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# HUSQVARNA DIAMOND TOOLS FOR GRINDING

## THE 5 MOST COMMON MISTAKES MADE WHEN SELECTING DIAMONDS FOR GRINDING APPLICATIONS

**1. Using half sets of diamonds and expecting flat floors.**

Often when grinding, many operators set-up the grinding heads on their planetary machines with half sets of diamonds (diamonds at three positions on each disc) and expect to achieve flat floors. It is often not till much later in the process (application of a glossy coating, vinyl tile or concrete polishing process) it is revealed that the floor is not flat.

The reason for this is that a half set of diamonds is like a tripod used for a camera. Just as a tripod will rest in a stable manner on an uneven surface, so too will a half set of diamonds. By their nature set up in this configuration, they too will follow the contour of the existing surface.

Principle: Unless the floor is flat to begin with, an operator will never achieve a flat surface using half sets of diamonds. If a flat floor is desired, full sets of diamonds (segments positioned at each 6 points on the grinding disc) are the only option.

**2. Using too few diamonds under the machine.**

Following on from 1, many operators use too few diamond segments on each grinding disc. This can cause many problems, some of which are listed below:

**Lack of flatness of floor (see above).**
**Solution:** Use full sets.

**Unnecessary pressure on equipment.**
Generally speaking, the **fewer** the number of diamonds under the machine, the **more pressure** on each diamond segment. The greater the pressure on the diamond segment, the greater the friction created. The **greater the friction** created, the **more power** required to drive the diamond segment across the surface of the floor. The greater the amount of power required to drive the diamonds, them **more load / stress** put on the drive systems of the machine (i.e. Motor(s), belt(s), gear(s), pulleys e.t.c.). In other words, the machine has to work harder to perform the function being asked of it.
Like any mechanical devise, the harder it is asked to work, the shorter either it's working life of that of the parts that make it up will be.

This scenario can be particularly problematic when grinding softer surfaces (e.g. rain damaged concrete, low MPa /PSi concrete mixes, epoxy based terrazzo floors, levelling compounds / screeds, ceramic tile adhesives, e.t.c.). The machine will be forced to operate at the upper-limit of its design specifications creating undue strains as mentioned above.

**Solution:** Make a change - increase the number of diamonds under the machine (this is very similar to changing gears in car when greater speeds are desired. You can either increase the RPM of the engine in the vehicle – shortening the engine life, or change to a higher gear and therefore, reduce the engine's RPM into more acceptable ranges).

**Accelerated wear of diamond tools.**
As mentioned in the previous point, many operators use fewer tools under the grinder, mistakenly believing they will use less consumables by doing so than if using a greater number of diamond segments. This is, in fact, opposite to reality – the more diamond segments under the machine, the more economical it is on diamond tool cost. Generally speaking, if you double the amount of segments under the machine, you will get more than double the life out of each segment. You will not wear-out double the amount of diamond tools in the same amount of time.

**Solution:** For lower consumable costs, increase the amount of diamond segments under the machine (of course the initial outlay will be greater, but the cost per square metre / foot will be lower).

**Aggressive nature of scratch patterns left in floor by diamond abrasive.**
Another problem which may arise when using too few diamond segments under the grinder is aggressive scratch patterns in the floor. This can be observed more commonly in applications such as polishing or preparation grinding for epoxy coatings. If there is not enough diamond tools under the machine, the higher pressure on the diamond tools can create very aggressive scratch patterns / swirls in the floor. Once the floor is polished / coated, these machine marks can be quite evident.

**Principle:** The greater the number of diamond segments used under the machine, the more even / smoother the surface will be.

**3. Not starting with hardest bonds first.**

Too often, too many operators begin to grind a new floor grinding project and use the wrong type of metal bond segment to begin with. The operator may begin grinding with whatever segments are still fitted to the machine (generally the same segments that were used on the last project), and if the diamond tools are incorrectly matched to the new floor (e.g. soft metal bonded diamonds on soft / abrasive concrete), as significant amount of diamond tooling can be worn away before the operator realizes the error.

A far safer way (as far as minimising the cost of consumables is concerned), is always to begin with the hardest metal bond tool you have to select from. This approach has the following benefits:

- If the floor to be ground is hard, the hard diamond tool will not be well suited and production will be low as the diamond tool will not wear and will "glaze over" or lose its cutting ability. Since an experienced operator should be able to assess within 5 minutes of commencement of grinding whether a diamond tool is well suited to the application or not, the worst result with this approach will be low productivity for a short period of time until a change to a softer bond is made (in which case productivity should then increase).

**Note:** If a diamond tool is not working effectively within 10 minutes of commencement of operation, a change is required. Do not persist with an inefficient tool for longer that this hoping for a change – it will not come.

- By beginning with the hardest bond to select from first, you will minimise the potential for excessive diamond wear, thus ensuring the best possible tooling economy for the project.

**Principle:** If unsure about the relative abrasiveness of the surface to be ground, always begin with the hardest bond available to select from. This will guarantee diamond tooling costs for the project will be kept to the best possible level of economy.

**4. Using too fine a grit when removing a coating.**

Far too often grinding contractors will attempt to grind a surface contaminant (e.g. Epoxy coating, vinyl / carpet adhesive, flexible ceramic tile adhesive, curing compound e.t.c.) from the surface of concrete with a 30 or 40 grit diamond tool and have relatively little success. They will then draw one of two conclusions:

- Decide the diamond tool is no good.
- Decide that it is not possible to grind the particular surface contaminant off the concrete surface.

Generally speaking, when removing surface contaminants from concrete surfaces, the coarser the diamond grit in the diamond tool, the more effective it will be. This is because as the diamond grit gets coarser, the diamond crystal becomes larger. The larger the diamond crystal, the further out from the face of the diamond segment it can protrude.

The further out from the face of the diamond segment it can protrude, the deeper it can penetrate into the surface contaminant. The deeper it can penetrate the more effective it will be at grinding the concrete beneath the surface contaminant and as the concrete is ground away, the surface contaminant will accompany it.

If too fine a grit is selected for the abovementioned purpose, the end result will be smearing of the surface contaminant and a build-up of contaminant on the surface of the diamond tool.

**Solution:** Use coarse grit (6 or 16 grit) diamond segments or PIRANHA™ tool for effective removal of surface contaminants.

**5. Add weight instead of changing to a softer bond**

Often when experiencing low productivity for a particular application, some operators will choose adding extra weight to the grinding machine to create extra grinding pressure. Whilst this may sometimes be a simple and effective solution, often it indicates the underlying problem is not the actual weight of the machine, rather the quality or bond hardness of the diamond tool being used.

Often the benefits gained by adding extra weight to the machine are outweighed by the accelerated wear on moving parts created by the extra weight.

**Solution:** In order to gain additional pressure on diamond segments, reduce the amount of segments under the machine. Furthermore, changing to a softer bond diamond will also increase productivity without the need for additional weight.

For preservation of the grinder, only resort to addition of extra weight if the above two possibilities have been tried.



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