

eurochem[®]

aviation, marine and industrial chemicals



COMPANY PROFILE

EUROCHEM was established in Athens, Greece in 1981, and soon became the leading manufacturing company in Chemical compounds and detergents, for cleaning and maintenance.

Our current production range includes over 2000 Chemical products for **AVIATION, MARINE, INDUSTRIAL USE, SPRAY-AEROSOLS** as well as **INSTITUTIONAL** and **HOUSEHOLD DETERGENTS**, in various packaging (bulk, drums, pails, cans, plastic bottles, aerosol).

EUROCHEM functions according to the International Quality Standards and is certified with the **Quality Standard ISO 9001 & 14001**

For design, production, and sales of:

- A. Cleaning and maintenance Chemicals for Marine, Aviation and Industrial use.**
- B. Detergents.**

The majority of them are manufactured under U.S. Military Specifications and most of them are approved by authorized organizations such as: The U.S. Army (QPL), Boeing, Public Power Corporation, The Greek Navy, The Greek State General Chemical Laboratory etc. and in general has all the approvals and certificates.

Eurochem's activities are expanded all over the world, supplying Shipping, Aviation and Industry Companies with its variety of products.

In 1990 **EUROCHEM** became the head of the **EUROCHEM GROUP** of Companies making a turnover of 20.000.000 U.S.D. per year.

Our Company's continuous research in the field of Chemical technology, together with our experienced professional personnel, ensures quality and reliability.

EUROCHEM is proud to offer its customers

«The complete solution in Maintenance»

Certificate Of Assessment International Quality Certification

hereby grants to:

EUROCHEM S.A.

4 RAFAILIDI STR., TAVROS, GR-17778

whose management system is in conformance with the standard:

ELOT EN ISO 9001:2015

the right to be listed in the IQC Registry for the following scope(s):

**DESIGN, DEVELOPMENT, PRODUCTION AND SALES OF:
A. CLEANING AND MAINTENANCE CHEMICALS FOR
MARINE, AVIATION AND INDUSTRIAL USE
B. DETERGENTS**

Signed

CEO



on behalf of IQC

This Certificate Number	GR/035/2018-1
ISSUED ON	23/11/2018
IS VALID UNTIL	22/11/2021



Certificate Of Assessment International Quality Certification

hereby grants to:

EUROCHEM S.A.

4 RAFAILIDI STR., TAVROS, GR-17778

whose management system is in conformance with the standard:

ELOT EN ISO 14001:2015

the right to be listed in the IQC Registry for the following scope(s):

**DESIGN, DEVELOPMENT, PRODUCTION AND SALES OF:
A. CLEANING AND MAINTENANCE CHEMICALS FOR
MARINE, AVIATION AND INDUSTRIAL USE
B. DETERGENTS**

Signed

CEO



on behalf of IQC

This Certificate Number	GR/035/2018-3
ISSUED ON	23/11/2018
IS VALID UNTIL	22/11/2021



Certificate Of Assessment International Quality Certification

hereby grants to:

EUROCHEM S.A.

4 RAFAILIDI STR., TAVROS, GR-17778

whose management system is in conformance with the standard:

ELOT EN ISO 27001:2013

the right to be listed in the IQC Registry for the following scope(s):

**DESIGN, DEVELOPMENT, PRODUCTION AND SALES OF:
A. CLEANING AND MAINTENANCE CHEMICALS FOR
MARINE, AVIATION AND INDUSTRIAL USE
B. DETERGENTS**

Signed

CEO



on behalf of IQC

This Certificate Number **GR/035/2018-9**
ISSUED ON **29/5/2020**
IS VALID UNTIL **28/5/2021**



Certificate Of Assessment International Quality Certification

hereby grants to:

EUROCHEM S.A.

4 RAFAILIDI STR., TAVROS, GR-17778

whose management system is in conformance with the standard:

OHSAS 18001:2007 / ELOT 1801:2008

the right to be listed in the IQC Registry for the following scope(s):

**DESIGN, DEVELOPMENT, PRODUCTION AND SALES OF:
A. CLEANING AND MAINTENANCE CHEMICALS FOR
MARINE, AVIATION AND INDUSTRIAL USE
B. DETERGENTS**

Signed

CEO



on behalf of IQC

This Certificate Number **GR/035/2018-6**
ISSUED ON **23/11/2018**
IS VALID UNTIL **22/11/2021**





eurochem®
aviation, marine and industrial chemicals

ΤΕΧΝΙΚΟ ΔΕΛΤΙΟ • TECHNICAL DATA

GAS TURBINE COMPRESSOR CLEANING CHEMICALS

**EUROCHEM has 3 one of a kind chemical products for on-line
and off-line cleaning of Gas Turbine Compressors**

THE MOST EFFECTIVE

HIGH EFFICIENCY HYDROCARBON BASED CLEANER

K - 310

K-310 is a high quality and most effective *hydrocarbon based* product for on-line and off-line compressor cleaning.

THE BEST PRODUCT FOR HEAVY FOULING

HYDROCARBON FREE

BIODEGRADABLE – HYDROCARBON FREE

K - 320

K-320 is a *biodegradable, hydrocarbon free* and very effective product for on-line and off-line compressor cleaning.

NATURAL SOLVENT

VERY EFFECTIVE HYDROCARBON FREE PRODUCT

ENVIRONMENTALLY

WATER BASED – BIODEGRADABLE

K - 330

**FRIENDLY &
BIODEGRADABLE**

K-330 is a water based, *environmentally friendly* cleaner for on-line and off-line compressor cleaning.

THE BEST ENVIRONMENTALLY FRIENDLY CLEANER

THE COMPLETE SOLUTION FOR COMPRESSOR CLEANING



K - 310

**«SOLVENT EMULSION CLEANER CONCENTRATE
CONTAINING AROMATIC HYDROCARBON SOLVENTS»
FOR
ON- LINE & OFF-LINE CLEANING
GAS TURBINE COMPRESSORS**

Description

K-310 is the most effective (compared with water based cleaners) concentrated liquid cleaner which has proved effective in the removal of oil, salt and solid deposits from compressor blades, guide vanes, and rotors of industrial, marine and aviation gas turbine engines. Periodic cleaning of these components is necessary to avoid power loss and abnormal temperature increases.

Specifications

K-310 meets the following specifications:

- **U.S. Military Specification MIL – PRF – 85704 Type I.**
- **Solarturbines Specification ES – 9 – 62.**
- **General Electric Specification GEK 107122B.**

Application

1) For On-Line, Cleaning:

On-line cleaning with K-310 is normally carried out by mixing 1 part of K-310 concentrate with up to 4 parts demineralized, distilled or deionized water into a stable solution.

The volume of chemical solution needed per wash and frequency of use depends on engine size, severity of fouling and operating environment. Detailed user instructions and recommendations are provided in the EUROCHEM manual and by our technical staff.

Two typical procedures for cleaning are given in our bulletin for in-place cleaning Gas Turbine Compressors.

2) For Off-Line, Crank Washing.

Off-line cleaning with K-310 is normally carried out by mixing 1 part of K-310 with up to 4 parts distilled, demineralized or deionized water. The solution is injected at cranking speed, allowed to soak for 20 to 60 minutes and then thoroughly rinsed off at cranking speed with distilled or acceptable good quality water.

Volume of cleaning solution per wash and washing frequencies should be as per the normal washing routine of the operator or as recommended by the engine manufacturer.

Packaging

K-310 is packaged in 210 liter drums and in 30 liter pails.



K - 320
«NATURAL SOLVENT BASED CLEANER»
FOR
ON-LINE & OFF- LINE CLEANING
GAS TURBINE COMPRESSORS

Description

K-320 is a concentrated, natural solvent based, liquid cleaner which has proved effective in the removal of oil, salt and solid deposits from compressor blades, guide vanes, and rotors of industrial, marine and aviation gas turbine engines. Periodic cleaning of these components is necessary to avoid power loss and abnormal temperature increases.

Specifications

K-320 meets the following specifications:

- **U.S. Military Specification MIL – PRF – 85704 TYPE II & III.**
- **Solarturbines Specification ES – 9 – 62.**
- **General Electric Specification GEK 107122B.**

Application

1) For On-Line Cleaning:

On-line cleaning with K-320 is normally carried out by mixing 1 part of K-320 concentrate with up to 4 parts of demineralized, distilled or deionized water into a stable solution.

The volume of chemical solution needed per wash and frequency of use depends on engine size, severity of fouling and operating environment. Detailed user instructions and recommendations are provided in the EUROCHEM manual and by our technical staff.

Two typical procedures for cleaning are given in our bulletin for in-place cleaning Gas Turbine Compressors.

2) For Off-Line, Crank Washing.

Off-line cleaning with K-320 is normally carried out by mixing 1 part of K-320 with up to 4 parts distilled, demineralized or deionized water. The solution is injected at cranking speed, allowed to soak for 20 to 60 minutes and then thoroughly rinsed off at cranking speed with distilled or acceptable good quality water.

Volume of cleaning solution per wash and washing frequencies should be as per the normal washing routine of the operator or as recommended by the engine manufacturer.

Packaging

K-320 is packaged in 210 liter drums and in 30 liter pails.



K - 330
«WATER BASED, BIODEGRADABLE CLEANER»
FOR
ON-LINE & OFF- LINE CLEANING
GAS TURBINE COMPRESSORS

Description

K-330 is a water based, concentrated, biodegradable, liquid cleaner which has proved effective in the removal of oil, salt and solid deposits from compressor blades, guide vanes, and rotors of industrial, marine and aviation gas turbine engines. Periodic cleaning of these components is necessary to avoid power loss and abnormal temperature increases.

Specifications

K-330 meets the following specifications:

- **U.S. Military Specification MIL – PRF – 85704.**
- **Solarturbines Specification ES – 9 – 62.**
- **General Electric Specification GEK 107122B.**

Application

1) For On-Line Cleaning:

On-line cleaning with K-330 is normally carried out by mixing 1 part of K-330 concentrate with up to 4 parts of demineralized, distilled or deionized water into a stable solution.

The volume of chemical solution needed per wash and frequency of use depends on engine size, severity of fouling and operating environment. Detailed user instructions and recommendations are provided in the EUROCHEM manual and by our technical staff.

Two typical procedures for cleaning are given in our bulletin for in-place cleaning Gas Turbine Compressors.

2) For Off-Line, Crank Washing.

Off-line cleaning with K-330 is normally carried out by mixing 1 part of K-330 with up to 4 parts distilled, demineralized or deionized water. The solution is injected at cranking speed, allowed to soak for 20 to 60 minutes and then thoroughly rinsed off at cranking speed with distilled or acceptable good quality water.

Volume of cleaning solution per wash and washing frequencies should be as per the normal washing routine of the operator or as recommended by the engine manufacturer.

Packaging

K-330 is packaged in 210 liter drums and in 30 liter pails.



2 PROCEDURES FOR IN-PLACE CLEANING OF GAS TURBINE COMPRESSORS WITH OUR PRODUCTS «K-310» «K-320» «K-330»

Equipment :

PROCEDURE -"A"--Pressure pot with control valve, hose and spray nozzle.

PROCEDURE -"B"--Special cleaning rig consisting of pressure tank, pump, valves and supply hose as specified by Engine Manufacturer.

Cleaning Procedure :

PROCEDURE -"A"--ROTATING ENGINE WITH STARTER.

1. Mix 1 part product with 4 parts distilled or demineralized water in pressure pot.
2. Spray the 5 gallons of product / water solution while energizing starter motor; 40 seconds.
3. Permit the product solution to dwell 5 minutes.
4. Repeat step #2.
5. Repeat step #3.
6. Cold distilled or demineralized water rinse with starter motor running for 60 seconds.
7. Repeat step #6 as necessary to flush out all residual product and loosened soil.
8. After starter has cooled, run engine and test performance.

PROCEDURE -"B"--WITH ENGINE OPERATING.

1. Allow engine to cool after shutdown for a minimum of 45 minutes.
2. Mix 1 part product concentrate with 1 to 4 parts of distilled or demineralized water in the spray tank.
Dilution and frequency of use depends on engine size, severity of fouling and operating environment.
3. Make sure supply hose valve is closed, then pressurize tank with compressed air to 100 psig.
4. Connect supply hose to anti-icing fitting or as directed by Engine Manufacturer.
5. Start the engine as directed in Engine Manual and run at 7,000 RPM or as prescribed by Engine Manufacturer.
6. When the engine has stabilized, turn on the cleaning rig pressure pump and inject the product solution at 45 psig into the engine.
7. When product solution has passed through the engine taking approximately 5 minutes, turn off the pump switch and shut off the supply valve.
8. Flush the engine with distilled or demineralized water for approximately 5 minutes.
9. Clear all fluids from the engine by increasing RPM to cruising for approximately 15 minutes.
10. Check engine operation and temperature. If performance is insufficient, further washing may be necessary.

NOTE : The above procedures are typical, however, the process recommended by the Engine Manufacturer should be followed.



APPROVALS & SPECIFICATIONS
FOR GAS TURBINE COMPRESSOR
CLEANING CHEMICALS

K-310, K-320 and K-330 meet the requirements of the following specifications:

- U.S. Military Specification MIL-PRF-85704.
- Solarturbines Specification ES-9-62.
- General Electric Specification GEK 107122B

Gas Turbine Manufacturers DO NOT APPROVE products for cleaning gas turbine compressors (this was done in the past).

Some Gas Turbine Manufacturers have their own specifications for cleaning compounds and only request that the cleaning compounds meet their specification (see documentation from Solarturbines).

Others approve products only upon request from the end user for specific applications. For example General Electric has approved our products, K-310 and K-320 to be used in the Power Station (Lavrion – Greece).

Attached find the following:

- Documentation from Solarturbines stating that they no longer have an approved product list.
- Documentation from ABB stating that they recommend only water and the use of any other cleaning agent is at one's own discretion or risk.
- Documentation from General Electric stating that our products K-310 and K-320 are approved for use in the Power Station (Lavrion – Greece).
- Certificates of Analysis of K- 310 & K-320 according to MIL - PRF - 85704 C.
- Typical Values of K- 310, K-320 & K- 330 in comparison to GE Specification.

Dear Nick Yiannoutsos,

Solar Turbines stopped qualifying engine cleaning solutions and no longer have an approved product list. However, if you would like to check whether your company's product meets the Solar's engine cleaning specification, this table lists the requirements for cleaning products used in ingestive cleaning of Solar engines.

	Test Method	Max. Limits for On- Crank Solutions	Max. Limits for On- Line Solutions
Sodium + Potassium	ASTM D1428	105 ppmw	1.9 ppmw
Fluorine		100 ppmw	1.9 ppmw
Chlorine	ASTM D512	100 ppmw	40 ppmw
Lead	ASTM D3559	2 ppmw	0.70 ppmw
Vanadium	ASTM D3373	2 ppmw	0.35 ppmw
Iron, Tin, Silicon, Aluminum, Copper, Manganese, Phosphorus	ASTM D857, D858, D1068, D1688	10 ppmw	3.8 ppmw
Calcium + Magnesium	ASTM D3605 ASTM D511	100 ppmw	3.8 ppmw
Ash	ASTM D482	0.25 wt. %	0.01 wt. %
Flash Point	ASTM D93	>140oF	>140oF
PH	ASTM D 1293	6 - 9	6 - 9

Best Regards,

Abdul Ahmed
Solar Turbines
Tel-619-544-5071
Fax-619-544-2830

----- Original Message -----

From: [ALEXANDRA TSIOMI](#)

To: eur98@otenet.gr

Sent: Friday, September 30, 2005 6:07 PM

Subject: FW: LAVRION V - GT COMPRESSOR DETERGENTS

With regards,

Alexandra Tsiomi

-----Original Message-----

From: ALEXANDRA TSIOMI [<mailto:ATSI@METKA.GR>]

Sent: Friday, September 30, 2005 6:05 PM

To: 'Marios KATSIKAROS'

Subject: FW: LAVRION V - GT COMPRESSOR DETERGENTS

This is valid for Turbo K and Eurochem products K-310 και K-320.

With regards,

Alexandra Tsiomi

-----Original Message-----

From: Houseknecht, Charles F (GE Energy) [<mailto:charles.houseknecht@ps.ge.com>]

Sent: Friday, September 30, 2005 5:52 PM

To: ALEXANDRA TSIOMI

Cc: Anastasios GEORGIADIS; nthe@METKA.GR

Subject: RE: LAVRION V - GT COMPRESSOR DETERGENTS

Alexandra,

GE Gas Turbine Engineering has reviewed the detergent specifications and confirmed they meet the GE specification GEK 107122B.

Regards,

Chuck Houseknecht

GE Energy

Project Manager

T 518-385-5436

F [949-838-9510](tel:949-838-9510)

C 518-265-9635

D *235-5436

charles.houseknecht@ge.com

www.geenergy.com

1 River Road, Bldg. 2-544, Schenectady, NY 12345, USA

General Electric International Inc.

-----Original Message-----

From: ALEXANDRA TSIOMI [<mailto:ATSI@METKA.GR>]

Sent: Wednesday, September 28, 2005 4:47 AM

To: Houseknecht, Charles F (GE Energy)

Cc: 'Anastasios GEORGIADIS'; nthe@METKA.GR

Subject: LAVRION V - GT COMPRESSOR DETERGENTS

METKA-A-12404

Dear Chuck,

We have forwarded the GEK 107122B for the compressor washing to various companies in order to acquire detergents. We send you attached hereto the data sheets from two products and we would like to have your acceptance or your comments, if any.

With regards,

For METKA SA

Alexandra Tsiomi

Dipl. Mechanical Engineer NTUA

Project Manager

tel: +302102709200

fax: +302102759528

No virus found in this incoming message.

Checked by AVG Free Edition.

Version: 7.1.385 / Virus Database: 268.4.4/318 - Release Date: 18/4/2006

Athens 28 – 11 – 2013

CERTIFICATE OF ANALYSIS

PRODUCT: K – 310
SPECIFICATION: MIL-PRF-85704C TYPE I
BATCH NO.: 003887 / 19-11-2013
DATE OF ANALYSIS: 22 – 11 – 2013

<u>PROPERTIES</u>	<u>REQUIREMENTS</u>	<u>TEST DATA</u>	<u>RESULTS</u>
pH	7-9	7,3	CONFORMS
Ash content	0,05% maximum	< 0,01%	CONFORMS
Insoluble matter	0,1% maximum	< 0,05%	CONFORMS
Flash point	60°C minimum	> 70°C	CONFORMS
Viscosity	15-25 cst	17 cst	CONFORMS
Total immersion corrosion	Table I (specification)	No corrosion	CONFORMS
Emulsibility	No phase separation	No phase separation	CONFORMS
Salt water stability	No separation	No separation	CONFORMS
Hard water stability	No separation	No separation	CONFORMS
Acid stability	No separation	No separation	CONFORMS
Accelerated storage stability	No corrosion or staining	No corrosion or staining	CONFORMS
Low temperature stability	No solidifying or crystallization	No solidifying or crystallization	CONFORMS
Elemental content, max			
Sulfur	500 parts per million (ppm)	10 ppm (max)	CONFORMS
Chlorine	100 ppm	1 ppm (max)	CONFORMS
Sodium	50 ppm	2 ppm (max)	CONFORMS
Potassium	50 ppm	2 ppm (max)	CONFORMS
Phosphorous	50 ppm	2 ppm (max)	CONFORMS

EUROCHEM S.A.

LAB DIRECTOR
M. DANIIL

CERTIFICATE OF ANALYSIS

PRODUCT: K – 320
SPECIFICATION: MIL-PRF-85704C TYPE II
BATCH NO.: 004008/16-12-2013
DATE OF ANALYSIS: 18 – 12 – 2013

<u>PROPERTIES</u>	<u>REQUIREMENTS</u>	<u>TEST DATA</u>	<u>RESULTS</u>
pH	7-9	7,3	CONFORMS
Ash content	0,05% maximum	< 0,01%	CONFORMS
Insoluble matter	0,025% maximum	< 0,015%	CONFORMS
Flash point	60°C minimum	> 70°C	CONFORMS
Viscosity	25 cst max	12 cst	CONFORMS
Total immersion corrosion	Table I (specification)	No corrosion	CONFORMS
Emulsibility	No phase separation	No phase separation	CONFORMS
Salt water stability	No separation	No separation	CONFORMS
Hard water stability	No separation	No separation	CONFORMS
Acid stability	No separation	No separation	CONFORMS
Accelerated storage stability	No corrosion or staining	No corrosion or staining	CONFORMS
Low temperature stability	No solidifying or crystallization	No solidifying or crystallization	CONFORMS
Elemental content, max			
Sulfur	500 parts per million (ppm)	10 ppm (max)	CONFORMS
Chlorine	100 ppm	1 ppm (max)	CONFORMS
Sodium	50 ppm	2 ppm (max)	CONFORMS
Potassium	50 ppm	2 ppm (max)	CONFORMS
Phosphorous	50 ppm	2 ppm (max)	CONFORMS

EUROCHEM S.A.
 LAB DIRECTOR
 M. DANIIL

GAS TURBINE COMPRESSOR CLEANING CHEMICALS

TYPICAL VALUES in comparison to GE Specification

A. Concentrated products				
Properties	GE Specification	K-310	K-320	K-330
Total alkali metals	25 ppm max	1 ppm (max)	1 ppm (max)	1 ppm (max)
Magnesium & Calcium	5 ppm max	0.2 ppm (max)	0.2 ppm (max)	0.2 ppm (max)
Vanadium	0.1 ppm max	0.05 ppm (max)	0.05 ppm (max)	0.05 ppm (max)
Lead	0.1 ppm max	0.05 ppm (max)	0.05 ppm (max)	0.05 ppm (max)
Tin & Copper	10 ppm max	0.2 ppm (max)	0.2 ppm (max)	0.2 ppm (max)
Sulfur	50 ppm max	10 ppm (max)	10 ppm (max)	10 ppm (max)
Chlorine	40 ppm max	1 ppm (max)	1 ppm (max)	1 ppm (max)
pH	6.5 – 7.5	7.0 – 7.5	7.0 – 7.5	7.0 – 7.5
Total solids (ash)	100 ppm max	10 ppm (max)	10 ppm (max)	10 ppm (max)
Storage stability	MIL-C-85704A	Conforms	Conforms	Conforms
Formation of gums	Will not occur	Conforms	Conforms	Conforms
Flash point	>60oC	> 62oC	>66oC	>66oC
Compatibility	Will not have adverse effects on engine system materials.	No effect	No effect	No effect
Specific gravity	Not mentioned	0.95 ± 0.04	1.00 ± 0.04	1.00 ± 0.04

B. Products diluted 1:4 with high purity water				
Properties	GE Specification	K-310	K-320	K-330
pH	6.5 to 7.5	7.0 – 7.5	7.0 – 7.5	7.0 – 7.5
Total solids (ash)	5 ppm max	2 ppm (max)	2 ppm (max)	2 ppm (max)
Total alkali metals	0.5 ppm max	0.2 ppm (max)	0.2 ppm (max)	0.2 ppm (max)
Heavy metals	Not mentioned	0.02 ppm (max)	0.02 ppm (max)	0.02 ppm (max)

EUROCHEM S.A.

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EUROCHEM A.B.E.E.

Attn. Mr N. Giannoutsos

18.04.2006

Re: Cleaning of ABB Turbochargers

Dear Sir,

Following your question regarding cleaning material for ON-LINE & OFF-LINE CLEANING FOR GAS TURBINE COMPRESSORS, we would like to comment as follows.

ABB does not recommend any cleaning material for the turbocharger compressor cleaning, except pure water.

In case one of your customers is willing to use any other cleaning agent, this is on his own discretion and risk.

Hoping that we have informed you well, we remain.

Best Regards

ABB SA
I. Kokkotos

General Manager
Marine & Turbocharging

ABB SA

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2 Argirokastrou & Gounari Str.
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aviation, marine and industrial chemicals

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