

The most common blower failure is due to lack of lubrication or improper lubrication.



## Roots Blower Lubrication

The recommended oil for all Roots' products is ROOTS™ Synthetic Oil. It is a long life, high film strength, energy efficient, synthetic lubricant that significantly increases bearing life and equipment reliability. It gains its performance advantages over competing mineral and synthetic oils through its superior blend of synthetic base oils plus proprietary additive technology. This unique additive technology is proven to make equipment run smoother, cooler, quieter, longer and more efficiently.

Refer to your operating manual for detailed instructions and lubrication intervals. Oils must be premium grade and non-detergent with rust, oxidation, and foam inhibitors.

ISO 320	Roots PN	ISO 220	Roots PN	ISO 150	Roots PN
Quart	13106004	Quart	13106001	5 Gallon	13106022
Gallon	13106005	Gallon	13106002	Case 4-1 Gallons	13106024
5 Gallon	13106006	5 Gallon	13106003	Case 12-32 oz Qts	13106023
Case 4-1 Gallons	13106010	Case 4-1 Gallons	13106009	55 Gallon Drum	13106025
Case 12-32 oz Qts	13106007	Case 12-32 oz Qts	13106008		
55 Gallon Drum	13106018	55 Gallon Drum	13106019		

ROOTS Synthetic Oil is NSF approved for ISO-VG 32, 150, 220 and 320. Oil viscosity is dependent on the expected ambient conditions surrounding the blower and driver. The required viscosity is as follows:

Splash Lubricated Blowers Ambient Temperature	ISO Viscosity	Pressure Lubricated Blowers Ambient Temperature	ISO Viscosity
90°F to 120°F (32°C to 48°C)	320	32°F to 120°F (0°C to 48°C)	220
32°F to 90°F (0°C to 32°C)	220	0°F to 32°F* (-18°C to 0°C)	100
0°F to 32°F* (-18°C to 0°C)	150		
below 0°F* (-18°C)	100		

Other oils listed below are recommended by the oil manufacturer as their product that satisfies Roots' lubrication specifications.

**NOTE:** Not all of these oils are synthetic and may not have the same operating life as Roots synthetic oil.

**Due to sludge build-up and seal leakage problems, do NOT use Mobil SHC synthetic oil.**

ISO 320	ISO 220	ISO 100
Sunoco Sunvis 9320	Sunoco Sunvis 9220	Sunoco Sunvis 9100
Mobil DTE AA	Mobil DTE BB	Mobil DTE 18M
Exxon Teresstic 320	Exxon Teresstic 220	Exxon Teresstic 100
CITGO Pacemaker 320	CITGO Pacemaker 220	CITGO Pacemaker 100
Texaco Regal R&O 320	Texaco Regal R&O 220	Texaco Regal R&O 100
Roots Synthetic 320	Roots Synthetic 220	Roots Synthetic 100

## Grease Lubrication

**IMPORTANT:** Shell clay-based grease and the Roots Synthetic aluminum-complex grease are not compatible and that they should not be interchanged or mixed. Also, lithium-based grease is not approved for any ROOTS blower.

Any URAI or Whispair MAX blowers built on or after August 1st, 2016 (serial numbers beginning with 1608A and later) require Roots Synthetic grease. It is purple in color and should not be mixed with any other grease.

Roots Synthetic Grease	Roots PN
14.5 oz. Tube	T200019001
Case (30 tubes)	T200019002
5 Gallon Pail	T200019003

Any URAI and Whispair MAX blowers built previous to August 2016 have Shell clay-based grease and should continue to be serviced with Shell Gadus S2 U1000 (NLGI grade #2, PN 71522 or Shell Darina SD 2 NLGI grade 2, PN 5067628). It is tan in color and should not be mixed with Roots Synthetic grease.

Visit [www.jlcomponents.com](http://www.jlcomponents.com) or call 816-207-0090 for more information on which type of oil or grease to use with your blower.

ROOTS™ Synthetic Oil

# ROOTS™ Synthetic Oil



## Synerlec® additive technology makes the difference!

Synerlec® additive technology forms a tough, slippery, synthetic film on all metal surfaces. This proprietary film significantly improves lubrication: first, by increasing the oil's film thickness, and second, by increasing the oil film's toughness, both of which help to prevent metal-to-metal contact. It displaces moisture from metal surfaces and protects all metals against rust and corrosion. It also fortifies the oil against the detrimental effects of heat, which causes oil to oxidize.

## Beyond Synthetic™

ROOTS® Synthetic Oil is a long life, high film strength, energy efficient, synthetic lubricant that significantly increases bearing life and equipment reliability. Roots Synthetic Oil gains its performance advantages over competing mineral and synthetic oils through its superior blend of synthetic base oils plus proprietary additive technology. This unique additive technology is proven to make equipment run smoother, cooler, quieter, longer and more efficiently.

ROOTS Synthetic Oil typically replaces conventional, low film strength. R & O (rust and oxidation inhibited) oils that rely solely on their viscosity to protect equipment against wear. ROOTS Synthetic Oil is NSF approved for ISO-VG 32, 150, 220 and 320.

## Performance advantages

- **High Oxidation Stability** - Contains oxidation-resistant additives that mean longer oil life and fewer oil changes. ROOTS Synthetic Oil excels in ASTM oxidation tests, and in the field, where it counts. Longer oil life means lower expenditures, and greater conservation.
- **Rapidly Separates from Water** - ROOTS Synthetic Oil rapidly and completely separates from water, which is easily drained from the bottom of the oil reservoir.
- **Saves Energy** - ROOTS Synthetic Oil has an extremely low coefficient of friction that is proven to save energy over conventional oils. In rotating equipment these savings frequently exceed the total cost of the oil within several months, making what was once an oil expense a profit.
- **Reduces Bearing Vibrations** - The tough oil film of ROOTS Synthetic Oil coupled with its ability to micro-polish contacting bearing elements provides superior bearing lubrication.
- **Longer Oil life** - ROOTS Synthetic Oil has outstanding oxidation stability that greatly extends oil change intervals while keeping equipment clean.
- **Excellent Corrosion Protection** - ROOTS Synthetic Oil's tough oil film forms an ionic bond on metal surfaces, which acts as a preservative oil during shutdown and provides instant lubrication at startup.
- **Synthetic Solvency** - ROOTS Synthetic Oil's natural solvency cleans up dirty equipment and keeps it clean.
- **Compatible with Seals** - ROOTS Synthetic Oil has excellent seal compatibility.
- **Environmentally Responsible** - ROOTS Synthetic Oil components are TSCA listed and meet EPA, RCRA and OSHA requirements. ROOTS Synthetic Oil extends oil drain intervals, eliminates premature oil changes, decreases the amount of oil purchased and disposed of and conserves energy.
- **Blower Protection** - Protects blower through a wide range of operating temperatures.
- **Pour Point** - from -40°F (-40°C). Flash Point - at 500°F (260°C).
- **Range of Use** - ROOTS Synthetic Oil can be used in any blower application or operating environment.
- **High Film Strength** - ROOTS Synthetic Oil carries up to 700% greater loads than other mineral and synthetic oils
- **Compatibility With Other Oils** - ROOTS Synthetic Oil is compatible with, and can be mixed with, other mineral oils and most other synthetic oils. No special cleaning is required at change out for blowers previously running on mineral oil. NOTE: It is NOT compatible with silicone or glycol synthetics.
- **ISO Grade Availability** - Available in ISO Grade 100, 150, 220, or 320.
- **Container Sizes** - Available in one-quart containers, 12-quart cases, one-gallon containers, 5-gallon pails, or 55 gallon drums.



**For further information contact**

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Typical Properties*	ISO Grade/AGMA Grade			
	100	150***	220	320
<b>AGMA Grade</b>	3	4	5	6
<b>Viscosity</b>				
cSt @ 40°C	100	150	220	320
cSt @ 100°C	12.6	16.1	21.5	27.0
SSU @ 100°C	518	783	1153	1685
SSU @ 210°C	70	84	108	139
<b>Viscosity Index</b>	120	112	117	112
<b>Specific Gravity @ 60°F</b>	0.863	0.869	0.874	0.880
<b>Lbs./Gal</b>	7.19	7.24	7.28	7.33
<b>Flash °F</b>	440	485	485	500
<b>Pour Point °F</b>	-53	-47	-35	-35
<b>ISO Cleanliness Level</b>	NA	NA	NA	NA
<b>ASTM D-1401 Demulsibility (from 40/40/0/06 to 40/40/0/30)</b>	Pass	Pass	Pass	Pass
<b>D-892 Foam Tests Sequences I, II &amp; III</b>	—	—	—	—
<b>D-130 Copper Corrosion</b>				
3 hrs. @ 210°F	1A	1A	1A	1A
250 hrs. @ 210°F	1A	1A	1A	1A
<b>Cincinnati Millicron "A"</b>				
72 hrs. @ 275°F	Pass	Pass	Pass	Pass
<b>D-665 Rust Test</b>				
Fresh Water	Pass	Pass	Pass	Pass
Salt Water	Pass	Pass	Pass	Pass
<b>D-2893 Dry Air Oxidation</b>				
312 hrs. @ 203°F,				
% Viscosity Increase	0	0	0	0
Precip. No. (% Solids)	0	0	0	0

\*All properties are typical and may vary.

**Note:**

ROOTS Synthetic Oil's solvency cleans wear metals and deposits left behind by previous oils. These wear metals and deposits can become soluble in the new oil, causing abnormally high values on used oil analysis until equipment is clean.

**Note:**

ROOTS Synthetic Oil is NSF approved for ISO-VG 32, 150, 220 and 320.

**Specified lubricants**

2"-8" Blower Recommended Oil Grades	
Ambient Temperature	ISO Viscosity Range
Above 90°F (32°C)	320
32° to 90°F (0°-32°C)	220
0° to 32°F (-18°-0°C)	150
Below 0°F (-18°C)	100

10"-20" Splash Lubricated Blower Recommended Lubricating Oils	
Ambient Temperature	ISO Viscosity Range
Above 90°F (32°C)	320
32° to 90°F (0°-32°C)	220
0° to 32°F (-18°-0°C)	150
Below 0°F (-18°C)	100

10"-20" Pressure Lubricated Blower Recommended Lubricating Oils	
Ambient Temperature	ISO Viscosity Range
32° to 120°F (0°-49°C)	220
Below 32°F (0°C)	100

**All RGS - Use ISO-VG-100**

See the manual provided with the blower for service intervals of the lubrications mentioned.



## Rotary Blower Lubrication Recommendations

Howden Roots **Recommended** oil for all Roots' products is Roots synthetic. Other oils listed below are recommended by the oil manufacturer as the product in their line that satisfies Roots' lubrication specifications.

Oils are to be premium grade, non-detergent, with rust, oxidation and foam inhibitors.

<u>Splash Lubricated Blowers:</u>	<u>Ambient Temperature °F**</u>	<u>ISO Viscosity</u>
	90 to 120	320
	32 to 90	220
	0 to 32*	150
	Below 32*	100

<u>Pressure Lubricated Blowers:</u>	<u>Ambient Temperature °F**</u>	<u>ISO Viscosity</u>
	32 to 120	220
	0 to 32*	100

\*Oil is to be heated to 60°F prior to starting the blower.

\*\* Ambient temperature is the temperature in the space the blower is located not the outside air temperature.

### Blowers with Mechanical Seals:

On all 10" and larger blowers with Mechanical Seals (RGS, RGS-J & HVB), use ISO 100 oil. Oil is to be heated to 60°F prior to starting the blower.

### High Vacuum Blowers (RGS-HVB):

All HVB's require oil with a vapor pressure of 0.1 micron of mercury or less at 180°F and 1.8 micron of mercury or less at 250°F. Both Sunoco Sunvis and Roots Synthetic oil meet this requirement.

### Oil Manufacturer's Suggested Lubricant:

ISO-320	ISO-220	ISO-100
Sunoco Sunvis 9320	Sunoco Sunvis 9220	Sunoco Sunvis 9100
Mobil DTE AA	Mobil DTE BB	Mobil DTE 18M
Exxon Teresstic 320	Exxon Teresstic 220	Exxon Teresstic 100
CITGO Pacemaker 320	CITGO Pacemaker 220	CITGO Pacemaker 100
Texaco Regal R&O 320	Texaco Regal R&O 220	Texaco Regal R&O 100
Roots Synthetic 320	Roots Synthetic 220	Roots Synthetic 100

## GREASE

**Note: Lithium based grease is not approved for any ROOTS blower.**

**Shell clay-based grease and the Roots Synthetic aluminum-complex grease are not compatible and that they should not be interchanged or mixed.**

Any URAI or Whispair MAX blowers built on or after August 1st, 2016 (blowers with serial numbers beginning with 1608A and later) have Roots Synthetic grease and must be serviced with Roots Synthetic or other compatible greases going forward, PN T20019001, Tube 14.5 OZ.

Any URAI and Whispair MAX blowers built previous to August 2016 have Shell clay-based grease and should continue to be serviced with Shell Gadus S2 U1000 or other compatible grease. Shell Darina EP NLGI grade #2, PN 71522 or Shell Darina SD 2 NLGI grade 2, PN 5067628

Grease for XA seals: Dow Corning Silicon Grease #44