Used for Metal Sorting Relative Seebeck Coefficient Differences

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Abstract: This paper is concerned with improving the accuracy of thermoelectric NDT distinguishing between metals and alloys of different composition. While the thermoelectric alloy sorters are known for decades, they generally depend only on thermoelectric voltage differences between samples of different materials, and standard samples for comparisons. In the presented approach, relative Seebeck coefficient is calculated in real time in order to raise the sorting resolution capability. This solution virtually eliminates the problem connected with temperature instability of the hot probe. The experimental test stand consisted of heated probe, two millivoltmeters and a PC with custom LabView processing software. The effectiveness of sample identification was verified in the blind test on example of metallic amorphous ribbons indistinguishable for the naked eye.