Overview of Steel Mold Design for Honeycomb-Type Tunnel Lining Segments (Postprint)

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Abstract

The article provides a brief overview of honeycomb-shaped tunnel segments, comparing their advantages and disadvantages with other segment types. It introduces the application of honeycomb-shaped segment linings in various engineering projects and presents an overview of the steel mold design for honeycomb-shaped segments based on the Guangzhou Rongjiang Guanbu Water Diversion Project. The paper describes the design challenges encountered in the steel mold due to the special geometry of the segments, and presents a series of targeted designs, including the base design of the honeycomb-shaped steel mold and the end plate opening mechanism. Through the specially designed end plate sliding rail device, end plate opening/closing mechanism, and damping buffer device, the difficulty in opening and closing end plates for irregular-shaped segments was resolved, successfully completing the design, processing, and manufacturing of the project. The project delivered a total of 20 sets of molds, with the produced segments meeting the design standards.

Full Text

Overview of the Design of Steel Molds for Honeycomb-Type Tunnel Lining Segments

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Abstract

This paper provides a brief introduction to honeycomb-type tunnel lining segments, comparing their advantages and disadvantages with other segment designs. It reviews the application of honeycomb-type segment linings in various engineering projects and presents an overview of steel mold design based on the

Guangzhou Rongjiang Guanbu Water Diversion Project. The special geometry of these segments introduces significant challenges to steel mold design, which were addressed through targeted solutions including specialized base structures and end plate opening mechanisms. Through the implementation of custom-designed end plate sliding rail systems, opening/closing devices, and damping buffer units, the difficulties associated with operating the end plates of irregular-shaped segments were effectively resolved. This comprehensive design approach enabled the successful completion of the project's manufacturing phase, delivering 20 sets of molds that produced segments fully compliant with design specifications.

Keywords: honeycomb-type steel mold; irregular end face; steel mold design

Note: Figure translations are in progress. See original paper for figures.