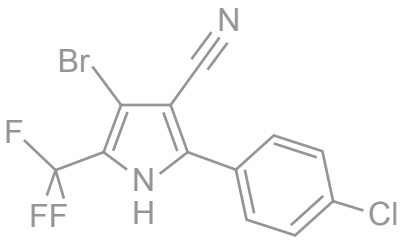
Marine Antifouling

ECONEA®

Product Description

ECONEA® is a metal-free antifouling agent for use in antifouling paints for ship hulls or other marine structures. ECONEA® has a broad spectrum of activity against hard-shelled and soft-bodied invertebrate animal fouling organisms. Because of its chemical and physical stability in coatings, the low water solubility and leachability, ECONEA® containing antifouling paints can often be specified for multi-year dry-docking intervals comparable to those achieved with copper-based products.

General Information

Common Name (ISO)	Tralopyril
IUPAC Name	4-bromo-2-(4-chlorophenyl)-5-(trifluoromethyl)-1H-pyrrole-3-carbonitrile
CAS Name	1H-Pyrrole-3-carbonitrile, 4-bromo-2-(4-chlorophenyl)-5-(trifluoromethyl)
CAS Registry No.	122454-29-9
Molecular Formula	$C_{12}H_5BrClF_3N_2$
Molecular Weight	349.5
Structural Formula	

Chemical And Physical Properties

These properties are typical but do not constitute specifications:

Appearance	White to off-white powder
Purity (Chromatography)	Minimum 95.0% w/w
Water Content (Karl-Fisher Titration)	Maximum 0.5% w/w
Particle Size Distribution (Laser Diffraction)	D_{50}: 4.0-10.0 µm; D_{99}: maximum 25.0 µm
Oil Absorption Value (ISO 787-5)	28 ml per 100 g
Density	1.714 g/ml at 20°C
Vapour Pressure	1.9×10^{-8} Pa at 20°C; 4.6×10^{-8} Pa at 25°C
Dissociation Constant	pK_a = 7.08 at 26°C
pH	5.16 at 22°C (0.1% w/v dispersion in distilled water)

Solubility In Water And Organic Solvents

Solubility in Water

Column Elution	Solubility, in mg/l, at 20°C
Distilled Water (pH 4.9)	0.17
Artificial Seawater (pH 8.1)	0.16

Solubility in Organic Solvents

	Solubility, in g/l, at 20°C
Acetone	300.5
Ethyl acetate	236.0
Methanol	109.1
n-Octanol	85.2
n-Heptane	7.2
Xylene	5.6

Chemical Stability And Compatibility

There are no known incompatibilities between ECONEA® and binder resins, pigments, fillers, solvents or additives that are commonly used in antifouling paints. ECONEA® is prone to hydrolysis and photolysis in dilute aqueous solutions. However, it has been demonstrated that ECONEA® can be used in water-borne antifouling paints without any stability issues. Photolysis of ECONEA® will normally not occur in pigmented coating systems.

Thermal Stability

ECONEA® exhibits excellent thermal stability. In dynamical Differential Scanning Calorimetry (DSC) in open atmosphere only melting (±249ºC) and endothermal decomposition was observed. In a dynamical DSC run under closed conditions a large exotherm was measured from ±230ºC (325 J/g), with melting during the exotherm.

Shelf Life

If stored at ambient temperature, in the original sealed container, ECONEA® Technical has an initial shelf life of five years.

Antifouling Paint Formulation

ECONEA® is fit for use in different types of antifouling paint including traditional rosin-based Controlled Depletion Polymer (CDP) paint types, as well as Self-Polishing Copolymer (SPC) systems.
It is recommended to use ECONEA® in conjunction with a soft fouling agent to ensure complete protection against both hard and soft fouling.

Recommended Use Levels

Effective use levels of ECONEA® in copper-free antifouling paints are typically between 4 and 6 per cent by weight (on total formula, wet paint). Alternatively, ECONEA® can be used in conjunction with a copper-based biocide, either to reduce the copper level without sacrificing performance or to increase the performance and/or service life of copper-based products.

US EPA Reg. No. 43813-27 and 43813-52
Use biocides safely. Always read the label and product information before use.
ECONEA® may not be registered for certain uses in certain countries.
For more information on the regulatory status in your country of interest, we invite you to contact us.

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