Simple method for the determination of the Young's modulus of PVD coatings

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Introduction

The residual stresses in thin PVD hard coating can be determined by measuring the curvature change of a thin metal strip coated on one side. If the same strip is being heated, this will result in a curvature change due to the thermal properties mismatch ($E, \alpha$) between the coating and the substrate. Establishing the relation $1/R=f(\Delta T)$ allows one to evaluate the Young’s modulus of the coating.

Theory

Outline of the method

Calculation

Experiment

Results

Conclusions

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