



## PRODUCT GUIDE

FOOD GRADE • ENVIRONMENTAL

# 2018





## 2018 Edition

This Clarion Lubricants product guide is your directory to Clarion fluids, greases and their applications.

Products are not available at all source points. Please check product availability and container sizes for your normal source point(s).

### Technical information and assistance:

#### Product Answer Line

800-248-4684

lubeshelp@citgo.com

### Pre-shipment inquiries:

#### Order Management

800-331-4068, option 1

ordermanagement@citgo.com

### Pricing, availability, post-shipment inquiries:

#### Customer Service

800-331-4068, option 2

lubescs@citgo.com

Properties shown are based on typical values for the product only and do not constitute a specification. The information contained herein is subject to change without notice.

The information in this book is provided with no express or implied warranty but with good faith on the basis of the most accurate information available; CITGO accepts no liability for content errors or omissions, or for damages as a result of relying on information contained within. Consult your owner's manual for proper lubricant selection.

Clarion® lubricants are prohibited from being repackaged. The reprinting of Clarion® labels and other material is also prohibited.

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Please visit [www.clarionlubricants.com](http://www.clarionlubricants.com) for the most up-to-date information on products or for Safety Data Sheets.

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CLARION® FOOD GRADE  
WHITE MINERAL OILS



**DESCRIPTION:** Clarion Food Grade White Mineral Oils are high purity oils refined by ultra high pressure hydrotreatment and are stabilized with Vitamin E oxidation inhibitor. They are available in five viscosity grades. They do not contain any natural products derived from animals, nuts or genetically modified organisms (GMOs). They are suitable for use where vegetarian and nut free food is prepared.

**QUALITIES:** Clarion Food Grade White Mineral Oils meet the requirements set forth in the U.S. FDA regulations 21 CFR 172.878 for contact with food for human consumption, and 21 CFR 178.3620 (a) for use as a component of nonfood articles intended for use in contact with food for human consumption, and are certified as Kosher with the Union of Orthodox Jewish Congregations of America (U) and Halal with the Islamic Food and Nutrition Council of America (M).

These oils meet the current standards of the National Formulary (NF) or US Pharmacopeia (USP), and are registered as 3H and H1 lubricants for direct and incidental food contact by NSF, for use in food plants under the jurisdiction of the USDA.

Clarion Food Grade White Mineral Oils 200 and 350 are certified under NSF/ANSI Standard 60: Drinking Water Treatment Chemicals—Health Effects and NSF/ANSI Standard 61: Drinking Water System Components—Health Effects.

**APPLICATIONS:** Clarion Food Grade White Mineral Oils can be used for coatings for fruits and vegetables, defoamers, shell egg spray, bakery pans and dough dividers, cutters, knives, meat packers benches, boards, trays and hooks, and as a lubricant and rust preventative for food processing machinery.

They can be used in cosmetics, suntan lotions, baby oils, bath oils, as a base for ointments, as a pelletizing aid, and as a drug processing agent.

They can be used in the fibers, plastics and resins area as a process aid, a diluent, a pigment dispersant, and textile fiber lubricant. In the food processing area, they can be used as a release agent on grills, pans and other food processing equipment.

Clarion Food Grade White Mineral Oils 200 and 350 are recommended as a lubricant for water well pump and other potable water system lubrication applications where an NSF/ANSI Standard 60 and/or Standard 61 certified lubricant is required or desired.



Certified to  
NSF/ANSI Standard  
60 and 61

Clarion Food Grade  
White Mineral Oils 200 and 350  
(ONLY)

(Continued)

CLARION® FOOD GRADE  
WHITE MINERAL OILS



(Continued)

TYPICAL PROPERTIES:

	CLARION® FOOD GRADE WHITE MINERAL OILS				
	70	90	200	350	500
Material Code	633507009	633509009	633512009	633514009	633516009
ISO Grade	10	15	32	68	100
Gravity, °API ASTM D4052	34.4	32.2	32.3	31.6	31.1
Density, lbs/gallon	7.10	7.2	7.23	7.23	7.25
Flash Point, °C (°F) ASTM D92	188 (370)	190 (374)	218 (424)	246 (475)	246 (475)
Pour Point, °C (°F) ASTM D97	-33 (-27)	-27 (-17)	-12 (+10)	-12 (+10)	-9 (+16)
Viscosity ASTM D445					
cSt at 40°C	12.6	16.0	37.5	65.04	107.8
cSt at 100°C	3.0	3.47	6.03	8.58	12.00
SUS at 100°F	72	87	193	337	562
Color, Saybolt, ASTM D156	+30	+30	+30	+30	+30
NF/USP	NF	NF	USP	USP	USP
USDA Shell Egg Oil	✓	✓	—	—	—
Kosher	Ⓢ	Ⓢ	Ⓢ	Ⓢ	Ⓢ
Halal	Ⓜ	Ⓜ	Ⓜ	Ⓜ	Ⓜ
NSF Registered (Registration Number)	3H/H1 (124614)	3H/H1 (124616)	3H/H1 (124609)	3H/H1 (124612)	3H/H1 (124618)
NSF/ANSI Standard 60 Certified	—	—	✓	✓	—
NSF/ANSI Standard 61 Certified	—	—	✓	✓	—
FDA 21 CFR					
172.878	✓	✓	✓	✓	✓
178.3620(a)	✓	✓	✓	✓	✓

**NOTE:** All oils above are colorless (Saybolt +30 Color), odorless and tasteless and surpass the requirements of FDA and U.S. Pharmacopeia standard for Neutrality, Sulfur Compounds, Solid Paraffins, Readily Carbonizable Substances and Residual Solvents.

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**CLARION® FG WHITE MINERAL OIL SPRAY**

**DESCRIPTION:** Clarion FG White Mineral Oil Spray is a high purity National Formulary (NF) white mineral oil packaged with propellant in an aerosol container. This provides a convenient means of application for direct food contact machinery and process lubrication applications. The white mineral oil component is colorless (Saybolt +30 Color), odorless and tasteless and surpasses the requirements of FDA and U.S. Pharmacopeia standard for Neutrality, Sulfur Compounds, Solid Paraffins, Readily Carbonizable Substances and Residual Solvents.

**QUALITIES:** Clarion FG White Mineral Oil Spray meets requirements set forth in the U.S. FDA regulation 21 CFR 172.878 for contact with food for human consumption.

Clarion FG White Mineral Oil Spray is registered as 3H, lubricants for direct food contact by NSF International, for use in food plants under the jurisdiction of the USDA. The white mineral oil component meets current standards of the National Formulary (NF).

**APPLICATIONS:** Clarion FG White Mineral Oil Spray can be used as a release agent on grills, pans and other food processing equipment, and as a general lubricant and rust preventative for food processing machinery.

**DANGER:** Extremely flammable aerosol. Please refer to SDS for proper transport, storage and handling. Always check with local jurisdictions for warehouse requirements. Refer to equipment owner's manual for proper lubricant recommendation.

**TYPICAL PROPERTIES:**

**CLARION® FG WHITE MINERAL OIL SPRAY**

Material and Package Code	633595009190
Propellant	Propane and Butane
Flash Point, °C (°F) ASTM D92	188 (370)
Spray Pattern	Fine Stream
Texture	Medium Oil Film
Oil Base	
Specific Gravity @ 60°F ASTM D1298	0.76
Flash Point, °C (°F) ASTM D92	188 (370)
Viscosity ASTM D445	
cSt @ 40°C	22
cSt @ 100°C	4.3
Viscosity Index ASTM D2270	94
NSF Registered	3H
(Registration Number)	152456
Meets FDA 21 CFR 172.878	

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**CLARION® FOOD MACHINERY A/W OILS**

**DESCRIPTION:** Clarion Food Machinery A/W Oils are designed specifically for use as lubricants for food processing equipment. They are formulated with a high purity white mineral oil and additive system for food processing applications. They are available in four ISO viscosity grades. They do not contain any natural products derived from animals, nuts, or genetically modified organisms (GMOs). They are suitable for use where vegetarian and nut free food is prepared.

**QUALITIES:** Clarion Food Machinery A/W Oils meet the requirements of U.S. FDA regulation 21 CFR 178.3570 for incidental food contact and are registered as NSF H1 lubricants, for use in food processing plants under the jurisdiction of the USDA.

Clarion Food Machinery A/W Oils are certified as Kosher (passover) with the Union of Orthodox Jewish Congregations of America (U) and Halal with the Islamic Food and Nutrition Council of America (M).

They are colorless, odorless, tasteless, non-staining lubricants that provide excellent wear, rust, and oxidation protection.

**APPLICATIONS:** Clarion Food Machinery A/W Oils are general purpose lubricants for machinery that processes, packages, or transports food for human consumption.

Clarion Food Machinery A/W Oils are recommended for medium pressure hydraulic systems and circulating systems in food processing, canning and bottling operations. They can also be used in air line lubrication applications.

Clarion Food Machinery A/W 68 and 100 Oil may also be used as gear oils for use in food machinery worm gears, spur gears and valves.

**CLASSIFICATIONS:** **NSF H1 Registered** — Listed in “NSF Registered Proprietary Substances and Nonfood Compounds.” These products are authorized for use under USDA Inspection and Grading Programs.

**NSF/ANSI Standard 60 and 61** — Clarion Food Machinery A/W 32 and A/W 68 Oils are certified under NSF/ANSI Standard 60: Drinking Water Treatment Chemicals—Health Effects and NSF/ANSI Standard 61: Drinking Water System Components—Health Effects. Clarion Food Machinery A/W 32 and A/W 68 Oils may be used in water well pump and other potable water system lubrication applications where lubricants certified to these standards are required or desired.



Certified to  
NSF/ANSI Standard  
60 and 61

Clarion Food Machinery  
A/W 32 and A/W 68 Oils  
(ONLY)

(Continued)



CLARION® FOOD MACHINERY A/W OILS

(Continued)

TYPICAL PROPERTIES:

CLARION® FOOD MACHINERY A/W OILS

ISO Grade	32	46	68	100
Material Code	633541009	633542009	633543009	633544009
Gravity, °API ASTM D4052	31.5	31.4	31.1	29.9
Density, lbs/gallon	7.23	7.23	7.25	7.30
Flash Point, COC, °C (°F) ASTM D92	202 (396)	206 (402)	242 (468)	250 (482)
Pour Point, °C (°F) ASTM D97	-18 (0)	-16 (+3)	-9 (+15)	-7 (+19)
Viscosity ASTM D445				
cSt @ 40°C	32.8	46.7	64.15	100
cSt @ 100°C	5.56	6.96	8.52	11.0
Viscosity Index ASTM D2270	107	105	103	105
Color ASTM D1500	L1.0	L1.0	L1.0	L1.0
Water Separability, mL-mL-mL (min) ASTM D1401				
@ 130°F	40-40-0 (5)	40-40-0 (5)	40-40-0 (10)	–
@ 180°F	–	–	–	40-40-0 (5)
Rust Test ASTM D665A	Pass	Pass	Pass	Pass
Four-Ball Wear, ASTM D4172				
mm @ 20 kg	0.32	0.32	0.32	0.34
mm @ 40 kg	0.40	0.40	0.40	0.42
Vickers Pump Wear, mg ASTM D2882	15	15	15	15
FZG Scuffing Load Capacity ASTM D5182	11	11	>12	>12
ANSI/AGMA 9005-E02	–	–	2EP	3EP
Oxidation Stability, hr ASTM D943	>8000	>8000	>8000	>8000
Tackifier	No	No	No	Yes
Kosher	Ⓢ	Ⓢ	Ⓢ	Ⓢ
Halal	Ⓜ	Ⓜ	Ⓜ	Ⓜ
NSF Registered (Registration Number)	H1 (124625)	H1 (124628)	H1 (124632)	H1 (124620)
NSF/ANSI Standard 60 Certified	✓	–	✓	–
NSF/ANSI Standard 61 Certified	✓	–	✓	–
FDA, 21CFR 178.3570	✓	✓	✓	✓

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**CLARION® FOOD GRADE FR FLUID**

**DESCRIPTION:** Clarion Food Grade FR Fluid is designed for food process applications such as fryers, ovens, cookers, and others where a fire resistant hydraulic fluid is desired. Very high viscosity index, low pour point, and excellent heat transfer properties allow use over a wide range of applications and operating conditions. Note: The water concentration in the fluid must be monitored and adjusted as needed to ensure proper fire resistance properties.

- QUALITIES:**
- Approved by Factory Mutual under Group 1 (HFC) as a less flammable fluid. Approval number 3021353.
  - NSF H1 registered lubricants (formerly USDA H1) for use in food processing plants under the jurisdiction and inspection of the USDA.
  - Demonstrates lower overall system temperatures thereby providing better system performance.
  - Demonstrated lower power consumption resulting in additional energy savings.
  - FDA 21 CFR 178.3570 for incidental food contact (may not exceed 60 ppm).

**APPLICATIONS:** Clarion Food Grade FR Fluid is designed for food process applications such as fryers, ovens, cookers and others where a fire resistant hydraulic fluid is desired.

Very high Viscosity Index, low pour point, and excellent heat transfer properties allow usage over a wide range of applications and operating conditions.

**Note:** The water concentration in the fluid must be monitored and adjusted as needed to ensure proper fire resistance properties.

**TYPICAL PROPERTIES:**

**CLARION® FOOD GRADE FR FLUID**

ISO Grade	46
Commodity Code	632503009
Specific Gravity @ 60°F ASTM D1298	1.06
Density, lbs/gallon	8.84
Color	Water White
Appearance	Slight Haze
Viscosity, cSt @ 40°C ASTM D445	46
Pour Point, °F (°C) ASTM D97	-58 (-50)
Flash Point, COC, °F (°C) ASTM D92	None
Rust Prevention ASTM G31-72 mod.	Pass
Copper Corrosion ASTM D130	1A
pH	8.9
Vane Pump Wear Test, mg wear	<25
Rust Test ASTM D665A	Pass
Bulk Modulus, kPa ASTM D6793	2.189 x 10 <sup>6</sup>
NSF Registered (Registration Number)	H1 (134001)
FDA, 21 CFR 178.3570	✓

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## CLARION® FOOD MACHINERY GEAR OILS



**DESCRIPTION:** Clarion Food Machinery Gear Oils are designed specifically for use in food machinery worm gears, spur gears and valves. They are formulated with a high-purity white mineral oil and additive system for food processing applications. They are available in three ISO viscosity grades. They do not contain any natural products derived from animals, nuts or genetically modified organisms (GMOs). They are suitable for use where vegetarian and nut-free foods are prepared.

**QUALITIES:** Clarion Food Machinery Gear Oils meet the requirements of US Food and Drug Administration (US FDA) regulation 21 CFR 178.3570 for lubricants with the possibility of incidental contact with food for human consumption and are registered as NSF H1 lubricants (formerly USDA H1) for use in food processing plants under the jurisdiction of the US Department of Agriculture (USDA).

Clarion Food Machinery Gear Oils are certified as Kosher (passover) with the Union of Orthodox Jewish Congregations of America (OU) and Halal with the Islamic Food and Nutrition Council of America (IFAN).

They are colorless, odorless, tasteless, non-staining lubricants that provide excellent wear, rust and oxidation protection.

**APPLICATIONS:** Clarion Food Machinery Gear Oils are general purpose lubricants for machinery that processes, packages or transports food for human consumption. These oils are recommended for use in food machinery worm gears, spur gears and valves.

Clarion Food Machinery Gear Oil 150 is recommended for lubrication of rotary can seaming machines equipped with a total loss system, such as those made by Angelus Sanitary Can Seaming Company.

Clarion Food Machinery Gear Oil 220 is certified under NSF/ANSI Standard 60: Drinking Water Treatment Chemicals—Health Effects and NSF/ANSI Standard 61: Drinking Water System Components—Health Effects, and is recommended as a lubricant for water well pump and other potable water system applications where an NSF/ANSI Standard 60 and/or Standard 61 certified product is required or desired.



(Continued)

CLARION® FOOD MACHINERY  
GEAR OILS



(Continued)

**TYPICAL PROPERTIES:**

**CLARION® FOOD MACHINERY GEAR OILS**

ISO Grade	150	220	460
Material Code	633547009	633546009	633548009
Gravity, °API ASTM D4052	30.3	29.3	28.9
Density, lbs/gallon	7.28	7.33	7.35
Flash Point, COC, °C (°F) ASTM D92	238 (460)	240 (464)	242 (468)
Pour Point, °C (°F) ASTM D97	-7 (+19)	-7 (+19)	-7 (+19)
Viscosity ASTM D445			
cSt @ 140°C	148	220	460
cSt at 100°C	15.0	18.8	29.6
Viscosity Index ASTM D2270	105	105	105
Color ASTM D1500	L0.5	L1.0	L1.0
Water Separation @ 180°F, mL-mL-mL (min) ASTM D1401	40-38-2 (10)	40-38-2 (10)	40-39-1 (15)
Rust Test ASTM D665A	Pass	Pass	Pass
Four-Ball Wear ASTM D4172			
Scar, mm @ 20 Kg	0.32	0.34	0.34
Scar, mm @ 40 Kg	0.40	0.44	0.44
FZG Scuffing Load Capacity ASTM D5182	>12	>12	>12
ANSI/AGMA 9005-E02	4EP	5EP	7EP
Oxidation Stability, hrs., ASTM D943	6000+	6000+	6000+
Kosher	U	U	U
Halal	M	M	M
NSF Registered (Registration Number)	H1 (139651)	H1 (124623)	H1 (124630)
NSF/ANSI Standard 60 Certified	-	✓	-
NSF/ANSI Standard 61 Certified	-	✓	-
FDA, 21CFR 178.3570	✓	✓	✓

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CLARION® SYNTHETIC GEAR FLUIDS

**DESCRIPTION:** Clarion Synthetic Gear Fluids provide excellent performance in gear boxes, bearings, blowers, reciprocating compressors and hydraulic systems where an NSF H1 lubricant is required or desired. They provide excellent performance in food and beverage canning machinery. Their exceptional heat resistance and low temperature fluidity make them ideal for high and low temperature applications.

Clarion Synthetic Gear Fluids are formulated with high-purity synthetic fluids and additives for food processing machinery applications. Clarion Synthetic Gear Fluids do not contain any natural products derived from animals, nuts or genetically modified organisms (GMOs). They are suitable for use where vegetarian and nut-free food is prepared.

- QUALITIES:**
- Clarion Synthetic Gear Fluids meet the requirements of US Food and Drug Administration (US FDA) regulation 21 CFR 178.3570 for lubricants with the possibility of incidental contact with food for human consumption and are registered as NSF H1 lubricants for use in food processing plants under the jurisdiction of the US Department of Agriculture (USDA).
  - Clarion Synthetic Gear Fluids are colorless, odorless, tasteless, non-staining lubricants that provide excellent wear, rust and oxidation protection.
  - Provide excellent high temperature stability and low temperature fluidity.
  - Can lower machinery operating temperatures and energy consumption.

- APPLICATIONS:**
- Clarion Synthetic Gear Fluids are highly recommended for applications where low temperature pumpability is required.
  - Clarion Synthetic Gear Fluids ISO 150 and 220 are designed for use in can seamers such as those made by Angelus Sanitary Can Seaming Company. The ISO 150 is recommended for high speed and the ISO 220 for low speed.

**TYPICAL PROPERTIES:**

**CLARION® SYNTHETIC GEAR FLUIDS**

ISO Grade	150	220	320	460
Material Code	632510009	632511009	632512009	632513009
Specific Gravity ASTM D1298	0.8459	0.8490	0.8520	0.8545
Density, lb/gal	7.04	7.07	7.09	7.11
Viscosity ASTM D445				
cSt @ 40°C	159	228	328	456
cSt @ 100°C	20	26	34	44
Viscosity Index ASTM D2270	142	145	148	151
Pour Point, °F (°C) ASTM D97	-54 (-48)	-54 (-48)	-44 (-42)	-44 (-42)
Flash Point, °F (°C) ASTM D92	529 (276)	532 (278)	540 (282)	530 (276)
Rust Test ASTM D665 A/B	Pass	Pass	Pass	Pass
Four-Ball Weld Point, kgf ASTM D2783	160	160	160	160
Four-Ball Load Wear Index, kgf ASTM D2783	50	50	50	50
Four-Ball Wear, mm @40 kg ASTM D4172	0.43	0.35	0.35	0.36
ANSI/AGMA 9005-E02	4EP	5EP	6EP	7EP
FZG Failure Load Stage ASTM D5182	>12	>12	>12	>12
NSF Registered	H1	H1	H1	H1
FDA 21 CFR 178.3570	✓	✓	✓	✓

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**CLARION® COMPRESSORGARD®**

**DESCRIPTION:** Clarion CompressorGard oils are designed for air compressors used in the food service industry. These low-foaming fully synthetic lubricants separate readily from water and offer superior protection against wear, rust and corrosion, and deposits. Available in ISO viscosity grades 32, 46, and 68. Do not contain any natural products derived from animals, nuts, or genetically modified organisms (GMOs). They are suitable for use where vegetarian and nut free food is prepared.

**QUALITIES:** Clarion CompressorGard oils provide outstanding wear, rust and corrosion protection. Their fully synthetic formulations offer excellent oxidation stability and provide long service life. They effectively minimize deposits in the discharge area of rotary screw compressors. Their very low pour point and high temperature stability makes them an ideal choice for a wide temperature range.

Clarion CompressorGard oils are formulated with ingredients to meet incidental food contact applications and comply with U.S. FDA regulation 21 CFR 178.3570. Clarion CompressorGard oils are NSF H1 registered lubricants (formerly USDA H1) for use in food processing plants under the jurisdiction and inspection of the USDA.

**APPLICATIONS:** Clarion CompressorGard oils are recommended for rotary screw and vane compressors in meat and poultry processing plants, bakeries and fruit and vegetable processing plants. They are compatible with seal and gasket materials normally used in hydraulic and compressor systems. Clarion CompressorGard oils are also recommended as a hydraulic fluid where extreme temperatures exist. Clarion CompressorGard 68 provides excellent service in vacuum pump applications.

**TYPICAL PROPERTIES:**

**CLARION® COMPRESSORGARD®**

ISO Viscosity Grade	32	46	68
Material Code	632545009	632541009	632540009
Gravity, °API ASTM D4052	39.4	38.6	37.8
Specific Gravity ASTM D1298	0.828	0.832	0.836
Density, lb/gal, 60/60 °F	6.89	6.93	6.96
Viscosity ASTM D445			
cSt at 40°C	30	44	66
cSt at 100°C	5.7	7.5	10
Viscosity Index ASTM D2270	134	136	135
Flash Point, °F (°C) ASTM D92	471 (244)	491 (255)	536 (280)
Pour Point, °F (°C) ASTM D97	-87 (-66)	-65 (-54)	-65 (-54)
Color ASTM D1500	L1.0	L1.0	L1.0
Cu Corrosion ASTM D130	1A	1B	1A
Rust Test ASTM D665	Pass	Pass	Pass
Four-Ball Wear, mm, 40 kg ASTM D4172	0.35	0.36	0.36
Foam Test ASTM D892			
Sequence I, II, III	Pass	Pass	Pass
Carbon Residue, mg, ASTM D524	0.06	0.06	0.05
FDA 21 CFR 178.3570	✓	✓	✓
NSF Registered	H1	H1	H1

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**CLARION® SYNTHETIC REFRIGERATION FLUID**



**DESCRIPTION:** Clarion Synthetic Refrigeration Fluid is a high performance refrigeration compressor lubricant formulated to provide outstanding thermal stability and oxidation resistance. It can be used over a wide range of temperatures. Does not contain paraffin wax component to form deposits in expansion valves or capillary area. This product is compatible with petroleum based products. Clarion Synthetic Refrigeration Fluid does not contain any natural products derived from animals, nuts or genetically modified organisms (GMOs). They are suitable for use where vegetarian and nut free food is prepared.

- QUALITIES:** Clarion Synthetic Refrigeration Fluid offer outstanding thermal and oxidation stability compared to mineral oils and offers:
- Outstanding low temperature performance.
  - Compatibility with most paints and elastomers used in refrigeration systems.
  - NSF H1 registered for use in food processing plants under the jurisdiction and inspection of the USDA.
  - Compliance with US FDA regulation 21 CFR 178.3570 for lubricants with the possibility of incidental food contact.

**APPLICATIONS:** Clarion Synthetic Refrigeration Fluid is recommended for use with many refrigerants, including ammonia, carbon dioxide, Chlorofluorocarbons (CFC) such as R-12 and Hydrochlorofluorocarbons (HCFC) such as R-22 and mixtures such as R-501.

This product is not recommended for use with Hydrofluorocarbons (HFC) such R-134A.

Clarion Synthetic Refrigeration Fluid ISO is designed for use in rotary screw compressors.

**TYPICAL PROPERTIES:**

**CLARION® SYNTHETIC REFRIGERATION FLUID**

<b>ISO Grade</b>	<b>68</b>
Material Code	632552009
Specific Gravity, 60/60°F ASTM D1298	0.835
Density, lb/gal	6.95
Viscosity, ASTM D445,	
cSt @ 40°C	66
cSt @ 100°C	10
cSt @ -20°C	3,380
cSt @ -40°C	39,000
Viscosity Index ASTM D2270	137
Flash Point, °F (°C) ASTM D92	510 (266)
Pour Point, °F (°C) ASTM D97	-54 (-48)
NSF Registered	H1
FDA 21 CFR 178.3570	✓

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## CLARION® SYNBAR® FLUID 22

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**DESCRIPTION:** Clarion SynBar Fluid 22 is formulated using premium polyalphaolefin synthetic fluids and additives to perform in mechanical seals where superior lubrication and cooling properties are a must to promote seal longevity. The enhanced additive system is designed to promote the natural properties of the polyalphaolefin base fluid and meet the special requirements for mechanical seals.

**QUALITIES:** Clarion SynBar Fluid 22:

- Is formulated to minimize system impurities and reduce catalyst poisoning.
- Has excellent low temperature fluidity and high temperature stability to cover a wide service temperature range.
- Is compatible with commonly used seal materials.
- Is formulated with additives and base stocks to meet incidental food contact applications and meets U.S. FDA regulation 21 CFR 178.3570 requirements.
- Is registered as an incidental contact NSF H1 lubricant for use in food processing plants under the jurisdiction of the USDA.

**APPLICATIONS:** Clarion SynBar Fluid 22 is designed for use in both pressurized and non-pressurized dual mechanical seals manufactured by companies such as John Crane, FlowServe, and others, where a superior buffer/barrier fluid is required.

Clarion SynBar Fluid 22 is recommended for use in mechanical seals found in chemical/hydrocarbon processing, food processing, gas compression, fluid pumps, etc., where a fluid with its unique properties are called for.

Clarion SynBar 22 can be used in low temperature hydraulic systems as a replacement for Mil-H-5606 fluids in non-aviation applications.

(Continued)



CLARION® SYNBAR® FLUID 22

(Continued)

**TYPICAL PROPERTIES:**

**CLARION® SYNBAR® FLUID 22**

<b>Grade</b>	<b>22</b>
Material Code	632507009
API Gravity, °API ASTM D287	41.4
Specific Gravity ASTM D1298	0.8184
Density, lbs/gal	6.814
Viscosity ASTM D445	
cSt at 40°C	18.6
cSt at 100°C	4.14
Copper Corrosion ASTM D130	1A
Flash Point, °F (°C) ASTM D92	432 (222)
Fire Point, °F (°C) ASTM D92	489 (254)
Pour Point, °F (°C) ASTM D97	-86 (-66)
Rust Test ASTM D665 A/B	Pass
Foam Test ASTM D892, Sequence I, II, III	Pass
Brookfield, Viscosity, cP at -40°C ASTM D2983	2700
Dielectric Strength, kV ASTM D877	35
Four-Ball Wear, mm @40 ASTM D4172	0.35
NSF Registered	H1
FDA 21 CFR 178.3570	✓

## CLARION® FOOD MACHINERY HT EP GREASES

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**DESCRIPTION:** Clarion Food Machinery HT EP Greases are high temperature, extreme pressure (EP), water resistant greases in NLGI No. 1 and 2 grades. They are NSF registered H1 lubricants for incidental food contact for use in food plants under the jurisdiction of the U.S.D.A. They meet the requirements of U.S. FDA regulation 21 CFR 178.3570 for lubricants having incidental contact with food. Clarion Food Machinery HT EP NLGI No. 2 Grease is certified under NSF/ANSI Standard 60: Drinking Water Treatment Chemicals—Health Effects and NSF/ANSI Standard 61: Drinking Water System Components—Health Effects.

- QUALITIES:**
- Superior Extreme Pressure (EP) and antiwear performance
  - Excellent rust protection
  - High dropping point and oxidation inhibited for high temperature use
  - Excellent adhesion for sealing and water washout resistance
  - NSF H1 Registered
  - Certified to NSF/ANSI Standard 60 and Standard 61—Clarion Food Machinery HT EP NLGI No. 2 (Only)

**APPLICATIONS:** Clarion Food Machinery HT EP Greases may be used with food processing and packaging machinery where there is a possibility of incidental contact with food. Clarion Food Machinery HT EP Grease, No. 1 has excellent pumpability, making it ideal for use in centralized lubrication systems such as those used with beverage bottle fillers.

Clarion Food Machinery HT EP NLGI No. 2 Grease may be used to lubricate water well pump and other potable water system applications where lubricants certified to NSF/ANSI Standard 60 and/or Standard 61 are required or desired.



(Continued)

CLARION® FOOD MACHINERY  
HT EP GREASES



(Continued)

**TYPICAL PROPERTIES:**

**CLARION® FOOD MACHINERY HT EP GREASES**

NLGI No.	1	2
Material Code	655701009	655700009
Thickener Type	Aluminum Complex	Aluminum Complex
Texture	Smooth, Tacky	Smooth, Tacky
Color, Observed	White to Off-White	White to Off-White
Worked Penetration, ASTM D217	310-340	265-295
Dropping Point, ASTM D566, °F (°C)	450 (232) Min.	500 (260) Min.
Wheel Bearing Leakage, ASTM D1263, % loss	N/A	4.5
Water Washout, ASTM D1264, % loss	N/A	7.7 @ 175°F
Water Spray Resistance, ASTM D4049, % loss	N/A	9.2
Rust Prevention, ASTM D1743, rating	Pass	Pass
Copper Corrosion, ASTM D4048, rating	1a	1a
Oil Separation, ASTM D1742, % loss	2.0	2.0
Timken Test, ASTM D2509, OK load, lbs	40	40
Four-Ball Wear, ASTM D2266, mm	0.55	0.55
Four-Ball EP Weld, ASTM D2596, kgf	400	400
Four-Ball Load Wear Index, ASTM D2596, kgf	55	55
Approximate Temperature Range, °F (°C)	10 to 325 (-12 to 163)	10 to 325 (-12 to 163)
NSF Registered (Registration Number)	H1 (142230)	H1 (124605)
NSF/ANSI Standard 60 Certified	—	✓
NSF/ANSI Standard 61 Certified	—	✓
FDA, 21 CFR 178.3570	✓	✓
<b>Characteristics of Oil Plus Oil Soluble Additives:</b>		
Viscosity ASTM D445		
cSt @ 40°C	581	581
cSt @ 100°C	65.8	65.8
Viscosity Index ASTM D2270	188	188

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## CLARION® FM CS EP 2 GREASE

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**DESCRIPTION:** Clarion FM CS EP 2 grease provides effective lubrication of machinery used to manufacture, process, package and store food products. Clarion FM CS EP 2 grease is NSF H1 registered and meets FDA 21 CFR 178.3570 requirements for incidental food contact lubricants.

- QUALITIES:** Clarion FM CS EP 2 grease offers:
- Excellent water washout and spray off resistance
  - Enhanced rust and corrosion resistance
  - Excellent wear protection
  - Outstanding high temperature properties

- APPLICATIONS:** Clarion FM CS EP 2 grease is recommended where an NSF H1 incidental contact grease lubricant is required. Typical applications include:
- Pellet mills
  - Fish, poultry, pork, beef processing plants
  - Canneries and bottling facilities
  - Ice cream production, cheese production, dairies
  - Breweries and wineries
  - Fruit and vegetable agriculture and processing applications

**CLASSIFICATIONS:** **NSF H1 Registered** — Listed in “NSF Registered Proprietary Substances and Nonfood Compounds.”



Nonfood Compounds  
Program Listed H1  
Registration No. 149593

(Continued)



CLARION® FM CS EP 2 GREASE

(Continued)

**TYPICAL PROPERTIES:**

**CLARION® FM CS EP 2 GREASE**

<b>NLGI No.</b>	<b>2</b>
Material Code	655732009
Thickener Type	Calcium Sulfonate Complex
Texture	Smooth
Color, Observed	White
Worked Penetration, ASTM D217	265-295
Dropping Point, ASTM D2265, °F (°C)	550 (288)
Oxidation Stability, ASTM D942, psi	<1
Water Washout, ASTM D1264, % loss	<1
Water Spray Resistance, ASTM D4049, % loss	22
Rust Prevention, ASTM D1743, rating	Pass
Copper Corrosion, ASTM D4048, rating	1b
Oil Separation, ASTM D1742, % loss	<0.5
Four-Ball Wear, ASTM D2266, mm scar	0.50
Four-Ball EP Weld, ASTM D2596, kgf	400
Four-Ball Load Wear Index, ASTM D2596	50
NSF Registered (Registration Number)	H1 (149593)
FDA, 21 CFR 178.3570	✓
<b>Characteristics of Oil Plus Oil Soluble Additives:</b>	
Viscosity, ASTM D445, cSt at 100°C	19.5
ASTM D445, cSt at 40°C	220
Viscosity Index	100

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CLARION® PM HI-TEMP  
FOOD MACHINERY 100 GREASES



**DESCRIPTION:** Clarion PM Hi-Temp Food Machinery 100 Greases are specifically blended for grease lubrication of machinery used in the food industry. They are high temperature, extreme pressure (EP) and water resistant greases. These NSF H1 registered greases are compliant with FDA 21 CFR 178.3570 and are suitable for incidental food contact.

- QUALITIES:**
- Superior Four-Ball EP and anti-wear
  - Excellent rust protection
  - High dropping point and oxidation inhibited for high temperature use
  - Excellent sealing properties and resistance to water washout
  - NSF H1 Registered

**APPLICATIONS:** Clarion PM Hi-Temp Food Machinery 100 Greases are suitable for rolling element and plain bearings and work in automatic and centralized lubrication systems. They are highly recommended for lubrication of animal feed pellet mills. These greases provide excellent water resistance and effective resistance to corrosion even in the presence of water.

**TYPICAL PROPERTIES:**

CLARION® PM HI-TEMP FOOD MACHINERY 100 GREASES

NLGI No.	1	2
Material Code	655721009	655722009
Thickener Type	Aluminum Complex	Aluminum Complex
Texture	Smooth, Tacky	Smooth, Tacky
Color, Observed	White to Off-White	White to Off-White
Worked Penetration, ASTM D217	310-340	265-295
Dropping Point, ASTM D566, °F (°C)	450	500
Rust Prevention, ASTM D1743, rating	Pass	Pass
Copper Corrosion, ASTM D4048, rating	1a	1a
Four-Ball Wear, ASTM D2266, mm	0.48	0.48
Four-Ball EP Weld, ASTM D2596, kgf	400	400
Modified Stability Test	6% Change	6% Change
NSF Registered (Registration Number)	H1 (144584)	H1 (144585)

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## CLARION® FOOD MACHINERY GREASE, NO. 2

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**DESCRIPTION:** Clarion Food Machinery Grease, No. 2 effectively lubricates most machinery used to manufacture, process, package and store food and beverage products. The approximate temperature range of this NLGI No. 2 grease is 0 to 275°F (-18 to +135°C). Clarion Food Machinery Grease, No. 2 is very resistant to water washout and is water insoluble. The texture is smooth, buttery, adhesive, and has a neutral mild petroleum odor and the color is clear with a slight cloud. The grease is non-staining.

**QUALITIES:** Neutral mild petroleum odor, nonstaining and nonpigmented. Mineral oil used to make this grease is Food Grade White Mineral Oil and meets FDA 21 CFR 172.878 and 178.3620(a). Very resistant to water washout and water insoluble. Finished product meets FDA 21 CFR 178.3570 "Lubricants with incidental food contact."

**APPLICATIONS:** Food processing and packaging machinery where there is a possibility of incidental food contact.  
Lubrication of water well pumps and water system machinery where an NSF/ANSI Standard 60 and/or Standard 61 certified lubricant is required or desired.

**CLASSIFICATIONS:** **Certified to NSF/ANSI Standard 60: Drinking Water Treatment Chemicals—Health Effects and NSF/ANSI Standard 61: Drinking Water System Components—Health Effects**

**NSF H1 Registered** — Listed in "NSF Registered Proprietary Substances and Nonfood Compounds." Authorized for use under USDA Inspection and Grading Programs.



Certified to  
NSF/ANSI Standard  
60 and 61

(Continued)

CLARION® FOOD MACHINERY  
GREASE, NO. 2



(Continued)

**TYPICAL PROPERTIES:**

**CLARION® FOOD MACHINERY GREASE, NO. 2**

<b>NLGI Consistency Number</b>	<b>2</b>
Material Code	655699009
Thickener Type	Anhydrous Calcium Soap
Texture	Smooth, Buttery, Adhesive
Fillers	None
Color, Observed	Clear with Slight Cloud (May have slight yellow cast after storage)
Worked Penetration, ASTM D217	265-295
Dropping Point, ASTM D566, °F (°C)	290 (143)
Water Washout, ASTM D1264, % loss at 100°F	2.4
Oil Separation, ASTM D1742, % loss	3.6
Approximate Application Temperature Range, °F (°C)	0 to 275 (-18 to 135)
NSF Registered (Registration Number)	H1 (124598)
NSF/ANSI Standard 60 Certified	✓
NSF/ANSI Standard 61 Certified	✓
FDA, 21 CFR 178.3570	✓
Oil and Oil Soluble Polymer:	
Viscosity @ 40°C (cSt)	92.1
Viscosity @ 100°C (cSt)	16.8
Viscosity Index	199

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**CLARION® CHAIN AND TROLLEY LUBE**

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**DESCRIPTION:** Clarion Chain and Trolley Lube is designed to effectively lubricate chains and trolleys used to manufacture, process, package, and store food products. It is not suitable for high temperature applications.

As a chain lube, it is suitable in lubricating chains and conveyors on food processing machinery. It has excellent tackiness, which makes it highly resistant to water wash-off, thus reducing the frequency of re-lubrication. It can be applied by brush on, drip feed, or centralized lubrication systems. As a trolley lube, it is suitable for lubricating the hooks and trolley systems in meat processing facilities and provides outstanding lubrication even under heavy loads. It reduces sluggish bearings or sticking trolleys. Clarion Chain and Trolley Lube is additized to inhibit corrosion, oxidation, and wear. Clarion Chain and Trolley Lube remains fluid in most low temperature applications and ensures lubrication of equipment in chilled areas. It is low odor and non-staining. Clean up is quick and easy in case of incidental contact.

**QUALITIES:** Neutral mild petroleum odor, non-staining and non-pigmented. Mineral oil base is high purity white mineral oil in accordance with FDA 21 CFR 172.878 and FDA 178.3620(a). Very resistant to water washout and water insoluble. Finished product is in accordance with FDA 21 CFR 178.3570 “Lubricants with incidental food contact.” NSF H1 registered (143464).

**APPLICATIONS:** Food processing and packaging machinery where there is a possibility of incidental contact.

**TYPICAL PROPERTIES:**

**CLARION® CHAIN AND TROLLEY LUBE**

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<b>NLGI Consistency Grade</b>	<b>(approximate) 0000</b>
Material Code	655695009
Thickener Type	Anhydrous Calcium Soap
Texture	Smooth, Buttery
Water or Fillers	None
Color, Observed	Clear with Slight Cloud
Stormer Viscosity, KU ASTM D562	81-85
Four-Ball Wear, mm ASTM D2266	0.40

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CLARION® FM SPRAY GREASE

**DESCRIPTION:** Clarion FM Spray Grease is an NSF H1 grease packaged with propellant in an aerosol container. This provides a convenient means of application for incidental contact grease lubrication applications. Clarion FM Spray Grease is NSF H1 registered and meets FDA 21CFR 178.3570 requirements for incidental food contact lubricants.

- QUALITIES:** Clarion FM Spray Grease offers:
- Excellent resistance to water washout
  - Antiwear and extreme pressure (EP) protection
  - Pressure separation resistance
  - Excellent rust and corrosion protection
  - Very good compatibility with common food grade greases

**APPLICATIONS:** Clarion FM Spray Grease is recommended for use as a general lubricant and rust preventative grease for food processing machinery. Applications include trolley chains (**DO NOT use as an oven chain lubricant**), casters, hinges and sliding mechanisms.

**DANGER:** Extremely flammable aerosol. Please refer to SDS for proper transport, storage and handling. Always check with local jurisdictions for warehouse requirements. Refer to equipment owner’s manual for proper lubricant recommendation.

**TYPICAL PROPERTIES:**

**CLARION® FM SPRAY GREASE**

Material and Package Code	633594009190
Propellant	Propane and Butane
Flash Point, ASTM D92, °C (°F)	188 (370)
Spray Pattern	Fine Stream
Texture	Medium Oil Film
Oil Component	
Specific Gravity, ASTM D	0.76
Viscosity, cSt at 40°C	150
cSt at 100°C	16.5
Viscosity Index	94
NSF Registered	H1
(Registration Number)	152455
Meets FDA 21 CFR 178.3570	

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**CLARION® FM SILICONE SPRAY**

**DESCRIPTION:** Clarion FM Silicone Spray provides is a fast drying aerosol spray that provides long lasting dry film lubrication. Clarion FM Silicone Spray is NSF H-1 registered and meets FDA 21CFR 178.3570 requirements for incidental food contact lubricants.

- QUALITIES:**
- Convenient aerosol spray application
  - High quality silicone fluid content
  - Rapid drying time
  - Long lasting dry lubricant film
  - When dry will not attract particulates such as dirt, dust, fibers, etc.

**APPLICATIONS:** Clarion FM Silicone Spray can be used in food and beverage manufacturing facilities as an incidental food contact dry film lubricant in applications such as:

- Levers, hinges and sliding mechanisms
- Fork lift tines when unloading slip sheets
- Zippers, snaps
- Packaging machinery
- Leather, vinyl and rubber protectant

**DANGER:** Extremely flammable aerosol. Please refer to SDS for proper transport, storage and handling. Always check with local jurisdictions for warehouse requirements. Refer to equipment owner’s manual for proper lubricant recommendation.

**TYPICAL PROPERTIES:**

**CLARION® FM SILICONE SPRAY**

Material and Package Code	633593009189
Propellant	Propane and Butane
Silicone Fluid Component, typical	
Flash Point, °C (°F) ASTM D92	620 (326)
Pour Point, °C (°F) ASTM D97	-65 (-85)
Viscosity, cSt at 40°C ASTM D445	266
Specific Gravity at 60°F ASTM D1298	0.977
Spray Pattern	Fine Mist
Texture	Evaporating Mist
Appearance	Clear
Consistency	Light
NSF Registered	H1
(Registration Number)	152457
Meets FDA 21 CFR 178.3570	

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CLARION® GREEN BIO

Environmental Products

Environmental Products

**DESCRIPTION:** Clarion Green BIO are a series of readily biodegradable anti-wear hydraulic fluids formulated with premium high oleic natural esters derived from renewable resources and zinc free ashless additives to provide protection for demanding hydraulic systems, especially those operating in environmentally sensitive areas.

Clarion Green BIO hydraulic fluids are zinc free. Zinc compounds are regulated as priority pollutants under provisions of the Clean Water Act and SARA Title 313.

- BENEFITS:**
- Meets EPA Vessel General Permit (December 2013) requirements for Environmentally Acceptable Lubricants (EAL)
  - Readily biodegradable
  - Non-toxic in acute aquatic toxicity test (LC-50)
  - Zinc free ashless formulation
  - Provide outstanding rust and corrosion protection.
  - Contain inhibitors to minimize foaming and air entrainment.
  - Provide premium anti-wear protection to pumps, motors and other hydraulic components
  - Meets Eaton (formerly Vickers) M-2950-S, I-286-S

**APPLICATIONS:** Clarion Green BIO hydraulic fluids offer anti-wear protection to vane, piston and gear pumps, motors, valves and other hydraulic circuit components when used in accordance with the manufacturer's recommendations. Recommended for hydraulic system applications operating in environmentally sensitive areas where the use of a zinc free, ashless, low aquatic toxicity readily biodegradable fluid is desired such as:

- Marine — Marine Vessels, Offshore and Inshore Rigs, Tugs, Dredges, Dock Equipment, Cranes, Pile-Drivers, Marine Construction Equipment
- Forestry — Scalpers, Excavators, Wheel Loaders
- Construction & Mining — Bulldozers, Graders, Backhoes, Conveyors, Crawlers, Hole Drillers
- Oil & Gas Exploration – Oil and Gas Drilling Rigs

Fluid monitoring through Lubealert CPM Oil Analysis is recommended to maximize the service life of Clarion Green BIO hydraulic fluids. Moisture content should be maintained at less than 500 ppm.

- ZINC FREE
- READILY BIODEGRADABLE
- MEETS 2013 EPA VGP REQUIREMENTS
- NON-TOXIC PER LC-50 AQUATIC TOXICITY TEST

(Continued)



CLARION® GREEN BIO

(Continued)

TYPICAL PROPERTIES:

CLARION® GREEN BIO

ISO VIS Grade	32	46	68
Material Code	633580009	633581009	633582009
Gravity, °API ASTM D4052	27.17	23.6	21.52
Flash Point, (COC) °C (°F) ASTM D92	200 (392)	212 (413)	256 (492)
Viscosity ASTM D445			
cSt @ 40°C	34	46	69
cSt @ 100°C	8.1	10.2	13.4
Viscosity Index, ASTM D2270	223	218	200
Pour Point, °C (°F) ASTM D97	-36 (-33)	-30 (-22)	-33 (-27)
Color, ASTM D1500	L0.5	L1.0	L3.0
Copper Corrosion, ASTM D130			
3 hrs @ 100°C	1B	1B	1B
Rust Test, ASTM D665A	Pass	Pass	Pass
Four Ball Wear ASTM D4172			
@ 40 kg, mm	0.31	0.31	0.33
Foam Test ASTM D892			
Seq. I, ml	0-0	0-0	0-0
Seq. II, ml	20-0	20-0	20-0
Seq. III, ml	0-0	0-0	0-0
Total Acid Number ASTM D974			
mg KOH/g	0.26	0.29	0.78
Water Separability ASTM D1401			
@ 130°F	40/40/0/30	40/40/0/30	40/40/0/30
Dielectric Strength ASTM D877			
KV, minimum	35	35	35
RPVOT ASTM D2272 minutes	260	205	110
Biodegradability			
OECD 301B, %	>60	>60	>60
Vickers 35VQ 25 Pump	—	Pass	—
Vickers V-104C Pump,			
Total Ring & Vane Loss (mg)	—	1.5	—

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Environmental Products



**CLARION® GREEN SYNTHETIC FLUIDS**

Environmental Products

**DESCRIPTION:** Clarion Green Synthetic Fluids are a series of high performance readily biodegradable anti-wear hydraulic fluids formulated with premium synthetic fluid components and zinc free ashless additives to provide protection for demanding hydraulic systems, especially those operating in environmentally sensitive areas.

Clarion Green Synthetic Fluids are zinc free. Zinc compounds are regulated as priority pollutants under provisions of the Clean Water Act and SARA Title 313.

- BENEFITS:**
- Meets EPA Vessel General Permit (December 2013) requirements for readily Environmentally Acceptable Lubricants (EAL)
  - Readily biodegradable, fully synthetic formulation
  - Non-toxic in acute aquatic toxicity test (LC-50)
  - Zinc free ashless formulation
  - Excellent low temperature performance
  - Provide outstanding rust and corrosion protection
  - Contain inhibitors to minimize foaming and air entrainment
  - Provide premium anti-wear protection to pumps, motors and other hydraulic components

**APPLICATIONS:** Clarion Green Synthetic Fluids offer anti-wear protection to vane, piston and gear pumps, motors, valves and other hydraulic circuit components when used in accordance with the manufacturer's recommendations. Provides excellent fluidity in low temperature applications. Recommended for hydraulic system applications operating in environmentally sensitive areas where the use of a zinc free, ashless, low aquatic toxicity readily biodegradable fluid is desired such as:

- Marine — Marine Vessels, Offshore and Inshore Rigs, Tugs, Dredges, Dock Equipment, Cranes, Pile-Drivers, Marine Construction Equipment, Subsea Equipment
- Forestry — Scalpers, Excavators, Wheel Loaders
- Construction & Mining — Bulldozers, Graders, Backhoes, Conveyors, Crawlers, Hole Drillers
- Oil & Gas Exploration – Oil and Gas Drilling Rigs

Fluid monitoring through LubeAlert® CPM Oil Analysis is recommended to maximize the service life of Clarion Green Synthetic Fluids. Moisture content should be maintained at less than 500 ppm.

- ZINC FREE
- READILY BIODEGRADABLE
- MEETS 2013 EPA VGP REQUIREMENTS
- NON-TOXIC PER LC-50 AQUATIC TOXICITY TEST

(Continued)



CLARION® GREEN SYNTHETIC FLUIDS

(Continued)

TYPICAL PROPERTIES:

CLARION® GREEN SYNTHETIC FLUIDS

ISO VIS Grade	22	32	46	68
Material Code	633585009	633586009	633587009	633588009
Gravity °API ASTM D4052	34.3	32.4	29.7	26.1
Flash Point (COC) °C (°F) ASTM D92	180 (356)	180 (356)	180 (356)	190 (374)
Viscosity ASTM D445				
@ 40°C	22.8	31.1	45.8	69.1
@ 100°C	5.4	6.6	8.8	12.0
Viscosity Index ASTM D2270	188	178	188	172
Pour Point °C (°F) ASTM D97	-57 (-70)	-57 (-70)	-57 (-70)	-54 (-65)
Color ASTM D1500	L1.5	L1.5	L1.5	L1.5
Foam Test ASTM D892				
Seq. I, ml	10-0	10-0	5-0	0-0
Seq. II, ml	25-0	30-0	30-0	40-0
Seq. III, ml	15-0	10-0	5-0	15-0
Water Separability at 130°F ASTM D1401	40/40/0/15	40/40/0/20	40/40/0/15	40/40/0/20
Dielectric Strength, kV, minimum ASTM D877	35	35	35	35
Total Acid No. mg KOH/g ASTM D664	0.1	0.1	0.1	0.1
RPVOT minutes ASTM D2272	1140	1050	850	780
Biodegradability % ASTM D7373	>60	>60	>60	>60

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Environmental Products



CLARION® GREEN A/W OILS

Environmental Products

**DESCRIPTION:** Clarion Green A/W Oils are high-performance, ashless, zinc free, anti-wear hydraulic oils, designed for use in the pumps and gears of high-pressure hydraulic equipment operating in environmentally sensitive areas.

**QUALITIES:** Clarion Green A/W Oils are inherently biodegradable and will pass the U.S. Coast Guard static sheen test requirements. They are non-toxic to aquatic life, exceeding U.S. EPA LC<sub>50</sub> test requirements for mysid shrimp, rainbow trout and fathead minnow.

Clarion Green A/W Oils have excellent thermal and oxidative stability, and are compatible with other premium mineral oil-based lubricants.

These oils are formulated with a state-of-the-art, ashless additive package that provides excellent wear protection for pump components, excellent rust and corrosion protection, hydrolytic stability and longer service life. Meets or exceeds ANSI/AGMA 9005-E02 requirements for antiscuff/antiwear (EP) oils. They are easily recycled.

**APPLICATIONS:** Clarion Green A/W Oils are recommended for high-pressure, high-temperature, vane, piston and gear-type hydraulic pumps operating in environmentally sensitive areas such as hydraulic lifts and cranes on off shore drilling and production platforms.

They are used in scalpers, excavators and wheel loaders in the forestry industry and in dredges, kelp-cutters and pile drivers in the marine industry.

**TYPICAL PROPERTIES:**

CLARION® GREEN A/W OILS

ISO VIS Grade	32	46	68
Material Code	633551009	633552009	633553009
Gravity, °API ASTM D4052	32.5	32.3	31.6
Flash Point (COC), °F (°C) ASTM D92	400 (204)	402 (206)	468 (242)
Pour Point, °F (°C) ASTM D97	0 (-18)	3 (-16)	15 (-9)
Viscosity ASTM D445			
cSt @ 40°C	33.1	46.7	64.2
cSt @ 100°C	5.6	7.2	9.3
Viscosity Index, ASTM D2270	106	104	102
Water Separability, mL-mL-mL(min) ASTM D1401 @ 130°F	40-40-0(5)	40-40-0(5)	40-40-0(5)
Four Ball Wear, mm D4172			
20kg	0.46	0.43	0.42
40kg	0.56	0.55	0.55
Rust Prevention ASTM D665 A/B	Pass	Pass	Pass
Copper Corrosion			
3 hr @ 100°C ASTM D130	1A	1A	1A
FZG Scuffing Load Capacity			
ASTM D5182	11	11	>12
Oxidation Stability, hr ASTM D943	>8,000	>8,000	>8,000

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CLARION® GREEN SYNTHETIC  
GEAR FLUIDS



**DESCRIPTION:** Clarion Green Synthetic Gear Fluids are high performance readily biodegradable extreme pressure gear lubricants. Formulated with premium synthetic fluid components and ashless additives, Clarion Green Synthetic Gear Fluids meet environmental compliance requirements while providing protection for heavily loaded machinery operating in environmentally sensitive areas.

**Clarion Green Synthetic Gear Fluids meet EPA Coast Guard Vessel General Permit (December 2013) requirements for Environmentally Acceptable Lubricants (EAL).**

- BENEFITS:**
- Readily biodegradable, fully synthetic formulation
  - Non-toxic in acute aquatic toxicity test (LC-50)
  - Zinc free ashless formulation. Zinc compounds are regulated as priority pollutants under provisions of the Clean Water Act and SARA Title 313.
  - Excellent low temperature performance
  - Outstanding rust and corrosion protection
  - Contain inhibitors to minimize foaming and air entrainment
  - Premium extreme pressure (EP) protection for heavily loaded industrial gears and plain or roller element bearings.

**APPLICATIONS:** Clarion Green Synthetic Gear Fluids are recommended for lubrication of industrial gear, plain or roller element bearing applications. Excellent for use in environmentally sensitive areas where the use of a zinc free, ashless, low aquatic toxicity readily biodegradable lubricant meeting EPA Vessel General Permit (December 2013) requirements for Environmentally Acceptable Lubricants (EAL) is desired.

Uses include:

- Marine — Marine Vessels, Offshore and Inshore Rigs, Tugs, Dredges, Dock Equipment, Cranes, Pile-Drivers, Marine Construction Equipment, Subsea Equipment
- Forestry — Scalpers, Excavators, Wheel Loaders
- Oil & Gas Exploration – Oil and Gas Drilling Rigs

Fluid monitoring through LubeAlert® Oil Analysis is recommended to maximize the service life of Clarion Green Synthetic Gear Fluids. Moisture content should be maintained at less than 500 ppm.

- MEETS EPA 2013 VGP EAL REQUIREMENTS
- READILY BIODEGRADABLE 
- NON-TOXIC PER LC-50 AQUATIC TOXICITY TEST
- EXTREME PRESSURE (EP) RATED
- ZINC FREE

(Continued)

CLARION® GREEN SYNTHETIC  
GEAR FLUIDS



(Continued)

**TYPICAL PROPERTIES:**

**CLARION® GREEN SYNTHETIC GEAR FLUIDS**

	<b>150</b>	<b>220</b>	<b>320</b>
<b>ISO Viscosity Grade</b>	<b>150</b>	<b>220</b>	<b>320</b>
<b>AGMA Grade</b>	<b>4EP</b>	<b>5EP</b>	<b>6EP</b>
Material Code	633589009	633590009	633591009
Gravity, °API ASTM D4052	22.1	18.92	16.42
Flash Point, (COC) °C (°F) ASTM D92	220 (428)	225 (437)	227 (440)
Pour Point, °C (°F) ASTM D97	-45 (-49)	-42 (-44)	-36 (-33)
Viscosity ASTM D445			
cSt @ 40°C	150	220	320
cSt @ 100°C	21.4	28.2	37.2
Viscosity Index, ASTM D2270	164	165	165
Color, ASTM D1500	L2.0	L2.0	L2.0
Foam Test ASTM D892			
Seq. I, mL-mL	0-0	0-0	10-0
Seq. II, mL-mL	0-0	20-0	15-0
Seq. III, mL-mL	0-0	0-0	0-0
Water Separability@ 180°F, mL/mL/mL/min ASTM D1401	>40/40/0/30	>40/38/0/30	>40/38/0/30
Copper Corrosion, 3 hours @ 100°C, ASTM D130	1A	1A	1A
Rust Test, ASTM D665 A/B	Pass	Pass	Pass
RPVOT, minutes ASTM D2272	150	144	121
Four Ball Wear, mm ASTM D4172			
20 Kg	0.43	0.43	0.43
40 Kg	0.55	0.55	0.54
Four Ball Weld Point, Kgf ASTM D2783	315	315	500
Biodegradability, % ASTM D7373	>60	>60	>60

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CLARION® GREEN GEAR LUBES

**DESCRIPTION:** Clarion Green Gear Lubes are high-performance gear lubes, designed for use in the gears of equipment operating in environmentally sensitive areas.

**QUALITIES:** Clarion Green Gear Lubes are inherently biodegradable and will pass the U.S. Coast Guard static sheen test requirements. They are non-toxic to aquatic life, exceeding U.S. EPA LC<sub>50</sub> test requirements for mysid shrimp, rainbow trout, and fathead minnow.

Clarion Green Gear Lubes have excellent thermal and oxidative stability, and are compatible with other premium mineral oil-based lubricants.

They are formulated with a state-of-the-art, ashless additive package that provides excellent anti-wear protection, ensures optimum rust and corrosion protection, hydrolytic stability and longer service life, and are easily recycled.

**APPLICATIONS:** Clarion Green Gear Lubes are recommended for enclosed or open helical, herringbone, straight, spiral bevel, spur gears and bearings operating in environmentally sensitive areas such as off-shore drilling and production platforms.

**TYPICAL PROPERTIES:**

CLARION® GREEN GEAR LUBES

ISO VIS Grade	220	320	460
Material Code	633558009	633556009	633554009
Gravity, °API ASTM D4052	29.3	28.8	28.4
Flash Point, COC, °F ASTM D92	464	468	468
Pour Point, °F (°C) ASTM D97	19 (-7)	19 (-7)	19 (-7)
Viscosity ASTM D445			
cSt at 40°C	200	315	460
cSt at 100°C	18.8	24.3	30.6
Viscosity Index, ASTM D2270	100	98	96
Water Separation @ 180°F, mL-mL-mL (min) ASTM D1401	40-38-2(10)	40-38-2(20)	40-37-3(10)
Four Ball Wear, mm ASTM D4172			
mm @ 20kg	0.34	0.34	0.34
mm @ 40kg	0.44	0.44	0.44
FZG Scuffing Load Capacity			
ASTM D5182	>12	>12	>12
ANSI/AGMA 9005-E02	5EP	6EP	7EP

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**CLARION® CLARIPAC OIL 90**

**DESCRIPTION:** Clarion ClariPac Oil 90 is refined by high pressure hydrotreating to produce a technical grade white mineral oil of the highest quality, and is stabilized with Vitamin E.

**QUALITIES:** Clarion ClariPac Oil 90 exceeds the requirements of U.S. FDA regulation 21 CFR 178.3620 (b), for use as a component of non-food articles in contact with food for human consumption, and is registered as an NSF H1 lubricant for incidental food contact, for use in food plants under the jurisdiction of the USDA.

**APPLICATIONS:** Clarion ClariPac Oil 90 is recommended for use as a lubricant for drawing, stamping, forming and rolling of aluminum foil used in food packaging, as a defoamer in the manufacture of paper and adhesives intended for food packaging, and as a lubricant for textile fibers/fabric used to process food.

Clarion ClariPac Oil 90 can be used as a plasticizer for rubber used on conveyor belts, hoses, rollers, and as a lubricant cleaner and rust preventive for machinery and other equipment in food processing plants. Can also be used as a base oil for the formulation of gel candles.

**TYPICAL PROPERTIES:**

**CLARION® CLARIPAC OIL 90**

Material Code	633532009
Gravity, ASTM D4052, °API	33.4
Density, lbs/gallon	7.14
Flash Point, °C (°F) ASTM D92	190 (374)
Pour Point, °C (°F) ASTM D97	-27 (-17)
Viscosity ASTM D445	
cSt @ 40°C	16.0
cSt @ 100°C	3.47
SUS @ 100°F	87
Color, Saybolt, ASTM D156	+20
FDA 21 CFR 178.3620 (b)	✓
NSF	H1

**Note:** Claripac Oil 90 is colorless (Saybolt +20 Color), odorless and tasteless and surpasses requirements of FDA for Technical Grade White Mineral Oil (21 CFR 178.3620[b]).

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## COMPARATIVE VISCOSITY CLASSIFICATIONS

### ISO Viscosity Grade

	22	32	46	68	100	150	220	320	460
Vis. @ 40 °C									
Min. cSt	19.8	28.8	41.4	61.2	90	135	198	288	414
Max. cSt	24.2	35.2	50.6	74.8	110	165	242	352	506
Vis. @ 100 °F				No Requirement*					
Min. SUS	96	135	191	280	410	615	900	1310	1880
Max. SUS	115	164	234	345	500	750	1110	1600	2300
Min. cSt	4.0	4.97	6.22	7.96	10.30	13.56	17.50	22.40	28.30
Max. cSt	4.5	5.61	7.05	9.09	11.82	15.51	19.96	25.50	32.30

### AGMA Lubricant Number

	1	2	3	4	5	6	7
Vis. @ 40 °C							
Min. cSt	41.1	61.2	90	135	198	288	414
Max. cSt	50.6	74.8	110	165	242	352	506
Vis. @ 100 °F			No Requirement*				
Min. SUS	193	284	417	626	918	1335	1919
Max. SUS	235	347	510	765	1122	1632	2346
Vis. @ 100 °C			No Requirement*				
Min. cSt	6.22	7.96	10.30	13.56	17.50	22.40	28.30
Max. cSt	7.05	9.09	11.82	15.51	19.96	25.50	32.30

\*Viscosities given are not required; however, for "informational purposes," viscosities listed are calculated assuming an oil with V.I. of 95.

### NLGI GREASE CLASSIFICATIONS

The following table shows the worked penetration values for the various NLGI grades of grease.

<u>NLGI Number</u>	<u>ASTM Worked Penetration at 77°F ±1° (25°C ±0.5°)</u>
000	445-475
00	400-430
0	355-385
1	310-340
2	265-295
3	220-250
4	175-205
5	130-160
6	85-115

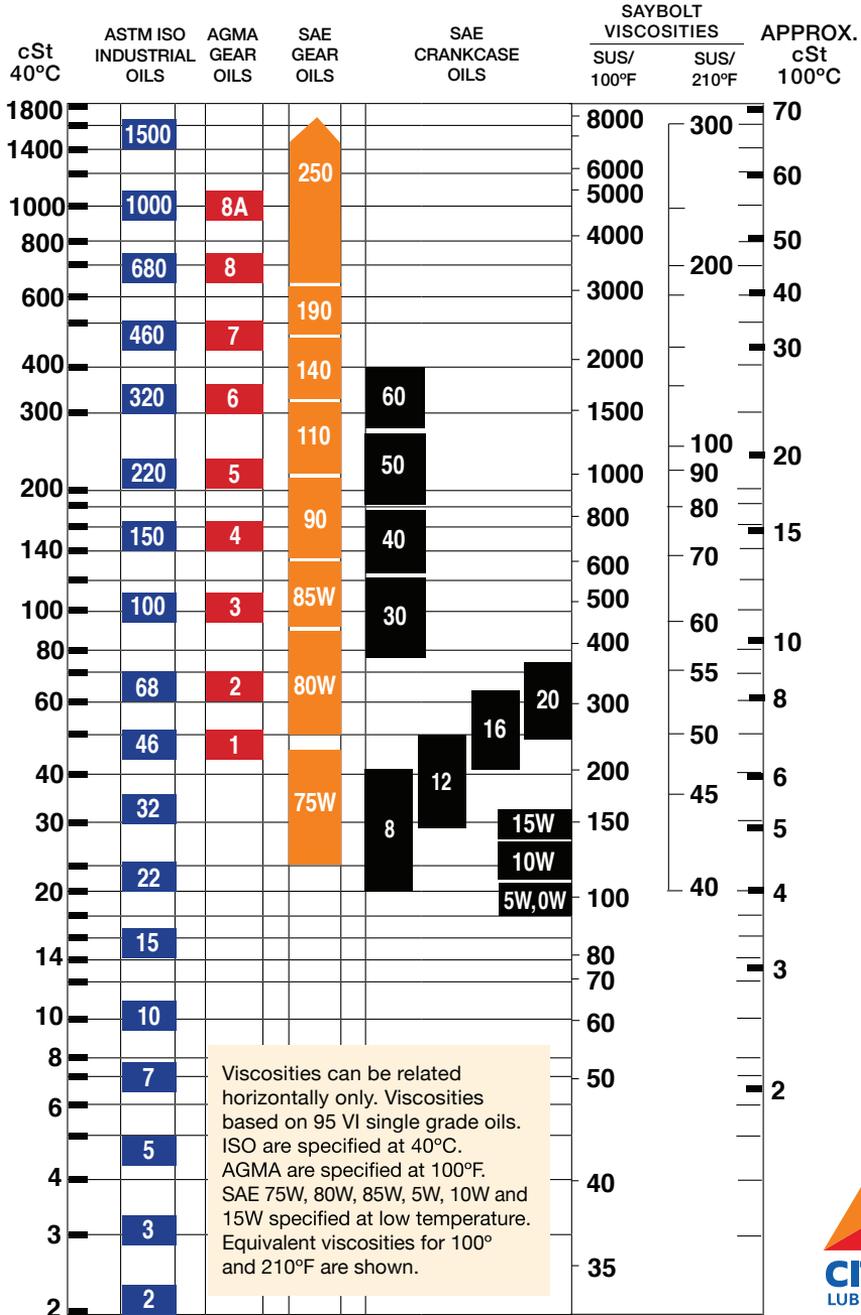
## GREASE THICKENER COMPATIBILITY CHART

General Guide -  
Exceptions Are Possible

	Aluminum Complex	Calcium Stearate	Calcium 12-Hydroxy	Calcium Sulfonate	Clay	Lithium Stearate	Lithium 12-Hydroxy	Lithium Complex	Polyurea	Sodium Soap
Aluminum Complex	C	I	I	I	I	I	I	I	I*	I
Calcium Stearate	I	C	I	B	I	C	I	C	B	C
Calcium 12-Hydroxy	B	C	C	B	C	I	C	C	C	I*
Calcium Complex	I	I	B	C	I	I	I	B	C	I
Calcium Sulfonate	I	B	C	I	C	I	I	B	B	I
Clay	I	I	I	I	C	I	I	I	I	I
Lithium Stearate	I	C	C	I	I	C	C	C	I*	I
Lithium 12-Hydroxy	I	B	C	I	I	C	C	C	I*	I
Lithium Complex	I	C	C	B	B	I	C	C	C	I*
Polyurea	I*	I*	C	I	I	I*	I*	I*	C	I
Sodium Soap	I	I	I	I	I	I	I	I	I	C

C - Compatible  
 B - Borderline  
 I - Incompatible  
 I\* - Dependent Upon Type

# Approximate Equivalence of Viscosity Grading Systems



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