Cr/Ni/Fe

Description

This application determines the thickness of Cr and Ni coatings on steel substrate. It is assumed that the steel substrate is composed of Fe and C only. If the substrate contains significant amounts (more than 3%) of another element such as Ni or Cr, please contact the CMI Application department.

Requirements

SmartLink FP version 2.0 or higher is required to run the application. The application was released on rules file version 4.14.99b. The following standards are used to create the calibration.

	Required Standards
1	Cr ∞
2	Ni ∞
3	Fe ∞
4	20 μ in Cr foil (0.5 μ m)
5	400 μ in Ni foil (10.0 μ m)

Accuracy / Feasible Range

The following is the thickness range in which one can expect 5% accuracy in thickness on the top layer and 10% accuracy or better on the second layer. 5 to 40 μ in Cr and 20 to 600 μ in Ni is the range that was tested based on a 12 mil collimator and the type standard recommended below.

In another calibration using a 20 Cr / 1000 Ni / Fe, customer parts in the range of 1 to 35 μ in Cr/100 to 1800 μ in Ni /Fe were tested. Similar results were obtained using a 0.5 and 3.5 inch focal distance. 1200 μ in Ni was the maximum that could be measured at both focal distances.

Precision

Measured Standard	Collimator	Meas. Time	Standard Deviation	
(Nominal thickness)	Size (mils)	(sec)	Cr Thck (μ in)	Ni Thck (μ in)
20 μ in Cr foil / 400 μ in Ni foil / Fe	12	30	24.9 ± 0.4	368.2 ± 3.5

How To Calibrate

Using the Calibrate FP mode, create a new calibration file by calling up the following elements in the indicated layers: **Cr/Ni/Fe**. The standards should be entered into the calibration in the following manner.

1	Cr ∞
2	Ni ∞
3	Fe ∞

4	20 Cr / 400 Ni / Fe infinite

The standard information such as thickness should be entered in the **Standards** tab. This application can be measured with either a Calibration file or an Application file. When creating the Application file, nothing should be entered in the Known Thickness or Composition table under the **Advanced** tab.