



BPTO 2380 SPC* With Superior Low Temperature Viscosity

premier accessory performance | excellent load carrying capability | best low temperature viscosity | typical STD grade cleanliness

***SPC- Standard Performance Capability**

BPTO (Turbo Oil) 2380:

A turbo oil designed for the commercial needs of established turbine engines

The product was carefully designed to achieve an optimum balance of properties. The balance of cold ambient temperature viscosity, load carrying capability, cleanliness and elastomer compatibility was at the forefront of the considerations in designing BPTO 2380. Today, BPTO 2380 is still one of the most widely used turbine oils in the commercial aviation industry. BPTO 2380 is among the first turbine oils to be qualified and approved for Mil-PRF-23699 STD (Standard) class and subsequently SAE AS5780 SPC (Standard Performance Capability) class. A full list of commercial approvals is available upon request.

BPTO 2380

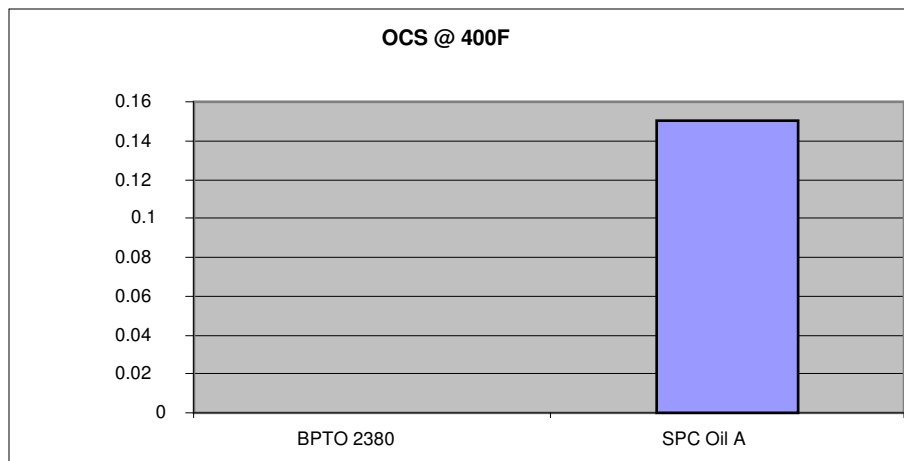
premier accessory performance/ excellent load carrying capability/
best low temperature viscosity/ typical STD grade cleanliness

***BPTO 2380 - Over 40 years of experience with
over "230" operators using the product today!***

Premier accessory performance

BPTO 2380 brings you exceptional accessory performance which leads to extended on-wing accessories lifespan and improved reliability. Also, the ability of BPTO 2380 to neutralize the effects of Copper (Cu) through superior metal passivation results in reduction of oxidation and sludge formation. The below chart illustrates this lab results.

Cu weight change (mg/cm²)



In service, the metal passivation effects of BPTO 2380 allow for proper filtration of Copper particles resulting in diminished metal wear effects and extend on wing life of IDGs and CSDs.

	<u>BPTO 2380</u>	<u>Competitor SPC A</u>
No. of IDG samples	48	35
Avg. used oil Cu level, ppm	0.6	7.7

→ Overall IDG reliability consistently higher when using BPTO 2380

	<u>Oil Type</u>	<u>Filter Chg.</u>	<u>MTBF** (hrs)</u>
US Operator A	BPTO 2380	200 hrs	4000
US Operator B	Comp. SPC A	900 hrs	2000

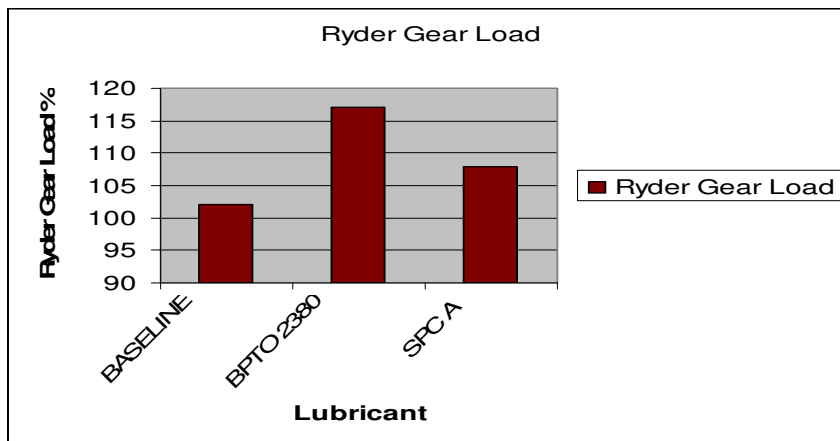
**Mean Time Between Failures

The result, reduction in unscheduled maintenance activities would reduce total costs and ground time!

BPTO 2380

excellent load carrying capability

One of the competitive attributes of BPTO 2380 is its load carrying capability. This parameter is calculated via the Ryder Gear Load, a test used to determine the anti-scuffing property of a lubricant. The baseline measurement of this test is 102% of the reference oil. In the load carrying test, BPTO 2380 yielded results of 117% or 14.7% above the baseline versus the leading SPC competitive oil with a value of 108% or 5.9% above base line. Clearly BPTO 2380 offers a greater margin of performance.



BPTO 2380 has demonstrated superior competitive performance in many different types of engines but specifically in the highly demanding environment of the turbo prop engines. In particular, 70% of the PT6 engines are lubricated by BPTO 2380!

This means that BPTO 2380 can generate savings to your fleet through potentially extending the life of your gears and bearings!

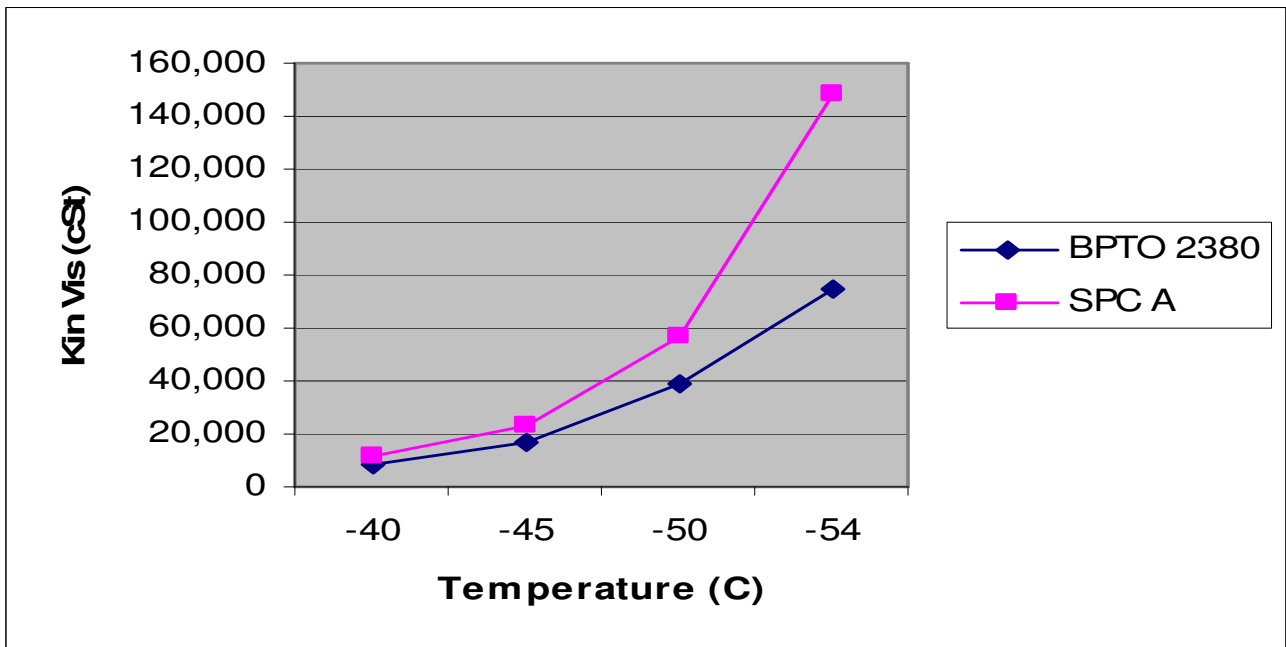
BPTO 2380 enhances the ETOPs (Extended Twin Engine Operations) performance of your fleet

best low temperature viscosity

BPTO has demonstrated the best low temperature viscosity performance for all 5 cSt Turbine Oils commercially available today. The low temperature viscosity performance of turbine oils is determined by measuring the kinematic viscosity of the oil at colder ambient temperatures. Higher viscosities at colder temperatures can result in more difficult engine starts on cold winter days. This attribute improves the cold soak engine restart reliability, an important factor for gaining or retaining ETOPs approval.

BPTO 2380 tops the leading STD and SPC oils today in the area of low temperature viscosity. A test was conducted comparing a competitor's leading STD/SPC turbine oil and BPTO 2380. The below chart shows the results of this comparison test.

The difference in performance was significant!!!



CLASS	PROD.	204 C	99 C	38 C	21 C	-40 C	-53.4 C
5cSt	BPTO 2380	1.30	5.09	26.38	51.0	7900	74500
	SPC A	1.31	5.19	28.40	58.0	11100	148300

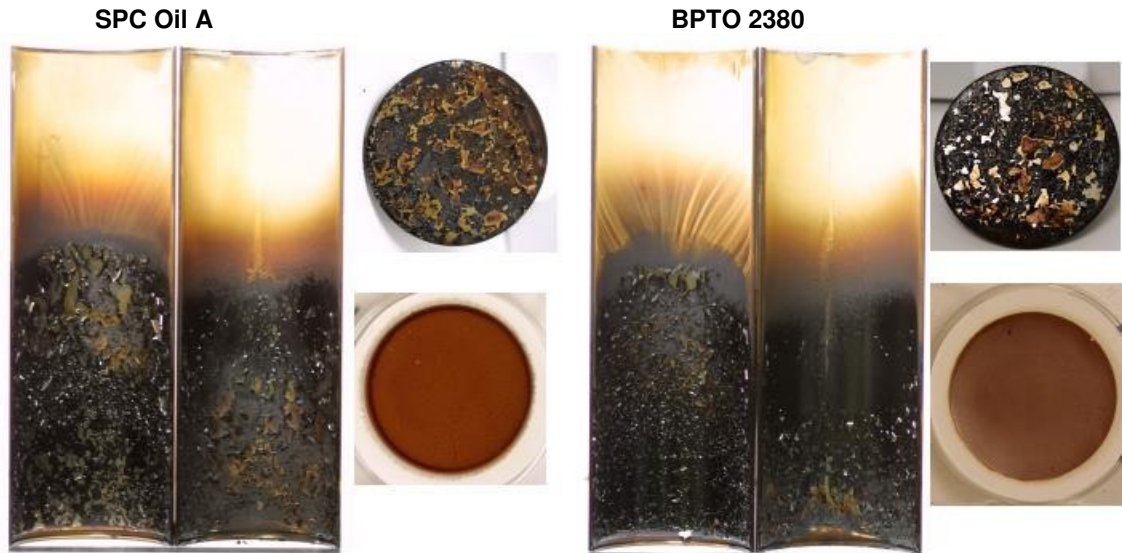
The competition was 40% more viscous at -40 C (-40 F) and 71% at -53.4 C (65 F). Pour point for BPTO 2380 was measured at -87 C (-125 F) versus -75 C (-103 F) for the competition.

The low temperature performance of BPTO 2380 translates into improved gear and bearing reliability in cold soak condition due to better lubrication at start up. The bottom line is that filter ΔP events during start up on cold days may be reduced significantly.

BPTO 2380

STD and SPC grade cleanliness

One of the benefits of BPTO 2380 is the balance between acceptable cleanliness and other critical properties. BPTO 2380 meets the cleanliness requirements of both specifications, US Military Mil-PRF-23699 for STD class and SAE AS5780 for SPC class. A laboratory test*** simulating a flight cycle condition in turbine engine was conducted. The purpose of this test is to compare the cleanliness performance of BPTO 2380 and a competitor's leading STD/SPC oil. The photos below illustrate the comparison:



*** BPTO Proprietary Test

AIR BPTO Lubricants

Technical/sales

Contacts

Africa

Alan Mocke
Tel: +27 11 488 5232
Fax: +27 11 642 4021
Mobile: + 27 83 401 5232
email: alan.mockke@za.bp.com

Asia-Pacific

Fong Yong Sheng
Tel: +65 6371 8906
Fax: +65 6270 7832
email: yong_sheng.fong@se1.bp.com

Australia – New Zealand

David Fettel
Tel: +61 (3) 9268 4101
Fax: +61 (3) 9268 4478
email: david.fettel@bp.com

Caribbean

Don Feeney
Tel: +1 973 401 4339
Fax: +1 973 401 4335
email: donald.feeney@bp.com

China

Philip Xue Fei
Tel: + 86 (21) 3860 5863
Fax: +86 (21) 3860 5950
Mobile: +86 (1390) 1866 128
email: philip.xue@se1.bp.com

Europe – Southern

Neil Frances
Tel: +44 1932 774868
Mobile: +44 7768 253194
email: Neil.Frances@uk.bp.com

Europe

Kevin Worthington
Tel: +44 1932 774853
Fax: +44 1932 739308
Mobile: +44 7776 450613
email: kevin.worthington@uk.bp.com

Japan

Masanori Hoshino
Tel: +81 3 5719 7907
Fax: +81 3 5435 2250
Mobile: +81 80 3466 8510
email: masanori.hoshino@se1.bp.com

Mexico, Central America & South America (excluding Brazil and South Cone)

Alfredo Lopez
Tel: +52 55 5063 2086
Fax: +52 55 5292 4959
email: lopezach@bp.com

Middle East & South Asia

David Zydzienowski
Tel: 971 4 307 9415
Fax: +971 4 331 0028
Mobile: +971 50 6562850
email: zydzd1@bp.com

Russia/CIS

Marina Markova
Tel: +7 495 787 8832
Fax: +7 495 787 6026
Mobile: +7 495 970 2306
email: marina.markova@ec1.bp.com

South America – Brazil

Juliano Diniz
Tel: +55 11 3054 9312
Fax: +55 11 3054 9301
Mobile: +55 11 8389 0431
email: juliano.diniz@bp.com

South America – South Cone

Don Feeney
Tel: +1 973 401 4339
Fax: +1 973 401 4335
email: donald.feeney@bp.com

Martin Sukiassian
Tel: +54 11 4114 5035
Fax: +54 11 4114 5091
Mobile: +54 9 11 4165 1587
email: martin.sukiassian@bp.com

Taiwan & South Korea & Philippines

Leon Chen
Tel: +886 7 384 2904
Fax: +886 7 392 7048
Mobile: +886 931 724 490
email: leon.chen@se1.bp.com

USA and Canada – Airline Sales

John Bryant
Tel: +1 973 401 4344
Fax: +1 973 401 4355
email: bryantjr2@bp.com

Nick Cuaresma
Tel: +1 714 228 6418
Fax: +1 714-228-6567
email: nick.cuaresma@bp.com

Don Feeney
Tel: +1 973 401 4339
Fax: +1 973 401 4355
email: donald.feeney@bp.com