

ECO-INNOVATIVE

Specific Coagulants For Wastewater Treatment





Sectors

From the industrial customer to the local, from the small and medium-scale enterprise to a multinational, in the national and international market, we are able to provide customized solutions for each customer. Our main clients come from the following sectors:

Public sector:

Treatment plants of urban waste water and treatment plants of water



Industrial Sector:

Automotive, metallurgy, paints, glass, ceramics, frits and glazes, sanitary, chemical, petrochemistry, pharmaceutical, food industries (livestock, processing of meat products, fish farms, preserves, mills, coffee products, ice cream, washing and processing of vegetables and fruits, frozen products,...) textile, energy (power plants, biodiesel producers, solar and thermal power plants, ...), paper and paperboard, mining, natural stones, plastic recycling and waste management.



ECOFLUOR Series - Fluoride Removal



ECOFLUOR Series is a new and innovative range of products developed by SERVYECO, based on coagulation aid liquid products, focused on eliminating fluorides from wastewater during chemical treatments, mainly in settling processes. High values of fluoride content in the wastewaters can not be removed with conventional inorganic coagulants like ferric chloride or polyaluminum chloride.

| PRODUCTS | ECOFLUOR A50 | ECOFLUOR A70 | ECOFLUOR B50 | ECOFLUOR B70 |
|--------------------|------------------|------------------|--------------|--------------|
| ASPECT | Yellowish Liquid | Yellowish Liquid | Amber Liquid | Amber Liquid |
| pH (0,3%) | 1,5 - 1,7 | 1,5 - 1,7 | 12,0 - 12,2 | 12,0 - 12,2 |
| ACTIVE CONTENT (%) | > 45 | > 65 | > 70 | > 90 |
| IONIC CHARACTER | Acid | Acid | Alkaline | Alkaline |

ECOFLUOR Series products remove fluorides present in wastewater, reaching levels of fluoride removal rate greater than 95%, producing a very compact sludge treatable by settling and subsequent filtration. These products are widely used in the Glass and Metal-Mechanic sector, including Automotive (phosphating processes), Minery (copper extraction) and Lacquered Metal Surfaces (Aluminum).

AUTOMOTIVE SECTOR – ECOFLUOR SERIES

| TEST | [F ⁻]initial (ppm) | ECOMIX RE 5 | ECOFLUOR A 70 | ECOPOL AS100 | [F ⁻]final (ppm) | % Removal |
|------|--------------------------------|-------------|---------------|--------------|------------------------------|-----------|
| 1 | 10 | 300 ppm | 600 ppm | 5 ppm | 4.7 | 53,0 % |
| | 25 | | | | 10.1 | 59,6 % |
| | 50 | | | | 14.7 | 70,6 % |
| | 75 | | | | 22.0 | 70,7 % |
| | 100 | | | | 33.0 | 67,0 % |
| 2 | 50 | 400 ppm | 600 ppm | 5 ppm | 12.8 | 74,4 % |
| | 75 | | | | 18.9 | 74,8 % |
| | 100 | | | | 24.0 | 76,0 % |
| 3 | 50 | 300 ppm | 800 ppm | 5 ppm | 12.4 | 75,2 % |
| | 75 | | | | 16.5 | 78,0 % |
| | 100 | | | | 23.0 | 77,0 % |
| 4 | 50 | 400 ppm | 800 ppm | 5 ppm | 13.2 | 73,6 % |
| | 75 | | | | 17.4 | 76,8 % |
| | 100 | | | | 19.1 | 80,9 % |
| 5 | 50 | 600 ppm | 1200 ppm | 5 ppm | 11.8 | 76,4 % |
| | 75 | | | | 12.6 | 83,2 % |
| | 100 | | | | 16.9 | 83,1 % |

ADIMET Series - Metals Removal

ADIMET Series products have been designed to act as high efficiency metals precipitating agents, interacting with copper, nickel, zinc, chromium, cadmium, silver, lead, iron or mercury, among others. The ADIMET products are applied when lime based conventional treatments, as the chemical oxidation and formation of metal hydroxides, are not able to remove the metals present in the wastewater.

| PRODUCTS | ADIMET TL | ADIMET LN | ADIMET M22 | ADIMET SR |
|--------------------|---------------------|----------------------|----------------------|--------------------|
| ASPECT | Bright green liquid | Bright yellow liquid | Reddish brown liquid | Clear green liquid |
| pH (0,3%) | 9,5 - 10,5 | 10,0 - 11,0 | 10,0 - 11,5 | 12,0 - 13,0 |
| ACTIVE CONTENT (%) | > 40 | > 20 | > 25 | > 15 |
| PREFERED METALS | Nickel | Zinc | Nickel, Zinc | Nickel |

ADIMET Series generates significant cost benefits associated with the doses and chemicals used. ADIMET products form an insoluble precipitate with multivalent metals, both complexed and chelated, reaching very high removal efficiency levels. These products are widely used in the metallurgic sector, including Automotive (cataphoretic processes), Minery, Textile, Electrolytic Zinc Plated and Galvanized Metal Surfaces, among others.

Oxidation:
Sodium hypochlorite

Flocculation:
pH = 10,5 with $\text{Ca}(\text{OH})_2$
Polyelectrolyte

Treatment: Physical - Chemical, Settling.

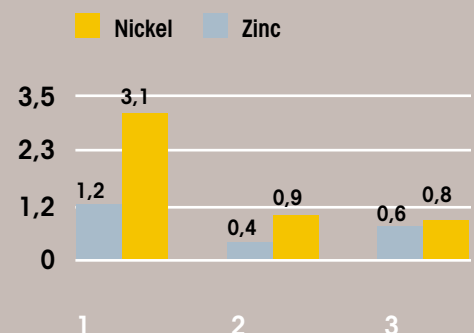
| PARAMETER | Units | Inlet | 0 | 1 | 2 | 3 |
|------------------|-------|-------|------|------|------|------|
| Zinc | mg/l | 420 | 145 | 1,2 | 0,4 | 0,6 |
| Removal Rate (%) | - | - | 65,5 | 99,7 | 99,9 | 99,8 |
| Nickel | mg/l | 16,7 | 14,2 | 3,1 | 0,9 | 0,8 |
| Removal Rate (%) | - | - | 15,0 | 81,4 | 94,6 | 95,2 |

- 0.- Only flocculation phase.
- 1.- Customer's Treatment.
- 2.- 100 ppm ADIMET TL + 3000 ppm ADIMET LN.
- 3.- 3000 ppm ADIMET M22.

Study Cases - METAL MECANIC

A very **aggressive treatment** is required to reach requested values of Nickel and Zinc, **simultaneously**.

ADIMET Treatment, single or double, **decreases both concentration of Nickel and Zinc** below the requested limit (1 ppm).



ECOPHOS Series - Phosphorus Removal

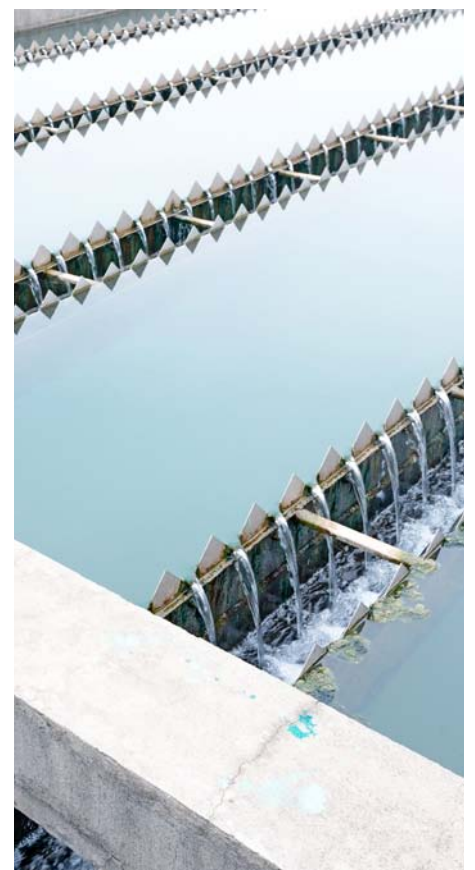
ECOPHOS Series products have been developed to increase the phosphorus removal efficiency in secondary systems after a biological treatments. Organic specific coagulants designed by SERVYECO are able to improve current treatments based on inorganic coagulants, like ferric chloride.

| PRODUCTS | ECOPHOS AN | ECOPHOS CL | ECOPHOS SC |
|------------------------------|--------------|-------------------|--------------|
| ASPECT | Brown liquid | Colourless liquid | Amber liquid |
| pH (20%) | 2,0 – 2,8 | 4,0 – 6,0 | 11,0 – 12,0 |
| ACTIVE CONTENT (%) | > 25 | > 45 | > 40 |
| Density (g/cm ³) | 1,06 - 1,12 | 1,10 - 1,15 | 1,45 - 1,55 |

ECOPHOS Series avoid the use of corrosive materials, generating a dewatered sludge free of metals, even reaching significant cost benefits associated with the chemical doses and waste management. These products are always used in secondary systems after a biological treatment, coming from industrial and urban wastewaters. Industrial wastewater examples are Dairy, Tannery, Textile or Beverage, among others.

ECOSULPHATE Series products aim to precipitate dissolved sulphates through physico-chemical treatments, based on inorganic complexes formation, through an efficient and profitable procedure. Chemical technology developed by SERVYECO reduces the generated sludge and increase the removal efficiency reached by lime based current techniques.

ECOSULPHATE products are widely used in different industrial sectors like Paper, Cardboard, Minery, Textile, Natural Stone or Galvanized Metal Surfaces, among others.





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