

>_ **PRODUCTS**

OILS

Product	Description	Viscosity (cst)	Temp. de work (°C)	Test 4 Balls (Kg)	Application
OMNIGEAR ADVANCE M	Mineral oil with PD technology. High performance oil for long term interval, till 40.000 hs	32 a 3200	-10 a 90	NA	Planetary, helicoidal and spur gears operating mill drive, cane bagasse and cake filters Conveyor belts submitted to high load
OMNIGEAR ADVANCE S	Syntethic oil with PD technology. High performance gear oil for long term intervals, up to 40.000 h	32 a 3200	-30 a 110	NA	Planetary, helicoidal and spur gears installed close to a warm area
OMNIGEAR ADVANCE 80W90	All kind of transmissions, differentials and final drives in cane harvesters, tractors and other field equipment which operates under high load and wet and dusty environment	SAE 80 w 90	-20 a 90	Min 3G	All kinds of automotive transmissions. Differentials and final drives
OMINGEAR ADVANCE 85W140	All kind of transmissions, differentials and final drives in cane harvesters, tractors and other field equipment which operates under high load and wet and dusty environment	SAE 85 w 140	-10 a 90	Min 3G	All kinds of automotive transmissions. Differentials and final drives.

GREASE

PRODUCTS	GRADE NLGI	THICKENER/ Or. BASE	Visc Oil 40 °C	TEMP. USE °C	POINT DROP	LOAD SOLDER 4 BALLS	FACTOR VELOC.	DAMAGE PROTECTION AND RESISTANCE TO EXTERNAL FACTORS	INDUSTRY EQUIPMENT
TARMELA 9300	1-2	OBCS PAO	100	-40-200	300	500	700000	Higher load capacity. High resistance to water	Bearings operating in a high temperature environment and submitted at high loads
TARMELA 9500	1-2	OBCS Min	150	-20-200	300	500	400000	Higher load capacity. High resistance to water	Bearings operating at high speeds and high loads, fans, electric Motors
TARMELA 9600	1-2	OBCS Min	500	-20-200	300	500	300000	Higher load capacity. High resistance to water	Bearings under extreme operating conditions like those in continuos casting, Rolling Mills, hammers, in the steel, paper and sugar industry
TARMELA 9700	1-2	OBCS Min + Pol	320	-10 a 200	300	500	100000	Higher load capacity and temperature resistance.	Mechanisms submitted at high loads and swept by water
TARMELA 9000 FG	2	OBCS - Min HT	100	-20-150	300	500	200000	High temperature and load	Bearings operating at high temperature and load in the food industry
TARMELA 9900 FG (nsf H1)		OBCS - PAO	100	-40 a 200	300	500	500000	Temperature and load	Bearings operating at extreme high and low temperatures load in the food industry in the food industry.

Knowledge, Experience and Technology: best Solutions in Industrial Lubrication

In a Framework of increasing demands, supplying effective answers and specific solutions based on different degrees of complexity is our ongoing commitment for over 15 years, with the objeotive of transforming the needs of our customers in results which improve their production processes.

As a team, our technical field advisers and our highly skilled laboratorians developers, suggest and promote best practices in industrial lubrication enabling the most advanced Technologies through a comprehensive range of solutions with the focus of optimizing Total Operative Costs.

LAAPSA operates under ISO 9001/2000 to ensure customer focus, teamwork, continuous improvement and beneficial relationships with customers and suppliers.



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new technologies lubricants

> **-PD- PLASTIC DEFORMATION TECHNOLOGY FOR GEAR OILS**

OMNIGEAR ADVANCE M
OMNIGEAR ADVANCE S
OMINIGEAR ADVANCE 80W90
OMNIGEAR ADVANCE 85W140

> **-OBES- OVERBASED CALCIUM SULPHONATE COMPLEX FOR GREASES**

TARMELA 9300
TARMELA 9500
TARMELA 9600
TARMELA 9700
TARMELA 9000 FG
TARMELA 9900 FG



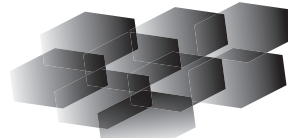
> SPECIAL OVERBASED CALCIUM SULPHONATE COMPLEX GREASES -OBCS TECH-



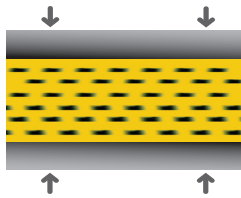
- > **HIGH TEMPERATURE RESISTANCE, DROPPING POINT OVER 300C**
- > **MAXIMUM WATER RESISTANCE, WATER WASH OUT 0,03**
- > **HIGH EXTREME PRESSURE PROTECTION, 4 BALL WELD POINT 500 KG (WITHOUT SOLIDS)**
- > **HIGH MECHANICAL STABILITY, 0% CHANGE UNDER ROLL STABILITY TEST**
- > **ITS SULPHONATED COMPOUNDS FORM A PERMANENT PROTECTIVE LAYER AGAINST CORROSION**
- > **EXCELLENT PUMPABILITY**
- > **LET IMMEDIATE CONSUMPTION REDUCTION, > 40%**
- > **ENSURES THE BEARING SEAL PREVENTING THE ENTRY OF CONTAMINANTS**
- > **REDUCE THE ENVIRONMENTAL IMPACT BECAUSE OF THE REDUCED CONSUMPTION**
- > **IT IS COMPATIBLE WITH OTHER GREASES**
- > **IT DOES NOT CONTAIN HEAVY METAL ADDITIVES**
- > **IT IS BIODEGRADABLE, 65% UNDER OECD 301 B TEST**

HOW THIS NEW TECHNOLOGY MEETS THE REQUIREMENTS WHICH SUBMIT THE MECHANISMS?

Conventional greases have in their formulation oil, thickener and additives. The additives reduce friction and improve the capability of withstanding the loads. Unwanted side-effect, many additives reduce some of the key properties. For example, the mechanical stability and water resistance. For this reason it is accepted that the use of additives is restricted, seeking to maintain the water repellency and mechanical stability within acceptable values. The solid additives such as graphite, molybdenum and others, can decrease the adhesion and limit the pumping levels as under pressure the oil trends to separate from the thickener forming agglomeration of particles.



The goal of the technology for **overbased calcium sulphonate complex greases** is that the thickener conferred the properties of high load capacity, corrosion protection, resistance to water and fluid attack and wear resistance, without the incorporation of additives. In Calcium sulphonate greases the thickener structure creates a single interface plates or scales between the surfaces, as shown. When load is applied, the plates (or scales) slide past each other with very low friction coefficient.

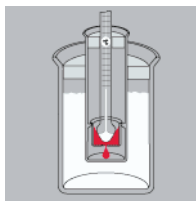
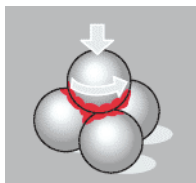


PERFORMANCE: TESTS AND STUDIES /

> **LOAD CAPACITY EXCEEDS 500 KG** / By the "FOUR BALL TEST" (ASTM D 2783) Weld load, greases based calcium sulfonate exceed 500 Kg This capability is given by the technology of the thickener. A lithium EP grease reaches between 200 and 250 kg

> **DROPPING POINT OVER 300 ° C** / According to ASTM D 566, is the temperature at which a grease starts its liquefaction. Greases based on calcium sulfonate have a Dropping point > 300 ° C, and can operate for long periods at temperatures > 200 ° C. A lithium EP grease has a dropping point of 180° C, and operate properly up to 90 °C.

> **RESISTANCE TO MECHANICAL WORK** / By the ASTM D 217, Test of stability mechanical shear, the calcium sulfonate greases do not change their consistency even after being tested with 100,000 hits under mechanical work. All other greases change their degree of consistency substantially.

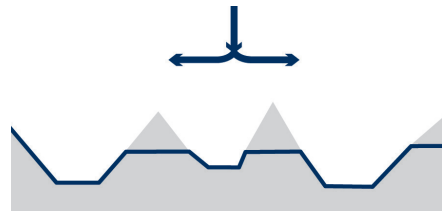


> GEAR OILS WITH PLASTIC DEFORMATION -PD TECH-

Developed innovative line of lubricants with additives 3rd Generation technology ("PD"), which cause plastic deformation of the surface roughness peaks.

- > **IMMEDIATE DETENTION AND REPAIRING OF EXISTING DAMAGE LIKE PITTINGS**
- > **EXTENDED DRAIN INTERVAL, OVER 40,000 HOURS**
- > **REDUCES FRICTION BY 50%, FRICTION COEFFICIENT <0,05**
- > **REDUCES VIBRATION AND NOISE LEVEL**
- > **REDUCES OPERATING TEMPERATURE**
- > **REDUCES ENERGY CONSUMPTION**
- > **INCREASES LIFE OF THE MECHANISMS**
- > **LOAD DISTRIBUTION AREA UP TO 80%**
- > **WARRANTY SERVICE X 4 YEARS (OR 30,000 HOURS)**

Lubricants fulfill several functions, among them, the friction control and wear between the contact surfaces that reduce useful life of mechanical components. First generation oils (EP) through a process of chemical action produces the breakdown of the peaks of roughness, and carry the distribution of the load in an area less than 20% of the total. The second generation of lubricants incorporating solids (graphite, MoS2 in suspension), that fill the irregularities of the surface (valleys), distributing the load over an area of around 35% of the total.



THE PEAKS OF ROUGHNESS ARE SMOOTHED BY PLASTIC DEFORMATION WITHOUT LOSS OF MATERIAL REDUCING THE FRICTION WITH HIGH RELIABILITY

LAAPSA now offers a new generation of advanced lubricants with additives designed to facilitate the PLASTIC DEFORMATION (PD) of the peaks of the surface roughness. The third generation of lubricants are manufactured with advanced technology additives containing organic-based metal merging at the contact surface of these peaks and deforming them. With this active exchange, surfaces become smooth and soft spot reducing pressure and friction immediately.

The quality of the surfaces that interact are significantly improved, without metal loss since there is no permanent chemical action. Only at the moment of contact, energy acts on the system, triggering the fusion of additives on the peaks. Under this high pressure the additive merges, the roughness softens and smooth spreading the load by 80% of the total area. When the pressure decreases the additive fails to act and is not consumed, thus maintaining their properties longer. There is no chemical attack. There is no aggression to the base oil. The life of an advanced third-generation oil exceeds 10 times that of an EP oil other generations.

TESTING AND PERFORMANCE STUDIES /

> **LESS FRICTION | TEST SRV** / The test verifies that a conventional oil EP, has an average friction coefficient of 0.12. In return, the lubricant OMNIGEAR ADVANCE, drops to a level less than 0.05 demonstrating the corrective effect and allowing hydrodynamic lubrication. By this way all temperature and friction parameters are reduced.

> **MAXIMUM PERFORMANCE | TEST FZG** / According to the FZG test (DLN 51354-2) that examines the behavior of the scuffing, OMNIGEAR ADVANCE OILS exceed 15 steps.

> **RESISTANCE TO THE "GREY FLECKING" - FZG test - FVA 54/IV MODIFIED** / Examines the ability of the lubricant to prevent the formation of micropitting or gray stain that represents the beginning of a more severe damage such as pitting. OMNIGEAR ADVANCE reaches class I - High -in GFT load step 10.

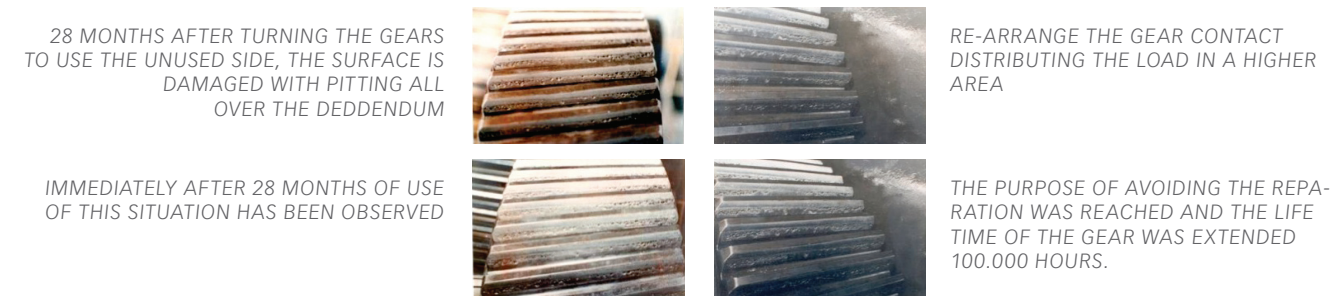
> CASE HISTORY: 1. STOPS DESTRUCTIVE PROCESS 18 Tons cement KRUPP mill gear box, 1000 HP engine

> INITIAL SITUATION:

28 months after beginning using a new side

> REPAIRING PROCESS

After 16 months, the deformation plastic process improved the surface stopping the destructive process



> TWO DIFFERENT COLOURS ARE DEFINED IN THE SURFACE

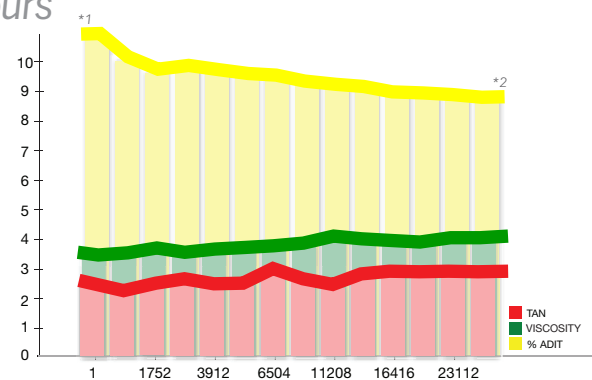


BRIGHT -LIMITED ROUGHNESS- IN THE AREAS SURROUNDING THE ORIGINAL PITTINGS
BLUE CEMENTED IN THE REST

> CASE HISTORY: 2. EXTENDED DRAIN INTERVAL MAINTAINING HIGH EP PROTECTION

comparison chart after 25,176 operative hours

1. SHOW ALSO CONTAINS 71% THE ORIGINAL ADDITIVES.
2. VISCOSITY Y T.A.N. ACCEPTABLE.
3. CONTAMINATION HAS NOT.
4. OIL IS IN GOOD CONDITIONS OF USE.



*1: New Oil: 400 kg load of solder ball test 4

*2: Oil 25,000 hours with 400 kg load four ball weld test