

BIOLOGICAL
BIOX

CLEANING SOLUTIONS COMBINING:
BIOX '02' IMMERSION FLUID
BIOX BIODEG
UTLRASONIC EQUIPMENT



BIOX LIQUID &
GEL DATA PACK

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ENVIRONMENT PRODUCTS AND PROCESSES

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N.B. Reports enclosed within the data pack are verified copies of the originals which are kept at our head office, and are available on request.

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IDENTIFICATION :

BIOX IS A BIOLOGICAL LIQUID OR GEL USED IN THE REMOVAL OF TARNISH, OXIDES, VERDIGRIS MANUFACTURING PROCESS CONTAMINANTS FROM IRON, STEEL, COPPER, BRASS AND ALUMINIUM.

DESCRIPTION

BIOX IS A RESULT OF 10 YEARS RESEARCH IN THE FIELD OF BIOCHEMISTRY TO PRODUCE A SAFE, NON-TOXIC, NON-FLAMMABLE RUST REMOVER.

ODOURS

VERY SLIGHT ORGANIC ODOUR.

PERFORMANCE :

FIRE :

NON-FLAMMABLE.

CORROSION & CONTAMINATES

AFTER OXIDE REMOVAL THE TREATED ARTICLE SHOULD BE PROTECTED BY PAINTING, OILING OR POLISHING.

TOXICITY:

NON-TOXIC. TESTS HAVE BEEN CARRIED OUT BY THE

(1) FINNISH RESEARCH CENTRE

(2) THAMES WATER

(3) THE NATIONAL WATER COUNCIL

BIOX WAS VERIFIED TO BE NON-TOXIC
REPORTS ARE AVAILABLE.

INGESTION:

IS NON-HAZARDEOUS.

WORKING LIFE:

BIOX CAN BE USED MANY TIMES UNTIL EVENTUALLY BECOMING EXHAUSTED - THIS MOMENT IS BEST JUDGED BY OBSERVATION.

PURITY:

BIOX HAS BEEN APPROVED TO THE CLEANING SPECIFICATION REQUIRED BY LLOYDS REGISTER OF SHIPPING.

WORKING TEMPERATURE:

DO NOT USE BELOW 4 C. THE PROCESS OF RUST REMOVAL IS ACCELERATED WHEN OBJECT BEING TREATED IS WARMED.

APPLICATION - LIQUID

REMOVE ALL OIL, GREASE AND LOOSE SURFACE MATERIALS. SHAKE BIOX CONTAINER WELL BEFORE USE. VERY LIGHT RUSTING OR TARNISH IS REMOVED IN MINUTES. JUST IMMERSE THE ARTICLE FOR 15 MINUTES AND RINSE OFF WITH WATER. FOR HEAVY RUST AND CONTAMINANT REMOVAL, IMMERSE ARTICLE IN BIOX LIQUID FOR ANYTHING UP TO 8 HOURS DEPENDING ON DEGREE TO BE REMOVED.

PROLONGED IMMERSION IN BIOX CAN CAUSE THE COLOUR OF STEEL TO TURN SLIGHTLY DARKER. HOWEVER THIS WILL NOT EFFECT THE STRENGTH OF THE METAL. IF RUST OR OXIDE IS NOT COMPLETELY REMOVED, RE-IMMERSE IN BIOX.

BIOX SHOULD NOT BE USED ON DISSIMILAR METALS

APPLICATION - GEL

REMOVE ALL OIL, GREASE AND LOOSE SURFACE MATERIALS. SHAKE BIOX CONTAINER WELL BEFORE USE. VERY LIGHT RUSTING OR TARNISH IS REMOVED IN MINUTES. JUST APPLY A GENEROUS LAYER (2 MM, 1/8") OF BIOX TO THE SURFACE, LEAVE FOR 15 MINUTES AND WASH OFF WITH WATER. FOR HEAVIER RUST AND OXIDE REMOVAL APPLY BIOX AND COVER WITH PLASTIC CLING FILM OR A POLYTHENE BAG TO RETAIN THE MOISTURE. BIOX WORKS SLOWLY AND A PERIOD OF 8 HOURS MAY BE NECESSARY. IF EXTENDED TREATMENT IS REQUIRED FREQUENT INSPECTION IS RECOMMENDED BECAUSE BIOX CAN CAUSE THE COLOUR OF STEEL TO TURN SLIGHTLY DARKER. JUST WASH OFF A SECTION FOR INSPECTION. IF RUST OR OXIDE IS NOT COMPLETELY REMOVED RETREAT WITH BIOX.

BIOX IS NOT HARMFUL TO PAINT, WOOD, STONE, CHROME, TEXTILES, PVC, METALS OR RUBBER.

PACKAGING & STORAGE

THE PRODUCT HAS A SHELF LIFE OF 1 YEAR FROM OPENING AND SHOULD NOT BE STORED BELOW 0 C

NATO No. 0889/0473/6850-99-701-6845
0899/0473/6850-99-920-1435



SOME INDUSTRIAL USES

- (A) Rust removal, metal finishing etc.
- (B) Cleaning oxygenated life support systems.
- (C) Carbon removal (aircraft & missile turbo systems).
- (D) Cleaning of steel moulds (plastic & rubber industry).
- (E) Cleaning air conditioning units.
- (F) Cleaning valves (petroleum industry).
- (G) Removal cement (building industry).
- (H) Cleaning artifacts (museums).
- (I) Cleaning vehicle bodies (transport industry).
- (J) Cleaning aluminium & stone masonry (architectural).
- (K) Marine equipment.
- (L) Rust mould on textiles.
- (M) Railway electrical connectors & brake gear.
- (N) Textiles Spinnerets.
- (O) Cleaning braised welded pipe work in Steel, Copper and Alloy.

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	LIQUID	GEL
Appearance	Brownish Green Liquid	Brownish Green Gel
Specific Gravity	1.02	1.04
pH.	2.2	2.7
Freezing Point	-3 C.	-3 C.
Boiling Point	96 C.	85 C.
Flash Point	None, Non-combustible	None, Non-combustible
Storage	Do not allow to freeze	Do not allow to freeze
Containers	Plastic or Stainless Steel	Plastic or Stainless steel
Spillage Procedure	Flush down drain with water	Flush down drain with water

CAUTION : If Biox comes in contact with eyes, rinse with plenty of water.

LABORATORY RESULTS OF EVAPORATION RATE OF LIQUID BIOX IN AN OPEN CONTAINER

250 ml each of Biox and water in separate open containers were placed in an oven for 24 hours at 40 Deg. C. Another container of 250 ml Biox was kept at room temperature, I.E. 20 Deg. C. for 24 hours.

The results are as follows :-

250 ml Biox	at 40 Deg. C.	lost	73ml
250 ml Water	at 40 Deg. C.	lost	88ml
250 ml Biox	at 20 Deg. C.	lost	8ml



GENERAL INFORMATION.

As Biox contaminant removers do not contain any strong solvents, any heavy layers of grease or wax on the surface to be cleaned may retard the process. If it is suspected that the surface is covered with grease or oil, it should be removed.

As in all chemical reactions temperature is of great importance for the rapidity of the process. See fig. 1.

REACTIVE EFFECTIVENESS AGAINST TEMPERATURE

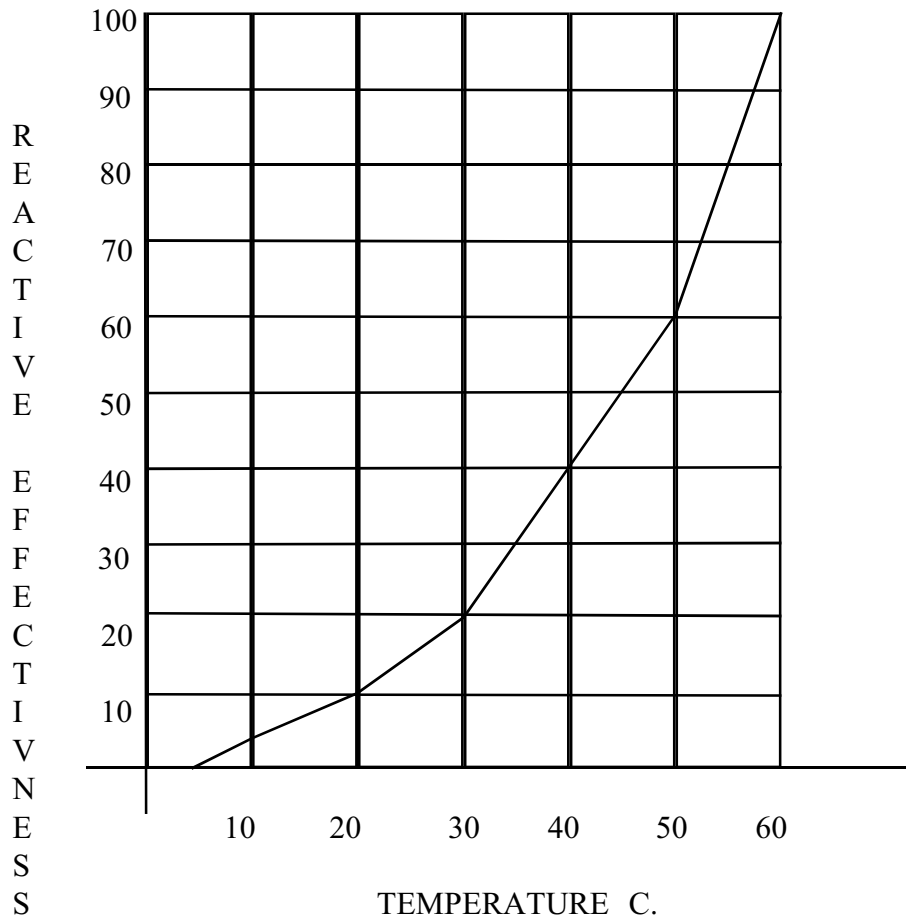


FIG 1.

In practice the lowest temperature recommended is +10 C.

The liquid can be warmed even up to +80 C. ; the time of treatment will be cut down to 1/10 compared with treatment at +20 C.



GENERAL INFORMATION (CON'T)

When using gel on a warm object or if the time of treatment must be prolonged to over 6 hours because of low temperature, the layer of gel can be covered with, say, polyethylene or else a thicker layer (5 - 10 mm) of Biox can be applied to prevent drying.

As the diffusion of active molecules is faster in liquid than in gel, the immersion treatment gives the best results, especially in removing thick layers of contaminant.

Consumption.

The thickness of the contaminant layer and the amount of salts and other impurities in it obviously affect the amount of Biox required to do the job. Therefore, only rough estimates can be given.

	GEL	LIQUID
Light surface rust.	1 - 2 mm	0.5 - 1.0 Litre/M2 of rust surface
Medium rust	2 x 2 mm	1.0 - 1.5 “ “
Heavy rust	2 x 3 mm	1.5 - 2.5 “ “

A layer of 1mm corresponds to 1 litre/M2

When the pH-value of the liquid has risen to 4.5 - 5.0 certain components start to crystallize on the object to be cleaned. Then also the effectiveness of the liquid has decreased and it should be replenished. If crystallization occurs, the white (yellow) film may be removed with water.

Note concerning treatment

As with all chemical treatments, during treatment with Biox an electrochemical potential difference between different metals will develop. The baser metal becomes an anode and the more precious one a cathode. Thus, the anode metal will dissolve.

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HEALTH & SAFETY DATA SHEETS



Material Safety Data Sheet in accordance with in the Council or State resolution about the identification and labeling system of products hazardous to health (286/78). Confirmed by the resolution of the National Board of Labour Protection in Finland (328/78) on the 4th May, 1978.

1 Product Information

1.1 Trade Name	PHAG-, BIOX-, liquid
1.2 Use	Removing of verdigris and contaminants.
1.3 Manufacture Address. Telephone and Fax	Biox Ltd., 52 Hughenden Avenue, High Wycombe. Bucks HP13 5SJ - Tel/Fax 01494 532818

2 Product classification (according to Finnish legislation)

2.1 Toxicity - N/A Class	2.2 Flammability Classification - N/A	3.2 Transport Classification - N/A
2.4 U.N. Number -	2.5 Carcinogenic Substances - N/A	
2.6 Warning Labels - N/A		

Substances Hazardous to Health

3.1 Substances	3.2 Proportion	3.3 Hazardous Property
N/A	N/A	N/A

4 Chemical. and Physical Properties of the Product

4.1 Boiling Point	96c	4.2 Melting Point -3.5C	
4.3 Vapour Pressure	N/A	4.4 Solubility in Water - Soluble	
4.5 Density	Liquid 1.2	4.6 Evaporation Rate (butyl acetate = 1)	4.7 pH-Value L: 2.2 :
4.8 Physical State, Colour and Odour	- Liquid - Clear - Odourless		

Fire and Explosion Properties or the Product

5.1 Flash Point	- None	
5.2 Ignition Limits	- N/A	5.3 Auto Ignition Temperature - N/A
5.4 Reactivity	- May react strongly with Sodium Nitrite (NaNO ₂). It is however, possible to use Sodium Nitrite quantities in small in rinsing water.	

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MATERIAL SAFETY DATA SHEET page 2.

Date 21st May 1993
Date 21st Feb 2003 REV 5/6 EDIT

Trade Name

PHAG-, BIOX-, Liquid

Health Risks

6.1 Ways of Exposure	N/A
6.2 Local Effects (skin, eyes, mucous membranes)	Causes drying and irritation of eyes and mucous membranes Rinse with plenty of water.
6.3 Effects of Overexposure Short-term Exposure	None.
6.4 Effects of Overexposure Long-Term Exposure	Can cause minor skin reactions either as a result of long-term exposure or in the case of persons susceptible to allergic or skin-sensitivity reactions. Long-term exposure dries the skin.

Special Safety Measures

7.1 Technical Safety Precaution	Rinse spillage and leakage from floor to avoid slipping.
7.2 Special First-Aid Measures	Rinse with plenty of water.

Special Instructions

8.1 Storage	In plastic or stainless steel drums. Temp. 0 - 50 C
8.2 Corrosiveness	Corrodes cement and iron following long periods of exposure.
8.3 Spill and Leak Procedures	Flush down the drain with water.
8.4 Environmental Hazards	None.
8.5 Destruction and Disposal Methods of Liquid	Neutralization: Add Sodium Bicarbonate, NaHCO ₃ (Baking Soda . 6% raises pH to 5.5, 9% raises pH to 7.0.
8.6 Instructions in Case of Fire	N/A

Additional Information through

Signature

Marti Kaiti

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Thames Water

New River Head Laboratories
177 Rosebery Avenue,
London EC1R 4TP

Telephone 01 837 3300 Ext. 2104

Director of Scientific Services,
Hugh Fish.O.B.E.,B.Sc.F.R.J.C.F.I.W.E.S.,F.I.P.H.E.,F.Inst,W.P.C

To: Biox Ltd

Our ref: JSC/JMO Your ref:

Date 26th October, 1978

CONFIDENTIAL TEST REPORT ON MATERIALS FOR USE IN CONTACT WITH POTABLE WATER

Report No. MWS 1082
Material: Biox Liquid Rust Remover

Component:

Fitting:

Material Manufacturer: Biox Ltd.,

Component Manufacturer:

Fitting Manufacturer:

Subm itting Manufacturer: Biox Ltd.,

Soaking test's produced no taste, colour and turbidity were unaffected and toxic metals were not detected.

Toxicity tests using monkey kidney cells showed no cytotoxicity.

Micro biological growth tests showed that this material did not support the growth of coliform organisms, bacteria capable of growth at 370c and 220c, Pseudomonas aeruginosa or fungi.

There is therefore no objection from the water quality point of view to the use of this product in contact with potable water provided that there is no change in the nature and source of the ingredients or in the process of manufacture.

Jennifer Colbourne

For Manager, Metropolitan Water Services

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NATIONAL
WATER
COUNCIL

Our Ref: JSWB/GDM/ LJJ 7904MX

Chairman
Sir Robert Marshall
K.C.E. M.B.E.

Head of Unit
J.S.W. Bath

**Fittings, Testings and
Standards Unit**

Fittings Testing Station
The Causeway
Staines
Middlesex
TW8 3DR

11th April, 1979

Dear Sir

“Items which have passed full tests of effect
on water quality” - Sample No. _____

1. Referring to your application for the material described below to be approved: the National Water Council has considered the results of the tests for effect on water quality carried out on the products so described, and has decided that there is no objection to their uses provided the source, nature and manufacturing processes of the ingredients and products are not changed.

COATINGS, PAINTS & LININGS

“BIOX” LIQUID RUST REMOVER

7904 MX

2. An entry, as above, will accordingly be included in the forthcoming supplement to the NWC “Classified List of Fittings Accepted” under the section headed, “Items which have passed full tests of effect on water quality”, a copy of which will be sent to you in due course.

Yours faithfully



J.S.W. Bath
Head of Fittings Testing & Standards Unit

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CASE STUDY

Divex, Aberdeen (42 employees)

Manufacturing deep-diving and hyper baric medical equipment the Company had used CFC-113 to clean pipe work and valves in an ultra-sonic bath process. Anticipating the C. F. C. phase out, the company switch in 1991 to Biox which is an organically based solvent. Biox was found to be more efficient and cheaper. No new equipment was required and operating cost were reduced.

LAWS AND ECONOMIC INSTRUMENTS

International, European and UK laws on the environment all have an impact on business and it makes business sense to keep abreast of developments anticipate changes and keep within the expected guidelines.

On an international level, there are agreements to reduce the use of substances whose environmental impact is globally damaging. C.F.Cs, for example, are being phased out by the end of 1994 because they destroy the ozone layer and by the end of 1993 are unlikely to be available. Many businesses are affected by international controls: if you're one of them you should be acting now!

In the European community, over 350 pieces of environmental legislation have been published. The trend now is towards a program of sustainable economics activity requiring the voluntary commitment of all members of society. An eco labeling scheme for consumer goods, for example, will allow customers to choose products which are less damaging to the environment. The scheme is voluntary, but gives a marketing advantage to those products carrying the eco label. Within Europe, different countries have their own legislation. If you've done business with Germany, for example, you'll know that this can be quite demanding.

In the UK, her Majesty's Inspectorate of Pollution (H. M. I. P.), local authorities and the National Rivers authority (N. R. A.) are the main players in controlling those industrial processes that most pollute the environment. These two bodies are due to combine with waste authorities to form the environment Agency. Integrated pollution control-treating the land, water and air as a part of a whole to the policed together-is a fundamental principle and covers the most polluting industrial processes. For industry, best available techniques not entailing excessive cost (B. A. T. N. E. E. C.) is the pragmatic measure you may need to match up to. A second level of controls covering releases to air only, are regulated by local authorities on similar principles. These apply to a far greater range of companies - your company could be one of them. You should also be aware of the "duty of care" regulations which make you responsible for the ultimate disposal of all waste: it doesn't stop being your concern when your disposal contractor drives it away from your premises.

Economic Instruments are likely to become more important in the UK and Europe. As an example, to encourage the recycling of packaging their could be raw material and product taxes, waste collection and disposal charges, and a take-back duty on suppliers.

If you have one, contact your trade association or representative body who worked with legislators on areas that affect you.