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OPTIMIZATION OF CASING WALL DESIGN FOR ELECTROSTATIC PRECIPITATORS

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Abstract

Electrostatic Precipitator draws many researches on flue gas treatment technology and very few researches on its structural design. The conventional structural design of electrostatic precipitator casing uses stiffened flat sheet as wallboard which consumes a great amount of steel. Consequently, a new structural idea was explored to optimize the conventional design which applies profiled steel sheet and locates wall beam and wall column. Optimization codes were programmed to select the optimum design with minimum steel consumption and analyze the wall structure. For the cases with varying geometry and varying load, the optimum sections of profiled steel sheet, the optimum layout of wall beams and wall columns and the overall optimum design of casing wall were found. Besides, the influences of wallboard size and load magnitude on the optimum design were investigated. Compared with the original wall structure of stiffened steel sheet, the optimized wall structure composed of profiled sheet, wall column and wall beam can save steel significantly which can be applied widely in large-scale electrostatic precipitator casing structures.

Key words: electrostatic precipitator, casing wall, optimizing design, profiled steel sheet, wallboard supporting member

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