

# APPLICATION NOTE:

## OPTICAL SPARK EMISSION SPECTROSCOPY

**Optical (Spark) emission spectrometry is one of the most effective solution for metal analyzing. Many foundries and factories are using instruments based on spark emission.**

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AvaSpec Dual Fiber Optic Spectrometer

UE = 175-295 nm  
 UD = 290-445 nm  
 Resolution: 0,15 nm  
 Purged to avoid UV absorption

Our company "Control System Abzar Novin" is designing it's own first optical emission analyzer by proper experience in the field of analytical instrument.

This instrument involves creating a spark as electrical energy between an electrode and a metal sample. Vaporized atoms come in a high energy state called "discharge plasma". The spark has specific characteristics in terms of voltage and frequency for exciting different type of samples. After a proper spark, excited atoms and ions create a unique emission spectrum specific to each element. Thus, a single element generates numerous characteristic spectral emission lines.

Therefore, the light generated by the discharge is a collection of the spectral lines generated by the elements in the sample.

This light is brought to a spectrometer designed and made by Avantes. Two different ranges of optics were included to analyze the emission spectrum.

The intensity of each emission spectrum depends on the concentration of the element in the sample. Detectors (CCD) measure the intensity of the spectrum.

Most important part for having best analysis is software. Software uses this collected data to calibrate optic and perform qualitative and quantitative analysis of the elements.

