



# Apcco

Applied Process Cooling Corporation

## Since 1981



# Lubrication Products



Tel: (559) 875-7720 | Fax: (559) 875-0170  
parts@apcco.net | www.apcco.net  
Locations to serve you

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# APCCO Lubrication Products

## Unmatched Refrigeration Lubricants

By providing the best to our customers, we encourage their loyalty and build our competitive edge. APCCO's line of refrigeration lubricants has been specifically formulated to provide the highest level of performance and protection possible. This has been achieved not only by the understanding of the complex chemistry of lubrication, but also by the understanding of the mechanics of refrigeration.

### Features

Expertly formulated for optimized refrigerant solubility plus enhanced anti-wear properties and cold-temperature fluidity

Ideally blended to meet our customers' specific operating conditions and technical requirements

Fully formulated utilizing a proprietary combination of advanced friction modifiers and anti-wear additives

Tested in challenging, unpredictable, real-world operating environments, not just the controlled conditions of a laboratory

### Benefits

Maximum performance, protection and fluid life without compromise

No more settling for less than exactly what you and your customers need

Increased compressor efficiency, energy savings and compressor life

Proven to excel in the conditions your customers face and the equipment they use today

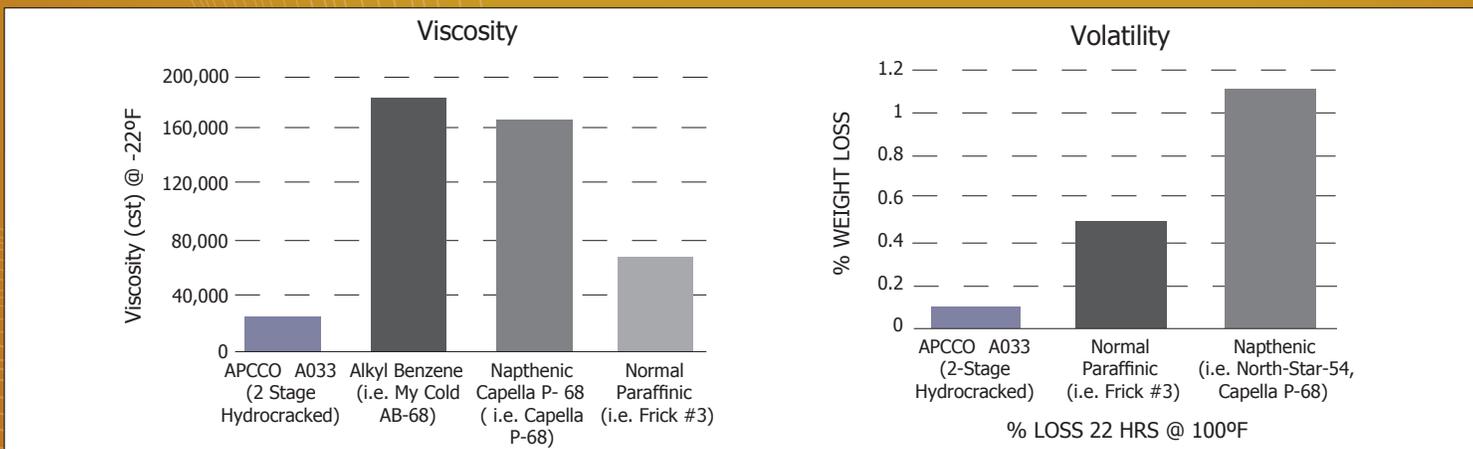
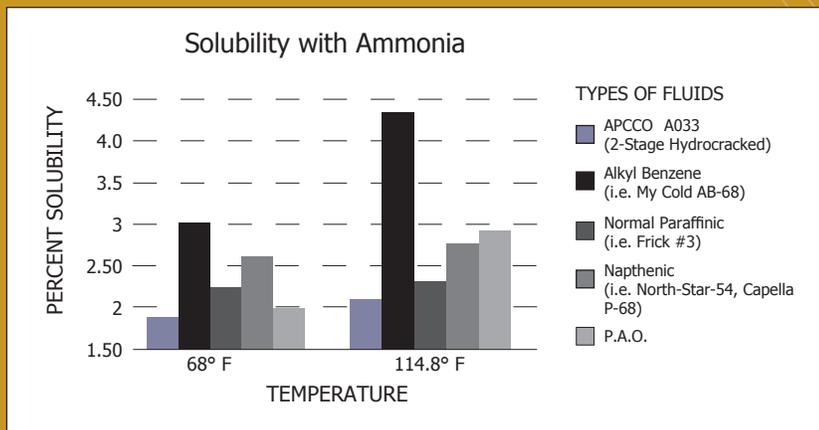
## A033 - Ammonia Compressor Fluid

APCCO A033 is specifically designed for use in Ammonia Refrigeration Systems. Designed to meet or exceed all OEM specifications, A033 provides reduced oil consumption, has excellent cold-temperature operations and a very long fluid life. Some benefits of A033 include:

- Specifically designed for use in ammonia refrigeration systems
- Formulated to meet or exceed all OEM specifications
- Reduces oil consumption and carry over
- Has excellent cold-temperature fluidity due to its high viscosity index and advanced-technology additive package
- Offers a very long fluid life

### Variations of A033

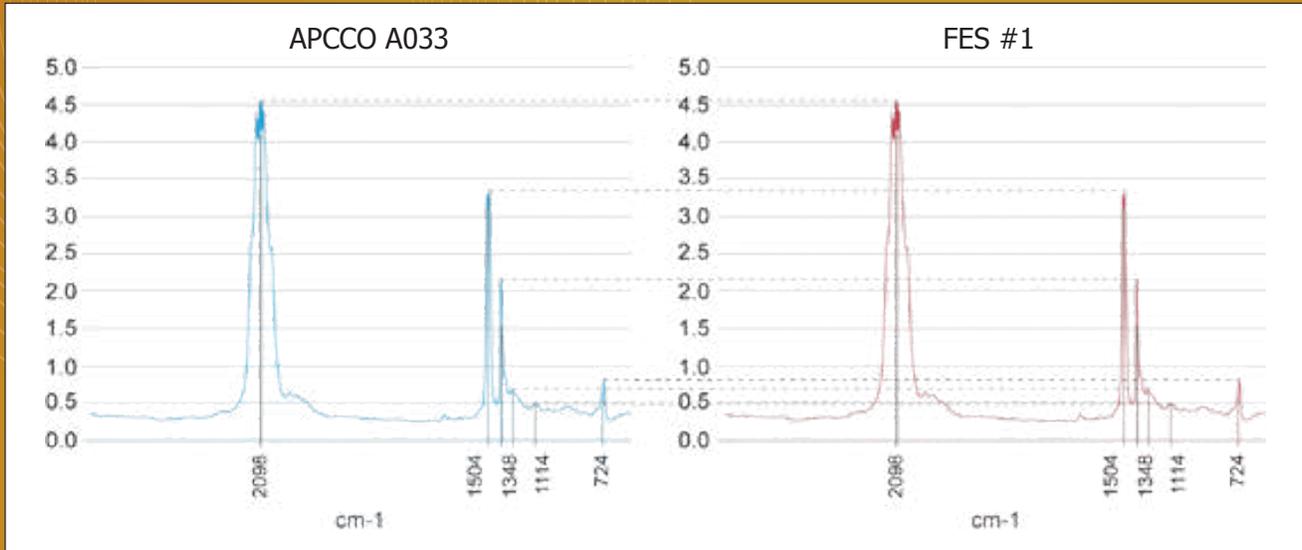
- A233: -65°F pour point
- A733: -76°F pour point
- A633: food-grade formulation
- A533: with seal conditioner additive



# APCCO Lubrication Products

## FTIR Correlations

This Fourier transform infrared spectroscopy (FTIR) graph illustrates the chemical compositions of A033 and FES#1. As you can see, the formulations are virtually identical — a 99.8% match.



## OEM Specifications

✓ A033 meets or exceeds OEM specifications.

Property	OEM Specifications	APCCO A033	
Viscosity @104°F cSt	ISO 68 <sup>†</sup>	64.2	✓
Viscosity @194°F cSt	> 10	10.3	✓
Viscosity Index	> 100	123	✓
Four Ball Wear Scar Dia (mm)	< 2	0.8	✓
Stability with NH3	Meets DIN 51538	Meets DIN 51538	✓
Flash Point °F	> 383	464	✓
Pour Point °F	No Requirement	< -54.4	✓
Miscibility with Ammonia (>104°F)	< 3	1.9	✓
Aniline Point	75 < X < 125	118	✓
Initial Water Content (ppm)	< 50	< 5	✓



A033 has an exceptionally low pour point for enhanced performance in cold temperatures.

<sup>†</sup>ISO Grade is plus/minus 10 so 68=(58-78)

# APCCO Lubrication Products

## Technical Properties

APCCO uses advanced additives to improve pour point and cold-temperature fluidity — providing distinct advantages over competitive formulations.

PROPERTIES	APCCO A033	Frick® #9	Vilter-717	FES #1	Camco 717HT	Frick® #3	Shell Refrigeration Oil S4 FR-V	Chevron® Texaco® Capella® P 68
Base Stock Type	OEM Quality 2-Stage Hydrocracked					Normal Paraffinic		
OEM Product	--	Yes	Yes	Yes	Yes	Yes	No	No
Viscosity (cSt) @ 104°F	<b>64.2</b>	62.9	77.0	69.0	69	71.0	68.0	64.6
Viscosity (cSt) @ 212°F	<b>9.7</b>	8.5	9.45	9.1	9.1	8.3	9.0	8.5
Viscosity Index (VI)	<b>123</b>	107	100	107	100	90	107	102
Viscosity @ -22°F	<b>26,000</b>	29,431	35,642	33,834	32,537	69,977	31,984	33,459
Pour Point °F (°C)	<b>-54 (-48)</b>	-38 (-39)	-38 (39)	-38 (39)	-40 (-40)	-32 (-35)	-38 (-39)	-36 (-38)
Flash Point °F (°C)	<b>465 (240)</b>	440 (226)	440 (226)	440 (226)	456 (235)	426 (254)	450 (232)	471 (244)
Volatility % Weight Loss 22hrs @ 212°F	<b>0.1</b>	0.1*	0.1*	0.1*	0.1*	0.5*	0.5*	0.5*
Solubility in Ammonia @ 122°F	<b>1.9</b>	1.9*	1.9*	1.9*	1.9*	2.8*	2.8*	2.8*
Viscosity % Increase (High Temp Oxidation) 1,500hrs	<b>2</b>	2*	2*	2*	2*	100*	100*	100*

PROPERTIES	APCCO A033	Chevron Ammonia Fluid	Stellar Ammonia Fluid	Mycom MyCold AB-68	Shell Refrigeration Oil S4 FR-V	Mobil™ Gargoyle Arctic SHC™ 226E	Chevron® Texaco® Capella® WF 68	Mobil™ Gargoyle Arctic 300	Shell Clavus 68
Base Stock Type		Single Stage Hydrocracked		Alkyl Benzene		PAO	Naphthenic		
OEM Product	--	Yes	No	Yes	No	No	No	No	Yes
Viscosity (cSt) @ 104°F	<b>64.2</b>	64.6	64.6	56.0	68.0	69.0	64.0	68.0	63.9
Viscosity (cSt) @ 212°F	<b>9.7</b>	8.5	8.5	5.9	6.2	10.1	6.4	6.7	9.1
Viscosity Index (VI)	<b>123</b>	102	102	1	1	136	12.3	12.9	100
Viscosity @ -22°F	<b>26,000</b>	30,321	32,321	181,358	494,178	17,737	241,704	256,379	32,537
Pour Point °F (°C)	<b>-54 (-48)</b>	-36 (-38)	-36 (-38)	-31 (-35)	-38 (-39)	-58 (-50)	-36 (-38)	-44 (-42)	-40 (-40)
Flash Point °F (°C)	<b>465 (240)</b>	446* (230)	446* (230)	354 (178)	374 (190)	491 (255)	354 (179)	392 (200)	385 (196)
Volatility % Weight Loss 22hrs @ 212°F	<b>0.1</b>	0.3*	0.3*	1.1**	1.1**	0.2*	1.2*	1.2*	1.2**
Solubility in Ammonia @ 122°F	<b>1.9</b>	2.3**	2.3**	4.2**	4.2**	2.8*	2.8*	2.8*	2.8**
Viscosity % Increase (High Temp Oxidation) 1,500hrs	<b>2</b>	28**	28**	100**	100**	2*	100*	100*	100**

\*Test data

\*\*Conservative estimates based on field observations

The APCCO products provided are approximate equivalents to competitive fluids. The information provided herein should only be used as a general guide, and not serve as a sole resource for determining the correct lubricant for a particular application. Lubricant specifications are subject to change. Please consult an APCCO representative to ensure that the replacement fluid is the correct choice for the application. Competitive products are registered and trademarked by their respective owners.

Ask us about our  
**FREE Oil Sampling**

# APCCO Lubrication Products



## Cross Reference

Designated APCCO equivalent fluids are top-off compatible and do not require change outs or time consuming flushing procedures.

### BVA

RPOE 22cc (A425-22)  
RPOE 32 (A425-32)  
RPOE 32M A (A425-32)  
RPOE LT32 (A425-32)  
RPOE 68 (A425-68)  
RPOE 100 (A425-100)  
RPOE 120 (A425-120)  
RPOE 170 (A425-170)  
RPOE 220 (A425-220)  
HTP 717P (A033)  
Alkyl 150 (A003-32)  
Alkyl 200ca (A003-46)  
Alkyl 300 (A003-68)  
Alkyl 500 (A003-100)  
3G Super (A004-32)  
4G Super (A004-68)  
5G Super (A004-100)

### Camco

717 (A033)  
4619-68 (A233)  
4600-15 (A755)

### Emerson/Vilter

Vilter-717 (A033)  
Vilter F-68 (A003-68)  
Vilter-D (A004-68)  
Vilter B-68 (A425-68)  
Vilter HCL-68 (A733)  
Vilter CO<sub>2</sub> (A884)

### Fuchs

Reniso K-68 (A033)  
Reniso SP-32 (A003-32)  
Reniso SP-46 (A003-46)  
Reniso SP-68 (A003-68)  
Reniso SP-100 (A003-100)  
Reniso KM-32 (A004-32)  
Reniso KS-46 (A004-46)  
Reniso KC-68 (A004-68)  
Reniso KES / TES-100 (A004-100)  
Reniso Triton SEZ 32 (A425-32)  
Reniso Triton SEZ 46 (A425-46)  
Reniso Triton SEZ 68 (A425-68)  
Reniso Triton SEZ 100 (A425-100)  
Reniso Triton SEZ 150 (A425-150)  
Reniso Triton SEZ 170 (A425-170)  
Reniso Triton SEZ 220 (A425-220)  
Reniso-C-86 (A227-85)

### GEA/FES

FES #1 (A033)  
FES #2 (A004-68)  
FES #3 (A033)  
FES #5 (A003-68)  
FES #6 (A003-32)  
FES #9 (A033)  
FES #11 (A233)  
FES #13 (A425-68)  
FES #14 (A884-68)

### Johnson Controls-Frick

Frick #2A (A004-68)  
Frick #3/#9 (A033)  
Frick #5 (A004-32)  
Frick #6 (A005-32)  
Frick #7 (A006-68)  
Frick #9ST (A533)  
Frick #10 (A086)  
Frick #11 (A733)  
Frick #12 (A046-15)  
Frick #12b (A415-100)  
Frick #13 (A425-68)  
Frick #13b (A425-100)  
Frick #14 (A884-68)  
Frick #18 (A416-200)  
Frick #20 (A004-68)

### Mobil

SHC NH-68 (A033)  
Zerice S-32 (A003-32)  
Zerice S-46 (A003-46)  
Zerice S-68 (A003-68)  
Zerice S-100 (A003-100)  
Garg Arctic-155 / SHC-224 (A004-32)  
Garg Arctic-C / SHC-266E (A004-46)  
Garg Arctic-300 / SHC-228 (A004-68)  
EAL Arctic-32 (A425-32)  
EAL Arctic-46 (A425-46)  
EAL Arctic-68 (A425-68)  
EAL Arctic-100 (A425-100)  
EAL Arctic-220 (A425-220)

### Mayekawa Mycom

Mycold-68 (A033)

### NuCalgon

Emkarate RL 22 H (A425-22)  
Emkarate RL 32 H (A425-32)  
Emkarate RL 46 H (A425-46)  
Emkarate RL 68 H (A425-68)  
Emkarate RL 100 H (A425-100)  
Emkarate RL 170 H (A425-170)  
Emkarate RL 220 H (A425-220)  
C-3S (A004-32)  
C-4S (A004-68)  
C5S (A004-100)  
Zerol 150 (A003-32)  
Zerol 200TD (A003-46)  
Zerol 300 (A003-68)

### Petro Canada

Reflo Synth 68A (A033)  
Reflo Synthetic / CFC (A004-46)

### Shell

S2 FR- A (A033)  
S4 FR-F-32 (A425-32)  
S4 FR-F-46 (A425-46)  
S4 FR-F-68 (A425-68)  
S4 FR-F-100 (A425-100)  
S4 FR- V-32 (A003-32)  
S4 FR- V-46 (A003-46)  
S4 FR- V-68 (A003-68)  
S4 FR- V-100 (A003-100)

### Sunoco

3 GS (A004-32)  
4 GS (A004-46)  
5 GS (A004-100)  
SL-32S (A425-32)  
T-68 (A425-68)

### Texaco / Chevron

Capella Premium 68 / Capella A 68 (A033)  
Capella Oil WF-32 (A004-32)  
Capella Oil WF-46 (A004-46)  
Capella Oil WF-68 (A004-68)  
Capella HFC-68 (A425-68)

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# APCCO Lubrication Products

## Refrigeration Compressor Lubricants

### Series A003 - AB Replacement Lubricant

- Excellent solubility in HCFC and blended refrigerants
- Very long fluid life
- Very good low-temperature fluidity
- Excellent rust, corrosion and deposit resistance

### Series A004 - Mineral Based Lubricant

- Excellent solubility in HCFC and blended refrigerants
- Excellent low-temperature fluidity
- Very long fluid life
- Excellent rust, corrosion and deposit resistance

### Series A225 - POE Based Lubricant

- Blend of POE and other synthetic based fluids and additives to provide unsurpassed performance
- Optimized solubility in HFC and blended refrigerants
- Very high viscosity index
- Excellent low-temperature fluidity
- Excellent carbon and varnish control

### Series A540 - PAG Based Propane Compressor Fluid

- Very low solubility with hydrocarbon gases
- Excellent resistance against rust and corrosion
- Very long fluid life
- Excellent wear protection
- Enhanced resistance against viscosity dilution
- Excellent cold-temperature fluidity

### Series A884 - Immiscible CO<sub>2</sub> Formulation

- Specifically formulated for use in CO<sub>2</sub> applications
- Food grade formulation
- High viscosity index
- Excellent low temperature fluidity

### Series A427-85 - Miscible CO<sub>2</sub> Formulation

- Specifically formulated for use in CO<sub>2</sub> applications that require miscibility
- High viscosity index
- Excellent low-temperature fluidity

## Leak Detection

### Series A199 - Leak Detection Dye

- Contains U/V dye to aid in the detection of leaks in HFC, HCFC and CFC refrigeration systems
- Compatible with POE, PAG and mineral-oil based lubricants

## Leak Stop

### Series A073 - Seal Leak Stop

- Formulated to prevent/stop leaks around seals, gaskets and hoses
- Will not harm many A/C systems
- Compatible with POE, PAG and mineral-oil based lubricants

## Recommended Lubricant per Refrigerant

Refrigerant Name	Refrigerant Type	Recommended Lubricant
R-12	CFC	A004
R-124	HFC	A425
R-134a	HFC	A225
R-22	HCFC	A004
R-290	Propane	A540
R-600	Butane	A540
R-401a	HCFC	A004
R-401b	HCFC	A004
R-402a	HCFC	A004
R-402b	HCFC	A004
R-403b	HCFC	A004
R-404a	HFC	A425
R-407c	HFC	A425
R-408a	HCFC	A004
R-409a	HCFC	A004
R-410a	HFC	A425
R-414b	HCFC	A004
R-416a	HCFC	A425
R-417a	HFC	A425
R-422a	HFC	A425
R-422d	HFC	A425
R-427a	HFC	A425
R-507	HFC	A425
R-508B	HFC	A425
R-717	Ammonia	A033/A733
R-744	CO <sub>2</sub> (I)	A884
R-744	CO <sub>2</sub> (M)	A227-85



# APCCO Lubrication Products

## Refrigeration Pump Oil

Technical Specifications	APCCO A755	APCCO A755 LT	Cornell Ammonia Pump Fluid
Viscosity Index	121	19	124
Viscosity @ 104°F	30.1	14.2	15.1
Viscosity @ 212°F	5.5	3.5	—
Flash Point °F	429	382	392
Auto-Ignition Point °F	662	615	—
Pour Point °F	-55	-70	-68
Copper Corrosion, 24 Hr	1a	1a	1a
Demulsibility, 130°F, 30 min	40/40/0	40/40/0	40/40/0
Color	<.5	<.5	<.5

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## How Can We Help?

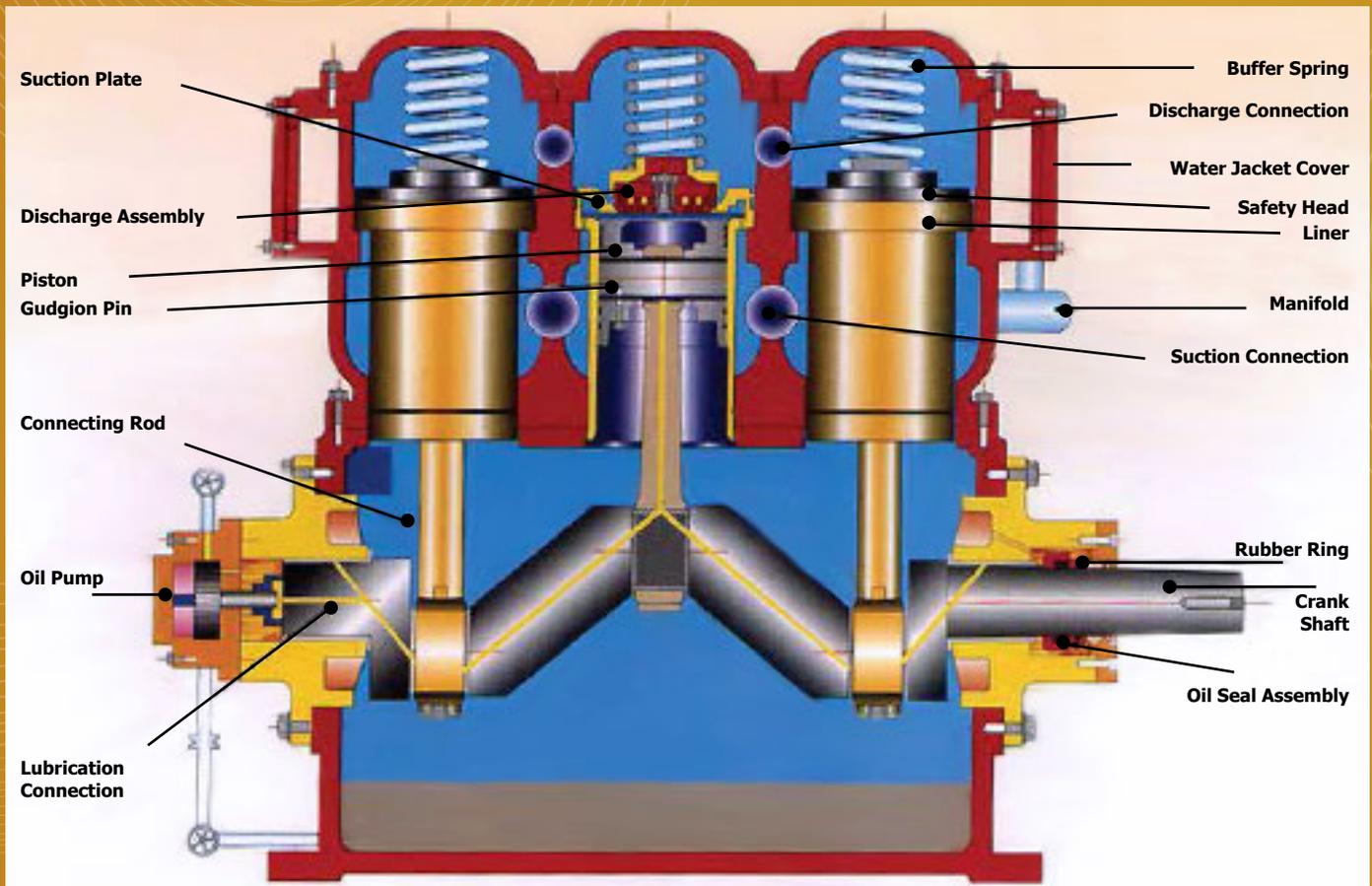
In addition to ammonia compressor lubricants, APCCO offers products specifically designed for other types of refrigeration systems such as CFC, HCFC, HFC and natural gas. For more information, please contact your sales representative at (559) 875-7720 or visit [www.apcco.net](http://www.apcco.net)



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