



**WATSON**  
SPECIALISED TOOLING

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## Why Should You Use Only Genuine Sunnen Abrasives and Lubricants

If you think you're saving money by using "bargain" oil and "cheap" abrasives **Think Again.**

Real value is found in honing supplies that produce parts to specifications at the lowest total cost. A closer look will usually show that using genuine Sunnen honing oil and Sunnen precision graded abrasives will produce the lowest overall honing cost per part!



Sunnen honing operates as a system, using relatively high rotational and stroke speeds, lower honing pressures compared to older honing methods, all combined with precision graded abrasives and the correct honing oil, to remove metal efficiently and economically with very low noise pollution.

Successful, profitable honing comes from a well trained operator and the machine, tooling, abrasives and honing oil working as a "perfect" system and the ability to predict and calculate your true honing costs.

We have heard the saying "any chain is only as strong as its weakest link". A forgotten link in the honing process chain is the oil or coolant.

The machine and tooling contribute the least variance of the four. Abrasive and oil choice is absolutely critical to the success of the process and has the greatest influence on process cost.

**The single largest expense of honing cost per part is labour (approximately 90%).**

**The second largest expenses is abrasive consumption (about 10%).**

**Typically, oil cost per part honed is less than one tenth of a percent of the total.**

Even a slight decrease in cycle time or a decrease in abrasive consumption resulting from a better lubricant, repays the cost of premium honing oil many times over.

The purchase of honing oil can be considered a one time expense. Abrasive is normally considered a consumable expense. The cost of oil is divided out over those parts made for a year or more. An extra investment made in honing oil that results in reduced abrasive consumption will generally pay for itself many times over.

It is not unusual to see abrasive use decrease when a user changes to Sunnen honing oil. The use of quality honing oil and abrasive allow the use of

higher cutting pressures resulting in faster stock removal. A 1% increase in stock removal rate means a 1% decrease in total labour costs.

Because labour is the greatest expense, the savings can be very large. When the cost of scrap, disposal and any operator medical problem is considered, the wisdom of using quality honing oil is clear.

## **Genuine Sunnen Honing Oils Ensure The Lowest Honing Cost Per Part**

Your investment in Sunnen honing oils, saturated with surface active agents, provides the extreme lubricity that allows you to use higher honing pressure and harder abrasives for faster, more profitable cutting rates.

And Sunnen honing oils have repeatedly demonstrated the fastest stock removal rates with the lowest abrasive consumption, resulting in the lowest cost per part honed.

Commonly, the fluids used for honing are referred to as “coolants”. This is a misnomer, because cooling is not one of the major functions of any honing oil or water-based product.



**By far the most important reason for using a honing fluid is its chemical activity.**

A good honing fluid must be inactive at normal temperatures, so it does not corrode anything. But it must instantly become active when the temperature comes close to melting point of the metal being honed. This high temperature occurs in microscopic spots at the points of cutting action and would result in welding of the metal guide shoe to the metal being honed. These tiny weld spots would be torn apart by the force of the honing machine, and the results would be rough surface finish and rapid wear of honing stone and guide shoe.

**However, capable “coolant” will prevent welding by chemically changing the hot spots from metal to a non-metallic compound, which will not be welded. This welding problem is especially likely to happen with high-alloy materials, such as stainless steel.**

MB-30 is Sunnen’s multi-purpose industrial strength honing oil. For over 60 years, MB30 has set the standards by which other honing oils are judged.

MB-30 is also very effective as a brush on cutting oil for drilling, tapping or reaming of difficult materials. MB-30 can be used as an additive to boost the performance of “lesser” petroleum based honing oils to improve abrasive and tooling life. No matter what the material is, Aluminium to Zirconium, MB-30 always works.

It is petroleum based and features high performance lubricity agents in combination with a sulphur extreme pressure additive and a metal deactivator to prevent staining of copper containing alloys.

MB-30 has been tested and determined to not be irritating to the skin or eyes and is not toxic.

## Problems Caused By Weak Honing Oil

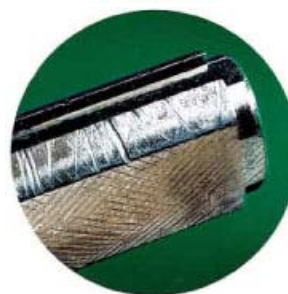
Sometimes a problem is not visible. The first sign of poor oil performance is a variation of the stone wear ratio. The ratio of abrasive used to stock removal is dependent on many factors such as a starting surface finish, material honed, honing pressure, surface speed and operator technique. In a production environment where the same parts are honed one after another, the stone wear ratio should be very stable reflecting the consistent bond structure of a quality honing abrasive. If the honing oil does not adequately lubricate the honing chip and grit the abrasive grain wear will increase and become erratic. This will affect the stone wear ratio and cause the finished part size to vary for a given stone feed up.

Weak honing oil allows welding of metal chips to the work piece which are then sheared off, causing a larger total surface roughness than that expected for a given abrasive grit size. The consequence is unwanted random scratches on the work piece deeper than those normally produced during honing operations. The results are lost productivity, material waste, part rejects, and lost profit.

Metal specks in the abrasive surface are a sure sign of honing oil with low lubricity. The oil fails to fully lubricate allowing chips to lodge in the abrasive surface similar to mud in a tyre. The embedded chips will hold the abrasive away from the work piece and prevent uniform grit penetration into the base metal.

The metal carried in the abrasive surface can scratch or tear the honed surface as the abrasive sweeps the chips along the honing tool path. If this "loading" of the abrasive surface is minor it will go unnoticed. When the loading is more severe it leads to fracture of the abrasive.

The trapped chips are forced against the part wall by the honing stone. If the chip re-welds to the part, it can scratch or chip the honing stone. Like concrete, abrasive is stronger in compression than in tension.



When embedded metal that is near the leading edge of the abrasive welds to the work piece, the abrasive is loaded in compression and seldom breaks. Instead the welded metal cuts a groove in the abrasive. If embedded metal that is near the trailing edge of the abrasive re-welds to the work piece, the abrasive has less support to resist the tearing motion and will break away leaving a chip on the trailing edge.

The most severe damage caused by low performance honing oil is quite noticeable. When the lubricant film separating the mandrel and work piece fails, the mandrel can weld to either the work piece or the chips leaving severe scratches on the mandrel and part.

A common myth is that honing tools without guide shoes are immune to welding problems. But, here again it is a honing fluid problem. For if the honing fluid does not have enough chemical activity it will permit stone loading, which means that metal chips created by the cutting action of the honing stones stick to the stone surface. Therefore, when there is stone loading, there will be metal-to-metal contact and welding, with the same undesirable results as when using a honing tool with metal guide shoes.

The use of quality honing oil allows higher pressure without welding of the tooling or work piece chips. This is why the use of Sunnen honing oil can reduce costs. It allows the use of higher honing pressures without problems resulting in more parts per hour. This in turn reduces the labour which typically makes up 90% of the honing cost per part.

MB-30 is compatible with the oil and filter system of all Sunnen honing machines and other manufacturer's machine tools in which petroleum oils are normally used. The material is stable and can be stored for extended periods of time. Five year old drums of MB-30 have been opened and used without incident. The service life in the honing machine is unlimited, providing the oil is kept clean by filtering and not polluted by extraneous harmful materials. In the event it is necessary to change the honing oil, disposal is simplified because MB-30 does not contain chlorine or other materials that are restricted by the EPA.

Honing oil is unique. The tool must guide, feed and support the abrasive which functions in the hostile environment of spent abrasive grit and metal chips. While it is cutting, the abrasive is shielded from direct lubricant flow by the work piece. Imagine asking an engineer to design a bearing for a shaft turning in abrasive paste with external splash lubrication. It must not gall or seize. Traditional lubricants are designed along hydrodynamic guidelines. They won't work in honing. Honing demands EP (extreme pressure) lubrication. Honing oil must cling to the surface and lubricate the chip as it slides over each tiny grit. After that it must prevent the chips from welding or lodging in the abrasive surface until the chip has made its circuitous trip out from between the abrasive and part wall. Additionally, the oil must prevent welding between the honing tool shoe surface and part wall. This all happens without direct lubricant flow.