160-802 SPC (MAR 2009)

File: EQUIPMENT MANUAL - Section 160
Replaces: E160-802 SPC (APR 2007)
Dist: 1, 1a, 1b, 1c, 4, 4b, 4c

FRICK® COMPRESSOR OILS

Johnson Controls - Frick® has manufactured refrigeration compressors for all types of applications and refrigerants since 1882. Continuous research backed by years of experience has resulted in Frick oils that meet the demands of all refrigeration and gas compression applications. We offer a wide range of oils that address your specific compressor lubrication and budget requirements. Our rigid specifications ensure that all Frick oils are produced to the highest quality standards for premium performance and durability.

Frick compressor oils deliver:

- Highest quality ensuring lubricity at designed operating temperatures and pressures.
- Chemically stable at designed operating conditions.
- Resistant to high temperature breakdown.
- High flash points.
- Low moisture content.
- Low pour points to resist congealing in condensers and evaporators.
- Exceptionally wax free.
- Formulated to proper viscosities for specific applications.

Johnson Controls - Frick® offers superior performance lubricants to match your application. Synthetic oils offer superior breakdown characteristics, better lubricity, extended viscosities, and reduced oil change intervals.

By maintaining these high standards of quality and product excellence, Frick® oils have won approval of the entire refrigeration industry. Since few end users have the resources to analyze the contents of oil and test their durability, it is good engineering practice to use oil which is backed by the experience of the leading refrigeration equipment manufacturer.

AMMONIA OILS

#3 Excellent medium/heavy weight hydrogenated mineral based oil for ammonia refrigerant. Frick #3 oil has proven it's versatility in thousands of reciprocating and screw compressor applications worldwide over the past 30 years. #3 oil is specially formulated with base oil and additives to meet our specifications. #3 oil offers greater thermal stability than napthenic products and better lubricity and viscosity in ammonia applications. #3 oil is a cost-effective alternative to most ammonia refrigerant applications. Recommended evaporator temperatures are -50°F and above.

#4 High quality, heavyweight, mineral base, hydrogenated oil for ammonia applications. Frick #4 oil is formulated with additives to meet our specifications. #4 oil is especially well suited for large, low speed reciprocating compressors.

#9 Premium semisynthetic hydro-treated oil designed for ammonia applications. Frick® #9 oil provides high thermal stability for improved breakdown characteristics and extended service intervals. #9 oil is less volatile and less soluble in ammonia resulting in decreased oil foaming for better compressor lubrication and lower oil carryover from the oil separator. This oil's higher viscosity results in less bearing wear than pure mineral based napthenic oils. Recommended evaporator temperatures are -50°F and above. Frick® #9 is registered as a lubricant where there is no possibility of food contact (H2) in and around food processing areas.

#9ST Similar to Frick® #9 but with additional seal treating properties. Frick® #9ST is specially blended to condition O-rings in ammonia systems changing from napthenic oils to higher quality paraffinic oils. #9ST helps extend the life of elastomers and reduce leaks.

#10 Premium quality oil for ammonia refrigeration systems utilizing direct expansion (DX) evaporators and rotary screw compressors. Frick® #10 oil is an ammonia soluble oil which will mix with ammonia within the refrigeration system and return to the compressor via the system suction line. In addition to it's solubility with ammonia, #10 oil offers superior lubricity and foaming characteristics when compared to PAG oils. Recommended for evaporator temperatures -20°F and above. Consult factory for application assistance before use in a new application.

#11 This premium synthetic lubricant is custom blended with additives for oxidation inhibition, corrosion protection, defoaming, and antiwear. #11 oil is highly refined to be totally wax free with an extremely low pour point which makes it especially suited for ammonia, low temperature refrigeration applications. #11 oil does not require warming of the system low side for oil return above -80°F. #11 oil's high thermal stability resists breakdown and extends service intervals. Recommended for evaporator temperatures of -80°F and above. Frick #11 is registered as an (H1) lubricant suitable for incidental contact in and around food processing areas.

#11ST Similar to Frick® #11 but with additional seal treating properties. Frick® #11ST is a custom blended Polyalphaolefin synthetic hydrocarbon fluid. #11ST is blended to condition O-rings in ammonia systems transitioning from napthenic oils to higher quality oils such as Frick® #3, #9, #11. This product is also compatible with mineral oils and equipment designed for mineral oils. #11 helps extend the life of elastomers and reduce leaks.

#19 A high quality custom blended Polyalphaolefin (PAO) synthetic hydrocarbon fluid which provides enhanced lubrication at both high and low temperatures, reduced volatility, chemical inertness, and compatibility with mineral oils.

#20 A high quality blended hydrocarbon fluid. This product has good chemical inertness, hydrolytic stability, and compatibility with mineral oil and mineral oil equipment. Frick® #20 offers an alternative to traditional synthetic lubricants for low temperature properties.

HALOCARBON OILS - R-22, etc.

#2A Excellent, medium-weight, mineral-base oil for halocarbon refrigerants. Frick® #2A oil is refined free of waxes that may congeal or precipitate at low evaporator temperatures. #2A oil has a naturally low pour point requiring no pour point depressants and a natural affinity to halocarbon refrigerants for good oil return and heat transfer. Frick® #2A is recommended for evaporator temperatures -50°F and above. #2A oil offers the lowest, first cost alternative for halocarbon refrigerant applications.

#5 High quality, lightweight, mineral-base oil for halocarbon refrigerants. #5 oil has a low pour point and good miscibility characteristics for improved oil return down to -50°F evaporator temperatures. Frick® #5 oil viscosity may be too low for some compressor applications. Consult factory for application assistance.

#6 & 7 High quality synthetic oil for low temperature application of halocarbon refrigerants. Frick® #6 and #7 oils are the best choice for low evaporator temperatures due to their low pour points. These oils are recommended for evaporator temperatures of -70°F and above. Oil return is enhanced on low temperature systems due to the oils excellent miscibility with CFC and HCFC refrigerants. Consult factory for application assistance.

HFC OILS

Frick® ester-based synthetic lubricants are especially suited for HFC refrigerants, R-134A, R-507, R-404 and the new refrigerant blends. Frick® synthetic oils are custom blended with additives for oxidation inhibition, corrosion protection, defoaming, and antiwear. Synthetic oils have extremely low pour points. The low pour point makes it specially suited for low temperature refrigeration applications. Frick® synthetic oil's high thermal stability resists breakdown and extends service intervals. Consult factory for application assistance.

#13 Premium quality ester-based synthetic oil. Frick® #13 oil is recommended for HFC refrigerant.

#13b Premium quality ester-based synthetic oil. Frick® #13b oil is recommended for HFC refrigerant applications where higher viscosity is required. Particularly suited with variable speed drives, high evap temperatures, and high refrigerant dilution of the oil.

HYDROCARBON and CO_2 OILS

Johnson Controls also supplies additional Frick specialty oils for hydrocarbon and gas compression applications.

#12 Premium quality synthetic oil for hydrocarbon and gas compression application. Frick® #12 oil is custom blended with additives for oxidation stability, corrosion protection, and lubricity. Additional advantages include the ability to withstand hydrocarbon dilution.

#12b Frick #12b is a superior blend of Polyalkylene glycols with additives for oxidation stability, corrosion protection, metal deactivation, and lubricity. The ability of this lubricant to withstand dilution by hydrocarbon and other compressed gas is advantageous to flooded screw compressors.

#14 Premium quality synthetic oil for CO_2 applications. Frick® #14 oil gives improved lubrication at high and low temperatures, reduced volatility, and compatibility with mineral oils. Frick® #14 is registered as a lubricant with incidental food contact (H1) for use in and around food processing areas.

#18 A custom blended Polyalphaolefin synthetic hydrocarbon fluid which provides enhanced lubrication at both high and low temperatures, reduced volatility, and compatibility with mineral oils and mineral oil equipment. Frick® #18 contains both rust and oxidation inhibitors. Typical applications include landfill gas.

FRICK COMPRESSOR OILS SPECIFICATIONS

PROPERTIES							
	VISCOSITY, cSt @ °C (°F)						
OIL	@ 40 (104)	@ 100 (212)	VISCOSITY, SUS @ 100°F	POUR POINT °F MAX	FLASH POINT °F MAX	SERVICE TEMP. °F	DENSITY (lb/gal) @ 60°F
#2A	62	6.9	338	-35	370	300	7.5
#3	70	9.1	365	-22	465	350	7.2
#4	102.2	10.4	541	-25	514	350	7.3
#5	30.2	4.4	159	-50	350	300	7.4
#6	32-34	4.5	150	-35	310	300	7.3
#7	56	5.9	298	-31	355	300	7.2
#9	62.9	8.5	327	-38	440	350	7.4
#9ST	67	9.2	348	-36	465	350	7.5
#10	98.5	11.9	515	-26	456	350	8.3
#11	48	7.9	241	<-76	514	350	6.9
#11ST	45.3	7.5	233	-60	485	350	6.9
#12	153	23.5	785	-30	500	350	8.3
#12b	92.3	18.6	466	-40	500	350	8.3
#13	64	8.9	332	-45	511	350	8.0
#14	68.5	10.4	353	-60	519	350	7.0
#18	98.3	14.0	508	-60	480	350	7.0
#19	68.5	10.4	353	-60	480	350	7.0
#20	64.3	8.8	334	-49	465	350	7.0

	RECOMMENDED APPLICATIONS FOR Frick® REFRIGERANT OILS[1]		ORDERING INFORMATION			
			ITEM NUMBERS			
OIL	REFRIGERANT[2]	SUCTION TEMPERATURE °F	1 GALLON	5 GALLON	55 GALLON	330 GAL. TOTE[3]
#2A	HALOCARBONS	-50°+	–	111Q0550019	111Q0550020	333Q0001866
#3	R-717	-50°+	333Q0001842	111Q0550001	111Q0550010	333Q0001861
#4	R-717	-50°+	–	–	111Q0550005	–
#5	HALOCARBONS	-50°+	–	–	111Q0550009	–
#6	HALOCARBONS	-70°+	–	333Q0000940	333Q0000941	–
#7	HALOCARBONS	-70°+	–	111Q0550024	111Q0550025	–
#9	R-717	-50°+	–	333Q0000850	333Q0000849	333Q0001862
#9ST	R-717	-50°+	–	333Q0001905	333Q0001904	–
#10	R-717	-20°+	333Q0000741	333Q0000740	333Q0000739	–
#11	R-717	-80°+	–	333Q0000852	333Q0000851	333Q0001863
#11ST	R-717	-80°+	–	333Q0001907	333Q0001906	–
#12	HYDROCARBONS	N/A	333Q0001140	333Q0001141	333Q0001142	–
#12B	HYDROCARBONS	N/A	–	333Q0001883	333Q0001884	–
#13	HFC	N/A	333Q0000511	333Q0001253	333Q0001254	–
#13B	HFC	N/A	333A0001939	333Q0001938	333Q0001937	–
#14	CO_2	N/A	333Q0001143	333Q0001144	333Q0001145	–
#18	LANDFILL GAS	N/A	–	–	333Q0001892	–
#19	R-717	N/A	–	333Q0001900	333Q0001899	–
#20	R-717	N/A	–	333Q0001902	333Q0001903	–
OIL ANALYSIS KIT - 333Q0001853		**SHIPPING WEIGHT:**	**8 lbs**	**40 lbs**	**466 lbs**	**2720+ lbs**

(1) For specific application questions, consult factory.
(2) For gases and refrigerants not listed, consult factory.
(3) Reusable Drain Valve for Tote - 333Q0001865.

COMPATIBILITY

Frick® oils are compatible with the standard materials utilized in refrigeration systems. Changing from one type of oil to another on equipment which has operated in the field may cause shrinkage of elastomers and could cause leaks. Replacement of leaking elastomers is required if this occurs. Consult factory for details.

MATERIAL SAFETY DATA SHEETS

Material Safety Data Sheets (MSDS) are available from Baltimore Parts Center, phone 800-336-7264.

WARNING **DO NOT MIX OILS of different brands, manufacturers, or types. Mixing of oils may cause excessive oil foaming, nuisance oil level cut-outs, oil pressure loss, gas or oil leakage and catastrophic compressor failure.**

NOTE: The Frick® oil charge shipped with the unit is the best suited lubricant for the conditions specified at the time of purchase.

Form 160-802 SPC (2009-03)
Supersedes: E160-802 SPC (APR 07)
Subject to change without notice
Published in USA • GUI

Johnson Controls
100 CV Avenue • P.O. Box 997
Waynesboro, PA USA 17268-0997
Phone: 717-762-2121 • FAX: 717-762-8624
www.johnsoncontrols.com