



Cobalt-Based Alloys: From Prosthetic Dentistry to Hot Turbine Components

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Message from the Guest Editors

At present, cobalt-based alloys are used in various applications: as refractory alloys for the hottest parts in aeronautical or power generation turbines, corrosion-resistant alloys for dental prostheses and other biomedical devices, wear-resistant alloys for hardfacing components, amorphous alloys for applications exploiting their magnetic properties, etc. Among the first cobalt-based alloys to appear, there were the conventionally cast chromium-rich ones which emerged about a century ago for responding dentistry needs and, a little later, their cousin cobalt-based superalloys which allowed developing turbines for WWII military aircrafts. From this period, the chemical composition and elaboration techniques were more or less continuously developed and improved. New elaboration ways, metallurgical strengthening principles, or answers for enhanced resistance against corrosion, for instance, are today investigated for crystalline cobalt-based superalloys (e.g., cobalt-rhenium-chromium alloys or gamma/gamma prime Co-based single crystals) as for dental alloys (e.g., new compositions and additive manufacturing).





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