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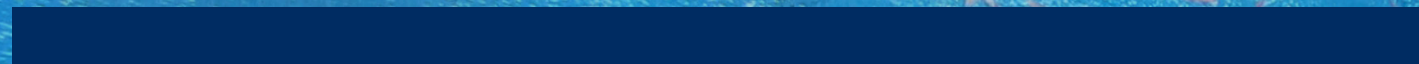
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# CHIMSPERSE 4000

Oil pollution causes considerable environmental damage with the possibility of affecting large areas and substantially altering the equilibrium of entire ecosystems.

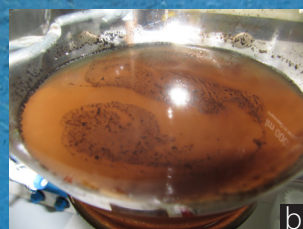
Oil spills in marine areas are a major issue. The formation of an oil layer on top of the water impedes the naturally occurring physical-chemical reactions between the marine environment and the atmosphere, thus leading to grave consequences for marine organisms.

**CHIMSPERSE 4000** reduces the dimension of the oil droplets to the microscopic level by reducing the interfacial tension. The resulting increase in

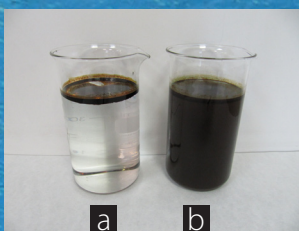
the contact area helps the natural occurring microorganisms to break down the oil. There are no chemical reactions between **CHIMSPERSE 4000** and the contaminants, there is no risk of formation of possibly harmful intermediate by-products.

**CHIMSPERSE 4000** is a powerful dispersant that accelerates the degradation of hydrocarbon pollutants.

**CHIMSPERSE 4000** has passed all tests for effectiveness, stability, ecotoxicity and biodegradability required by the Italian Ministry of the Environment Decree of February 25th , 2011.



Oil polluted water samples before (a) and after (b) the treatment with **CHIMSPERSE 4000**



Effect of Chimesperse 4000 over time

EFFECTIVENESS AND STABILITY	ITALIAN LAW DECREE 25.2.2011	CHIMSPERSE 4000
Emulsifying effectiveness	≥60% of the spilled oil	85%
Emulsion stability in agitation	>60% ± 10% of the spilled oil	98.6%
Static emulsion stability	>60% ± 10% of the spilled oil within 1h >20% of the spilled oil after 23 h	93%

ECOTOXICOLOGICAL PARAMETERS	ITALIAN LAW DECREE 25.2.2011	CHIMSPERSE 4000
Biodegradability (28 days) OECD306/92ThOD Chimec Chimspersperse 4000	-	78%
Biodegradability (28 days) OECD306/92ThOD of all components	>60%	71.4% - 80.0%
Log Pow Chimec Chimspersperse 4000	-	1.85
Log Pow of all components	≤ 3	0.47 - 1.94
Acute Toxicity on Shellfish (Artemia franciscana 96h EC50)	>10 mg/l	36.42 mg/l
Algal Growth Inhibition (Skeletonema costatum, Phaeodactylum tricornutum EC50)	>10 mg/l	103.96 mg/l
Acute Toxicity on Fish (Common bass LC50-96h)	>10 mg/l	80-160 mg/l
CHEMICAL PHYSICAL PARAMETERS	ITALIAN LAW DECREE 25.2.2011	CHIMSPERSE 4000
Flash Point Cinematic Viscosity @ 20°C Cloud Point	>55°C ≤ 400 cSt ≤ -10°C	>100°C 19.64 cSt -10°C