

Metal Anti-wear Device Structure Optimization Design and Application in CFB Boiler

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Abstract

Based on the principle of active anti-wear method, seven metal anti-wear devices of types A through G were designed and numerically evaluated by comparing the erosion distribution of the local water wall surface in this work. The result shows: an approximate vertical triangle structure with an inclined upper surface and a vertical lower surface, is the most ideal structure for reducing the erosion rate. The type G and ash deposition can be combined into this ideal structure. The simulation results based on the type G show that the erosion rate increases correspondingly with the increasing inlet velocity and particle size and is somewhat mitigated by the addition of cohesive particles. The height of the ash deposition zone decreases with decreasing particle diameter and proportion of cohesive particles. The type G is preferred to be tested on the CFB boiler for half a year, and achieved a good anti-wear effect.

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