

THE CARBIDE GRINDER DYE AND PERFUME FREE SYNTHETIC CARBIDE GRINDING FLUID

PRODUCT DESCRIPTION:

THE CARBIDE GRINDER is a dye and perfume free synthetic fluid specifically formulated for grinding cemented carbide (tungsten or titanium carbide) materials with cobalt leaching inhibitors incorporated in its formulation to eliminate or greatly reduce cobalt leaching effects found in most coolants.

WHAT IS CARBIDE GRINDING?

Carbide is an extremely hard material used in tooling to cut hard super-strength alloys and provide good tool life and surface finish. Carbide is made up of powdered tungsten or titanium carbide materials bound together with cement-like material using cobalt as its base. Since this composition is so hard, they normally grind this material with diamond wheels in order to provide the proper shape for the tool. During this grinding procedure, a good coolant is needed to ensure proper cooling, lubrication, and corrosion protection so the best possible tool will be produced.

One of the main drawbacks with most coolants manufactured today is that the coolant will actually leach the cobalt out of the tungsten carbide, cobalt mixture. The tool can become very brittle and tool breakage is possible during machining operations. Cobalt is a heavy metal and thus is very toxic to individuals and to the environment. When cobalt leaches into the cutting fluid, the entire cutting fluid can become a toxic waste. Numerous studies are being conducted today by OSHA, the industry, academia, and the EPA as to the health effects of operators and the environment of cobalt in carbide grinding operations. The International Agency for Research on Cancer has determined that cobalt is a possible carcinogen to humans. Studies on animals have shown that cobalt causes cancer when placed directly into the muscle or under the skin. Cobalt however, did not cause cancer in animals that were exposed in the air, food, or drinking water. Studies on humans are inconclusive regarding cobalt and cancer.

OSHA has an exposure limit of 0.1 milligrams of cobalt per cubic meter of air in the workplace atmosphere for an eight hour work day (40 hour week). American Conference of Government and International Hygienists (ACGIH) has recommended an occupational exposure limit of 0.02 milligrams of cobalt per cubic meter of air for an eight hour workday, or 40 hour week. The National Institute of Occupational Safety and Health

(NIOSH) has recommended occupational exposure limits of 0.5 milligrams of cobalt per cubic milliliter of air in a 10 hour work day (40 hour week).

These exposure limits are in air. Exposure limits of cobalt solubilized in a water-dilutable coolant are still under evaluation. The leaching of cobalt when grinding carbide tooling into the water-dilutable coolant is going to be one of the major health concerns of OSHA and the EPA in the future.

INHIBITS COBALT LEACHING:

Using brand new, state-of-the-art coolant chemistry, THE CARBIDE GRINDER is formulated with specific non-leaching materials, as well as cobalt leaching inhibitors. THE CARBIDE GRINDER ensures against the solubilization of cobalt from the cemented tungsten or titanium carbide materials. Today, most common water based corrosion inhibitors, lubricants and wetting agents used in coolants have a tendency to leach cobalt out of the carbide tooling. THE CARBIDE GRINDER chemistry does not incorporate commonly used lubricants, wetting agents, or corrosion inhibitors. Instead, corrosion inhibitors and lubricants that do not tend to leach cobalt out of the solution are used.

OPERATOR FRIENDLY:

THE CARBIDE GRINDER, by preventing cobalt leaching, reduces operator risk of cobalt-related dermatitis and lung diseases associated with cobalt waste, dust, and mist. Cobalt is a toxic material and causes a leaching effect into the water-dilutable coolant. When operators come in contact with it, they are working in a hazardous environment. THE CARBIDE GRINDER, by preventing cobalt leaching, provides a much safer and healthier work environment for the operator.

IMPROVES WORK PIECE FINISH: T

he reduction of cobalt leaching from the work piece or tool results in a better surface finish and improved structural integrity of the material. Cobalt is the cement, which holds the tungsten and titanium carbide together to form extremely hard carbide material. By eliminating cobalt leaching, much longer tool life and improved tolerances of the carbide tooling are obtained . . . resulting in much better surface finish and tolerances of the parts machined using carbide tooling.

OIL AND SOLVENT FREE:

THE CARBIDE GRINDER is completely solvent and oil free, thus providing a clean, residue free atmosphere for the operators, with no sticky, tacky build-up on machines and/or parts. Fines settle quickly to improve visibility of the work piece, leaving a free-rinsing, water-resoluble film when dry. THE CARBIDE GRINDER eliminates the deep red-to-purplish color change of the coolant caused by high levels of dissolved cobalt into the coolant, as well as reducing the hard cement-like residue, which causes tools to stick together.

SAFE:

THE CARBIDE GRINDER does not contain nitrites, nitrates, phenols, creosols, phosphates, chlorine, sulfur, PCB, heavy metals, harsh alkalies, monoethanolamine, diethanolamine, or triethanolamine. THE CARBIDE GRINDER contains no hazardous ingredients at 1% or greater concentration, it is not a suspected carcinogen, and has a health rating of 1 in the NFPA.

MULTI-METAL SAFE:

THE CARBIDE GRINDER contains superior corrosion inhibitors for ferrous metals as well as brass, copper, galvanized and aluminum. THE CARBIDE GRINDER is non-corrosive to various parts in the machines and can be used to grind metals other than carbide tooling.

LOWER MAINTENANCE AND COOLANT PURCHASE COSTS:

THE CARBIDE GRINDER inhibits cobalt leaching so frequent recharging is not needed. It is formulated with special materials, which resist bacterial growth, thereby reducing clean out and recharge costs. It also resists foaming and exhibits excellent filterability to allow for a much cleaner, longer sump life. Most competitive coolants are pumped out and recharged on a weekly or bi-weekly basis due to the cobalt leaching effect. THE CARBIDE GRINDER, with its excellent cobalt leaching inhibitors, has lasted more than six months in some of our test machines without any leaching whatsoever . . . significantly reducing maintenance and coolant purchasing costs. By increasing the sump life by only 50%, coolant costs decrease proportionately.

EXCELLENT FILTERABILITY:

THE CARBIDE GRINDER can easily be filtered through positive media filtration, magnetic separators, hydrocyclonic filtration units, and diatomaceous earth. By filtering out the small carbide fines, the life of the coolant is increased by reducing the possibility of cobalt leaching. The excellent cobalt leaching characteristics of THE CARBIDE GRINDER, coupled with filtering, results in grinding solutions that can last indefinitely.

DIRECTIONS FOR USE:

A concentrate designed to be diluted with water, The Carbide Grinder forms a clear solution in a wide range of water temperatures and hardness.

1. To insure a uniform solution, mix The Carbide Grinder with water at the appropriate concentration in a separate container. For most operations, The Carbide Grinder should be charged at 20:1 (5%).
2. Agitate solution until thoroughly mixed.
3. Add the mixed coolant to the cleaned sump.
4. **Makeup:** When adding make up coolant, always mix at 2 the original concentration. For example, a 20:1 (5%) solution will require a 40:1 (2.5%) make up solution.

RECOMMENDED STARTING CONCENTRATION:

For most grinding operations, The Carbide Grinder should be charged at a 20:1 (5%) concentration. If the concentration stays below 25:1 (4%) for extended periods, there is an increased chance of cobalt leaching.

THE CARBIDE GRINDER RATIO VS. REFRACTIVE INDEX	
DILUTION RATIO	REFRACTIVE INDEX
10-1	2
15-1	1.5
20-1	1
25-1	0.8
30-1	0.6

*American Instrument Model 10440 Industrial Fluid Tester

SPECIFICATION DATA:

Specific Gravity -- 1.037 @ 24°C/75°F

Viscosity -- Water thin

pH (Concentrate) -- 9.8-10.3

pH (5% solution) -- 8.9-9.4

Density @ 24°C/75°F -- 8.63 lbs./gal.

Miscibility -- Completely miscible in all proportions with hot or cold water.

Flash Point (TCC) -- None

Storage Stability -- a. Shelf @ 24°C/75°F -- One year minimum

b. Accelerated @ 49°C/120°F -- 30 days minimum

c. Freeze/Thaw -- Withstands 3 cycles

PACKAGING: THE CARBIDE GRINDER is available in tank wagons; 330-gallon reusable totes; 275-gallon, DOT-approved totes; recyclable HDPE (High Density Polyethylene) 55-gallon drums and 5-gallon pails. Label copy is available in both English and Spanish.

Be sure to read all Directions, Precautionary and First Aid Statements on product labels before use of this or any IPG/Spartan product. Material Safety Data Sheets for all IPG/Spartan products are available from your authorized IPG/Spartan distributor.

GUARANTEE: Spartan's modern manufacturing and laboratory control insure uniform quality. If dissatisfied with performance of product, any unused portion may be returned for credit within one year of the date of manufacture.