Study of advanced Ni – base ŽS6K alloy by quantitative metallography methods

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The aerospace industry is one of the biggest consumers of advanced materials because of its unique combination of mechanical and physical properties and chemical stability. Highly alloyed stainless steel, titanium alloys and nickel based superalloys are mostly used for aerospace applications. High alloyed stainless steel is used for the shafts of aero engine turbines, titanium alloys for compressor blades and finally nickel base superalloys are used for the most stressed parts of the jet engine – the turbine blades. Nickel base superalloys were used in various structural modifications: as cast polycrystalline, a directionally solidified, single crystal and in last year's materials which were produced by powder metallurgy. In this chapter, a problem of polycrystalline (equiaxed) nickel base superalloy turbine blades - such as the most stressed parts of the aero jet engine - will be discussed. Also the application of quantitative metallography and colour contrast on the ŽS6K Ni–base superalloy are the main objectives discussed in this chapter.

Keywords: Ni - base superalloy, gamma prime phase, quantitative metallography, colour contrast

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