



大型プラントのメンテナンスに用いる 硬質肉盛溶接材料の仕上加工の自動化

Automation of Finish Grinding of Welded Hardfacing in Maintenance of Large Plant Equipment

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Vertical mills are used to crush fuel for coal fired power plants and to crush limestone to make cement. These vertical mills experience uneven wear during use, so especially at large plants, on-site maintenance often includes welded hardfacing. Because of the high hardness of the hardfacing material, however, the final hardfacing step, which is the finish grinding process, is extremely difficult. Beset with such problems as remarkably low grinding efficiency, abnormal grindstone abrasion, and noise, this process has become a bottleneck in the automation of maintenance and repair. The present study addressed the grinding problems in welded hardfacing and attempted to optimize the grinding method through functionality evaluation. When the results of the study were applied to actual production equipment, they demonstrated consistently efficient grinding and held grindstone abrasion to one third of its former value. The findings of the study became guidelines for the automation of the complete sequence of processes from hardfacing welding to finish grinding in the on-site maintenance and repair of large plant equipment.

Key words : giant equipments, maintenance and improvement, hardfacing by welding, automation, grinding process, Taguchi methods, robust quality engineering

1. はじめに

巨大なプラントの補修やメンテナンスは、多大な労力や費用が発生し、企業の生産性を大きく低下さ

せる要因である。火力発電の石炭燃料や、セメント原料、製鉄所の水砕スラグは、全高20 mを超える大型^な型ミルを複数個利用して粉砕される¹⁾が、使用頻度に伴ってミルの粉砕ローラが部分的に摩耗(偏摩耗)するため、交換や補修を余儀なくされている。現在は、偏摩耗した粉砕ローラやテーブルライナを修正可能な段階において、現場にて摩耗箇所に硬質材料を肉盛溶接して補修する方策が採用され

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