



**DIAMOND
CLEAR**
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PRODUCT DATA SHEET

Diamond Clear Vacuum Pump Oil ISO 46

Non-detergent, severely hydroprocessed mineral oil for oil-sealed rotary vane vacuum pumps

GRADE ISO VG 46 BASE STOCK API Group II, 220 SN ADDITIVE Ashless, non-detergent PART NOS. DC-01Q / DC-01G REVISION 01

NON-DETERGENT

No detergents or dispersants to hold water, acid and debris in suspension. Contaminants settle out or drain with the oil instead of circulating through the cartridge.

SEALS AND LUBRICATES

Correct ISO 46 body seals the vane-to-housing clearance while lubricating vanes, rotor and bearings, and carries heat away from the pumping chamber.

EXTRA PURE

Greater than 99 percent saturates, near zero sulfur and aromatics, water clear in color. Purity is what keeps blank-off pressure low and deposits from forming.

LOW VAPOR PRESSURE

Vacuum distilled to strip light ends. The oil will not back-stream measurable vapor into the system, so the pump reaches and holds deep vacuum.

HYDROPROCESSED

Severe hydroprocessing removes the light and reactive fractions that solvent refining leaves behind, producing a narrow boiling range and high oxidation stability.

ISO 46

Blended to ISO VG 46 for direct drive and belt drive service pumps, with cold flow down to 5 °F for cool shop and field starts.

01 DESCRIPTION

A single grade, non-detergent vacuum pump fluid blended from severely hydroprocessed API Group II 220 solvent neutral base oil and finished to ISO VG 46. The base stock is vacuum distilled to a narrow boiling range so that the lighter fractions responsible for high vapor pressure are removed before blending.

In an oil-sealed rotary vane pump the fluid does three jobs at once. It seals the running clearance between the vanes and the housing bore, it lubricates the vanes, rotor and bearings, and it carries heat out of the pumping chamber. A fluid that is too light will not seal. A fluid that is too heavy will not clear the cartridge on a cold start. A fluid carrying volatile light ends will out-gas and put a floor under the vacuum the pump can pull, no matter how sound the mechanical condition of the pump.

This product is formulated with no detergents, no dispersants and no metallic additives. Sulfated ash is below 0.01 percent by weight.

02 APPLICATIONS

- Single stage and two stage oil-sealed rotary vane vacuum pumps
- HVACR evacuation and dehydration service on air conditioning, refrigeration and heat pump systems
- Rotary piston and oil-flooded rotary pumps calling for a non-detergent ISO 46 vacuum fluid
- Laboratory and light industrial roughing and backing pump duty
- Original equipment fill and refill where the manufacturer specifies an oil refined for deep vacuum service

NOT RECOMMENDED FOR

Ammonia and lithium bromide systems. Diffusion pumps, which require silicone, polyphenyl ether or Apiezon class fluids. Oxygen, halogen or other strongly oxidizing service, which requires perfluoropolyether fluids. Any pump where the manufacturer specifies a synthetic PAO, PFPE or silicone fluid.

03 PERFORMANCE FEATURES

Deep vacuum capability. Low vapor pressure and a narrow boiling range allow a sound two stage pump to reach and hold below 15 microns on a blank-off test with a direct connected micron gauge.

Oxidation and thermal stability. Group II saturates resist the oxidation and varnish formation that shortens fluid life at the 160 °F normal operating temperature of a continuous duty service pump.

Clean cartridge surfaces. The ashless, non-detergent formulation leaves no metallic residue on vanes, rotor, exhaust valve or intake relief valve.

Rapid water and acid separation. Because contaminants are not held in suspension, moisture and acid drop out and leave the pump with the drain rather than being carried back through the pumping mechanism.

Corrosion protection. Rust and copper corrosion inhibition protect ferrous and yellow metal surfaces during idle periods between jobs.

Low foam and fast air release. Controlled foaming under gas ballast operation keeps the sight glass readable and prevents oil carryover at the exhaust.

04 SERVICE PRACTICE

Change interval. Vacuum pump oil is a consumable, not a fill-for-life lubricant. On evacuation service, drain and refill after every job while the pump is warm and the oil is thin. On heavily contaminated systems the oil may need to be changed several times during a single evacuation. Used oil holds water and corrosive acid that will etch cartridge surfaces if left standing in the pump.

Fill level. Fill to the top of the oil level line with the pump running and the isolation valve closed. Oil below the line will pull air past the exhaust and cost ultimate vacuum. Oil above the line will blow out of the exhaust. Milky, rusty or dark oil in the sight glass indicates the pump interior is in worse condition than the sight glass shows and calls for a flush.

05 COMPATIBILITY AND CHANGEOVER

Fully miscible with conventional mineral vacuum pump oils of the same grade. No flush is required when converting from another non-detergent mineral fluid, although a flush is always good practice on a pump with a service history that is unknown.

Do not mix with perfluoropolyether, silicone or polyphenyl ether fluids. These are not miscible with hydrocarbon oil, and any changeover in either direction requires a complete disassembly and solvent flush of the pump.

Compatible with the seal and elastomer materials used in standard rotary vane service pumps, including nitrile, fluoroelastomer and PTFE.

07 TYPICAL PROPERTIES

VISCOMETRICS

ISO viscosity grade	ISO 3448	46
Kinematic viscosity at 40 °C, cSt	ASTM D445	44.0
Kinematic viscosity at 100 °C, cSt	ASTM D445	6.6
Viscosity at 100 °F, SUS	ASTM D2161	228
Viscosity index	ASTM D2270	102

VACUUM PERFORMANCE

Vapor pressure at 20 °C, torr	ASTM D2879	$<1 \times 10^{-3}$
Ultimate vacuum, two stage pump, blank-off, microns Hg	McLeod / thermistor	<15
Ultimate vacuum, single stage pump, blank-off, microns Hg	McLeod / thermistor	<50
Evaporation loss, 22 h at 100 °C, wt %	ASTM D972	0.4

PHYSICAL

Flash point, Cleveland Open Cup, °C (°F)	ASTM D92	232 (450)
Pour point, °C (°F)	ASTM D97	-15 (5)
Specific gravity at 15.6 °C	ASTM D4052	0.866
API gravity, °API	ASTM D287	31.8
Density at 15.6 °C, lb/gal	ASTM D4052	7.22
Color	ASTM D1500	L0.5
Aniline point, °C	ASTM D611	106

Values shown are typical results on production blends and are not a specification. Minor variation within normal manufacturing tolerance is expected and does not affect performance. Ultimate vacuum figures are obtained on a mechanically sound pump with clean fittings and a micron gauge connected directly to the intake without a charging line. A charging hose will report a higher pressure because of permeation and out-gassing of the hose compound.

Handling and storage. Store sealed containers indoors between 40 and 100 °F, away from moisture and direct sunlight. This fluid is hygroscopic in the sense that it will pick up atmospheric moisture from an open container, and absorbed water will raise the achievable vacuum. Keep containers closed and reseal immediately after pouring. Shelf life is 60 months from date of manufacture in an unopened original container.

Health and safety. Based on available toxicological data this product is not expected to present health hazards when used in the intended application and handled in accordance with good industrial hygiene practice. Avoid prolonged or repeated skin contact. Used vacuum pump oil contains water and corrosive acids drawn from the evacuated system and should be handled with gloves and eye protection. Consult Safety Data Sheet DC-01 before use. Dispose of used oil in accordance with federal, state and local regulations. Do not discharge to drains, soil or surface water.

The information in this data sheet relates only to the product named and does not constitute a warranty of merchantability or fitness for a particular purpose. Product performance depends on equipment condition, operating practice and the contaminants present in the system being evacuated. Users are responsible for confirming suitability for their own application and for observing the pump manufacturer's fluid recommendation. Revision 01, issued August 22, 2026.

06 PACKAGING AND ORDERING

Sealed containers only. Because absorbed atmospheric moisture raises the achievable vacuum, smaller sealed packages are recommended for field service and jobsite use. Safety Data Sheet DC-01 is available on request and at dcvacoil.com.

PART NO.	PACKAGE	UPC
DC-01Q	1 U.S. quart (946 mL) jug, individually and by the case	Assigned at release
DC-01G	1 U.S. gallon (3.785 L) jug, individually and by the case	850047358017
Bulk	5 gal pail, 55 gal drum, 275 gal tote	On request

COMPOSITION AND PURITY

Saturates, wt %	ASTM D2007	>99
Sulfur, wt %	ASTM D4294	<0.03
Sulfated ash, wt %	ASTM D874	<0.01
Water content, as packaged, ppm	ASTM D6304	<50
Total acid number, mg KOH/g	ASTM D974	0.02

PROTECTION AND CLEANLINESS

Copper strip corrosion, 3 h at 100 °C, rating	ASTM D130	1a
Rust prevention, procedure A	ASTM D665	Pass
Foam, sequence I / II / III, tendency, mL	ASTM D892	0 / 0 / 0
Demulsibility at 54 °C, minutes to 40-37-3	ASTM D1401	15
Oxidation stability, RPVOT, minutes	ASTM D2272	250