## *The Art of Grinding Beyond the Push of a Switch*

**by Mauro Cipolla**

The purpose of grinding coffees is to increase the surface of the coffee "bed" so that hot water can easily extract essences of flavor and aroma from water-soluble and emulsifiable substances found in coffee grounds. There is thus a direct and important relationship between the need to expose the extraction surface to hot water and the rate of flow of the hot water through the bed of grounds.

The specialty coffee community has spoken of a fine espresso grind for a long time, but has placed no emphasis at all on the importance of the mechanical grinding components, and of the actual process needed to achieve this grind.

The reality is that most retailers simply look for a fine espresso grind, and forget about checking and maintaining the espresso grinder's mechanical components. These components must be serviced frequently for otherwise the result is UNEVEN and INCONSISTENT grind particles. This yields an uneven extraction of coffee oils and essences, that will offer an unfavorable look, feel, and taste of the espresso drink.

It is of extreme importance to realize that the espresso grounds need to be evenly and consistently ground through the mechanical process of crushing and shaving. In fact, since the geometric and cellular structure of coffee beans is varied and not homogeneous, the need for a fine tuned and properly maintained grinder is an imminent reality.

The grinder must crush the cellular structure of the bean into smaller fragments of one to two millimeters in size, and it must shave finer particles off the already crushed larger grind fragments. This shaving will properly allow for the chemical interaction of water and soluble/emulsifiable substances. This complete process of crushing and shaving can only be accomplished with grinding disks that are in proper cutting shape.

Let us look at proper maintenance of the grinder. Regular usage of the espresso grinder places wear and tear on the disks. Once dull, the worn cutting edges will do much more crushing than shaving, and proper extraction will be impossible. In addition, worn disks will heat up very quickly, and the coffee grounds will be overheated and burned. This condition will yield overheated coffee oils that will make the espresso taste thin and bitter. Worn disks will also tend to speed up the degassination process, and in turn greatly increase the size of the pores of the coffee bean cell structure, which along with increased inner hydraulic pressure will force outward much more coffee oils than normal. This yields extremely oily coffee grounds that will harm the packing and extraction process of the espresso drinks. When replacing grinder disks, one must use original factory replacement disks, and not use any other brands that may appear to be similar in design.

I remember one occasion when with brand new grinding disks (and all of the other extraction variables set properly) we were able to achieve what appeared to be a consistent grind, and yet the espresso had no crema, no flavor: simply dark, hot water. Then I realized that the grinding disks were new but made by a manufacturer different from the original one. At sight they appeared almost identical to the original disks, but with a closer look one could see that they differed widely in geometry and design. The results were grind fragments of excessive size, and an excess content of gases within the fragments. With the proper disks in place, and the very same espresso blend, espresso machine and grinder, we were able to extract the most beautiful espressos.

Another area of interest in the espres grinder's maintenance schedule is the a that turns the lower cutting disks of m professional grinders. This axle must t at least 900 to a maximum of 1200 RPS. must do so with a fluid, consistent a balanced movement. It thus ve important to check the rotating motion the axle from time to time, and look inconsistencies. The axle's bearings a lubrication (if existent) should also serviced. A simple cleaning of the a housing to free adjoining areas from cof grounds and other debris is also advisab Lastly, the power supply to the grin must be of proper voltage and consisten available without any power drops increases.

The last three areas of concern for pro grinder maintenance, are the grind hopper itself (which must be washed a dried every week to eliminate oil a bacterial build-ups); the grinder's magn which must be in its place at all times attract damaging metal debris (present all coffee blends) that could harm yo grinder disks; and the grind adjustmen threaded components that need to brushed free of coffee grounds and heat oils that could easily "weld" the gri adjustment wheel in a single grind positi forever.

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