

## Factors affecting abrasive performance

There are a number of factors which will affect the performance of cast steel abrasive.

When comparing 'like for like' abrasives (e.g. two high carbon steel shots, or two high carbon steel grits), the following will have an effect on the life of the abrasive and its cleaning power.

### Size

The coarser grade will give less coverage.	Slower cleaning speed.
The coarser grade will give more impact.	Higher abrasive consumption.
The coarser grade will give more impact.	Rougher surface profile.

*The optimum size is the smallest abrasive to remove the largest contaminant and produce the required surface finish at an acceptable productivity and cost.*

### Hardness

The harder the abrasive the more impact.	Faster cleaning speed.
The harder the abrasive the more impact.	Higher abrasive consumption.
The harder the abrasive the more impact.	Rougher surface profile.

*Optimum hardness is considered to be 45 to 47 HRC (445 to 470 HV)*

### Chemical Analysis

Higher Carbon.	Faster cleaning speed.
Higher Carbon.	Higher abrasive consumption.
Lower Silicon & Manganese.	Increases abrasive consumption.
Higher Sulphur & Phosphorous.	Increases abrasive consumption.
Higher Chromium, Copper & Tin.	Increases abrasive consumption.

## Factors affecting abrasive performance

### Microstructure

Poor microstructure.

Slower cleaning speed.

Poor microstructure.

Higher abrasive consumption.

*Microstructure should be fine tempered martensite, or fine martensite. Carbide network, partial decarburisation, grain boundary segregation or pearlite are detrimental.*

### Defects

High level of defects.

Slower cleaning speed.

High level of defects.

Higher abrasive consumption.

*Internal unsoundness reduces transmitted energy, increasing cleaning speed and increases the breakdown rate of the abrasive.*

### Please Note

None of the above factors can be taken in isolation as having the above quoted affect unless all the other factors are the same.

**For example;-** An abrasive which is harder will not clean faster if the size grading is not the same, the level of internal defects is higher, or the microstructure is poor.

**For example;-** An abrasive which is softer will not last longer if the chemical analysis is poor, the grading is coarser, the level of internal defects is higher, or the microstructure is poor.