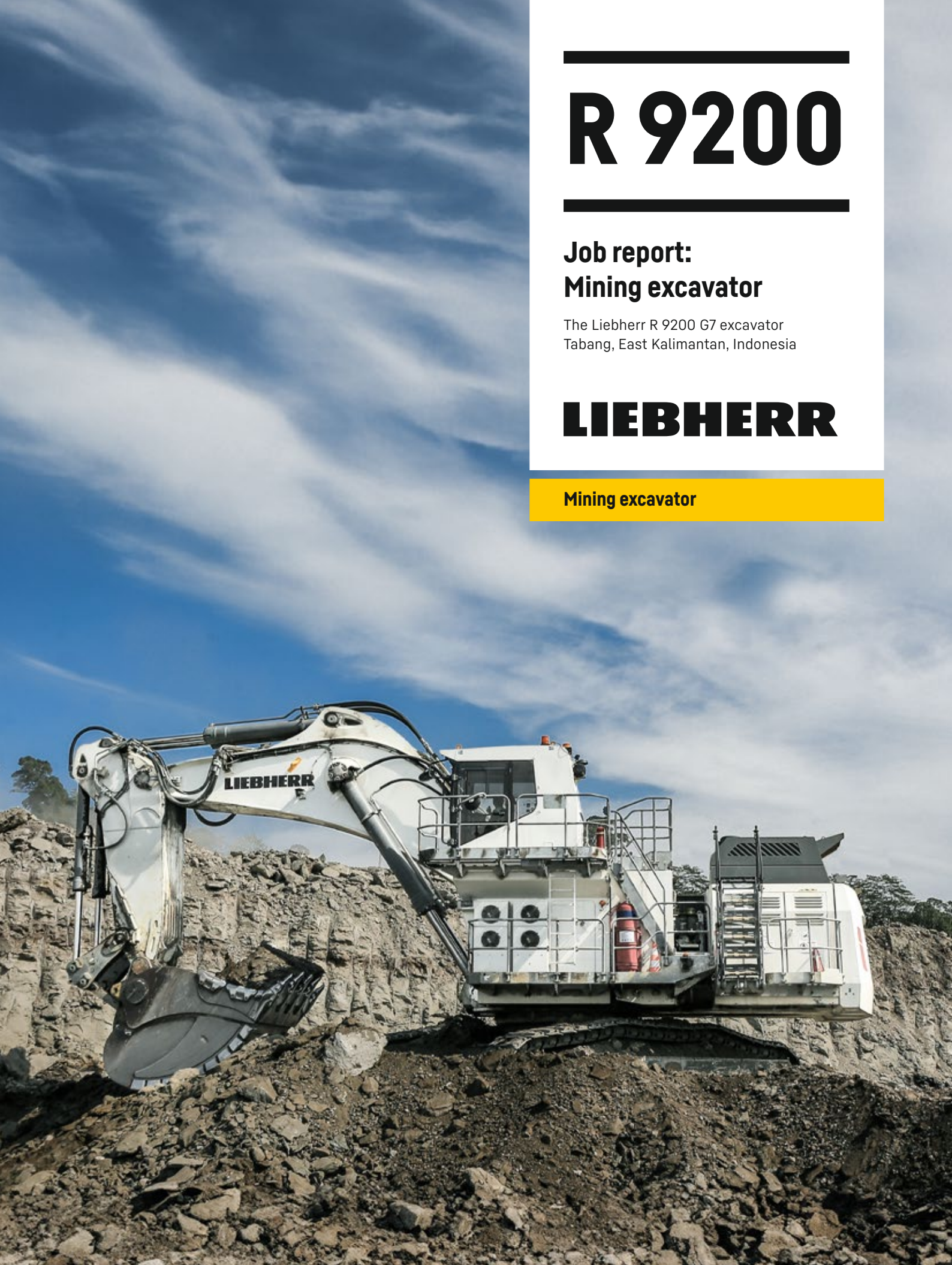
R 9200

Job report:
Mining excavator

The Liebherr R 9200 G7 excavator
Tabang, East Kalimantan, Indonesia

LIEBHERR

Mining excavator



Situation

The Tabang mine is an open-cut thermal coal mine located in the East Kalimantan region of Indonesia – an area known for its extensive coal resources. The mine produced 43.8 million tonnes of coal in 2023.

PT Karunia Armada Indonesia (Karunia) is a mining contractor based in Balikpapan, East Kalimantan. In 2011, Karunia was offered a contract for the Tabang mine by PT Bayan Resources Tbk, which operates the site. The business relationship between Liebherr Mining and Karunia began in late 2021, when an R 9100 mining excavator was delivered to Tabang. Since this time, Karunia's fleet of Liebherr machines at Tabang has grown to 30 machines, with deliveries of PR 776 dozers as well as R 9100, R 9200, and R 9300 excavators over the past three years.

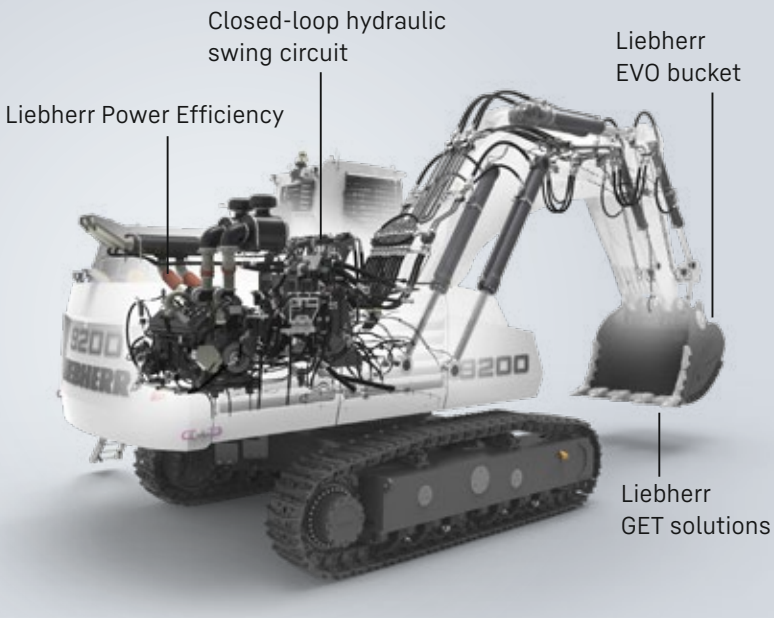
The R 9200 Generation 7: optimised for enhanced performance

In 2021, Liebherr launched the R 9200 Generation 7 (G7) excavator, successor to the R 9200 G6. Like its predecessor, this machine is available in backhoe and face shovel configuration and is fitted with Liebherr's advanced bucket and GET solutions. With a standard bucket volume of 12.5 m^3 (16.40 yd^3) for a material density of 1.8 t/m^3, the R 9200 bucket solution delivers superior digging performance and high fill factors, even in the most extreme mining conditions. The R 9200's combination of Liebherr's proprietary engine and hydraulics management systems – Liebherr Power Efficiency – and a closed-loop hydraulic swing circuit means that this G7 machine not only consumes less fuel but also offers fast cycle times.

When engineering the R 9200, optimising the hydraulic circuit was the focus. This was achieved by reducing pressure losses in the hydraulic lines, thereby extracting maximum efficiency from every drop of fuel. This world-class mining excavator is designed to work alongside mining trucks with payloads of up to 140 tonnes. Since its launch in 2016, over 150 units of the R 9200 have been delivered to customers worldwide.

Karunia's R 9200 specifications

Operating weight
205 tonnes / 225 tons
Motor output
810 kW / 1,086 HP
Bucket capacity (1.6 t / m^3)
14 m^3 / 18.3 yd^3
Max. digging force (ISO 6015)
650 kN (146,126 lbf)
Max. breakout force (ISO 6015)
740 kN (166,359 lbf)
Max. oil flow
2,048 l/min (540 gpm)



Onsite performance

The R 9200 is the preferred solution for removing overburden at Tabang. The machine not only features greater digging and breakout forces, but also boasts a better fuel efficiency than equivalent models in its class. Karunia's R 9200 is currently being used to load overburden into 100-tonne mining trucks in five passes with a 14.0 m³ (18.3 yd³) bucket (at 1.6 t/m³ [2,697 lb/yd³] density).

Availability rate

From September 2022 to June 2023, the R 9200 reached an average of 94 % availability and achieved an average of 500 hours per month.

24/7

94 %
availability rate

500 hours
per month (on average)

Liebherr vs. Competition

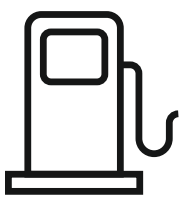
Production

In the first ten months of operation, Karunia reported an average production of 759 BCM per hour, which is an impressive achievement for a machine in the 200-tonne class. In the same period, the R 9200 worked beside other 200-tonne excavators and outperformed these by moving up to 16 % more material per hour.

16% **The R 9200 moved up to 16 % more material per hour.**

Fuel consumption

Between September 2022 and June 2023, Karunia reported that the R 9200 consumed an average of 129.1 litres of fuel (34.1 US gallons) per hour – a similar fuel consumption to its peers in the same application.



129.1 litres
per hour (on average)

Production test

Study conditions

Liebherr Mining conducted a production study in March 2023 at Tabang to measure the instantaneous production of the R 9200. Throughout the study, Liebherr's engineers and operator trainer ensured optimal truck fleet match and loading conditions. The R 9200 worked on a non-blasted bench of overburden, equipped with a 14.0 m³ (18.3 yd³) bucket, loading a fleet of thirty 100-tonne trucks in free-dig conditions.

Study results

Total test duration	77.5 minutes
Total trucks loaded	30
Average load per truck	103.2 tonnes (113.8 tons)
Average excavator cycle time	25 seconds
Fuel consumption	145 litres (38.3 US gallons) per hour
Measured production	1,076 BCM per hour
Average exchange time	56 seconds

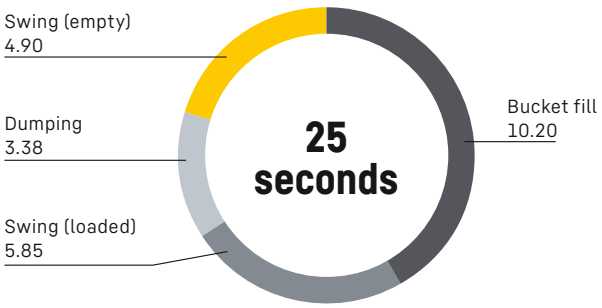
Fuel information was not available at the time of the production study. As such, the average fuel consumption of the R 9200 over the first six months of operations has been used as a reference.

Machine efficiency and productivity

Productivity

The R 9200's productivity during the production study was 1,076 BCM per hour (2,368 tonnes [2,610 tons] per hour). The production achieved by the R 9200 was made possible due to the machine's capacity and then optimised by having a good fleet match as well as a good exchange time between trucks. If the trucks had achieved an average exchange time of 45 seconds – the international best practice benchmark for truck exchanges – the R 9200 could have achieved 8 % more production.

1,076 BCM
per hour



Cycle time

The R 9200's 25-second average cycle time was achieved through a combination of its closed-loop swing circuit, Liebherr Power Efficiency technology, and its weight-optimised attachment.

Fuel efficiency

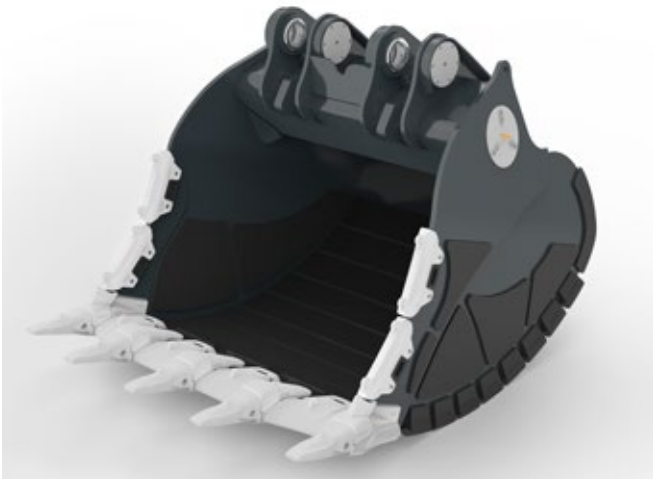
7.5

BCM per litre

During the study, Karunia's R 9200 achieved a fuel efficiency rate of 7.5 BCM per litre (28.1 BCM per US gallon), an excellent result for a 200-tonne class excavator. This achievement was made possible thanks to the machine's fantastic productivity and the Liebherr Power Efficiency systems. The engine and hydraulics management systems within the Liebherr Power Efficiency solution automatically adapt to different working phases, substantially reducing fuel consumption without compromising the overall productivity of the machine.

Liebherr's tailor-made bucket and GET solutions

Liebherr offers customers tailor-made bucket and GET solutions to best suit the conditions on their site. Because Karunia does not blast overburden material before the excavators remove it, Liebherr needed to supply the company with a bucket and GET solution that could handle the density of the material at Tabang. As such, Liebherr equipped Karunia's R 9200 with a 14 m³ (18.3 yd³) bucket with Liebherr's P-Profile teeth – a typical configuration for R 9200s used to remove overburden in open-pit coal mines in Indonesia.



The R 9200's 14 m³ (18.3 yd³) bucket works best with the abrasiveness and density of the overburden at Tabang and was also the right fit based on Karunia's truck fleet. Furthermore, the size of this bucket allows the R 9200 to reach its full potential in terms of cycle times, longevity, and reliability.

The P-Profile teeth on the bucket are designed to offer optimal penetration when working in very compact material that has not been blasted – such as the overburden at Tabang. These teeth are also built for durability and can achieve a service life of 1,000 – 1,500 hours, meaning fewer teeth changeouts over the life of the excavator, which in turn reduces life cycle costs.

P-Profile teeth

Liebherr's GET solutions are available in different sizes and profiles, providing an optimal combination of bucket penetration and high fill factor for mining excavators from 100 to 400 tonnes. The Z system is available in four different profiles to cover an extensive range of applications, from soft to hard. The Z tooth system is Liebherr's innovative and patented tooth system. It consists of the tooth adapter, tooth, securing bolt with a locking arrangement, and a protective plug. All that is required to replace the tooth is the lock spanner – a single and easy-to-carry double-sided extraction tool designed by Liebherr that matches its complete range of tooth sizes.

CL profile
Soft to medium abrasive

CLH profile
Soft to medium highly abrasive

CLI profile
Soft compact, frozen ground, slightly abrasive

P profile
Hard, slightly abrasive

Opportunities

The first R 9200 was delivered to Tabang in June 2022. Over the past two years, Karunia's fleet of R 9200s at Tabang has continued to expand, with the most recent R 9200 joining the fleet in January 2024, bringing the total number of R 9200s on site to nine. These numbers highlight the confidence and satisfaction Karunia has in Liebherr's mining solutions, particularly the R 9200 excavator.

Subject to technical modifications. All comparisons and claims of performance are made with respect to the prior Liebherr model unless specifically stated.

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