# Technical Section

## CHART FOR THE THICKNESS OF ELECTRO DEPOSITED PLATES

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Electrolytic stripping methods (1 to 6) are available for the determination of thickness of the deposited metal. In these methods, lot of calculations are involved for obtaining the thickness. To avoid such tedious calculations,charts can be prepared which ean readily give the thickness from the coulombs of the electricity passed during stripping. One such chart is given below for chromium deposition.

**Calculation :**

It is assumed that the anodic efficiency of stripping of metal is 100% and there is no chemical attack. The dissolution of metal is purely electrochemical. Faraday's laws are used in the calculations. The Coulombs of electricity (q) is converted to equivalents from (E) of metal. From the equivalents, it is known the amount of metal deposited (M). Using the density of metal (d), the volume of metal can be obtained. From the known area (a), the thickness of the metal deposited can be calculated. The following equation is used for calculation of the thickness :

$$\text{Thickness} = T = \frac{QE}{Fda}$$

where F is Faraday Constant, and E equivalent weight of metal. Making use of the above equation, the thickness of the chromium deposited is calculated below :

Diameter of electrolyte contact (pore diameter) = 1 mm

Area of (pore) spot = $7.857 \times 0^{-8}$ sq.cm.

Current = $2mA = 2x10^{-3}$ amps.

Time = 25 seconds

Electricity = $50 \times 10^{-6}$ Coulombs

Density = 7.14 gms/cm$^3$

Thickness = $1.602 \times 10^{-4}$cm

1 Thou = $25.4 \times 10^{-4}$cm

Electricity for 1 thou thickness deposition = 0.7929 Coulombs

Usually the thickness is measured in thous and therefore the chart is drawn versus coulombs. Similar charts can be prepared for other metals for ready reference for thickness of the metal deposited. The accuracy of the method depends however on the methods used for stripping.

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