

Preface

Concrete mix-design is the method to transform the required engineering properties into the composition of the concrete mixture in terms of kg/m³ of cement, water, sand and coarse aggregate.

The concrete mix design elaborated in this handbook is based on the EN 197-1 for the cements to be adopted, and the EN 206-1 for the required exposure and consistency classes

This handbook takes into account two types of mix-design depending on the complexity of the required performances: simple or complex mix design.

Simple mix-design is based on the relationships between the concrete properties, on one hand, and the composition of the mixture, on the other, when the concrete properties are the 28-day characteristic strength in the hardened state, and the workability in the fresh state. These relationships depend on the cement strength class and the maximum size of the aggregate.

Complex mix-design is based on the relationships between properties and concrete composition when the properties include durability, permeability, early strength, flexural or tensile strength, besides the 28-day compressive strength. Complex mix-design also includes the calculation of the slump loss depending on the time and temperature transportation, as well as the presence of chemical admixtures.

This handbook also takes into account how to predict drying shrinkage, creep and thermal heating in concrete structures on the basis of the concrete composition elaborated from the mix design.

A special software called CMD (*Computerized Mix Design*) is available to elaborate automatically simple and complex mix designs.