

TABLE 3.7.2. NDT Methods for Determining Chemical and Physical Properties of Concrete

Test Method	Purpose of Test	Principle of Operation	User Expertise	Advantages	Limitations	References
Break-off method	Determination of flexural strength.	Break-off of a cylindrical specimen of in-place concrete. Cores are drilled into concrete and broken off with commercial tester.	No specialized expertise required.	Safe, simple and fast to perform requiring only exposed surface.	Limited by maximum aggregate size and minimum member thickness.	8, 14, 23
Nuclear gamma radiation	Determination of in-place density.	A Gamma source housed in a probe inserted into a preformed hole in the concrete to a predetermined depth. Readings are related to density by a calibration curve.	Licensed trained operators are required but minimum operator skills required.	Useful information is obtained and very accurate if calibration curves are established for each project.	Results can be altered by reinforcing steel, chemical composition of concrete constituents and sample heterogeneity.	4, 20
Neutron probe	Determination of chloride content in concrete.	Detection and counting of captured activated gamma rays emitted by chloride ions.	Licensed, trained operators are required but minimum operator skills required.	Can detect very small concentration of chloride content.	In order to avoid modeling the neutron flux distribution, an assumption must be made on chloride ion profile in concrete. The alternate involves considerable computation.	13, 20