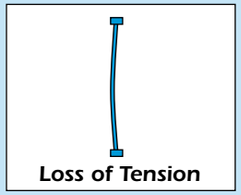
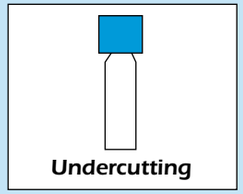
Various Types of Damage and Wear


Loss of Tension

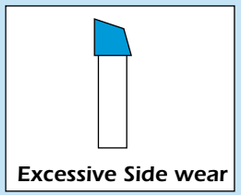
Loss of tension to the wheel.

1. **The machine is out of alignment.**
2. **The wheel is too hard for the material being cut.**


Undercutting

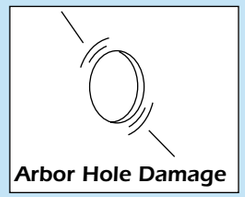
Under cutting (wheel being worn behind the segment).

1. **Material being cut is very abrasive and debris is not being sufficiently cleared from the cut.**
2. **Lack of or insufficient supply of water or dust extraction.**


Excessive Side wear

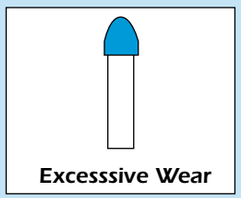
Excessive side wear to segment.

1. **Machine is out of alignment.**
2. **Lack of or insufficient supply of water to the worn side.**


Arbor Hole Damage

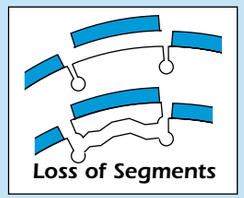
Arbor hole damage.

1. **Wheel incorrectly seated on the shaft.**
2. **Flanges not holding wheel securely allowing wheel to rotate on the shaft.**


Excesssive Wear

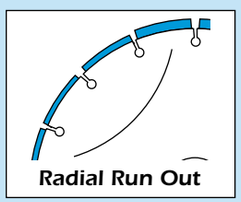
Excessive wear to the segment.

1. **Material being cut is very abrasive and the segment is for use on hard materials.**
2. **Lack of or insufficient supply of water or dust extraction.**
3. **Rotation speed either too slow or too fast.**


Loss of Segments

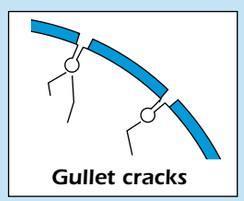
Loss of Segment

1. **The wheel has twisted or jammed in the cut.**
2. **Lack of or insufficient supply of water or dust extraction.**


Radial Run Out

Radial run out.

1. **Wheel running eccentrically due to wrong sized flanged plates.**
2. **Drive shaft bent.**
3. **Drive shaft bearings faulty.**
4. **Damaged flange plates.**


Gullet cracks

Gullet cracks.

1. **Rotation speed too fast.**
2. **Lack of or insufficient supply of water or dust extraction.**
3. **Excessive cutting pressure by operator.**

Rules & Regulations

Note that the use of diamond wheels in certain (mainly trade) situations is regulated by law. Both the wheels themselves, and the way in which they are fitted and used, must conform to BS4481 and BS4581. If in doubt, contact your local HSS Hire Shop for advice.

If you have hired the machine from HSS, contact your local HSS Hire Shop if you have any problems.

In any case, **never force a wheel onto the machine's spindle and never over-tighten the machine's mounting bolt/flange.**

Before switching the machine back ON, remember to reposition the safety guard.

USING WHEELS

Make sure the workpiece is firmly and safely secured.

If using a portable machine, adopt a comfortable, balanced stance that lets you support and control the machine, keeps the whole of your body clear of the wheel, and lets you see clearly what you are doing.

Make sure too, that the work area is free from trip hazards and that the ground offers a secure footing.

When cutting, work in a straight line, taking care not to trap or pinch the wheel in the cut.

Never try to force the wheel through the workpiece and never apply pressure to the side of the wheel.

Regularly check the wheel's condition and replace if worn out or damaged.

When you have finished using a portable machine, wait for the wheel to stop turning and put the machine down gently; taking care not to knock the wheel. Ideally, rest the machine, clear of the ground, on a suitable cradle.

Always let the wheel come to a halt naturally. Never apply pressure to the wheel in order to slow it down.

DUST WARNING

The dust, sparks and fumes produced by cutting are always unpleasant and can be dangerous. So, do take adequate precautions. If the machine is designed to be used with water, ensure there is an adequate supply. If your machine has a vacuum dust collection system for dry operation, use a suitable dust extraction unit (available for hire from your local HSS Hire Shop). In any case, make sure the work area is well ventilated and that all personnel in the vicinity wear suitable personal protective equipment.

...any comments?

If you have any suggestions to enable us to improve the information within this guide please fax your comments or write to the Product Manager at the address below

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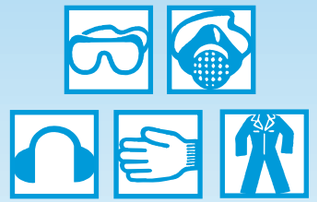
Web Site: http://www.hss.co.uk

Operating & Safety Guide 599

HSS Hire Shops

Diamond Wheels

For a fast, clean and accurate cut.



Resale

GENERAL SAFETY

For advice on the safety and suitability of this equipment **contact your local HSS Hire Shop.**

There is a serious risk of personal injury if you do not follow all instructions laid down in this guide.

This equipment should be used by an able bodied, competent adult who has read and understood these instructions. Anyone with either a temporary or permanent disability, should seek expert advice before using it.

Keep children, animals and bystanders away from the work area.

Never use this equipment if you are ill, feeling tired, or under the influence of alcohol or drugs.

Safety Goggles MUST be worn by everyone in the work area.

Some materials when cut contain substances which, when inhaled, can be harmful to health. A suitable mask must be worn when using Diamond Wheels.

Grinding and cutting equipment generates potentially harmful noise levels. To comply with health and safety at work regulations, **ear defenders must be worn by everyone in the vicinity.**


Wear gloves, protective clothing and footwear that covers all exposed skin. Avoid loose garments and jewellery that could catch in moving parts, tie back long hair.

Keep your hands and feet clear of the diamond wheel at all times. Don't be fooled, the segments may look smooth but they will still cut you!

Caution

If you sustain an injury while using a diamond wheel, seek medical advise immediately.

Ensure the work area is well lit and ventilated, if in doubt, ask about dust extraction and ventilation equipment at your local HSS Hire Shop.

Do not work near flammable gases or liquids, petrol or paint thinner fumes for example**. Keep combustible materials at a safe distance –** at least 5m.

If working above ground-level, work from a suitable, stable platform – an access tower for example. Never work from ladders or steps.

Take special care when cutting into anything that may contain pipework or electrical cables. If in doubt, hire a metal locator from your local HSS Hire Shop, to determine the exact position of such hazards**.**

Make sure you know how to switch the machine OFF before you switch it ON in case you get into difficulty.

Check the condition of the diamond wheel before use (see the table overleaf).

Watch your footing. Take special care if working other than on firm, level ground.

MACHINE SAFETY

Make sure you know how to operate your particular machine safely and correctly.

If using an HSS MACHINE...

Read the Operating & Safety Guide supplied with it. If you have any queries, contact your local HSS Hire Shop for advice.

If using your OWN MACHINE Have it professionally serviced regularly. In particular, check the tension of any drive belts, and double check that any built-in speed control governor is working correctly.

Have its spindle speed checked regularly. Always have the speed checked if the machine has just been serviced or repaired.

WHATEVER you are using...

Make sure the machine is fitted with an adequate, securely fitted safety guard.

Make sure the safety guard is correctly positioned before switching the machine ON. It should cover at least half the wheel and protect the operator during use.

Check the machine's general condition before use, paying special attention to the state of the wheel flange plates. If it shows signs of damage or excessive wear, do not use it! If you have any doubts about the condition of an HSS machine, return it to your local HSS Hire Shop.

HOW THEY WORK

Diamond wheels come in various sizes, types and hardness. Each type is designed for cutting different types of material.

HSS wheels have been selected to give a good performance in as wide a range of materials as possible. Ask your local HSS Hire Shop for advice on selecting the best wheel for your particular task.

All diamond Wheels consist of a metal disc with segments containing industrial diamonds either brazed or laser welded to the edge. **All HSS wheels are laser welded for safety, reliability and ease of use.**

Laser Welded Diamond Wheels can be used wet or dry, however, **it is recommended that they are used wet in all petrol, 2-stroke and diesel powered machines.**

They should also be used wet with electric bench type equipment.

Only use them dry with electrically powered, hand held equipment where advised and where possible **always use a dust extraction system** (available for hire at your local HSS Hire Shop).

The use of water or a dust extraction system will not only keep the dust level to a minimum and give greater user comfort, but will increase the speed of the cut. It will also prolong the life of the wheel by moving debris away from the cutting edge.

Wet cut diamond wheels require a minimum 15ltrs of water per minute.

Different areas of the country have building materials with differing hardnesses, compounds and aggregates and **this must be taken into consideration when selecting the type of wheel.**

A common occurrence with diamond wheels is that the wheel stops cutting and the user thinks the wheel is blunt. The fact is that the material being cut is not abrasive enough and the diamonds fragment before the compound is worn away enough to reveal new diamonds.

A dull or blunt wheels can be re-faced by running the wheel through a soft material such as a breeze block.

Another common problem is when a wheel tip wears away very quickly. This is caused by cutting a soft abrasive material, with a wheel designed for hard material. The debris wears the compound and so releases the diamond before it is worn or has had a chance to work properly.

TROUBLE SHOOTING

Damage to and uneven wear on the wheel and its tips is caused by a variety of faults either because of machine or user/operator errors. The diagrams overleaf will give you a rough idea of what has or may go wrong.

WHEEL SAFETY

Use the right wheel for your machine. In particular, check that the machine's spindle speed does not exceed

Diameter mm	Surface Speed
100 – 230mm	100 metres per second
300 – 500mm	80 metres per second

the maximum at which the wheel can safely run (see the wheel's label).

Use the right type of wheel for the job. If in doubt, contact your local HSS Hire Shop for advice.

Handle Diamond wheels with care. They are easily damaged if knocked or dropped. **Damaged wheels are potentially dangerous.**

Always check the wheels for damage before use. Brush off any dust and tap gently with a non metallic object. If the wheel emits a dull thud instead of a clear ring, assume it is cracked.

Never fit or use a wheel you think may be damaged.

WHEEL STORAGE

Stack Diamond wheels one on top of the other, ideally on a flat, level, steel base-plate.

Never store diamond wheels where they will be exposed to extreme temperatures or damp. Improper storage damages the wheels.

WHEEL FITTING

Diamond wheels should be fitted only by authorised, trained personnel.

Before fitting a wheel, switch OFF the machine and unplug it if electric.

Use the proper tools to change/fit wheels. These are supplied with machines hired from HSS. If using your own machine, consult the manufacturer's instructions.

Note that some machines have reversible front flanges to take thick and thin abrasives wheels. **Make sure such flanges are the right way round** and grip the chosen wheel firmly.

Ensure the wheel mounting flanges, are clean, undamaged and free from burrs.

Make sure the flange size is compatible with the size of the wheel (see table).

FLANGES FOR WHEELS
(From 100mm to 450mm diameter)

Wheel Diameter	Minimum outside diameter of flange	Minimum flange thickness at bore	Minimum flange thickness at edge of recess	Minimum flange recess	Radial width depth of bearing surface	
					(Min)	(Max.)
/mm	/mm	/mm	/mm	/mm	/mm	/mm
100	30	–	–	–	–	–
125	39	–	–	–	–	
230	39	–	–	–	–	
300	100	13	5	2	8	16
350	117	13	8	2	10	20
450	150	16	10	2	13	25

To fit a wheel, follow the instructions supplied with your machine.

Ensure the direction arrow on the diamond wheel corresponds to the direction arrow on the machine it is being fitted to. If no arrow can be found on the wheel, look closely at the segment and fit the wheel so that the diamond is at the front of the cut and the tail is at the rear.