

## 隧道掘进机在我国应用的进展

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收稿日期 2006-3-29 修回日期 2006-4-28 网络版发布日期 2007-2-13 接受日期 2006-3-29

**摘要** 我国应用隧道掘进机近半个世纪, 特别是实行改革开放以来, 掘进机得到广泛应用, 并且取得许多经验和教训。大中型水利水电工程、铁道、高速公路工程显示了开敞型TBM适合于良好的地质环境, 而双护盾TBM适合中等地质条件。在石灰岩地区, 用传统的钻煤法比较合适。盾构机在中国也得到广泛应用。在今后10~30 a中, 南水北调整西线工程、海底隧道将要建设, 市政工程、铁路和高速公路将提高建设速度, 可以预期, TBM在中国将得到越来越多应用。

**关键词** [隧道工程; 隧道掘进机; 应用; 经验和教训; 进展](#)

分类号

## ADVANCES IN TUNNEL BORING MACHINE APPLICATION IN CHINA

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### Abstract

Nearly half century has passed since the TBM(tunnel boring machine)was applied in China. Particularly since China carried out reform and open policy, various TBMs have been used in tunnel construction. In the meantime through practice, we obtained a series of experiences and lessons. Since 2002, through the cooperation with manufacturers from the United States, Japan, Germany, France and so on, Chinese machine-building plants have produced many TBMs. Application practices of rock TBMs in China's large and medium sized project of hydraulic and hydroelectric engineering, railway, and highway show that the open-type TBM is suitable for good geological conditions of surrounding rocks, while the double shield TBM is suitable for medium geological conditions of surrounding rocks. But where there are a lot of karst caves or high pressure gushing water or dense minor faults or fracture zones in rock masses, the TBM method should be replaced by drilling and blasting because TBMs can not give their advantage of rapid excavation. Shield TBMs have been widely applied in China's soft soil tunnels(urban metros and river crossing tunnels). Only in the metro construction of Shanghai, Beijing, and Guangzhou, there have been 72 shields used. Usually, the earth pressure balanced shields are applied to the construction of urban metros because of poorer underground water and lower water pressure in their soil beds, while the slurry shields are applied to the construction of river crossing tunnels because of high water pressure on their excavated sections. Recently, China has begun to undertake the design and construction in using TBMs for foreign countries(for example, Iran and Singapore). Within the coming 10 to 30 years, the construction of 5 undersea tunnels will be taken into account besides the construction of long and deeply buried tunnels in the first and second stages of the West Line of the South-to-North Water Transfer Project

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in China. And the construction of urban metros, railways, and highways will be accelerated. It can be expected that all of these will certainly make more and more application of TBM in China.

**Key words** [tunneling engineering](#); [tunnel boring machine \(TBM\)](#); [application](#); [experiences and lessons](#); [advance](#)

DOI:

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