



General information

ECOPHOR® A/447 is a pre-treatment system for degreasing and organic phosphating, works in a single step (no rinsing) at room temperature, to prepare metal surfaces for printing.

ECOPHOR® A/447 consists of an organic polymer which contains phosphating groups, dissolved in a particular mixture of organic solvents. This phosphatic polymer has the special capacity to capture and incorporate into its structure the oily contaminants found on the parts to be treated.

During treatment, the oily contaminants are first dissolved by the fluids mixture, and then incorporated in the polymer. After the product is dried off, the treated surface is coated by an extremely thin layer (1 micron) of a continuous three-dimensional conversion compound of organic polymer, which promotes top-coat adhesion and provides flash rust protection, increasing the performance of subsequent finishing operations. The polymer film formed by **ECOPHOR® A/447** also provides excellent temporary protection against corrosion: parts treated can be stored indoors for 2 - 3 months.

ECOPHOR® A/447 captures the oily contaminants on the parts, and in addition does not create any sludge to treat or dispose of (only the fines that came in on the parts, plus any powders, etc. From the finishing process are filtered out and disposed of). Therefore, the typical problem of waste disposal and treatment that is endemic to traditional water-based phosphating systems is not encountered with this process. In addition, the bath does not become saturated or contaminated with sludge and has an essentially unlimited life. All that is required is replenishing the chemical as it is used in production.

ECOPHOR® A/447 works in a very simple way, in inexpensive and compact equipment: it can be used by spray at extremely low pressure (*flow-coating*) or by dip with liquid agitation. A dry-off oven is required to dry off the chemical.

ECOPHOR® A/447 is a water-free technology: water is not used at all.

ECOPHOR® A/447 guarantees significant reduction of energy consumption. The high-energy costs of traditional multi-step pre-treatment systems are eliminated and this system, unlike others, does not require any on-site analytical controls by the user.

The **ECOPHOR® A/447** system can be used for simultaneous treatment of steel, aluminum, light alloys and galvanized steel.

ECOPHOR® A/447 is compatible with all wet painting products, one- or two- component, water or solvent based, as well as with powder coating (in any event, given the large number of different kinds of paints on the market, trials and preliminary tests are always recommended).

The **ECOPHOR® A/447** system does not contain any toxic or harmful substances and according to the Directive 1999/13/EC of 11 March 1999, annex II, point 5, is exempt from the V.O.C. regulations. **ECOPHOR® A/447** also does not contain solvent or any teratogenic, cancer creating or mutagenic substances, chlorinated solvents, CFCs (Chlorofluorocarbons), HCFCs (Hydrochlorofluorocarbons) and substances with depressive power for stratospheric ozone.

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Technical features

APPEARANCE	slightly viscous liquid
COLOR	transparent/yellowish
SPECIFIC GRAVITY.....	0.87 - 0.89 Kg/Lt
pH	3.5 - 5.0

Application data

• Product preparation

The product is supplied as ready to use.

- FIRST TANK FILL: ECOPHOR® A/447 100 %

- TOP UP: ECOPHOR® A/447 - FLUID A/447 (corrective fluid to be used occasionally as recommended in the bath analysis results).

• Application

Static or in-line dip process; flow coating spray process (variable pressure between 0.20 and 0.50 bar).

• Operating temperature

Ambient.

• Process time

- TREATMENT TIME: 60 - 120 seconds depending on the shape of the parts and to the kind and quantity of oily contaminants to be removed.

- DRIP-OFF TIME: 4 - 6 min approx. at room temperature, including blow-off.

- DRYING TIME:

- 5 - 8 minutes at 110° - 120°C or 15 - 20 minutes at 70° - 80°C.

- 40 - 45 minutes at 30 - 35°C.

Strong air circulation is recommended in the drying oven.

**These are general data. Drip-off/blow-off and drying times may vary depending on the shape of parts, temperature and air circulation. Where extra drain time is possible, recovery of chemicals can be further improved.*

• Coverage

Between 15 - 25 m²/lt depending on product application, drip-off, part shape and equipment.

• Warning

Parts should be hung at an angle for maximum drainage to avoid the creation of pockets of accumulation or flat areas where the product can accumulate before drying. This is to avoid loss of chemical and/or over-thickness which may cause defects or problems in painting.

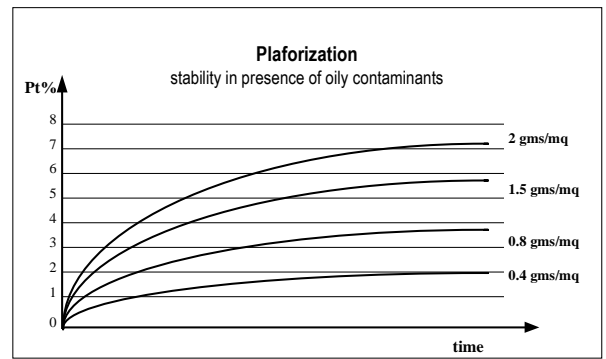
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- **Life of chemical**

Product replacement/disposal is never required when the average amount of oily contaminants is lower than 1.5 gr/m² of metal surface treated.

In case of higher oil contamination, a pre-degreasing step is required.

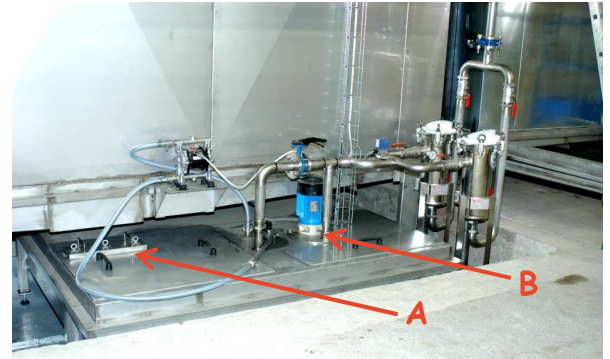


Maintenance

- Weekly controls:

With a pump, replenish the liquid according to the instructions given in the last analysis report. Make additions at least once a week or more frequently, if necessary, depending on the use rate. The filling level is marked on an indicator (B).

Use of a magnet is recommended, to remove steel dust in the chemical (A).



- Monthly controls:

Once a month, or more frequently if production rates are high, filter bags should be replaced. If the equipment has a single filter, this operation should be performed with tunnel off, after isolating the filter bags upstream and downstream. A pressure switch monitors the obstruction status of the filter. It is recommended that the maintenance frequency be adjusted according to the intensity of use and the amount of metal dust and fines coming in on the parts.

- Quarterly controls:

The system does not require any complex analytical controls by operators. Every 3 months the user will take and send a sample of the bath which will be analyzed free of charge by our laboratory: analyses are made every 2 - 3 months to control the condition of the chemical and provide recommendations for correct maintenance of the bath.

Following this analysis, Chemtec will provide to the customer a written report covering the main physical and chemical properties of the phosphating solution, including any recommendations for continued bath stability.

The analysis report will also include the indication of the recommended ratio of **ECOPHOR® A/447** and **FLUID A/447** (concentration corrector) to add to the tank to top up the liquid level. This instruction will remain valid for three months, until the next analysis control.

- Annual controls:

Once a year, it is recommended to completely empty the tank and clean it to remove any impurities that have settled at the bottom. After cleaning, decantation and filtration, the product will be reused.

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Limitations

ECOPHOR® A/447 does not remove any oxides or hydroxides: the product works exclusively on the oils, and it cannot remove calamine, rust or any oxides on the surface. Therefore it cannot be used for pickling or as a rust converter.

Limitation on amount of oily contaminants: ECOPHOR® A/447 accomplishes its combined degreasing and phosphating action only if the average amount of oil on the parts is less than 1.5 mg/m². If the production on average has oil levels above the recommended limits, those parts with above-average levels of oily contaminants must be treated in an appropriate degreasing section.

Nature of the contaminants: ECOPHOR® A/447 should not be used on surfaces contaminated by stearate-based products and similar stubborn oils, silicon-based oils, paraffin, waxes and oils with a high softening point. Avoid treating surfaces contaminated with alkaline and acidic compounds, or strong aggressive chemicals. Do not treat silicon alloys and surfaces covered by silicones.

Specific preliminary tests must always be performed. It is highly recommended that the **ECOPHOR® A/447** system not be used on surfaces contaminated with these substances without a preliminary mechanical or chemical preparation.



Equipment

The equipment for the application of **ECOPHOR® A/447** is very simple: dip or spray plant operating at low pressure (*flow-coating*), static or in-line, provided with a drying oven. The specific features of the equipment can be tailored to meet the customer's requirements.

- Materials

The tank and all parts in contact with the product must be made of stainless steel, polyethylene or high-density polypropylene.

For more information, please refer to engineering guidelines.

- Tank

For dip equipment, the tank containing the product must be designed with a very high freeboard: at least 80 - 100 cm or the same width as the tank. Be sure to take into account the liquid displaced by the parts being treated. This high freeboard is to avoid product vapors, which are heavier than the air, escaping into the working area, increasing odors and loss of product.

- Air extraction

The equipment must be provided with suitable air extraction to avoid vapors escaping into the working area.

- Filter group

The equipment should include a filtration system and pump. The filter group, which contains a polypropylene filter bag, captures the solid impurities on the parts and keeps the solution in the tank clean. The mechanical action of the product on the parts is provided by the pump, which causes the liquid to circulate over the parts and guarantees the cleaning action.

- Double tank

Placement of a removable false bottom in the tank is suggested, for easy recovery of fallen items and for tank cleaning.

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- Containment tank

Current regulations require a containment tank capable of containing any liquid that might be spilled.

- Draining

In order to reduce product consumption, it is suggested that any drained-off product be returned to the treatment tank.

- Treatment section

For in-line equipment, to reduce product consumption and to avoid product escaping into the working area, the placement of self-closing and flexible doors or curtains is suggested between the various sections of the equipment (entrance, treatment area, blow-off and draining area, drying). Also provide suitable exhaust systems to prevent vapors from escaping and being stripped.

Packaging

ECOPHOR® A/447 and **FLUID A/447** are supplied in homologated polyethylene high density 30 liters drums and 200 liters drums and in homologated 1.000 liters industrial bulk containers (I.B.C.).

Storage

The product if transported and stored at proper temperatures between 10 and 40°C, in its original packing perfectly sealed, in the shade, far from heat sources or electrostatic charges, expires two years after the date of delivery.

Warning

Read the MSDS carefully before using the product.

Our technical service department is at your complete disposal for any further information you may need.

We are not responsible in case of failure to comply with our recommendations.

The information represents our current knowledge on the subject. Since we cannot anticipate all variations in actual end-use conditions, we make no warranties and assume no liability in connection with any use of this information. This information may be subject to revision as new knowledge/experience becomes available.

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