

b) Torque Calculations

$$HP = \text{Torque} \times \text{RPM} \div 5252$$

5.4 Cutter Selection

6. Factors Involving Concrete Cutting

When cutting concrete, several factors influence your choice of blades. These include:

- Compressive strength
- Hardness of the aggregate
- Size of the aggregate
- Type of sand
- Steel reinforcing (rebar)
- Green or cured concrete

Concrete slabs may vary greatly in compressive strength, measured in pounds per square inch (PSI). Compressive strength in concrete is a measurement of the load carrying capability of concrete.

Aggregate hardness is one important factor when cutting concrete. Because hard aggregate dulls diamond more quickly, segment bonds on diamond saw blades generally need to be softer when cutting hard aggregate. This allows the segment to wear normally and bring new, sharp diamond grit to the surface. Softer aggregate will not dull diamond grit as quickly, so harder segment bonds are needed to hold the diamonds in place on the saw blade long enough to use their full potential. Diamond saw blades are widely used in cutting concrete materials in civil engineering industry. Concrete is a kind of difficult-to-cut composite material. By taking all these factor under consideration we select three types of blade for cutting concrete.[4,5]

1. Diamond tipped blades
2. Tungsten carbides blades
3. Gemeni concrete blades

We made our cutter blades zigzag so that it can cut chases of 36 mm wide in the wall.



Figure 4: Cutters

5.5 Dust Cover

Dust cover is made of mild steel material. Which act as safeguard for user from dust while using machine.



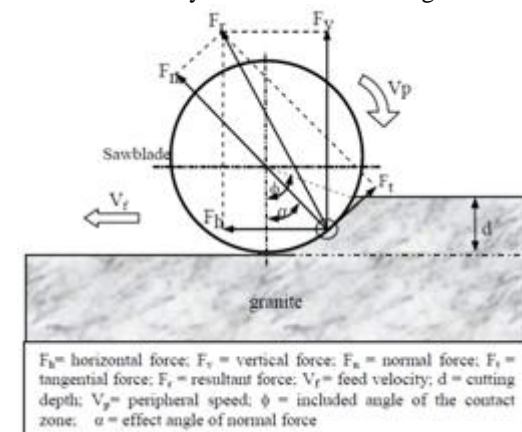
Figure 5: Dust Cover



Figure 6: Dust Cover

7. Force Analysis

To do force analysis we have following method.[3,4]



Calculations:

$$F_t = P/V_c$$

$$F_n = [(F_h)^2 + (F_v)^2 - (F_t)^2]^{1/2}$$

$$Q_w = d \times V_f$$

8. Advantages

- Great time saving for engraving.
- Simple and faster operation.
- Get rid of hand tools.

9. Acknowledgements

The author wish to thanks Mr. D. B. Gaikwad (M.D.) Puja Engineering works, Aurangabad for his contribution in the design process.

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