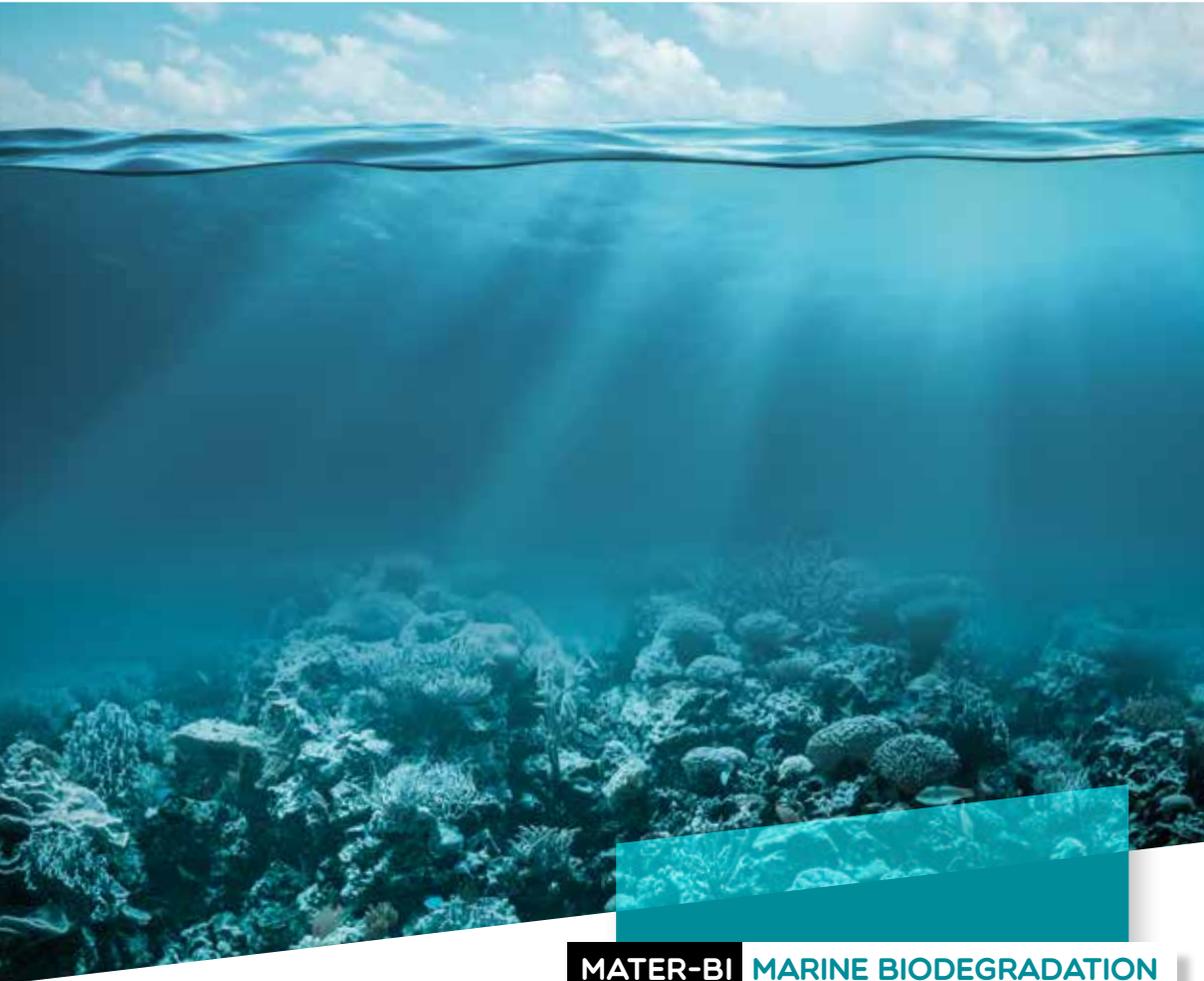


MARINE BIODEGRADATION OF THIRD GENERATION MATER-BI



MATER-BI MARINE BIODEGRADATION

MATER-BI is a family of fully **biodegradable and compostable** bioplastics which use renewable resources to provide a solution with low environmental impact and to solve specific environmental problems in various sectors, such as foodservice, packaging and separate collection of organic waste.

In laboratory tests, samples of MATER-BI were exposed to marine sediments from coastal areas, a habitat where a lot of plastic waste ends up.

The test data confirm that MATER-BI tends to biodegrade in relatively short times, even in natural conditions such as the marine environment.

The laboratory tests, supervised by the Italian Institute of Plastics (IIP), were Verified by Certiquality, within the framework of the European Commission's "Environmental Technology Verification" (ETV) pilot programme.

WASTE SHOULD NOT BE DUMPED

Plastic waste in our oceans is a growing concern. The uncontrolled disposal of waste is a major **social problem** which needs to be resolved by increasing **environmental and civic education**, that is, environmental awareness among citizens. **Products made of MATER-BI** are not designed for uncontrolled

disposal but for recovery through organic waste recycling (i.e. composting and anaerobic digestion). Biodegradability cannot be used as an excuse to dump waste – our oceans are not rubbish dumps and cannot support the uncontrolled discharge of waste (regardless of whether or not it is biodegradable).

That said, it is interesting to note the marine biodegradation properties of biodegradable plastics made of MATER-BI. When plastic products reach the sea (from rivers, land or boats), they are dragged by the waves, currents and tides and generally end up on the beaches or at the bottom of the sea.

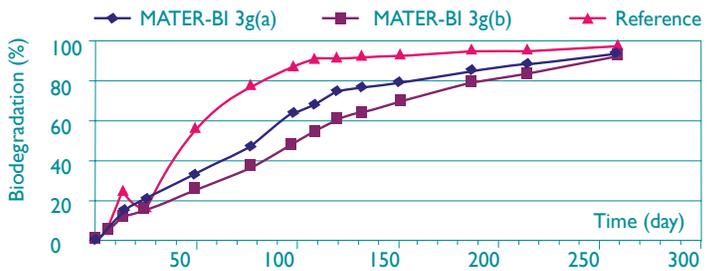
MARINE BIODEGRADATION TESTS ON MATER-BI

What is the fate of products made of MATER-BI that end up in the coastal area (the area between the beach that is wet by waves and the sea bed)? **NOVAMONT** has verified the behaviour of products made of **MATER-BI** using test methods prepared by international standards organisations.

The results make interesting reading. Samples of MATER-BI were exposed to marine sediments from coastal areas and biodegradation was tracked by monitoring metabolism by the bacteria that “digest” bioplastic. High levels of biodegradation were achieved in relatively short timeframes (less than 1 year), suggesting that these materials can be suitable to manufacture plastic items with a high risk of dispersion in the sea (such as fishing equipment). More specifically,

the biodegradation of the materials tested was over **90%**, in absolute terms and relative to a reference material such as cellulose (see example in the chart). When products made of MATER-BI reach the sea (from rivers, land or boats), they do not “disappear” immediately. Nevertheless, the environmental risk caused by a product released into the sea is lessened by rapid biodegradation that reduces the time the product remains in the environment.

The results of the environmental biodegradation of 3rd generation MATER-BI represent a technological innovation in the environmental field and have been **verified by Certiquality within the framework of the “Environmental Technology Verification (ETV)” pilot programme**. More information on this new environmental technology verification tool can be found at: <http://iet.jrc.ec.europa.eu/etv/>



MATER-BI is certified as biodegradable and compostable. If disposed of in the wet waste fraction, it is converted into fertile, useful compost. www.materbi.com

