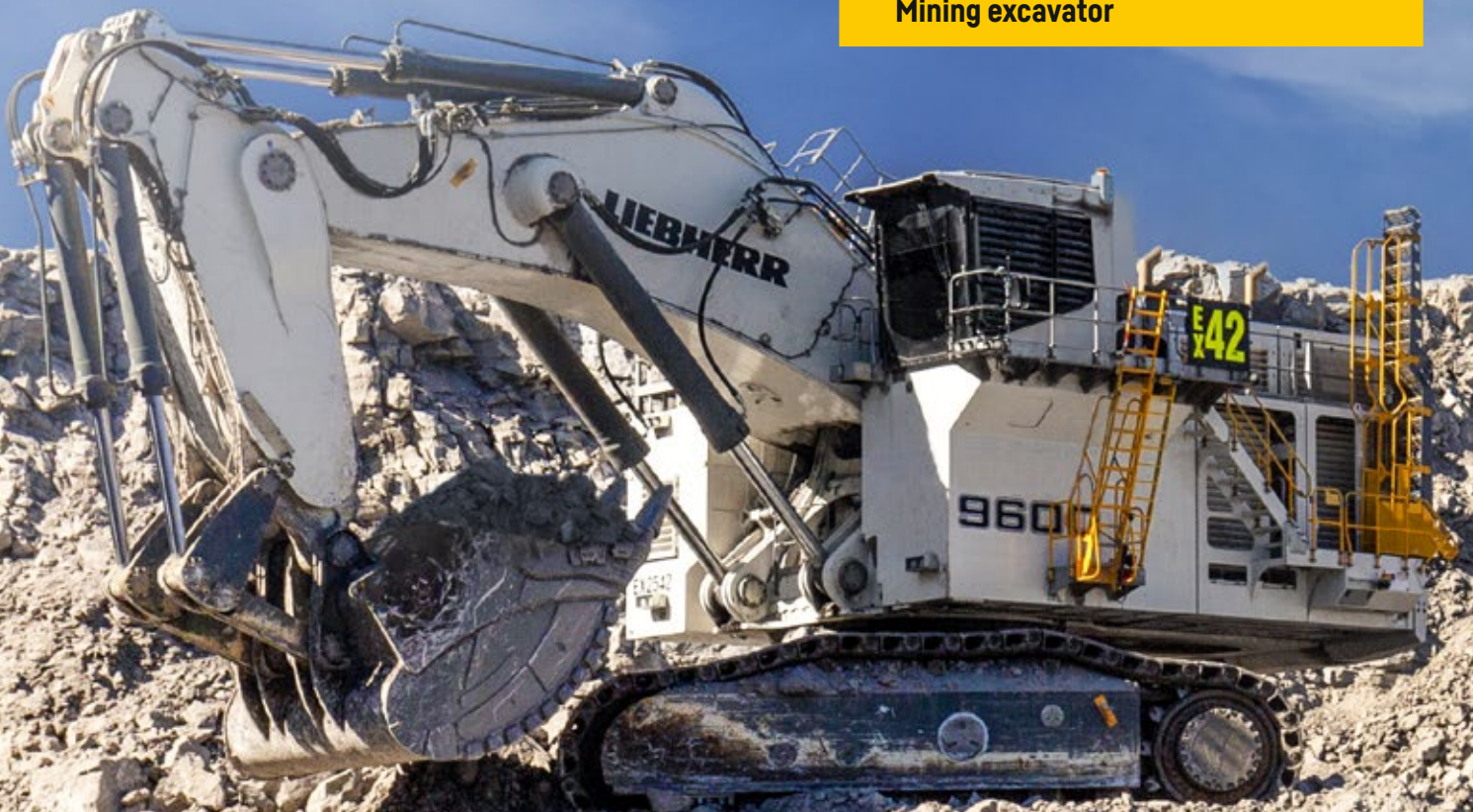

R 9600

Job report: Mining excavator

The Liebherr R 9600 G8 excavator
Curragh North, QLD, Australia

LIEBHERR

Mining excavator

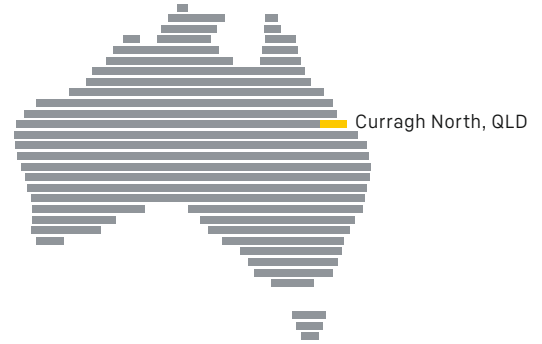


Situation



Curragh North mine is an open cut metallurgical coal mine located in the Bowen Basin in Central Queensland, Australia. Curragh North and Curragh East form part of the Curragh Mine Complex owned by Coronado Global Resources Inc.

Australia



Thiess Pty Ltd has held successive mining services contracts at Curragh North since 2004. Their current contract includes overburden removal and haulage, mining and run of mine rehandling services, equipment maintenance, and pit dewatering.

Over Thiess and Liebherr's relationship spanning over thirty years, Thiess has acquired Liebherr's pre-series new equipment on multiple occasions including the R 996, the R 9800, and now the R 9600. The R 9600 is the newest excavator in the 600 t class, and the successor to the R 996B. Thiess took ownership of one of the first pre-series R 9600 excavators in Australia in May 2020.

At present, Thiess operates 14 pieces of Liebherr equipment within their fleet at Curragh North mine including a fleet of T 282C trucks, and a range of 300 t – 600 t excavators.

R 9600 performance

As the next generation of Liebherr 600 t class mining excavators, the R 9600 has been designed to offer outstanding performance, safety and comfort. Integrating latest Liebherr cutting-edge technologies, the R 9600 delivers best in class force distribution, optimal power transmission and unrivalled productivity.

Operating weight

633 tonnes / 698 tons

Motor output

2,500 kW / 3,350 HP

Bucket capacity (1.65 t/m³)

40 m³ / 52.3 yd³

Max. digging force (ISO 6015)

1,560 kN

Max. breakout force (ISO 6015)

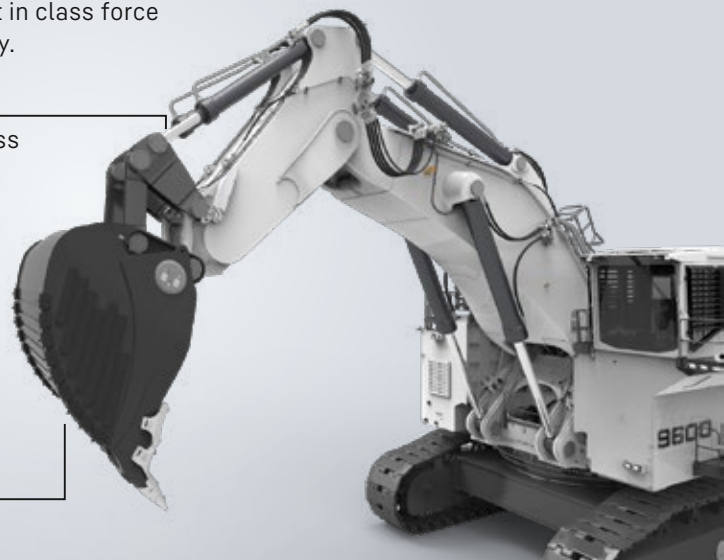
1,730 kN

Max. oil flow

8,520 l/min

Highest digging and breakout forces in its class

Patented EVO bucket



Production test

Study result

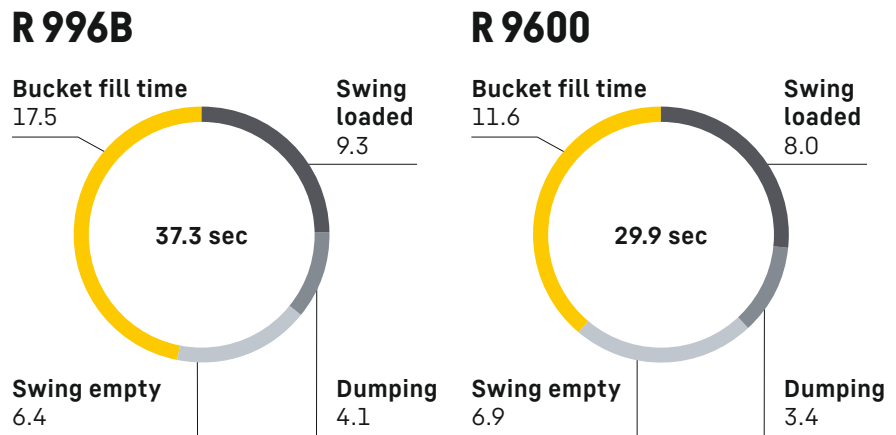
	R 996B	R 9600
Engine model	2x Cummins K 1800 E	2x Cummins QSK50
Bucket capacity	40 m ³ Standard bucket	40 m ³ EVO bucket
Average cycle time	37.3 sec	29.9 sec
Instantaneous productivity	7,988 t/h 3,328 BCM/h	9,554 t/h 3,981 BCM/h

The instantaneous production rates were calculated by dividing the tonnes moved by loading time, excluding initial pass and truck exchange times. Floor maintenance and cleaning practices were not included.

Cycle time

- 19.8 %

Unrivalled cycle time thanks to an efficient power management system and class leading force distribution.



Study conditions

A production study was conducted by Liebherr-Australia at Curragh North in April 2021 to measure operational efficiency of the new R 9600 as an individual unit, as well as in comparison to the R 996B operating at the site. For the duration of the study, operating conditions were normalised for both excavators to achieve an unbiased outcome. A hydraulic tune-up was performed on both excavators prior to the study to enable optimum hydraulic performance.

Both machines operated at the same work area on a bench of (nominally) 5 m and were equipped with the 40 m³ buckets suitable for the light material present at work area. The material was densely packed, clay rich, sticky, and fine-grained overburden providing a challenging task for both excavators. Large bucket size and limited diggability had an impact on bucket fill times for both R 9600 and the R 996B.

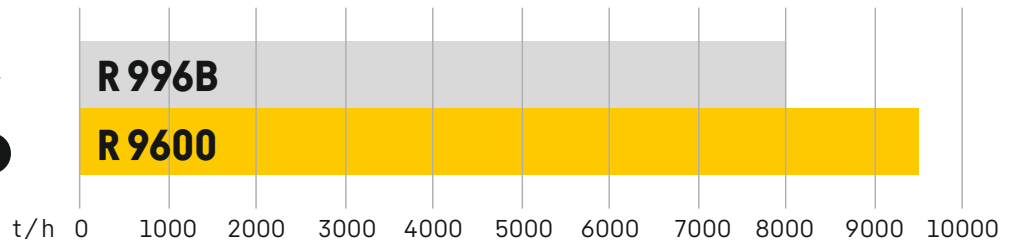
The R 996B and R 9600 loaded a varied fleet of trucks (360 t, 300 t, 240 t, 180 t), and a total of 78 truck loads were recorded. The nominated truck loads were verified by an independent third-party scale, and potential inaccuracies in truck payload measurements were eliminated for reporting purposes.

A support dozer assisted both machines and maintained a well-prepared, clean, and levelled working area for both excavators and the trucks operating under them.

Machine efficiency & productivity

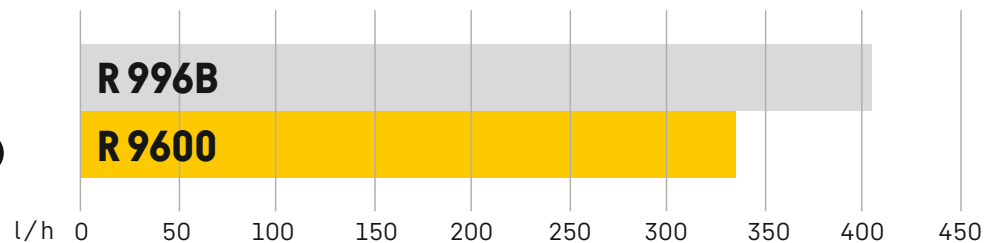
Productivity

+19.6 %



Fuel consumption

-18.2 %



Fuel efficiency

Based on actual production per litre

+40 %

Yearly CO₂e emission reduction

Well-to-wheel for 6,000 operating hours

-1,465 t

Conclusion

Excellent productivity and reduced fuel consumption enable competitive cost per tonne in mining operations with the R 9600. The reduction in engine load is expected to extend engine life, further reducing the cost of ownership.

This production study determined the R 9600 to be 19.6 % more productive and 19.8 % faster than the R 996B on site. With 18.2 % less annual fuel consumption, the new Liebherr 600 t class mining excavator has 40 % more fuel efficiency than its predecessor.

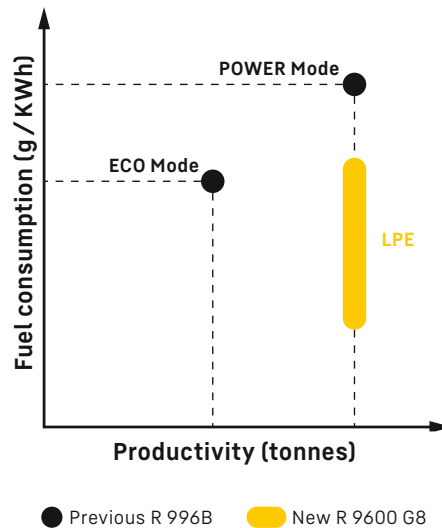
Liebherr Power Efficiency (LPE)

Moving more with less

Specific engine and hydraulic management system which drastically reduces fuel consumption.

- Adapted piloting processes according to operator requirements and machine condition
- Electronically controlled pressure and oil flow
- Reduced hydraulic throttling and load profile of the engine for increased component lifetime
- Reduced energy consumption without impact on the machine performance

Based on constant research and development, Liebherr is able to provide size-equivalent machinery with higher production rates and less fuel consumption. These outstanding efficiencies allow the R 9600 to set a new benchmark in its class without compromising environmental consciousness.



"The Liebherr Power Efficiency adapts the power and hydraulic flow specifically to the load profile."





Opportunities

The clear advantages of the R 9600 not only in comparison to the R 996B but also as a leader in the 600 t mining excavator class, has led Thies to purchase two additional R 9600 units for 2022 for a separate coal mining services contract.

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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