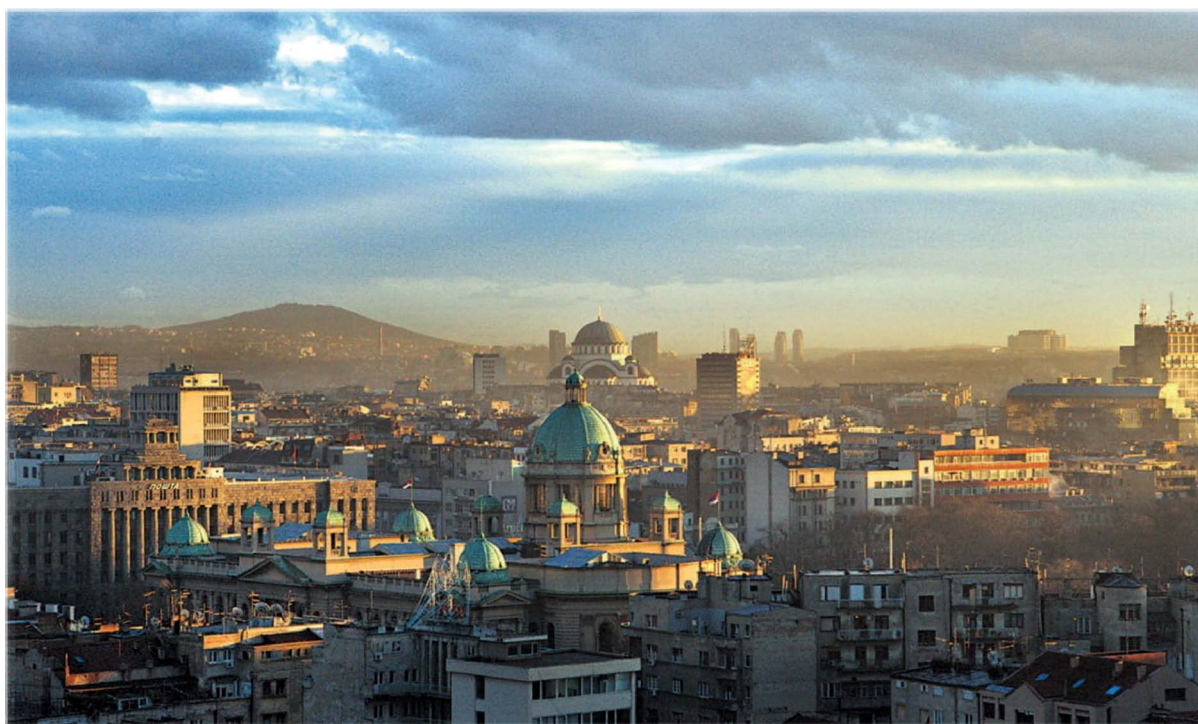


# TENTH YOUNG RESEARCHERS' CONFERENCE MATERIALS SCIENCE AND ENGINEERING

December 21–23, 2011, Belgrade, Serbia  
Serbian Academy of Sciences and Arts, Knez Mihailova 35 & 36



## PROGRAM AND THE BOOK OF ABSTRACTS

Materials Research Society of Serbia  
Institute of Technical Sciences of SASA

December 2011, Belgrade, Serbia

Tenth Young Researchers' Conference  
Materials Science and Engineering

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X/5

### **Assessment of safety valve springs failure**

Ana Alil, Bojan Gligorijević, Mirjana Prvulović,  
Stevan Budimir, Marko Ristić, Milan Prokolab

*Institute Goša, Belgrade, Serbia*

The aim was to investigate the cause of failure of as-received ultra-high strength steel springs, which were deposit-coated. The qualitative analysis of surrounding environment was performed. Springs were visually and radiographically examined. Their chemical composition was determined using spectrophotometer, primary and secondary structure by use of bright-field reflected light microscope with vertical illumination source, and fracture mechanism by scanning electron microscope with energy dispersive system. Macro-hardness measurements were employed, also. The phases present in deposit were identified using X-ray Powder Diffractometry and Electron Microprobe analysis. The safety valve springs failure is caused probably by corrosion-assisted process with presence of overloading.

X/6

### **Technology of obtaining alloy powder CoCrAlYSi**

Olga P. Vasilega, N.I. Grechanyuk, V. G. Zatonvskyi

*Frantsevich Institute for Problems of Materials Science of NASU, Kiev, Ukraine*

The aim of this paper is obtaining alloy powder Co-Cr(20 – 30 % mass.)-(8 – 14 % mass.)Al-(0,5 – 1,8 % mass.)Y-(2 – 4 % mass.)Si. Alloy powder was been obtained by duplex technology. The first stage process consists in electron-beam melting clean charge materials in ingot. On the second stage process this ingots crushing on the rolling mill to the powder of the fraction 40 – 100  $\mu\text{m}$ . Bulk weight of the obtaining alloy powder (40 – 100  $\mu\text{m}$ ) consist from 2,7 to 3,35  $\text{g}/\text{cm}^3$ .

Surface morphology was been studied of the obtaining alloy powder of the scanning microscopy method. Powder particle has polyhedral form. Some of them has little crack. Surface of powder particles are sufficiently develop.

Chemical composition of the powder was obtained in different region of the powder, by the assist dispersion analyzer. The content of the oxygen in powder is 0,08 % mass., what less then in powder obtained by another methods obtaining powder, such as, atomization.