Grinding

The classical representation of coffee usually pictures it in beans, either green or roasted. But for coffee to be consumed as food, it is necessary to destroy the beautiful form nature has given the seed by transforming it into a powder. The operation which effects this conversion is called, in engineering language ‘comminution’, which means breaking down particles into smaller fragments, while in coffee industry jargon it is commonly known as grinding.

Grinding is performed by a grinder, or coffee-mill, and the resulting product is ground coffee. The term ‘grind’ applies to an important variable in espresso coffee preparation, as we shall see later: it refers to the degree of comminution associated with the concept of fineness of ground coffee.

The main objective of grinding is to increase the specific extraction surface, or rather, to increase the extent of the interface between water and the solid per unit weight of coffee, so as to facilitate the transfer of soluble and emulsifiable substances into the brew. Each time a solid body is broken up, additional surface is generated that comes into contact with the surrounding environment, in this case the extraction water.

Two apparently contradictory needs must be satisfied to prepare a good cup of espresso: on the one hand a short percolation time is required, while, on the other hand, high concentration of soluble solids must be reached. Both requirements can only be attained if a close contact between solid particles and extraction water can be achieved. Thus, espresso percolation needs a plurimodal particle size distribution, where the finer particles enhance the exposed extraction surface (chemical need) and the coarser ones allow the water flow (physical need).