

PERMEABILITY: Rapid Chloride Permeability Test

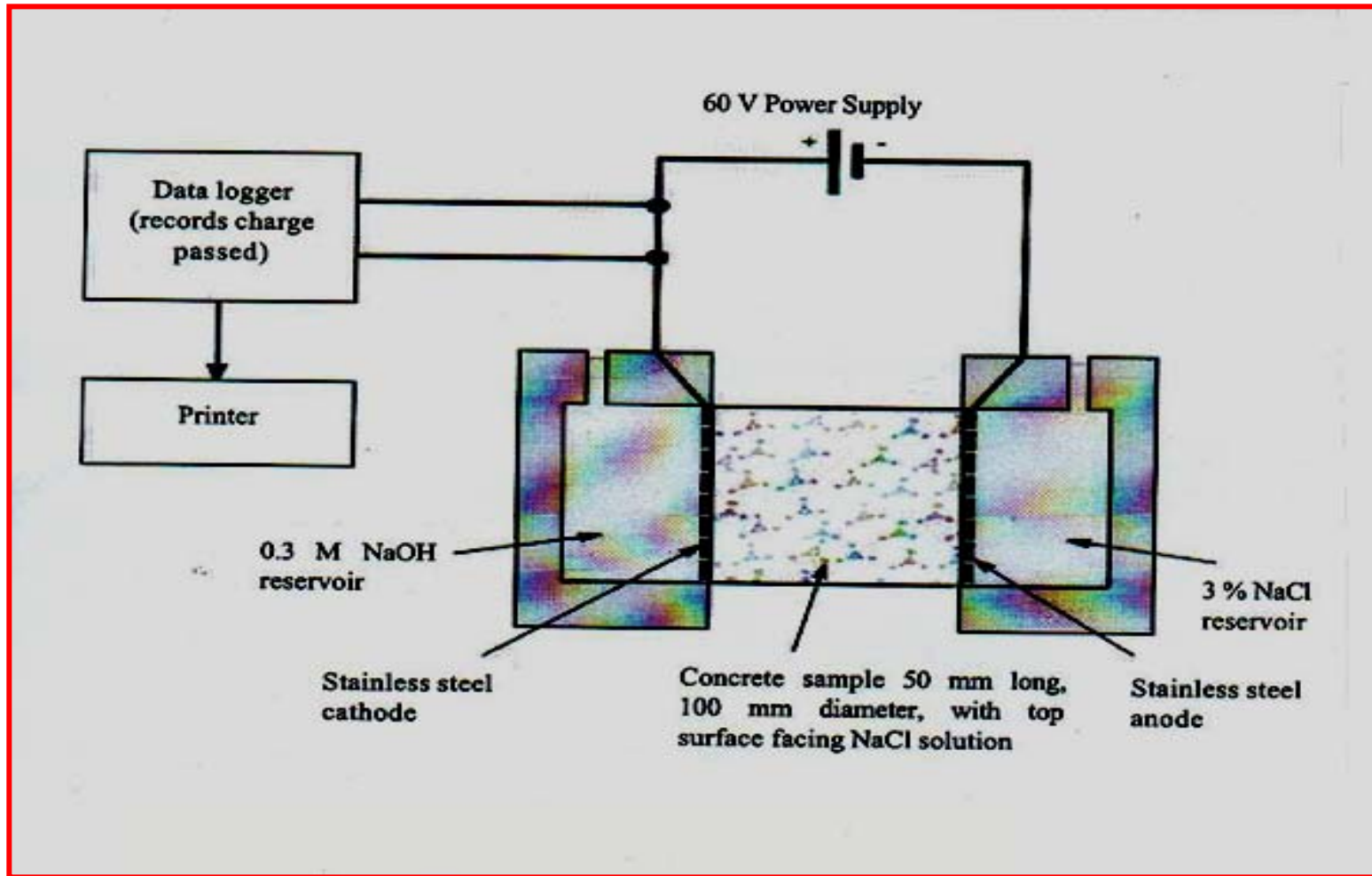
- Chloride permeability of concrete is determined indirectly by measuring the electrical conductance (in Coulombs or Amp-sec) of concrete subjected to accelerated chloride diffusion under applied electric field
- The test is known as "rapid chloride permeability test" on concrete, conducted in accordance with ASTM C 1202 or AASHTO T-277
- For this test, a 75 mm diameter and 50 mm thick cylindrical disk specimen is used
- The curved surface of the disk is epoxy-coated to avoid evaporation of moisture during testing.
- The disk specimen is saturated with water under vacuum and kept saturated for about 24 hours.
- The specimen is clamped between the two halves of a chloride permeability cell, as shown below:



PERMEABILITY:

Rapid Chloride Permeability Test----continued

- Using the set up shown below, the charges are passed through the specimen for a period of 6 hours and the resulting current is recorded with time using a data logger .

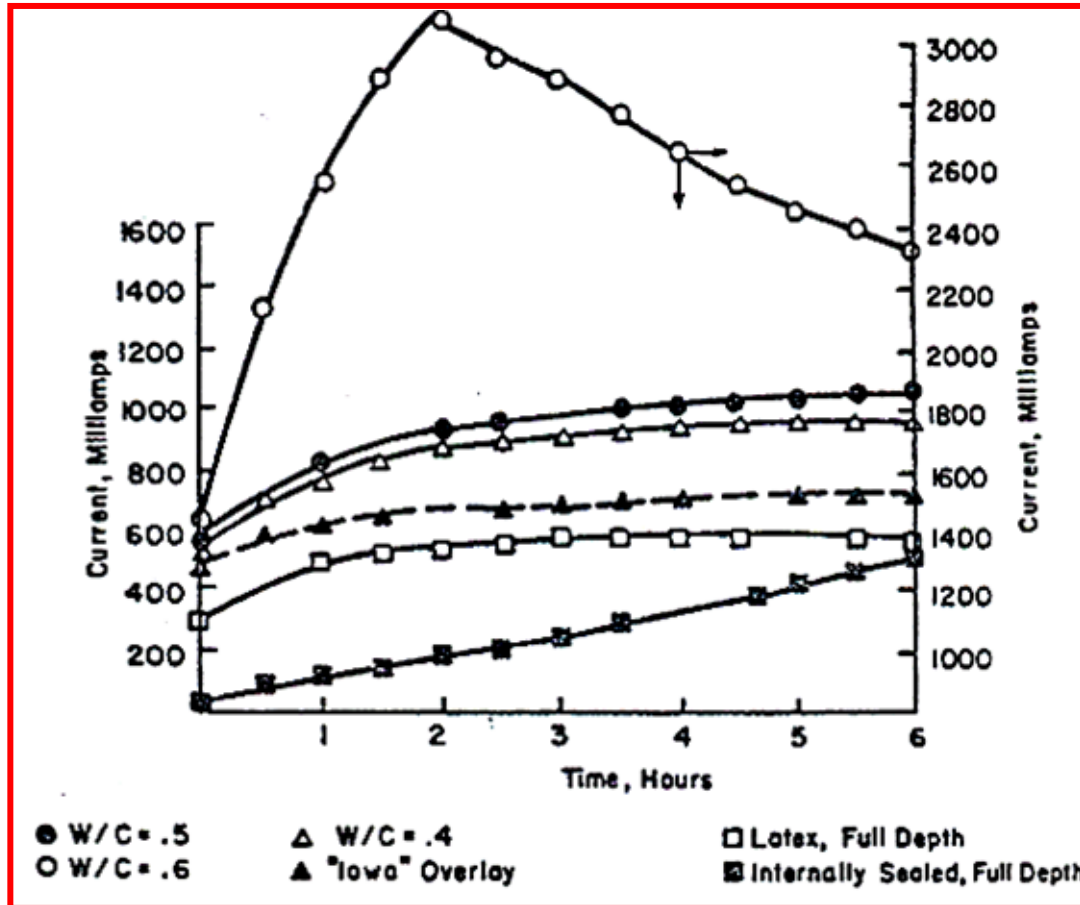


Set-up for rapid chloride permeability of concrete

PERMEABILITY:

Rapid Chloride Permeability Test-----continued

- Current versus time data are plotted, as shown below:



- The area under the curve gives the total charge passed in Coulombs (Ampere-seconds).
- Higher values of the total charge passed indicate increased diffusion of chloride ions

PERMEABILITY:

Rapid Chloride Permeability Test-----continued

Assessment of Chloride Permeability based on Charge Passed

Charge Passed (Coulombs)	Chloride Permeability	Typical of
> 4,000	High	High water-cement ratio, (> 0.6) PCC
2,000-4,000	Moderate	Moderate water-cement ration, (0.4-0.5)
1,000-2,000	Low	Low water-cement ratio, with admixtures (< 0.4)
100-1,000	Very low	Very dense concrete, sealed concrete
< 100	Negligible	Polymer concrete