Petro-Canada

TechBulletin

PEERLESS™ XCG-FLEX COUPLING GREASE

Introduction

High speed couplings are a unique application from the standpoint of satisfactory lubrication. The combination of high speed, and often a sizeable diameter, means that very high “G” forces, or centrifugal forces, are generated in such components. Hence it is obvious that in designs which require grease lubrication, such as metallic grid, chain, or gear couplings, it takes a special product to do the job. A grease which has a high base oil viscosity and a low tendency of oil/thickener separation is required. The grease has to prevent oxidative fretting corrosion, prevent wear under potentially high gear tooth loading and vibration, resist water wash-off, and prevent rusting.

Petro-Canada PEERLESS XCG-Flex Coupling Grease meets the requirements of the ANSI/AGMA 9001-B97 standard for coupling grease specifications CG-1 and CG-2. This grease also meets performance requirements relative to competitive coupling grease products.

Performance Benefits

Excellent Resistance to Oil Separation
Retention of oil in the thickener means it is always available to lubricate between re-lubrication intervals. The percentage of oil separated after eight hours of centrifuging @ 36000 rpm is zero.

Excellent EP and Antiwear Properties
High Timken OK loads (29.5 kg) and 4-ball weld points (500 kg) are achieved with this product. The high base oil viscosity and carefully selected additives are instrumental in preventing wear.

Unparalleled Rust Prevention
Rust Prevention is provided by the unique calcium sulphonate complex thickener, which is used in combination with water-resistant polymers to thicken the grease.

Resists Hardening
The oxidation resistance of this grease is very good indeed, showing only a 6 psi drop after 1000 hrs. in the bomb oxidation test.

Resists Wash-off
The polymer in the grease, while preventing oil separation, has also given very good results in the GM panel spray-off test (20%). Most greases give values in excess of 50% in this test.

What is the HT difference?

Petro-Canada starts with the patented HT purity process to produce water-white, 99.9% pure base oils. The result is a range of lubricants, specialty fluids and greases that deliver maximum performance for our customers.

MAXIMUM PERFORMANCE HT PATENTED PURITY PROCESS™

Lubrication Requirements

Coupling lubrication requirements are unique. As a result, proper lubrication methods must be specified to ensure satisfactory performance and long life of lubricated flexible couplings. Proper lubrication consists of selecting the proper grease and an adequate maintenance program. AGMA, American Gear Manufacturers Association, performed various tests that generated data under specific operating conditions for a certain amount of time. The data is shown in the table below. Petro-Canada XCG-Flex Coupling Grease meets AGMA specifications CG-1 and CG-2. The standards for CG-1 and CG-2 were determined with respect to operating groups I and II, respectively. Rotational speed, shaft diameter, degree of misalignment, continuous torque, peak torque, maximum coupling surface temperature and the normal re-lubrication interval are what determine whether the grease lubricated coupling is classified as operating group I or II. It is very important that these AGMA standards are met; this, in conjunction with proper lubrication, will allow satisfactory performance and long life of lubricated flexible couplings.

The following table compares Petro-Canada's XCGFlex Coupling Grease performance characteristics to AGMA CG-1 and CG-2 specifications

Package Availability

PEERLESS XCG-FLEX 400G Tubes: PLXCGC30

PEERLESS XCG-FLEX 17KG Pails: PLXCGP17

Typical Performance Data

Properties	Petro-Canada Peerless XCG Flex Coupling Grease
Base Oil Viscosity @ 40°C @ 100°C @ 100°F @ 210°F	 329 23 1524 109
NLGI	1
Thickener Type	Calcium Sulphonate Complex/polymer
Thickener %	17
Dropping Point (°C/°F)	290/554
Operating Range (°C) (°F)	-40 to 163 -40 to 325
Rust & Oxidation Inhibitors	Yes
Timken EP (OK Load)	
(lbs)	65
(kg)	29.5
Four Ball EP (ASTM D2596)	
Load Wear Index	62
Weld Point (kg)	500
Four Ball Wear, Scar (ASTM D2266) (mm)	0.41
Penetration (ASTM D217)	
Worked 60 Strokes (mm/10)	335
Worked 10,000 Strokes (mm/10)	—
Worked 100,000 Strokes (mm/10)	343
% Change from Baseline, Shell Roll, (ASTM 1831)	3.7
Oil Separation (ASTM D1742) (mass %)	0.1
Centrifuge Test (ASTM D4425)	
8 hrs. @ 36,000 rpm (%)	0
K-36 Value @ 24 hrs.	6/24=0.25

AGMA Coupling Grease Specifications[1] vs. Petro-Canada XCG-Flex Coupling Grease

Characteristic (test method)	Type CG – 1[2]	Type CG – 2[2]	Petro-Canada XCG-Flex Coupling Greases
1. Minimum base oil viscosity: In centistokes (cSt) In SUS (approx.)	198 at 40°C (104°F) 900 at 38°C (100°F)	288 at 40°C (104°F) 1300 at 38°C (100°F)	329 at 40°C (104°F) 1524 at 38°C (100°F)
2. Separation Characteristics[3] fluid insoluble material	K36 ≤ 60/24, or 8% maximum	K36 ≤ 24/24	6/24 = 0.25
3. National Lubrication Grease Institute (NLGI) grade			
a) Metallic grid	1 thru 3	1 thru 3	1
b) Gear or chain			
Where rpm ≥ 200 $\sqrt{d}$ in 1008 $\sqrt{d}$ mm[4]	0 thru 3	0 thru 1	1
where rpm ≤ 200 $\sqrt{d}$ in 1008 $\sqrt{d}$ mm[4]	0 thru 1	Not applicable	
[1] Minimum dropping point	88°C (190°F)	91°C (195°F)	290°C (554°F)
1. Compatibility[5]	The coupling grease must be compatible with coupling seals and gaskets		
2. Oxidation resistance – max. pressure drop at 100 hours	20 lb/in^2 (137 900 Pa)	20 lb/in^2 (137 900 Pa)	6 lb/in^2 (41 370 Pa) (@ 1000 hrs)
3. Anti – rust properties	Not required	ASTM Rating Pass	ASTM Rating Pass
4. Anti – wear additives[5]	Not required	Not required	Present
5. Extreme pressure (EP) additives[5]	Not required[6]	Not required[6]	Present
6. Timken OK load	Not required	Not required	65 lbs (29.5 kg)
7. Four ball EP test	Not required	Not required	Weld point 500 kg

NOTES:
[1] Accepted test methods:
- Viscosity ASTM D-445
- Grease composition ASTM D-128
- Centrifuge Test ASTM D-4425
- NLGI Grade ASTM D-217
- Dropping point ASTM D-566 or D-2265
- Anti-rust properties ASTM D-1743
- Oxidation resistance ASTM D-942
- Four Ball EP Test ASTM D-2596
- Timken OK load ASTM D-2509

[2] See 6.1.2 for lubricant selection guide
[3] ASTM centrifuge test
[4] Relates to a centrifugal force on the lubricant of approximately 10
[5] No test method
[6] EP additives recommended by some coupling manufacturers

TechBulletin Info Lines

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