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## TUNNEL BORING MACHINE, MADRID METRO, SPAIN

CASE STUDY

# Alimak elevator in tunnel boring machine breaking all records

Access anytime, anywhere

**ALIMAK**

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In the S-300 EPB Shield, the world's largest tunnel boring machine, manufactured by Herrenknecht, everything is over the top. The TBM weighs 4,364t and has an excavation diameter of 15.20m. It also possesses the highest torque ever installed in a TBM. The unique machine is being used to bore the 3.65km long north tunnel on the new M-30 urban motorway around Madrid, Spain.

### A NEED FOR SMOOTH TRANSPORTATION

Since the mega TBM is the world's largest, the manufacturer knew it would draw a lot of attention, and thus a lot of visitors. They needed to install an elevator, transporting people as well as materials between the floors in the TBM. Herrenknecht chose an Alimak elevator.

The elevator, installed in the rear of the TBM, is a standard ALIMAK SE-450 with a capacity of 450kg and a lifting height of 9m. This is the first time an elevator is ever installed in a TBM. And it is yet another example of Alimak's ability to solve all kinds of vertical transportation problems.

### JAPANESE ORDER FOLLOWED

A further proof of Alimak's unique experience and technical knowledge of extraordinary projects is yet another installation concerning the M-30. In a joint venture between Spanish manufacturer Duro Felguera and Japanese designer Mitsubishi Heavy Industries, another of the world's largest TBMs has been constructed for re-routing the M-30 motor-way underground. Since Herrenknecht had installed an elevator in their TBM, the Japanese wanted to match that. They placed

an order on two ALIMAK SE-300 elevators, with the capacity of 300kg. One elevator will be installed in the front of the TBM, behind the cutting wheel, and the other in the rear.

The TBMs equipped with Alimak elevators have already started working on the tunnel, which will help solve the chronic traffic jams, frequent accidents, noise and lack of greenery in the city center. It is due to open for traffic in 2008.

### EXPERT KNOWLEDGE OF THE TUNNELING SEGMENT

Alimak rack and pinion elevators provide reliable and efficient access in a great number of road and railway tunnel shafts around the world. They are used for transportation of personnel and materials, for inspection, maintenance, and emergency escape. They adapt to inclinations, curves, and tight spaces, and climb deep down through the earth's crust.

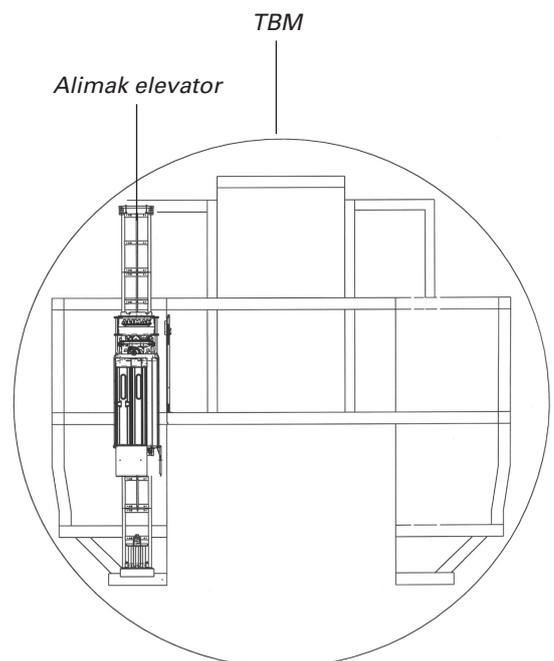
The first Alimak tunnel elevator was installed in Austria in 1975 and was used to inspect the 600-meter high ventilation shafts in the tunnel under the Tauern pass. Since then, Alimak tunnel elevators have been installed in a number of tunnels all over the world.

### ELEVATOR DETAILS

Location:	Madrid Metro Project, Spain
Applications:	Tunnel Boring Machines (TBM)
No. of elevators:	3
Elevator type:	Rack and pinion
Elevator model:	ALIMAK SE 300 and 450
Capacity:	300 kg and 450 kg
No. of landings:	2
Lifting height:	9 m



*Alimak elevator inside the world's largest tunnel boring machine.*



*Alimak is a global market leader and pioneer in the design and manufacture of vertical access solutions for industrial and construction industries. The company provides high quality rack and pinion and traction elevators, construction hoists and work platforms. Alimak has a well-established global sales, service and distribution platform across more than 90 countries with strong market presence. The company has a large global installed base of over 23,000 units which provides unique know-how of all industrial application areas. Alimak was founded in 1948 and employs over 1,200 people across the world. Alimak is part of Alimak Group which is headquartered in Stockholm, Sweden.*

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