



ABSTRACT

A new family of chromium boride coatings having excellent adhesive wear and corrosion resistance is disclosed. The coatings comprise hard, ultrafine, chromium boride particles dispersed in a metal matrix, the particles having an average particle size of less than one micron and constituting less than about 30 volume percent of the coating, the balance being metal matrix. The metal matrix may be composed of nickel or a nickel base alloy containing a metal selected from the group consisting of chromium, silicon and iron. The coatings may be prepared by a process which comprises depositing a mechanically blended powder mixture of chromium metal or a chromium alloy or mixture of both, and a boron-containing alloy onto a substrate and then heat treating the as-deposited coating. The heat treatment effects a diffusion reaction between the deposited elements resulting in the formation of ultrafine particles of chromium boride dispersed in a metal matrix. The coating can be deposited onto the substrate using any of the known deposition techniques.