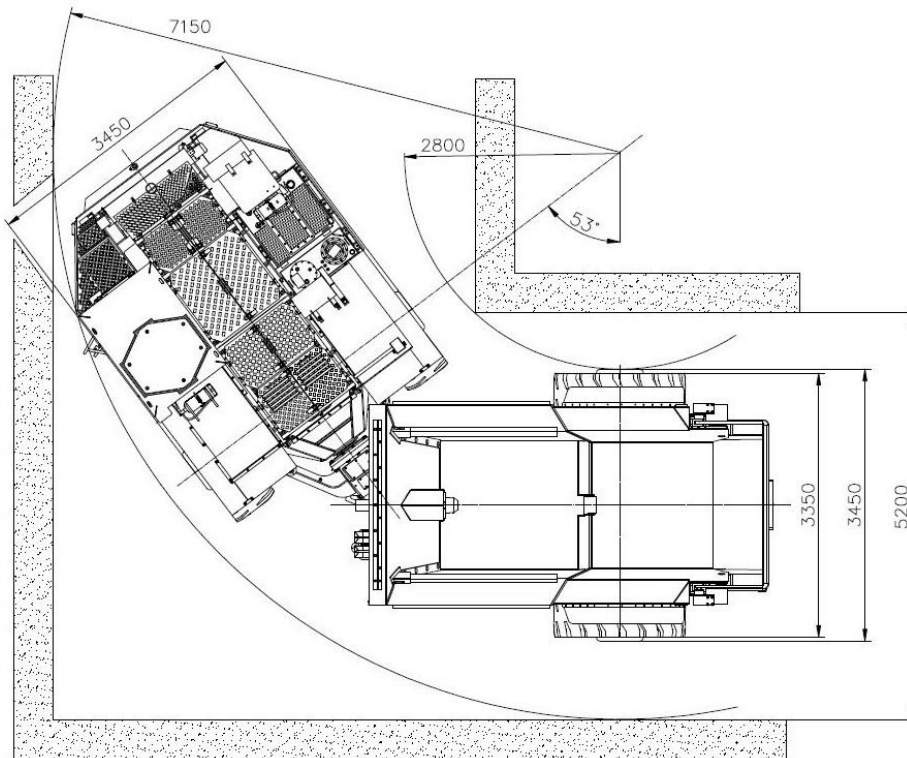
Hydraulic engines in the rear hubs

as additional drive by transferring torque to rear hubs – 4x4 drive.



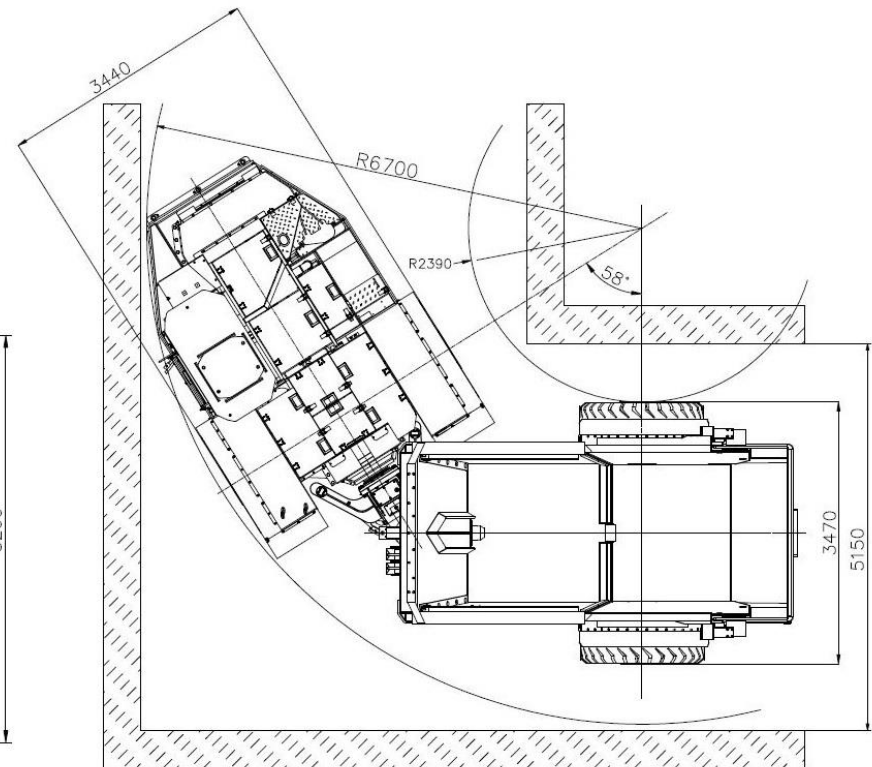
Greater turning angle for better maneuverability

CB4P-24K - wymiary



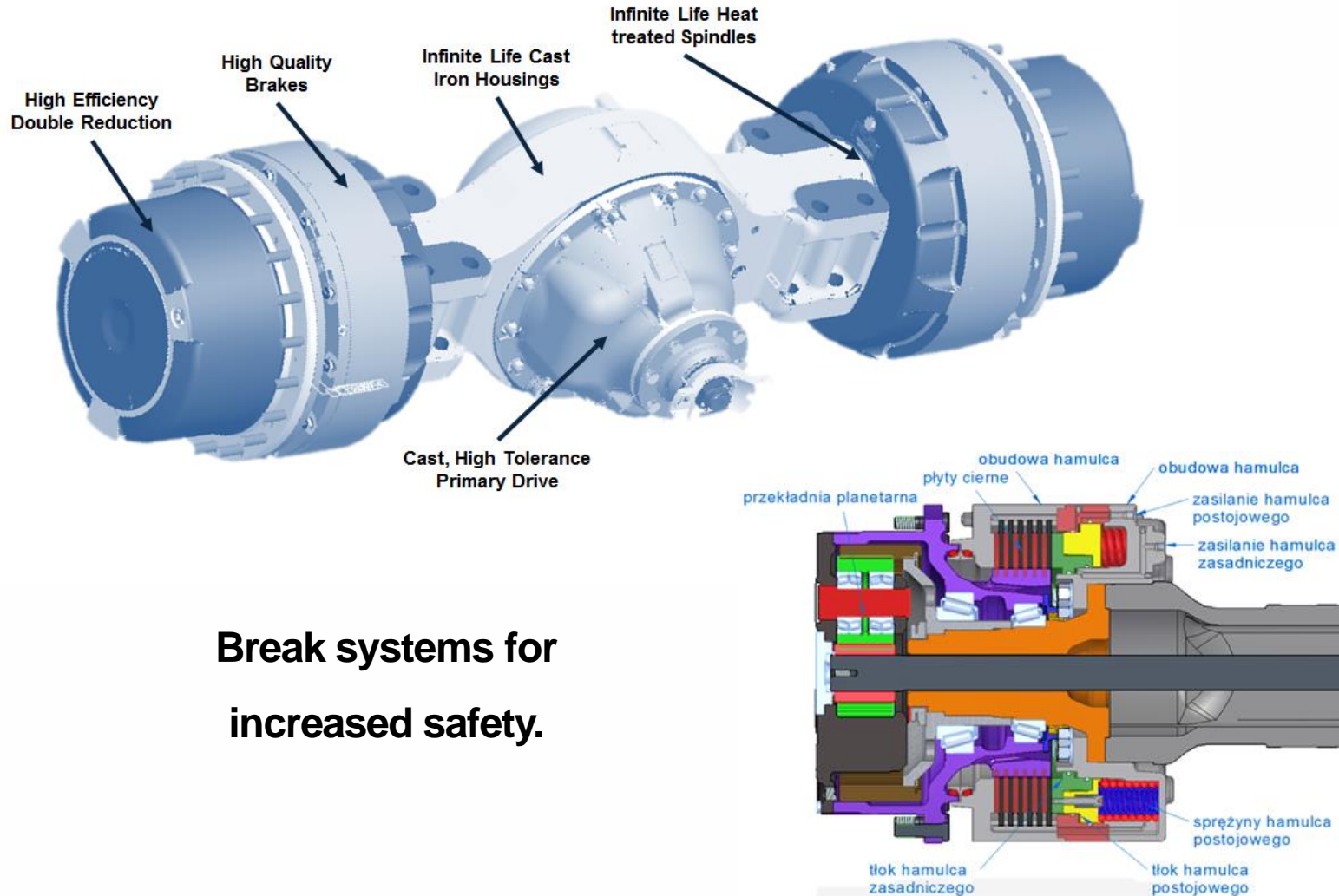
Previous standard - 53° (angle).

CB4-24TB - wymiary



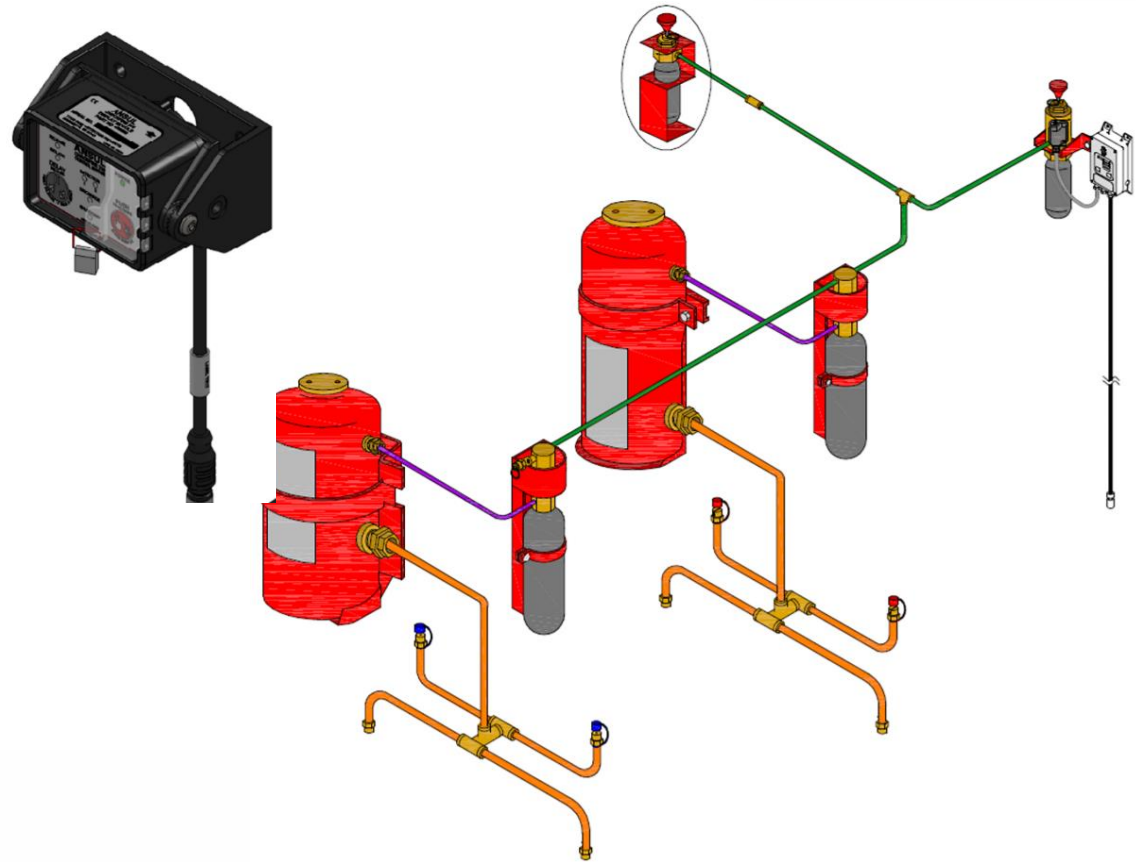
New standard - 58° (angle).

New axles with Posi-Stop system



**Break systems for
increased safety.**

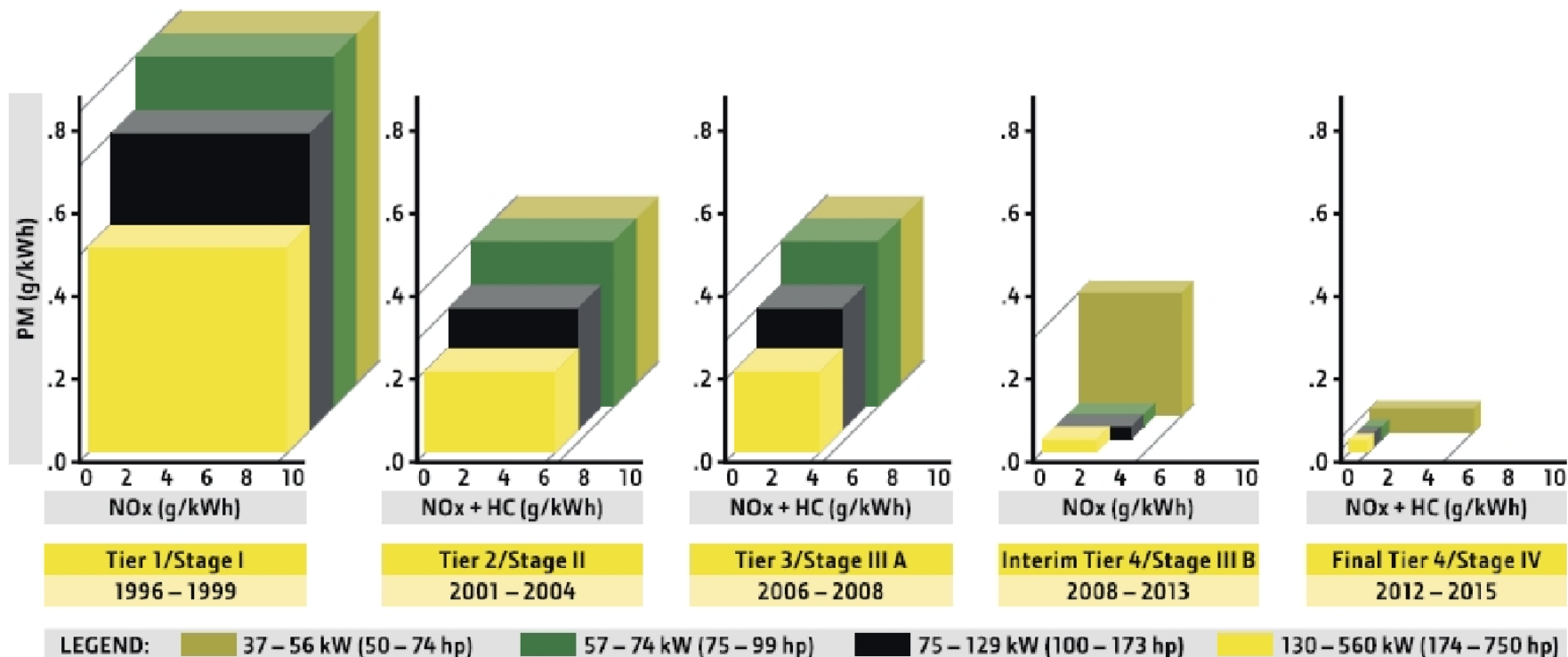
Fixed fire suppression system



**Fixed system activated manually and automatically –
constant protection of the working unit and workers safety.**

Exhaust systems with higher standards

Stage IV new higher standard of emission of exhaust gases to be implemented in new mining machines.



Exhaust systems with higher standards



**DOC+SCR: Diesel
Oxidation Catalyst
and Selective
Catalytic Reduction**

**DOC+SCR system applied in
new 7 ton loader LKP-0702**



Electric instalation

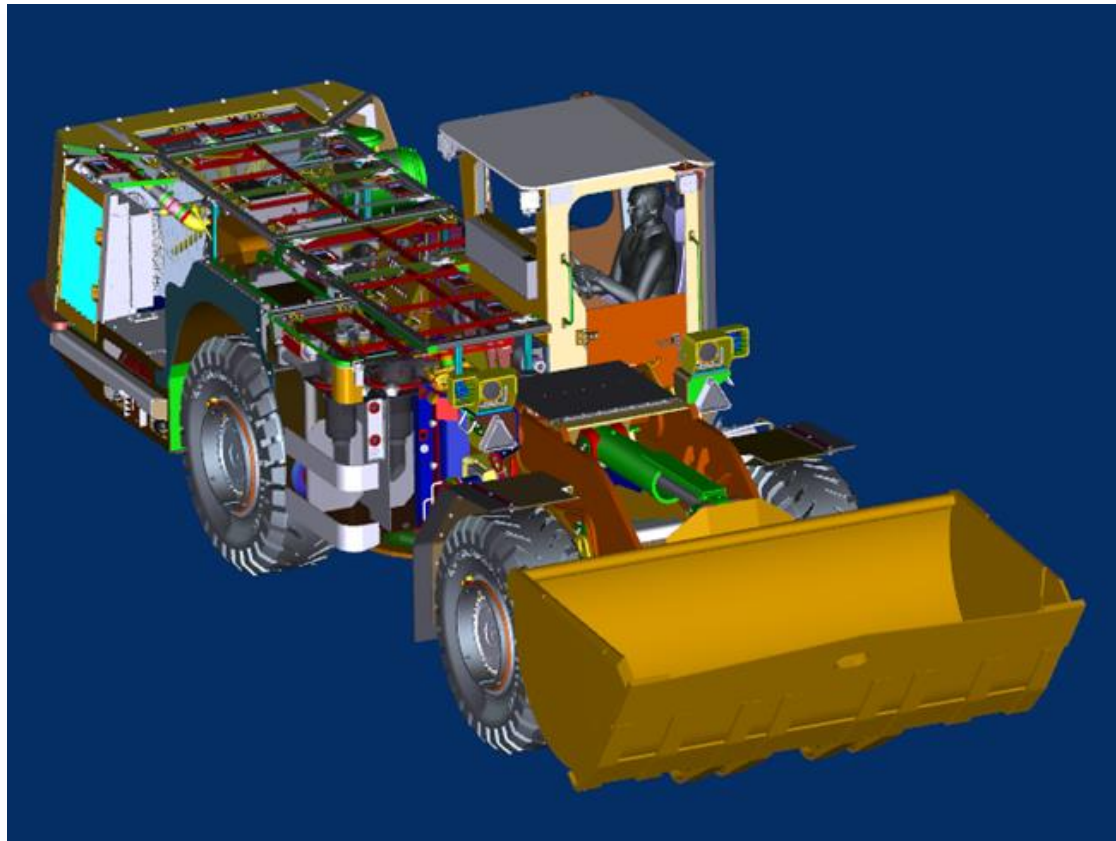


Wires in insulation with self-extinguishing and non-toxic attribute.

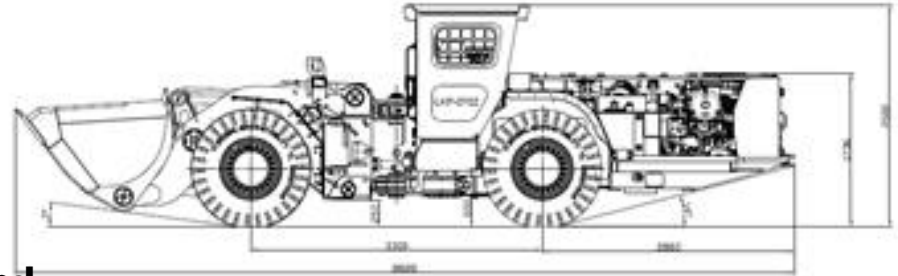


NEW PROJECTS – NEW MACHINES in 2017

Loader LKP-0702



New technical solutions



- **Engine Stage IV emission standard**

The Cummins QSB 6,7 engine with higher standard of emission of combustion - Stage IV (with DOC+SCR: Diesel Oxidation Catalyst and Selective Catalytic Reduction).

- **Axles**

Loader 700 series machine with the new Kessler D91 axles with Posi-Stop brake system.

- **Variable displacement pumps**

Working and turning hydraulic systems with a new type of pumps.

- **Brake system control**

Electric main brake and hill brake used simultaneously.

- **Modular electrical installation**

No installation bundles, stainless steel boxes.

NEW PROJECTS – NEW MACHINES in 2017

Blasting utility vehicle WS-172



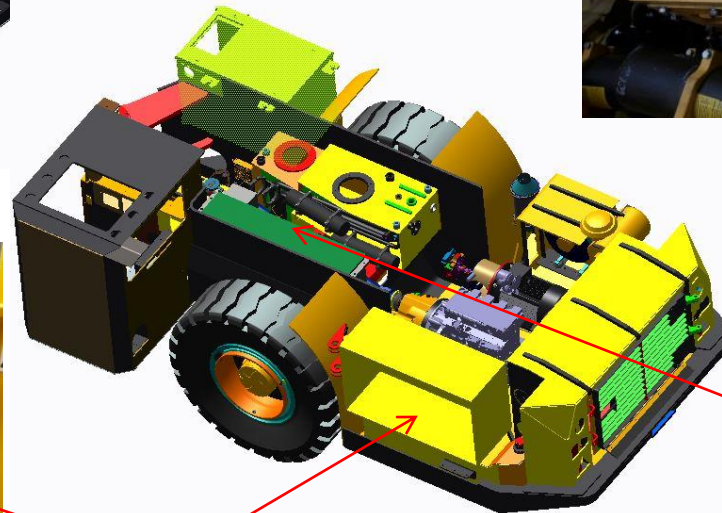
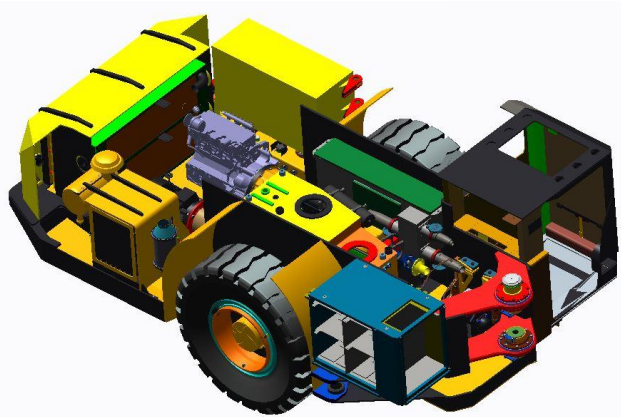
New technical solutions - cabin

New construction with lateral protection, compliant with the mining standard PN-G-59001 (Self-propelled mining machines - Protective structures against rock debris).



New technical solutions – battery drive

Power Supply for Modular Pump Equipment (MUP) - location of the battery pack and control apparatus on the machine.



Control unit

Battery box

New technical solutions – parameters display

Vizualization of working paramenters of the battery powered explosive emulsion discharge unit.



Operator's cabin



Battery unit working parameters display.

PRIZES AND AWARDS

- Numerous awards from the Organisation of Copper Masters
- Modernization 2016
- Medal for the innovative product of the Katowice Mining Fair 2017
(for WS-172 Blasting utility vehicle)
- Diamonds of Forbes 2017
- Pearls of the Polish Economy



Thank you for your attention!



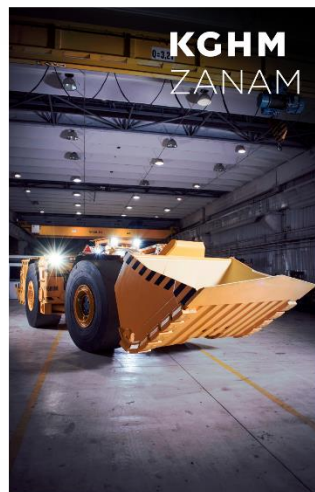
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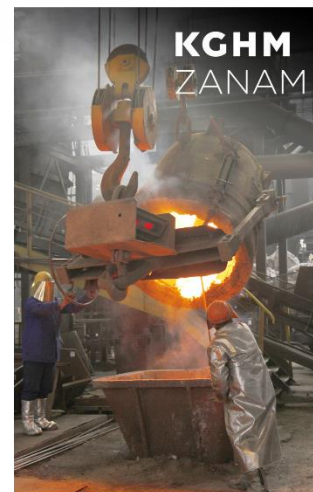
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