

## **OIL ANALYSIS REPORT**

## Area BRUCE A/1/75120 Machine Id 1-75120-CP3002

Component Reciprocating Compressor Fluid ATLAS COPCO ROTO Z FLUID (35 LTR)

## DIAGNOSIS

## Recommendation

Resample at the next service interval to monitor.

#### Wear

All component wear rates are normal.

#### Contamination

The system cleanliness is acceptable for your target ISO 4406 cleanliness code. The water content is negligible. The system and fluid cleanliness is acceptable.

## Fluid Condition

The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.





NORMAL

SAMPLE INFORM	ATION	method	limit/base	current	history1	history2
Sample Number		Client Info		WC0729956		
Sample Date		Client Info		21 Nov 2022		
Machine Age	hrs	Client Info		0		
Oil Age	hrs	Client Info		0		
Oil Changed		Client Info		N/A		
Sample Status				NORMAL		
WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185(m)	>90	6		
Chromium	ppm	ASTM D5185(m)	>5	0		
Nickel	ppm	ASTM D5185(m)		0		
Titanium	ppm	ASTM D5185(m)		0		
Silver	ppm	ASTM D5185(m)		0		
Aluminum	ppm	ASTM D5185(m)	>40	0		
Lead	ppm	ASTM D5185(m)	>7	0		
Copper	ppm	ASTM D5185(m)	>35	0		
Tin	ppm	ASTM D5185(m)	>7	0		
Antimony	ppm	ASTM D5185(m)		0		
Vanadium	ppm	ASTM D5185(m)		0		
Beryllium	ppm	ASTM D5185(m)		0		
Cadmium	ppm	ASTM D5185(m)		0		
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185(m)	limit/base	current <1	history1	history2
	ppm ppm		0			
Boron		ASTM D5185(m)	0	<1		
Boron Barium	ppm	ASTM D5185(m) ASTM D5185(m)	0	<1 0		
Boron Barium Molybdenum	ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	0	<1 0 0		
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	0 0 0	<1 0 0 0		
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	0 0 0 0	<1 0 0 0 0		
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	0 0 0 0 10	<1 0 0 0 0 0		   
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	0 0 0 0 10 450	<1 0 0 0 0 0 505	   	   
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	0 0 0 0 10 450 0	<1 0 0 0 0 0 505 <1		
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	0 0 0 0 10 450 0	<1 0 0 0 0 0 505 <1 662		
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	0 0 0 10 450 0 650 imit/base	<1 0 0 0 0 505 <1 662 <1		
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	0 0 0 10 450 0 650 650 <b>limit/base</b> >15	<1 0 0 0 0 505 <1 662 <1 <1 current		
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	0 0 0 10 450 0 650 650 <b>limit/base</b> >15	<1 0 0 0 0 505 <1 662 <1 662 <1 0		
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) <b>method</b> ASTM D5185(m) ASTM D5185(m)	0 0 0 10 450 0 650 bimit/base >15	<1 0 0 0 0 505 <1 662 <1 662 <1 <i>current</i> 0 0	      history1 	
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m)	0 0 0 10 450 0 650 650 <b>imit/base</b> >15	<1 0 0 0 0 505 <1 662 <1 662 <1 <b>current</b> 0 0 0 <1	      history1	       history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium Water	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m)	0 0 0 10 450 0 650 650 515 >15 >20 >0.1	<1 0 0 0 0 505 <1 662 <1 662 <1 <b>Current</b> 0 0 <1 0 0 <1	       history1  	      history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium Water ppm Water	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m)	0 0 0 10 450 0 650 650 <b>imit/base</b> >15 >20 >0.1 >1000	<1 0 0 0 0 505 <1 662 <1 <b>current</b> 0 0 <1 0.002 16.7	      history1    	       history2   
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium Water ppm Water	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) ASTM D6304*	0 0 0 10 450 650 650 515 >15 >20 >0.1 >20 >0.1 >1000	<1 0 0 0 0 505 <1 662 <1 <i>current</i> 0 0 <1 0.002 16.7 <i>current</i>	     history1        history1	      history2       history2

ASTM D7647 >80

ASTM D7647 >20

ISO 4406 (c) >20/18/15

ASTM D7647 >4

7

0

0

15/14/11

Particles >21µm

Particles >38µm

Particles >71µm

**Oil Cleanliness** 

#### Sample Rating Trend



# **OIL ANALYSIS REPORT**

00 T			FLUID DEGRADA	ATION	method	limit/base	current	history1	history2
00 - Severe			Acid Number (AN)	mg KOH/g	ASTM D974*	0.18	0.19		
00			VISUAL		method	limit/base	current	history1	history2
0			White Metal	scalar	Visual*	NONE	NONE		
00-			Yellow Metal	scalar	Visual*	NONE	NONE		
Abnormal			Precipitate	scalar	Visual*	NONE	NONE		
Nov21/22		Nov21/22 -	Silt	scalar	Visual*	NONE	NONE		
Nová		Novž	Debris	scalar	Visual*	NONE	NONE		
Particle Trend			Sand/Dirt	scalar	Visual*	NONE	NONE		
2k 4μm			Appearance	scalar	Visual* Visual*	NORML			
ik - 		-	Odor Emulsified Water	scalar scalar	Visual*	NORML			
3k -			Free Water	scalar	Visual*	20.1	NEG		
k			FLUID PROPERT		method	limit/base	current	history1	history
(-			Visc @ 40°C	cSt	ASTM D7279(m)	68.0	67.8	mistory	
		22							
Nov21/22		Nov21/22	SAMPLE IMAGE	5	method	limit/base	current	history1	history
Water (KF)			Color					no image	no image
0			Bottom					no image	no image
Abnomal		22	GRAPHS						
Nov21/22		/ 1.C.~IV	Ferrous Alloys			491,520	Particle Count		
Viscosity @ 40	°C		iron chromium			122,880	Severe		
Abnormal			E 5- mickel			30,720			
4 2			0			= 7,680	Abnormal F		
0 - Base			v21/22			Nov21/22 1/20 10561 [ 1 m]		•	
8 - <b>Quise</b> 6			N C			No No	1		
4			Non-ferrous Meta	IS		offined jo			
2 Abnormal			copper			Jo 120			
Nov21/22		60.1	톱 5 tin			ē 30			
Nov2		M7	0			8	+		
Particle Trend			Nov21/22			Nov21/22	-		
4μm						Novi	- 4μ 6μ	14µ 21µ	38µ 71
<ul> <li>κ - μοιοσιτιαι 6μm</li> <li>κ - 14μm</li> <li>κ - 14μm</li> </ul>			Viscosity @ 40°C			-	Acid Number	E I Ja	50µ 11)
						(D)HO.20 BU.15	Base		
			75 - Anorma 9 70 - Base 65			<u></u>			
			<sup>43</sup> 65			and 0.10			
			60 Abnormal			00.0 gci	5		
21/22		2	Nov21/22			Nov21/22	Nov21/22		
Nov2		.C.reli	Nc			Nc	N		
		Laboratory	: WearCheck - C8-117	5 Appleb	/ Line, Burlin	iaton, ON L7L	5H9	Bruce Power -	Bruce A P
		Sample No.	: WC0729956	Rece	i <b>ved</b> :18	3 Jan 2023		0, 177 Tie Road,, RM-222	2 U2 Column 2N11
			. 00504007	Teste	A .10	) Jan 2023			Therton
	ISO 17025:2017	Lab Number							Tiverton, (
	ISO 17025:2017 Accredited	Lab Number Unique Number Test Package	: 5515086	Diagr		) Jan 2023 - W	es Davis	Contact	CA NOG 2