



HNTI

(Formerly Known as Harita-NTI Ltd)

Metal Working Fluids & Industrial Lubricants





Metal Working Fluids (MWF)

Metalworking fluids are intricate chemical mixtures with a variety of tasks to complete during the machining process. Along with excellent chemical and biological stability, a high level of cutting performance is anticipated. Protection against corrosion of machine parts and tools is essential, as is a high standard of public health and safety. Considering all of the demands being made on a fluid.

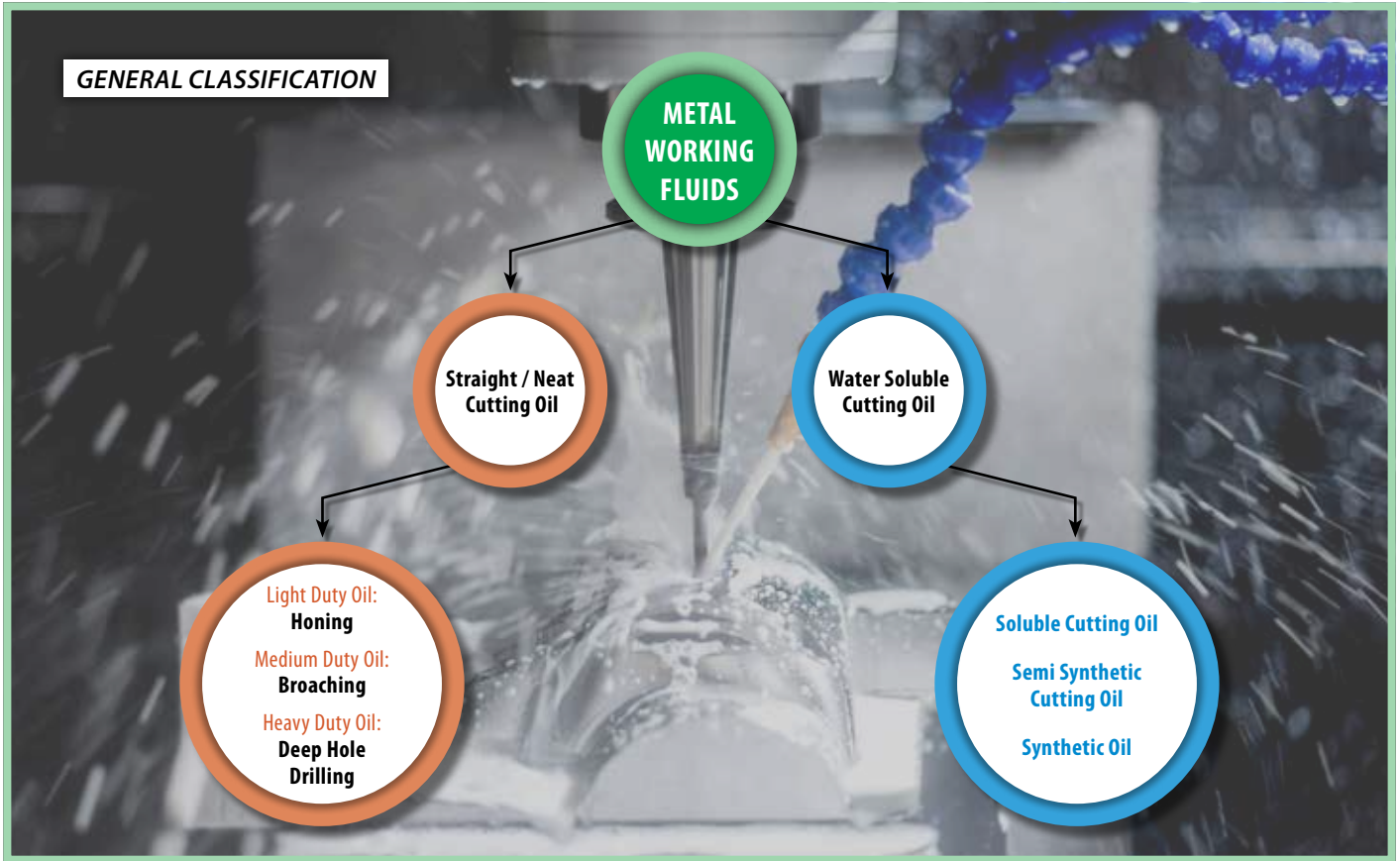
It takes time and persistence to identify the metalworking fluid that is best suited for a given application and to comprehend how to care for the coolant to get the best performance out of it. The cutting edge needs to be lubricated, heat must be removed from the cutting edge, and chips must be flushed from the cutting edge. If the fluid is not performing to these standards, it is time to replace it with a different coolant or oil or to perform maintenance on the current fluid.

There are numerous formulations, ranging from straight oils to water-based fluids, which include soluble oils and semisynthetic/synthetic fluids.

The most important requirements of metal cutting coolant fluids are Reduction of tool wear, High-quality surface finish & Economy of use. **HNTI** range of water-Soluble coolants, and neat cutting oils properties exceed these highly specialized expectations of the industry.

Excellent surface finish, Good flushing capability of coolants, cleaner and hazard free working environment are some of the desired parameters that directly affect cost per component and productivity levels in cutting process.

HNTI metal cutting fluid are the most preferred cutting fluids that have set new benchmarks in the industry by achieving maximum performance with minimal consumption. Fortified with advanced additives the HarKool series of metal cutting fluids are equipped to contend external impurities such as hydraulic oil and grinding dust whilst delivering unmatched performance.



Metal Cutting – Neat oils

Harol Neat Cutting Series of Grinding Oils, Deep Hole Drilling, Multipurpose Oils

These Neat Cutting Oils specifications are formulated with selected base oils which are nearly free of aromatic hydrocarbons with a combination of EP and Polar Additives, ensuring excellent surface finish, enhanced tool life and optimum rinsing and cooling properties. These Neat Cutting Oils are specially developed Grinding Oils for hard metal operations.

Our Grinding Oils balance the lubrication and self-sharpening effect. For deep-hole drilling or gun drilling of cast iron, alloy steel, carbon steel and stainless steel.

Harol Hon Series of Honing Oils

These Neat Cutting Oils are designed to provide excellent heat removal, fast stock removal, long stone life and superior finish for honing and grinding operations of cast iron and hard steel.

Our Honing Oils have excellent chip flushing and good heat carrying capacity with a better visibility

of work piece and tool, providing a longer life to the honing stone.

Specially designed for honing and super finishing of ferrous and non-ferrous metals. It can also be used for grinding applications, drilling and general machining of aluminum and yellow metals.



Honing Oil - Harol HON 5

Product

Harol Hon 5 is light coloured, low viscosity oil with good lubricity characteristics for honing operations of all ferrous and non-ferrous metals with good surface finish.

Application

This product is specially designed for honing and superfinishing of ferrous and non-ferrous metals. It can also be used for grinding applications, drilling and general machining of aluminum and yellow metals.

Typical Characteristics

Properties	Method	Limits
Appearance	Visual	Clear & Bright Liquid
Kinematic Viscosity @ 40 °C	ASTM D 445	4.5 to 6.5
Viscosity Index,	ASTM D 2270	90,Min
Flash Point, °C	ASTM D 92	125,Min
Density @ 29.5 °C, g/ml	ASTM D 1298	0.78,min
Copper strip corrosion test @100°C for 3 hrs	ASTM D 130	1b



Harol NC 15

Product

Harol NC 15 is Medium-duty oil designed for general machining, broaching, grinding and superfinishing operations of different grades of ferrous and Non Ferrous metal

Application

It offers highest machining performance for broaching and all kind of general machining operations on non-ferrous metals. Machining of ferrous metals where the severity of operation is not high

Typical Characteristics

Properties	Method	Limits
Appearance	Visual	Clear & Bright Yellow Liquid
Kinematic Viscosity @ 40 °C	ASTM D 445	15 - 17
Viscosity Index	ASTM D 2270	90,Min
Flash Point, °C	ASTM D 92	170,Min
Density @ 29.5 °C, g/ml	ASTM D 1298	0.85,min
Copper strip corrosion test @100°C for 3 hrs	ASTM D 130	1b



Harol NC 12

Product

Harol NC 12 is heavy-duty oil developed for deep-hole drilling or gun drilling of cast iron, low to high alloy steel.

Application

This product is suitable for deep-hole drilling or gun drilling of cast iron, alloy steel, carbon steel and stainless steel. It is not suitable for Non-ferrous metals

Typical Characteristics

Properties	Method	Limits
Appearance	Visual	Clear & Bright Yellow Liquid
Kinematic Viscosity @ 40 °C,cSt	ASTM D 445	12 to 15
Flash Point, °C	ASTM D 92	170, Min
Density @ 29.5 °C, g/ml	ASTM D 1298	0.83, Min
Copper strip corrosion test @100°C for 3 hrs	ASTM D 130	4b



Water Soluble Cutting Fluids

Harkool series water soluble cutting fluids

Metal cutting fluid is formulated with various additives such as coupling agents, stabilizing agents, Surfactants and corrosion inhibitors. The Soluble cutting fluids can be used for all types of general machining of ferrous and non-ferrous metals, which gives excellent lubricity and flushing ability to have clear and clean surface.

Harkool series semi-synthetic cutting coolants

Semi-Synthetic Metal cutting fluid is formulated with E.P additives, excellent lubricating properties and enhanced corrosion protection. Formulated with Low oil content to provide long sump life, less bacterial growth with increased tool life & machine cleanliness. The products are suitable for rough and fine machining of aluminum, steel and cast iron material as well as grinding operations.

Harkool series synthetic cutting and grinding fluids

Oil-free water soluble grinding concentrate additives formulated with excellent wetting capability, tramp oil rejection & stable in hard water up to 1000ppm properties ensuring high grinding performance for steel, cast iron (Ferrous metals). The range covers products for specialized requirements such as grinding of HSS, Carbide & PCD tools also.



Hakool M50

Product

HARKOOL – M50 is general purpose soluble cutting oil suitable for multi metal application.

Application

General Machining, Reaming, Honing, Broaching, Tapping, Grinding. Not suitable for GDC Aluminium component and shotblasted aluminium.

Typical Characteristics

Properties	Results	Method
Appearance	Clear Amber Liquid	Visual
Density @ 29.5°C, g/mL	0.89	ASTM D 1298
pH of 5% in DI Water	9.2	ASTM E70
Viscosity at 40°C, cSt	50	ASTM D 445
Flashpoint COC, °C	160	ASTM D 56



Hakool M50S

Product

HARKOOL – M50S is special grade soluble cutting oil suitable for all aluminium grades.

Application

General Machining, Reaming, Honing, Broaching, Tapping, Grinding. Suitable for GDC Aluminium component and shotblasted aluminium.

Typical Characteristics

Properties	Results	Method
Appearance	Clear Amber Liquid	Visual
Density @ 29.5°C, g/mL	0.893, typical	ASTM D 1298
pH of 5% in DI Water	9.2	ASTM E70
Viscosity at 40°C, cSt	50 to 60	ASTM D 445
Flashpoint COC, °C	150	ASTM D 56



Harkool ME

Product

HARKOOL – ME is special grade high performing premium mild emulsion cutting oil suitable for multimetal* application.

Application

General Machining, Reaming, Honing, Broaching, Tapping, Grinding. Not suitable for GDC Aluminium component and shotblasted aluminium.

Typical Characteristics

Properties	Results	Method
Appearance	Clear Amber Liquid	Visual
Density @ 29.5°C, g/mL	0.893, typical	ASTM D 1298
pH of 5% in DI Water	9.2	ASTM E70
Viscosity at 40°C, cSt	48 to 55	ASTM D 445
Flashpoint COC, °C	160	ASTM D 56



Harkool SSA

Product

Harkool SSA is a moderate duty, semi-synthetic water soluble cutting & grinding fluid. This is specially recommended for Aluminium jobs.

Application

It is suitable for Drilling, Milling, Reaming, broaching, tapping, grinding application only on aluminium & its alloy. Not suitable for shotblasted components.

Typical Characteristics

Properties	Results
Appearance	Yellow Liquid
Specific gravity @ 29.5°C	0.935
pH of 5% in DI Water	9.5
Emulsion stability 1:10 solution in DM & 400 ppm Hard water	Stable
Refractometer reading 1:20	3.5 to 4.0



Harkool SS

Product

Harkool SS is a moderate duty, semi-synthetic water soluble cutting & grinding fluid. It is suitable only for ferrous metals.

Application

Drilling , Milling, Reaming, Boring, Broaching, Tapping, Grinding.

Typical Characteristics

Properties	Results	Method
Appearance	Clear Yellow Liquid	Visual
Density @ 29.5°C, g/ml	1.01	ASTM D 1298
pH of 5% in DI Water	9.26	ASTM E70
Mineral oil content	25 to 35	Calculated
5% Emulsion in DI Water	Translucent	Visual



Harkool SSM

Product

Harkool SSM is an excellent cutting fluid designed for multi-metal operation where clarity, foam control is challenge.

Application

Drilling , Milling, Reaming, Boring, Broaching, Tapping, Grinding. It is suitable for PDC Aluminium component and shotblasted aluminium.

Typical Characteristics

Properties	Results
Appearance	Amber Liquid
Specific gravity @ 29.5°C	0.94
pH of 5% in DI Water	9.2
Emulsion stability 1:20 solution in DM & 400 ppm Hard water	Stable



Harkool S100

Product

This unique Synthetic technology offers benefits such as improved productivity, tool life, surface finishes and sump/system life.

Application

Drilling , Milling, Reaming, Boring, Broaching, Tapping, Grinding. It is suitable only for ferrous Metals.

Typical Characteristics

Properties	Results	Method
Appearance	Clear Yellow Liquid	Visual
Density @ 29.5°C, g/ml	1	ASTM D 1298
pH of 5% in DI Water	9.77	ASTM E70
Mineral oil content	Nil	Calculated
5% Emulsion in DI Water	Transparent	Visual



Industrial Lubricants

HNTI industrial lubricants are developed for providing the exceptional and balanced performance required for today's industrial equipment.

Our industrial oils and Hydraulics are specially formulated to:

- **Protect your equipment**
- **Enable problem-free operation in high or low temperatures, wet environments and under high loads**
- **Provide longer lubrication intervals**

Available in a range of viscosity and grades to offer you the right choice for your application, HNTI lubricants can help you enhance performance, reduce cost and waste, and improve industrial productivity.



Harol AW Series

HAROL – AW Grade Hydraulic oils are superior quality anti-wear type lubricants formulated with Zinc free additives & superior quality of hydro finished base stock. The product has high oxidation stability, good anti-rust and anti-wear properties. It has natural demulsification property, low foaming tendency and quick air release property

Application

Harol AW Series of hydraulic lubricants are recommended for hydraulic system, pump, circulation, splash, bath, and ring oiling systems of the bearings. These oils can be used for chain drives and compressor crankcase lubrication.

Product Specification

It meets IS 10522, DIN 51524 PART 1, DIN 51517 part 2 requirements

Typical Characteristics

Properties	Method	AW 32	AW 46	AW 68	AW 100	AW 150
Appearance	Visual	Clear & Bright Yellow Liquid				
K. Viscosity @ 40 ^o C, cSt	ASTM D 445	29 – 35	42 – 50	62- 74	90 – 110	135 – 165
Viscosity Index, Min	ASTM D 2270	90	90	90	95	95
Flash Point(COC) ^o C, Min	ASTM D 92	180	190	210	210	230



Harol GP Series

HAROL – GP grades are premium quality general purpose machinery lubricants formulated with superior quality highly refined base oil. These grades provide high oiliness for general lubrication of machinery even under boundary lubrication conditions. It maintains a thin film of oil under light and medium loads and provides protection against corrosion and rust even during idle periods.

Application

Harol GP Series of Machinery lubricants are recommended for all types of industrial machinery using on-continuous lubrication systems. It is also recommended for use in the lubrication systems of machine tools, textile machinery and other machine parts which are lubricated by a thin film of oil

Product Specification

It meets IS 493(Part 1) 1981 standard requirements

Typical Characteristics

Properties	Method	GP 68	GP 100	GP 150	GP 220
Appearance	Visual	Clear & Bright Liquid			
Kinematic Viscosity @ 40° C, cSt	ASTM D 445	62- 74	90 – 110	135 – 165	198 - 242
Viscosity Index, Min	ASTM D 2270	90	90	90	90
Flash Point(COC) °C, Min	ASTM D 92	180	180	180	200



Harol HY Series

HAROL – HY Grade Hydraulic oils are premium quality anti-wear type lubricants formulated with Zinc free additives & superior quality of hydro treated base stock. They provide long service life and are recommended for hydraulic and circulation systems of wide variety of equipment's.

vacuum pumps, mining machinery, machine tools, circulating oiling systems etc., where the oil is recirculated and used for extensive periods. It is specially recommended for sophisticated high performance electro-hydraulic or numerically controlled systems.

Product Specification

It meets DIN51524 part 2 and 3, (HLP, HVLP); DIN51515 part 2, IS 11656 : 1986

Application

Harol HY Series of hydraulic lubricants are used in hydraulic systems, chain drives, compressors,

Typical Characteristics

Properties	Method	HY 15	HY 22	HY 32	HY 46	HY 68	HY 100	HY 150
Appearance	Visual	Clear & Bright Liquid						
K. Viscosity @ 40° C	ASTM D 445	14 - 17	20 – 24	29 – 35	42 – 50	62- 74	90 – 110	135 – 165
Viscosity Index, Min	ASTM D 2270	90	90	90	90	90	95	95
Flash Point(COC) °C, Min	ASTM D 92	150	160	180	190	210	210	230



Harol SP Series

HAROL – SP grades are manufactured from highly refined base oils & selective additives which possess excellent chemical & oxidation stability. These grades protect bearing surface from rusting and corrosion even in the presence of moisture.

Application

Harol SP product series are recommended for bearing lubrication

of high-speed textile spindles and machine tool spindles. Other applications include timing gears, positive displacement blowers and tracer mechanism and hydraulic systems of precision machine tools.

Product Specification

It meets IS 493(Part 2) standard requirements

Typical Characteristics

Properties	Method	SP 02	SP 05	SP 10	SP 22
Appearance	Visual	Clear & Bright Liquid			
Kinematic Viscosity @ 40° C,cSt	ASTM D 445	2 to 5	5 to 10	10 to 15	20 to 25
Density @ 29.5 ° C,g/ml	ASTM D 1298	0.783	0.792	0.851	0.842
Flash Point(COC) °C,Min	ASTM D 92	130	160	180	200



Harol SW Series

HAROL – SW grades are premium quality Slideway lubricant oil contains tackiness, anti-rust, anti-wear and anti-foam additives enabling higher loading of machine tools, minimum stick-slip, and chatter, and it provides improved surface finish to the job. These oils protect parts against rust and corrosion and reduce oil consumption due to good adhesive characteristics.

Application

Harol SW product series are recommended for slideway lubrication of planers, grinders, horizontal boring machines, shapers, jig borers etc., involving high precision work.

Product Specification

It meets Cincinnati P-47 standard requirements

Typical Characteristics

Properties	Method	SW 32	SW 46	SW 68	SW 100
Appearance	Visual	Clear & Bright Yellow Liquid			
Kinematic Viscosity @ 40° C,cSt	ASTM D 445	29 – 35	42 – 50	62- 74	90 – 110
Viscosity Index,Min	ASTM D 2270	90	90	90	90
Flash Point(COC) °C,Min	ASTM D 92	180	190	200	200



Harol HVI Series

HAROL HVI Series grade is premium quality anti-wear type hydraulic oil with very high shear stability and Viscosity Index. It is recommended for all modern hydraulic systems used in earth moving equipment's. HAROL HVI 32 oil is also recommended for low operating temperature conditions.

Application

Harol HVI Series hydraulic lubricants are used in hydraulic

systems, chain drives, compressors, vacuum pumps, mining machinery, all modern hydraulic systems used in earth moving equipment's, machine tools, circulating oiling systems etc., where the oil is recirculated and used for extensive periods.

Product Specification

It meets DIN 51524 Part 3 HVLP type specification standards.



Typical Characteristics

Properties	Method	HVI 32	HVI 68
Appearance	Visual	Clear & Bright	Clear & Bright
K. Viscosity @ 40 ^o C	ASTM D 445	29 – 35	62- 74
Viscosity Index, Min	ASTM D 2270	141	145
Flash Point (COC) °C, Min	ASTM D 92	235	240
Pour Point °C, Min	ASTM D 97	-39	-39
Copper Strip Corrosion @100°C for 3hrs., Max.	ASTM D 130	1A	1A

***Packing Availability: 20 liters, 35 liters and 210 liters**





Domestic Customers

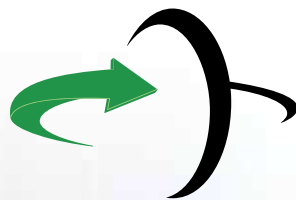


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**RAMCO
STEELS**



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