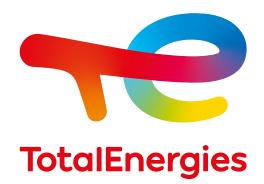


Natural gas value chain TCO^{*} enhanced lubricants

Optimizing your efficiency from Gas Wells to Gas compressors



Summary

- → OEM specifications & approvals
- → Natural gas industry
- → Gas engine oil range
- → Turbine oil range
- → Gas compressor oil range
- → Heat transfer fluid
- → Five good reasons for choosing TotalEnergies Lubrifiants

specifications and approvals

GAS ENGINE		Nateria MH	Nateria MP	Nateria MJ	Nateria MWX	Nateria MX	COOLANT
JENBACHER	Туре 2 & 3	(gas A, B, C, CAT)	(gas A, CAT)	(gas B, C)	(gas A)	(gas A)	Coolelf Supra Coolelf CHP Supra
	Туре 4 А, В	(gas A, B, C, CAT)	(gas A, CAT)		(gas A)	(gas A)	
	Type 4 C, E				(gas A)	(gas A)	
	Туре 6 С, Е	(gas A, B, C, CAT)	(gas A, CAT)		(gas A)	(gas A)	
	Type 6 F, J				(gas A)	(gas A)	
	Туре 6 Н, К					(gas A)	
▶ WAUKESHA	VGF, VHP, 275GL/GL+, APG series						
	Cogeneration		\checkmark				
	CAT CG132/170/260		\mathbf{r}	\mathbf{r}		\mathbf{r}	Coolelf
 CATERPILLAR ENERGY SOLUTIONS 	CG132B/170B						Supra Coolelf
	3300, 3400, 3500 series				\mathbf{r}		MDX
► MWM	TCG 2016/2020/2032		\mathbf{r}	\mathbf{r}			Coolelf Supra Coolelf MDX
	TCG 3016/3020					\mathbf{r}	
Wärtsilä	34SG, 50SG				In progress		WT Supra
	4000 series L32/33		$\mathbf{\nabla}$				
	4000 series L61/62/63		$\mathbf{\nabla}$				Coolelf Supra Coolelf MDX
MTU	4000 series L64		$\mathbf{\nabla}$				
MIO	4000 series L32FB						
	4000 series L62FB			\mathbf{r}			
	400BR series		\checkmark	\mathbf{r}			
BERGEN ENGINES	K-G1, -G2 and -G3 C26:33 B35:40						
	B36:45					In progress	
MAN Energy Solutions	35/44, 51/60		(SAE 40, 50)				Coolelf Auto Supra
MAN Truck & Bus	M3271-2		\mathbf{r}				Coolelf MDX
	M3271-4			\mathbf{r}			
CUMMINS	QSK60, QSV91				In progress		
	HSK78					In progress	
> DEUTZ	0199-99-01213/1 (all engines)		\checkmark				Coolelf Supra
▶ TEDOM	Cento		\checkmark	\checkmark		In progress	Coolelf Supra
KHI KAWASAKI	KG series					In progress	
MHIET	GS-R series		\mathbf{r}			In progress	

Summary

TURBINE OIL	Preslia	Preslia GT	Preslia Evo
Meets the requirements:			
ANDRITZ Hydro			
GE GEK 27070, 46506, 28143, 101941, 32568, 107395			
GE LM series			
SIEMENS Industrial Turbo. AB MAT 812101 /02 /06/ 07 /08 /09			\mathbf{r}
 SIEMENS Turbomachinery 1CW0047915 			
SOLAR ES 9-224, Class II			
VOITH Hydro			
Approved for:			
ALSTOM HTGD 90117	Ľ		
ALSTOM HTWT 600050			
ANSALDO TG02-0171			
BAKER HUGHES ITN0000033			
DOOSAN SKODA, Turbiny Plzen			
FUJI ELECTRIC steam turbines			
HTC HANGHZOU steam turbines			
MAN ES TED 1000494596			
NANJING Turbines (NTC)			
SHANGHAI ELECTRIC			
SHIN NIPPON			
SIEMENS TLV 901304, 901305			
 SIEMENS SGT-A05 (501-K), SGT-A35 (RB 211), SGT-A20 (AVON) 			
TOSHIBA steam turbines			
TRIVENI steam turbines			

HYDRAULIC FLUID

Meets the requirements:

ISO 15380 (HEES fluids)

Approved for:

- ALSTOM HTGD 690149
- FUJI ELECTRIC
- GE GEK 120319
- MHPS MS04-MA-CL004
- SIEMENS zinc-free mineral hydraulic oils
- SIEMENS TLV 901203



Summary OCH OCH OCH OCH



Your challenges

- Reduce downtime
- Optimize the lube oil life
- Operate at high and low pressures
- Reduce overhead and consumables cost

Simplified version of natural gas value chain

Our solutions

With our carefully selected base oils and additives meeting leading **equipment manufacturers' requirements,** we keep your equipment reliable in any conditions by providing:

- OEM approved and qualified products
- Optimize total cost of ownership (TCO)
- Higher reliability
- Optimized mean time between failures

• Gas compressor oil range Select based on PSIG and gas stream

GAS STREAM	< 1000	1000 to 2000	2000 to 3500	3500 to 5000	> 5000
	Cortis MS 150 (NC)	Cortis MS 150-220 (NC)	Cortis MS 220 (NC)	Cyl C 320-460 (C)	Cyl C 460-680 (C
Pipeline quality including CNG (Dry)	Dacnis LPG 150	Dacnis LPG 150	Dacnis LPG 220	Dacnis LPG 220	031 0 400 000 (0
Natural gas, water saturated and/or heavy hydrocarbons where SG > 0.7	Cortis MS 150-220 (NC)	Cortis MS 220-320 (NC) Danis P 220 CD (C)	Cyl C 460-680 (C)	Cyl C 680 (C)	
	Dacnis LPG 150	Dacnis LPG 150	Dacnis LPG 220		
Natural gas, water saturated and carbon dioxide	Cortis MS 150-220 (NC)	Cortis MS 220-320 (NC) Danis P 220 CD (C)	Cyl C 460-680 (C)	Cyl C 680 (C)	
> 2 to 10 %	Dacnis LPG 150	Dacnis LPG 150	Dacnis LPG 220		
Natural gas, water saturated and carbon dioxide > 10 %	Cortis MS 150-220 (NC)	Cortis MS 220-320 (NC) Danis P 220 CD (C)	Cyl C 460-680 (C)	Cyl C 680 (C)	
	Dacnis LPG 150	Dacnis LPG 150	Dacnis LPG 220		
Natural Gas, water saturated and H2S > 2 % to 30 %	Cortis MS 150 (NC)	Cortis MS 150-220 (NC)	Cortis MS 220 (NC)	Cortis MS 320 (NC)	Cyl C 460-680 (C
	Dacnis LPG 150	Dacnis LPG 150	Dacnis LPG 220	Dacnis LPG 220	
Natural Gas, water saturated and H2S > 30 %	Cortis MS 150 (NC)	Cortis MS 150-220 (NC)	Cortis MS 220 (NC)	Cortis MS 320 (NC)	Cyl C 460-680 (C
	Dacnis LPG 150	Dacnis LPG 150	Dacnis LPG 220	Dacnis LPG 220	
Air or gas mixtures with > 4 % oxygen content	Diester or POE ISO 100	Diester or POE ISO 150	Consult TotalEnergies	Consult TotalEnergies	Consult TotalEnergies
	Dacnis LPG 150	Dacnis LPG 150			
Nitrogen	Cortis MS 150 (NC)	Cortis MS 150-220 (NC)	Cortis MS 220 (NC)	Cortis MS 320 (NC)	Cyl C 460-680 (C
	Dacnis LPG 150 (P)	Dacnis LPG 150	Dacnis LPG 150	Dacnis LPG 150	Dacnis LPG 220
Propane	Cortis MS 150 (NC)	Cortis MS 150 (NC)	Consult TotalEnergies	Consult TotalEnergies	Consult TotalEnergies
(refrigerant)			3	5	J

* C : Compounded / NC: Non-compounded

• Heat transfer fluid

PRODUCT	OPERATING TEMPERATURE	VISCOSITY		
Seriola AB	Process temperature -30 to +300 °C (+320 °C in the film)	Viscosity at 40 deg - 20 mm2/s		
Seriola 32, 100	Process temperature 0 to +310 °C (+330 °C in the film)	Viscosity at 40 deg - 32, 100 mm2/s		
Seriola ECO2	Process temperature 0 to +300 °C (+320 °C in the film)	Viscosity at 40 deg - 34 mm2/s		
* For refrigeration compressor – please consult TotalEnergies				

Support and partnership

Thanks to local technical presence, we provide a high level of service to optimize your Total Cost of Ownership.

A major player

With our production, supply chain and commercial presence in more than 160 countries, we deliver a full range of lubricants.

References & OEMs

TotalEnergies Lubrifiants cooperates with equipment manufacturers to create high-technology products for optimal performance and production of your machinery.

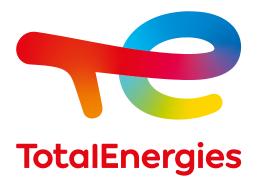
good reasons for choosing TotalEnergies Lubrifiants

Innovation & Research

TotalEnergies Lubrifiants invests in biotechnologies to find the most suitable components to reach energy efficiency through formulations designed in our Research Centers.

Quality and environment

TotalEnergies Lubrifiants ISO 9001 and 14001 Certifications are the guarantee of a long term commitment to quality and environment. From the initial design stage, our R&D teams seek to develop products that minimize toxicity risks and environmental impact.





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TotalEnergies Industry Solutions

Safety Data Sheets are available at ms-sds.totalenergies.com