

Machine Id **70049** Component **Pump Drive** Fluid **GEAR OIL ISO 220 (--- GAL)**

RECOMMENDATION

The oil change at the time of sampling has been noted. Resample at the next service interval to monitor.

WEAR

All component wear rates are normal.

CONTAMINATION

Appearance is layered. There is no indication of any contamination in the oil.

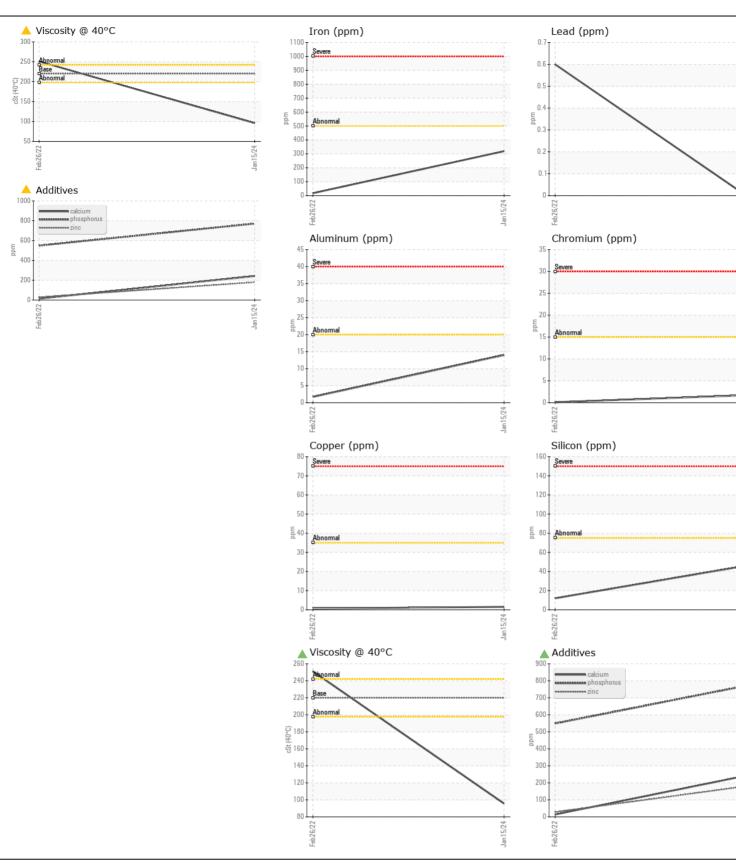
FLUID CONDITION

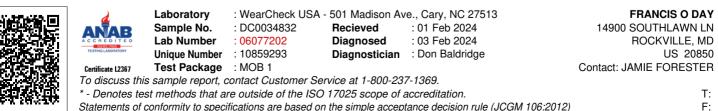
The oil viscosity is lower than normal. This plus the additive levels indicates the addition of a different brand, or type of oil. Confirm oil type.

TestUOMMethodLimit/MCurrentHistory1History2Sample NumberCClient InfoDC0034832DC0019507Sample DateClient InfoIS Jan 202426 Feb 2022Machine AgehrsClient InfoI0001000Filter AgehrsClient InfoI0001000Filter AgehrsClient InfoChangedChangedFilter AngedClient InfoN/AN/AN/ASample StatusClient InfoN/ANORMALChromiumppmASTM D5185>50031917NickelppmASTM D5185>10<1<NickelppmASTM D5185>10<1SilverppmASTM D5185>20142JuminumppmASTM D5185>2<14AurninumppmASTM D5185>2<14VanadiumppmASTM D5185>2<14VanadiumppmASTM D5185>2<14VanadiumppmASTM D5185>2<14VanadiumppmASTM D5185>2<14VanduppmASTM D5185>2<14SilicorppmASTM D5185>20A42Yand							
Sample DateClient InfoIs Jan 202426 Feb 2022Machine AgehrsClient Info36782365Oil AgehrsClient Info10001000Filter AgehrsClient InfoCChangedOil ChangedrClient InfoCChangedFilter ChangedIClient InfoN/ANASample StatusClient InfoMNANASample StatusVXTM D5185>50031917.7IronppmASTM D5185>5003191.7NickelppmASTM D5185>10<1<1NickelppmASTM D5185>10<1SilverppmASTM D5185>10<1AluminumppmASTM D5185>2142IronppmASTM D5185>5012<1CopperppmASTM D5185>5012<1NuminumppmASTM D5185>40<1Yellow Metalscalar"VisualNONENONENONESiliconppmASTM D5185>754612Yellow Metalscalar"VisualNONENONENONESiliconppmASTM D5185>50142Yellow Metalscalar	Test	UOM	Method	Limit/Abn	Current	History1	History2
Machine AgehrsClient InfoJon36782365Oil AgehrsClient Info00.00Filter AgehrsClient InfoChangedChangedOil ChangedClient InfoN/AN/AN/ASample StatusClient InfoN/AN/AN/AIronppmASTM D518m500319177ChromiumppmASTM D518m50031917.7NickelppmASTM D518m5004.1NickelppmASTM D518m5004.1SilverppmASTM D518m5004.1AluminumppmASTM D518m5201442.2LeadppmASTM D518m5201442.4VanadiumppmASTM D518m5201442.4VanadiumppmASTM D518m520142.4VanadiumppmASTM D518m520142.4VanadiumppmASTM D518m520142.4VanadiumppmASTM D518m520142.4VanadiumppmASTM D518m520142.4SiliconppmASTM D518m520142.4SiliconppmASTM D518m520AGENONE </th <th>Sample Number</th> <th></th> <th>Client Info</th> <th></th> <th>DC0034832</th> <th>DC0019507</th> <th></th>	Sample Number		Client Info		DC0034832	DC0019507	
Oil Age Filter AgehrsClient InfoI0001000Filter AgehrsClient Info00Oil ChangedClient InfoN/AN/ASample StatusClient InfoN/AN/AIronppmASTM D5185>500319177ChromiumppmASTM D5185>500319177NickelppmASTM D5185>10<1<1NickelppmASTM D5185>10<1<1SilverppmASTM D5185<0<142AluminumppmASTM D5185>20142LeadppmASTM D5185>20142VandaumppmASTM D5185>20142VandaumppmASTM D5185>20142ValdaumppmASTM D5185>20142ValdaumppmASTM D5185>20142ValdaumppmASTM D5185>20142SiliconppmASTM D5185>20142SiliconppmASTM D5185>20Af2SiliconppmASTM D5185>20Af2SiliconppmASTM D5185>20Af2SiliconppmASTM D518	Sample Date		Client Info		15 Jan 2024	26 Feb 2022	
Filter Age OIIss Client InfoIss Client InfoChangedChangedGli ChangedClient InfoN/AN/AFilter ChangedQClient InfoN/AN/ASample StatusTATTENTIONNORMALIronppmASTM D5185n>500319177ChromumppmASTM D5185n>10<1<1NickelppmASTM D5185n>10<1<1NickelppmASTM D5185n>10<1<1SilverppmASTM D5185n>201422AluminumppmASTM D5185n>352<1CopperppmASTM D5185n>440<1VanadiumppmASTM D5185n>504612Vellow Metalscalar'VisualNONENONENONESiliconppmASTM D5185n>204612ValdervolusiNONENONENONESiliconppmASTM D5185n>204612ValdervolusiNONENONENONESiliconppmASTM D5185n>204612SoliconppmASTM D5185n>20AGESiliconppmASTM D5185n>10AGE <td< th=""><th>Machine Age</th><th>hrs</th><th>Client Info</th><th></th><th>3678</th><th>2365</th><th></th></td<>	Machine Age	hrs	Client Info		3678	2365	
Oli ChangedClient InfoKhangedChangedChangedFilter ChangedOlient InfoN/AN/ASample StatusXTM D5185>5003191.7IronppmASTM D5185>102<1NickelppmASTM D5185>10<1<NickelppmASTM D5185>10<1<TitaniumppmASTM D5185>10<1<SilverppmASTM D5185>2014<<AluminumppmASTM D5185>352<1CopperppmASTM D5185>440<1VanadiumppmASTM D5185>440<VanadiumppmASTM D5185>52<1Vellow Metalscalar'visualNONENONENONESiliconppmASTM D5185>724612SiliconppmASTM D5185>724612SiliconppmASTM D5185>042SiliconppmASTM D5185>72Aff2SiliconppmASTM D5185>72Aff2SoliconppmASTM D5185>72Aff2SiliconppmASTM D5185>72Aff2<	Oil Age	hrs	Client Info		1000	1000	
Filter ChangedClient InfoNAN/AN/ASample StatusClient InfoNAN/AIronppmASTM D5185>50031917IronppmASTM D5185>10<1<1NickelppmASTM D5185>10<1<1NickelppmASTM D5185>10<1<1SilverppmASTM D51850<142<AluminumppmASTM D5185>0<14<LeadppmASTM D5185>352<14<CopperppmASTM D5185>352<1<VanadiumppmASTM D5185>352<1<VanadiumppmASTM D5185>352<1<Vellow Metalscalar*VisualNONENONENONE<SiliconppmASTM D5185>754612SiliconppmASTM D5185>2042SiliconppmASTM D5185>2042SiliconppmASTM D5185>2042SiliconppmASTM D5185>2042SiliconppmASTM D5185>2042SiliconppmASTM D5185>20NONENONESoliconppmASTM	Filter Age	hrs	Client Info		0	0	
Sample StatusATT DY IONNORMALIronppmASTM D5185m>50031917ChromiumppmASTM D5185m>10<1<1NickelppmASTM D5185m>10<1<1TitaniumppmASTM D5185m0<1SilverppmASTM D5185m0<142<AluminumppmASTM D5185m201442<LeadppmASTM D5185m>201442<CopperppmASTM D5185m>352<1YanadiumppmASTM D5185m>352<1VanadiumppmASTM D5185m>754612Yellow Metalscalar*VisualNONENONENONESiliconppmASTM D5185m>754612SiliconppmASTM D5185m>2042SiliconppmASTM D5185m>2042SiliconppmASTM D5185m>2042SiliconppmASTM D5185m>2042SiliconppmASTM D5185m>20ASiliconppmASTM D5185mNONENONESoliconppmASTM D5185mNONENONE <th>Oil Changed</th> <th></th> <th>Client Info</th> <th></th> <th>Changed</th> <th>Changed</th> <th></th>	Oil Changed		Client Info		Changed	Changed	
IronppmASTM D5185m>500 319 177ChromiumppmASTM D5185m>10<1<1<NickelppmASTM D5185m>10<1<1<TitaniumppmASTM D5185m<0<14<1<SilverppmASTM D5185m<0<14<1<AluminumppmASTM D5185m<0<142<LeadppmASTM D5185m<0<14<1<CopperppmASTM D5185m>4000<1YanadiumppmASTM D5185m>4000<<VanadiumppmASTM D5185m>4000<<Yellow Metalscalar*VisualNONENONENONE<SiliconppmASTM D5185m>754612Yellow Metalscalar*VisualNONENONENONE<SiliconppmASTM D5185m>2042Yellow Metalscalar*VisualNORMODERNONESiliconppmASTM D5185m>2042SoliconppmASTM D5185m>754612SoliconppmASTM D5185m>0AASoliconppmASTM D5185m>0NORENORESoliconscalar	Filter Changed		Client Info		N/A	N/A	
Chromium ppm ASTM D5185m >10 2 <1	Sample Status				ATTENTION	NORMAL	
Chromium ppm ASTM D5185m >10 2 <1	Iron			. 500	210	17	
NickelppmASTM D5185m>10<1							
TitaniumppmASTM D5185mGGISilverppmASTM D5185m0<1AluminumppmASTM D5185m>20142LeadppmASTM D5185m>20142CopperppmASTM D5185m>352<1TinppmASTM D5185m>40<1VanadiumppmASTM D5185m>40<1VanadiumppmASTM D5185m>40<1VanadiumppmASTM D5185m>754612Yellow Metalscalar*VisualNONENONENONESiliconppmASTM D5185m>754612SiliconppmASTM D5185m>2042WaterWC Method>0.2NEGNONESilitscalar*VisualNONENONENONESand/Dirtscalar*VisualNORNONENONEAppearancescalar*VisualNORMLALAYRDNORLLGodrscalar*VisualNORMLNCRMLNORMLAppearancescalar*VisualNORMLALAYRDNORLLBoronppmASTM D5185m15<10BariumppmASTM D5185m15<1<-1<					_		
SilverppmASTM D5185m0<1				>10			
AluminumppmASTM D5185m>20142LeadppmASTM D5185m>20142CopperppmASTM D5185m>352<1TinppmASTM D5185m>40<1VanadiumppmASTM D5185m>40<1White Metalscalar*VisualNONENONENONEYellow Metalscalar*VisualNONENONENONESiliconppmASTM D5185m>754612Yellow Metalscalar*VisualNONENONENONESiliconppmASTM D5185m>754612Yellow Metalscalar*VisualNONEMODERNONESiliconscalar*VisualNONEMODERNONEYellow Metalscalar*VisualNONEMODERNONESilitscalar*VisualNONEMODERNONEDebrisscalar*VisualNORMNONENONEAppearancescalar*VisualNORMNORMLAGoroscalar*VisualNORMLNORMLNORMLBoronppmASTM D5185m50217BariumppmASTM D5185m15<10Magna					-		
LeadppmASTM D5185mO<1				00	-		
Copper ppm ASTM D5185m >35 2 <1				>20			
TinppmASTM D5185m>40<1				05	-		
VanadiumppmASTM D5185m000White Metalscalar*VisualNONENONENONENONEYellow Metalscalar*VisualNONENONENONENONESiliconppmASTM D5185m>754612PotassiumppmASTM D5185m>2042WaterWC Method>0.2NEGNEGSilitscalar*VisualNONEMODERNONEDebrisscalar*VisualNONENONENONESand/Dirtscalar*VisualNORMNONENORMAppearancescalar*VisualNORMNORMLNORMLOdorscalar*VisualNORMNORMLNORMLSodiumppmASTM D5185m50217BoronppmASTM D5185m15<10MaganeseppmASTM D5185m15<10MagnesiumppmASTM D5185m50113MagnesiumppmASTM D5185m50113PhosphorusppmASTM D5185m50180242144SoliumppmASTM D5185m50180249MagnesiumppmASTM D5185m50180249					_		
White Metalscalar*VisualNONENONENONENONEYellow Metalscalar*VisualNONENONENONESiliconppmASTM D5185m>7546612PotassiumppmASTM D5185m>2042WaterWC Method>0.2NEGNEGSilitscalar*VisualNONEMODERNONEDebrisscalar*VisualNONEMODENONESand/Dirtscalar*VisualNONENONENONEAppearancescalar*VisualNORMLACTM P1Odorscalar*VisualNORMLNORMLNORMLSodiumppmASTM D5185m50217BariumppmASTM D5185m15<10ManganeseppmASTM D5185m50113ManganesiumppmASTM D5185m50113ManganesiumppmASTM D5185m50113PhosphorusppmASTM D5185m50113ManganesiumppmASTM D5185m50113ManganesiumppmASTM D5185m50113PhosphorusppmASTM D5185m10018028SilfurppmASTM D5185m <td< th=""><th></th><th></th><th></th><th>>4</th><th>-</th><th></th><th></th></td<>				>4	-		
Yellow Metalscalar*VisualNONENONENONE \sim SiliconppmASTM D5185m>7546612PotassiumppmASTM D5185m>2042WaterWC Method>0.2NEGNEGSilitscalar*VisualNONEMODERNONEDebrisscalar*VisualNONENONENONESand/Dirtscalar*VisualNONENONENONEAppearancescalar*VisualNORMLALAYRDNORMLOdorscalar*VisualNORMLMOERNORMLSodiumppmASTM D5185m50217BariumppmASTM D5185m15<10ManganeseppmASTM D5185m50113MagnesiumppmASTM D5185m50113PhosphorusppmASTM D5185m50113SiturppmASTM D5185m50113MagnesiumppmASTM D5185m50113PhosphorusppmASTM D5185m5011249MagnesiumppmASTM D5185m5018028SiturppmASTM D5185m10018028MagnesiumppmASTM D5185m <td< th=""><th></th><th></th><th></th><th>NONE</th><th></th><th></th><th></th></td<>				NONE			
SiliconppmASTM D5185m>754612PotassiumppmASTM D5185m>2042WaterWC Method>0.2NEGNEGSiltscalar*VisualNONEMODERNONEDebrisscalar*VisualNONENONENONESand/Dirtscalar*VisualNONENONENONEAppearancescalar*VisualNORMLALAYRDNORMLOdorscalar*VisualNORMLNORMLNORMLSodiumppmASTM D5185m50217BariumppmASTM D5185m15<10MaganeseppmASTM D5185m50113MagnesiumppmASTM D5185m50113PhosphorusppmASTM D5185m50114MagnesiumppmASTM D5185m50114PhosphorusppmASTM D5185m350771549ZincppmASTM D5185m125015297686							
PotassiumppmASTM D5185m>2042WaterWC Method>0.2NEGNEGSiltscalar*VisualNONEMODERNONEDebrisscalar*VisualNONENONENONESand/Dirtscalar*VisualNONENONENONEAppearancescalar*VisualNORMLALAYRDNORMLOdorscalar*VisualNORMLNORMLNORMLEmulsified Waterscalar*Visual>0.2NEGNEGSodiumppmASTM D5185m502177BariumppmASTM D5185m15<10MolybdenumppmASTM D5185m50113MagnesiumppmASTM D5185m501113PhosphorusppmASTM D5185m502422144PhosphorusppmASTM D5185m350771549ZincppmASTM D5185m350118028SulfurppmASTM D5185m12500152976866	Yellow Metal	scalar	*Visual	NONE	NONE	NONE	
ValueMathematicationMathematicationMathematicationWaterWC Method>0.2NEGNEGSiltscalar*VisualNONEMODERNONEDebrisscalar*VisualNONENONENONESand/Dirtscalar*VisualNONENONENONEAppearancescalar*VisualNORMLALAYRDNORMLOdorscalar*VisualNORMLNORMLNORMLEmulsified Waterscalar*Visual>0.2NEGNEGSodiumppmASTM D5185m502177BariumppmASTM D5185m15<10MolybdenumppmASTM D5185m15<1<MagnesiumppmASTM D5185m50113PhosphorusppmASTM D5185m50<14PhosphorusppmASTM D5185m50<14PhosphorusppmASTM D5185m350<14SulfurppmASTM D5185m10018028SulfurppmASTM D5185m12500152976866	Silicon	ppm	ASTM D5185m	>75	46	12	
Siltscalar*VisualNONEMODERNONEDebrisscalar*VisualNONENONENONESand/Dirtscalar*VisualNONENONENONEAppearancescalar*VisualNORMLALAYRDNORMLOdorscalar*VisualNORMLNORMLNORMLOdorscalar*VisualNORMLNORMLNORMLEmulsified Waterscalar*Visual>0.2NEGNEGSodiumppmASTM D5185m502177BoronppmASTM D5185m15<10MolybdenumppmASTM D5185m15<10MagnesiumppmASTM D5185m50113PhosphorusppmASTM D5185m50113PhosphorusppmASTM D5185m10018028SulfurppmASTM D5185m1250152976866	Potassium	ppm	ASTM D5185m	>20	4	2	
Debrisscalar*VisualNONENONENONESand/Dirtscalar*VisualNONENONENONEAppearancescalar*VisualNORML▲ LAYRDNORMLOdorscalar*VisualNORMLNORMLNORMLNORMLEmulsified Waterscalar*Visual>0.2NEGNEGSodiumppmASTM D5185m502177BoronppmASTM D5185m15<10MolybdenumppmASTM D5185m15<10MagnesiumppmASTM D5185m50113PhosphorusppmASTM D5185m50113ZincppmASTM D5185m350 180 28SulfurppmASTM D5185m125015805686	Water		WC Method	>0.2	NEG	NEG	
Sand/Dirtscalar*VisualNONENONEAppearancescalar*VisualNORML▲ LAYRDNORMLOdorscalar*VisualNORMLNORMLNORMLNORMLEmulsified Waterscalar*Visual>0.2NEGNEGSodiumppmASTM D5185m502177BoronppmASTM D5185m502177BariumppmASTM D5185m15<10MolybdenumppmASTM D5185m15<1<1MagnesiumppmASTM D5185m50113CalciumppmASTM D5185m50113PhosphorusppmASTM D5185m350 180 28ZincppmASTM D5185m12500180286	Silt	scalar	*Visual	NONE	MODER	NONE	
Appearancescalar*VisualNORML▲ LAYRDNORML····Odorscalar*VisualNORMLNORMLNORMLNORML····Emulsified Waterscalar*Visual>0.2NEGNEG····SodiumppmASTM D5185m50217····BoronppmASTM D5185m15<10····BariumppmASTM D5185m15<10····MolybdenumppmASTM D5185m15<10····ManganeseppmASTM D5185m50113····CalciumppmASTM D5185m501113····PhosphorusppmASTM D5185m350 A 242 144····PhosphorusppmASTM D5185m10018028····SulfurppmASTM D5185m100180286····	Debris	scalar	*Visual	NONE	NONE	NONE	
Odorscalar*VisualNORMLNORMLNORMLEmulsified Waterscalar*Visual>0.2NEGNEGSodiumppmASTM D5185m0<1BoronppmASTM D5185m50217BariumppmASTM D5185m15<10MolybdenumppmASTM D5185m15<10ManganeseppmASTM D5185m50113MagnesiumppmASTM D5185m501113PhosphorusppmASTM D5185m350 A 242 144PhosphorusppmASTM D5185m10018028SulfurppmASTM D5185m100152976866	Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	
Emulsified Water scalar *Visual >0.2 NEG NEG Sodium ppm ASTM D5185m 50 2 17 Boron ppm ASTM D5185m 50 2 177 Barium ppm ASTM D5185m 15 <1 0 Molybdenum ppm ASTM D5185m 15 <1 0 Manganese ppm ASTM D5185m 15 <1 3 Magnesium ppm ASTM D5185m 50 11 3 Phosphorus ppm ASTM D5185m 50 11 3 Phosphorus ppm ASTM D5185m 50 242 14 Phosphorus ppm ASTM D5185m 350 771 549 Zinc ppm ASTM D5185m 100 180 28 Sulfur ppm ASTM D5185m 125	Appearance	scalar	*Visual	NORML	LAYRD	NORML	
Sodium ppm ASTM D5185m 0 <1	Odor	scalar	*Visual	NORML	NORML	NORML	
Boron ppm ASTM D5185m 50 2 17 Barium ppm ASTM D5185m 15 <1 0 Molybdenum ppm ASTM D5185m 15 <1 0 Manganese ppm ASTM D5185m 15 <1 <1 Magnesium ppm ASTM D5185m 50 11 3 Calcium ppm ASTM D5185m 50 111 3 Phosphorus ppm ASTM D5185m 50 114 Zinc ppm ASTM D5185m 350 ▲ 771 5499 Sulfur ppm ASTM D5185m 100 180 28	Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	
Barium ppm ASTM D5185m 15 <1	Sodium	ppm	ASTM D5185m		0	<1	
Molybdenum ppm ASTM D5185m 15 <1	Boron	ppm	ASTM D5185m	50	2	17	
Manganese ppm ASTM D5185m 3 <1	Barium	ppm	ASTM D5185m	15	<1	0	
Magnesium ppm ASTM D5185m 50 11 3 Calcium ppm ASTM D5185m 50 ▲ 242 14 Phosphorus ppm ASTM D5185m 350 ▲ 771 549 Zinc ppm ASTM D5185m 100 180 28 Sulfur ppm ASTM D5185m 12500 15297 686	Molybdenum	ppm	ASTM D5185m	15	<1	<1	
Calcium ppm ASTM D5185m 50 ▲ 242 14 Phosphorus ppm ASTM D5185m 350 ▲ 771 549 Zinc ppm ASTM D5185m 100 180 28 Sulfur ppm ASTM D5185m 12500 15297 686	Manganese		ASTM D5185m		3	<1	
Calcium ppm ASTM D5185m 50 ▲ 242 14 Phosphorus ppm ASTM D5185m 350 ▲ 771 549 Zinc ppm ASTM D5185m 100 180 28 Sulfur ppm ASTM D5185m 12500 15297 686	Magnesium		ASTM D5185m	50		3	
Phosphorus ppm ASTM D5185m 350 ▲ 771 549 Zinc ppm ASTM D5185m 100 180 28 Sulfur ppm ASTM D5185m 12500 15297 686			ASTM D5185m	50	242	14	
Zinc ppm ASTM D5185m 100 180 28 Sulfur ppm ASTM D5185m 12500 15297 686	Phosphorus		ASTM D5185m	350		549	
Sulfur ppm ASTM D5185m 12500 15297 686	-					28	

Contact/Location: JAMIE FORESTER - FRAROCDC

WEAR NORMAL CONTAMINATION ATTENTION FLUID CONDITION ATTENTION





Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

Contact/Location: JAMIE FORESTER - FRAROCDC