

BREAK-THRU®

Face-to-Face with Microbials





BREAK-THRU® additives are well known innovative solutions in the crop protection industry. They are used as tank mix adjuvants and as in-can additives for agrochemical formulations. Our products enhance the performance of synthetic pesticides as spreaders, penetrants, antifoams, dispersants and emulsifiers.

BREAK-THRU® additives can also increase the performance of biological active ingredients and are especially beneficial for products based on living microorganisms.

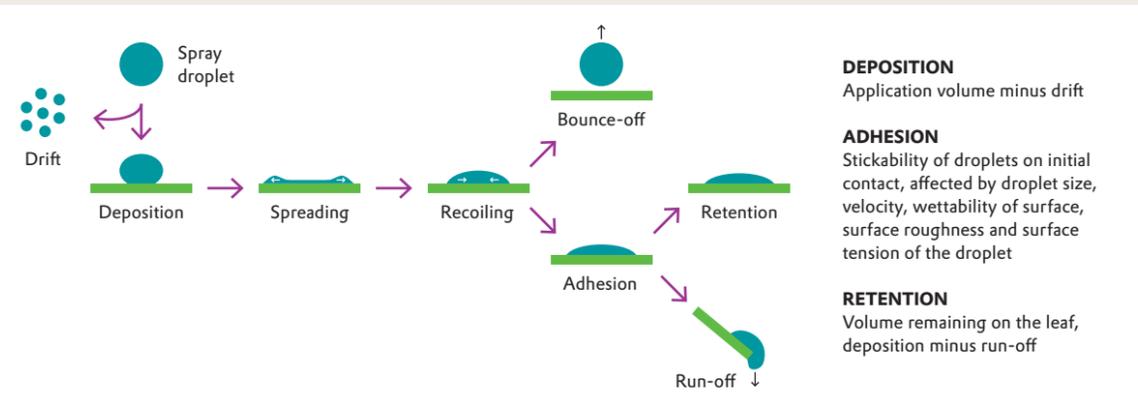
IMPROVING THE PERFORMANCE OF MICROBIAL AGRO SOLUTIONS

ENHANCED SHELF LIFE AND TARGETED DELIVERY

Biological alternatives to chemical crop protection products have become increasingly important as consumers look for food containing less chemical residues. Growers need alternative modes of action to control resistant pests or prevent resistance build-up. This demand and the regulatory phase-out of many chemical pesticides globally, provides an opportunity for biological solutions. However, growers often perceive biological products – especially products based on living microorganisms – as having a lower and/or inconsistent efficacy compared to chemical ones.



TARGETED DELIVERY OF MICROBIAL SPRAY SOLUTIONS: BREAK-THRU® ADDITIVES ENHANCE DEPOSITION, ADHESION & RETENTION



Common causes of low or inconsistent efficacy of microbial biopesticides and biostimulants are limited stability of the product during storage prior to application, too little of the active material reaching the target site, and the rapid degradation of the active material on the target by environmental stress.

STABILIZATION

Microorganisms should remain viable during storage and transport without compromising their efficacy or the desired formulation properties. The viability of microorganisms depends on several criteria. Besides suitable growth conditions during production and appropriate downstream processing the right formulation helps to reduce loss of viability of microbial active ingredients.

BREAK-THRU® carrier liquids and additives enhance the shelf life of bacterial and fungal microorganisms and allow for physically stable solid and liquid formulations.

TARGETED DELIVERY

For a microbial product to be effective and economical, it is essential that the organism reaches the target site. Even though a biological active ingredient is applied to the site where the pathogen is found, e.g. by spraying, much of the product can be lost by drift, bounce-off and/or run-off. Many of the physico-chemical principles known for the delivery of chemical crop protection products also apply to microorganisms. However, the additives or surfactants used must be biocompatible, i.e. they must not affect the viability of the microorganism. Biocompatibility of surfactants is even more important in formulations than it is in tank mixtures where only low concentrations of adjuvants are used.

BREAK-THRU® additives are biocompatible and provide excellent wetting performance, deposition, adhesion and retention. In addition, BREAK-THRU® additives reduce the amount of droplets

prone to drift of foliar applied products and enable wetting of the leaf underside. They provide homogeneous spreading of actives in the soil with no leaching into deeper soil zones.

PROTECTION

On the target, microbial active ingredients need protection from harmful environmental effects such as desiccation, UV radiation or wash-off by irrigation or rain. BREAK-THRU® additives provide humectant properties and improved rainfastness.

Our BREAK-THRU® product portfolio for microbial agro solutions enhances the often limited shelf life of microbial biocontrol agents and biostimulants as well as their delivery and efficacy. This leads to an increase in performance of microbial agricultural solutions and contributes to their acceptance in the market.

Product range of biocompatible BREAK-THRU® Additives

Products	w/o Hazard Symbol	Biodegradable ¹⁾	Biobased	OMRI ²⁾	FIBL ³⁾	Application Properties/Mode of Action	Chemistry
MULTIFUNCTIONAL CARRIER FLUID FOR AN ENHANCED SHELF LIFE OF LIVING MICROBIAL ACTIVES							
BREAK-THRU® BP 787	●	●				For foliar and soil and seed applications. Binder properties in combination with AEROSIL® 200 with low dust-off values	Polyether
BREAK-THRU® SP 133	●	●	●	●	●	For foliar and soil applications	Polyglycerol ester
IN-CAN ADDITIVES							
WETTING AGENTS							
BREAK-THRU® S 301		●		●		Superspreader for adhesion and retention/flowability, adherence and homogeneous coating for seed application/ soil wetting	Organo modified Trisiloxane
BREAK-THRU® SD 260		●		●		Superspreader for solid formulations with humectant properties, excellent adhesion, retention/soil wetting	Organo modified Trisiloxane/PEG ⁴⁾ 6000
BREAK-THRU® S 233		●		●		Excellent adhesion and retention and penetration/ soil wetting	Organo modified Trisiloxane
BREAK-THRU® S 200				●		Excellent adhesion and retention, excellent emulsifying properties in methylated seed oils	Organo modified Trisiloxane
BREAK-THRU® S 255	●					For oil based formulations, with humectant properties, antidust agent in WDG & for seeds treatments/wetting of top soil layer	Organo modified siloxane
BREAK-THRU® SP 133	●	●	●	●	●	Excellent adhesion, retention, and drift reduction/ optimized adherence and flowability for seed treatment/ low foam tendency	Polyglycerol ester
TEGO® SML 20		●	●	●		Economical wetting agent for advanced adhesion and retention/soil wetting	Ethoxylated sorbitan monolaurate, HLB 16.7
DISPERSING AGENTS							
BREAK-THRU® DA 646	●					Excellent dispersion and reduction of active agglomeration, for OD formulations (oil/solvent based), emulsifier for methylated vegetable oil, optimized adherence and flowability for seed treatment	Polyether
BREAK-THRU® DA 647	●					Excellent dispersion and reduction of active agglomeration, for OD formulations (oil/solvent based), emulsifier for methylated vegetable oil, optimized adherence and flowability for seed treatment	Polyether
EMULSIFIERS							
BREAK-THRU® EM 05	●	●	●	●		Co-emulsifier to reduce HLB value in combination with other emulsifiers	Polyglycerol ester, HLB 5.5
BREAK-THRU® EM V 20	●					Emulsifier for vegetable oil and naturally derived pesticidal oils	PEG ¹⁾ (20) Glyceryl Oleicinate, HLB 8.3
TEGO® STO 85 V	●	●	●	●		Emulsifier for paraffinic oil	PEG ¹⁾ (20) sorbitan trioleate, HLB 10.5

Products	w/o Hazard Symbol	Biodegradable ¹⁾	Biobased	OMRI ²⁾	FIBL ³⁾	Application Properties/Mode of Action	Chemistry
ANTIFOAMS							
BREAK-THRU® AF 5503	●					Especially for SL formulations, easy-handling due to self emulsifiability, high tolerance to salts	Organo modified siloxane
BREAK-THRU® AF 9902	●					For oil-/solvent-based formulations	Organo modified siloxane with silica
BREAK-THRU® AF 9903	●					Especially for water-based formulations, easy-handling due to self emulsifiability, high tolerance to salts	Organo modified siloxane with silica
TEGO® Antifoam N	●					For fermentation processes	Silicone oil with silica
TANK-MIX ADJUVANTS							
BREAK-THRU® MSO MAX						Spreader, penetrant and anti-evaporant	Organo modified Trisiloxane / MSO ⁵⁾
BREAK-THRU® SP 133	●	●	●	●	●	For excellent adhesion, retention, and drift reduction, low foam tendency	Polyglycerol ester
BREAK-THRU® S 301		●		●		Superspreader for excellent adhesion and retention and soil wetting	Organo modified Trisiloxane
BREAK-THRU® S 240				●		Superspreader for excellent adhesion and retention and soil wetting	Organo modified Trisiloxane
BREAK-THRU® S 255	●					Wetting of top soil layer, with humectant properties	Organo modified siloxane
BREAK-THRU® S 233		●		●		Excellent adhesion and retention and penetration and soil wetting	Organo modified Trisiloxane
BREAK-THRU® OE 446				●		Stable within a pH range of 3–11, spreader esp. for methylated vegetable oils	Organo modified siloxane
BREAK-THRU® SF 420		●	●	●		Improved wetting and adhesion, low foaming tendency	Sophorolipid
BREAK-THRU® Vibrant	●					Enhanced deposition due to extremely fast reduction of spray solution surface tension, esp. good for monocots with vertical leaves, very low foam tendency	Polyether

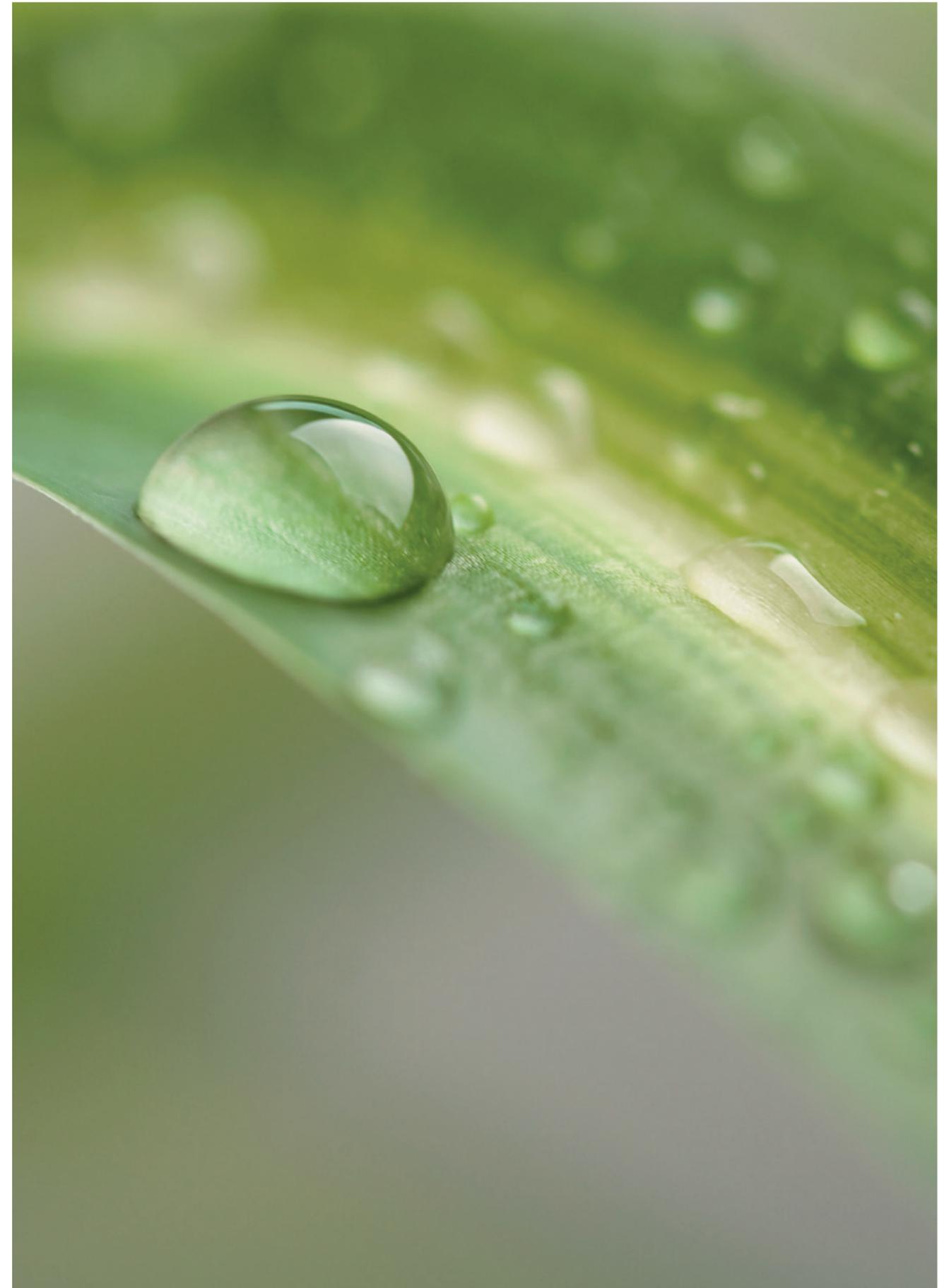
1) OECD 301 (OECD = Organisation for Economic Co-operation and Development) according to OECD 301 test
 2) OMRI = Organic Materials Review Institute
 3) FIBL Forschungsinstitut für biologischen Landbau, Schweiz, Deutschland, Österreich
 4) EPA = United States Environmental Protection Agency
 5) FIFRA = Federal Insecticide, Fungicide, and Rodenticide Act
 6) Compliant with 40 CFR 180.910 or 40 CFR 180.960 (CFR = United States Code of Federal Regulations)

Biocompatibility matrix of BREAK-THRU® products

Products	Fungal spores					Gram-positive	Gram-negative		
	<i>Trichoderma</i>	<i>Clonostachys</i>	<i>Paeecilomyces Illicinus</i>	<i>Beauveria</i>	<i>Metarhizium anisopliae</i>	<i>Bacillus</i>	<i>Pseudomonas</i>	<i>Azospirillum</i>	<i>Bradyrhizobium</i>
MULTIFUNCTIONAL CARRIER FLUIDS									
BREAK-THRU® BP 787	●	●	●	●	nt	●	nt	nt	nt
BREAK-THRU® SP 133	●	●	●	●	nt	●	●	●	nt
IN-CAN ADDITIVES									
WETTING AGENTS									
BREAK-THRU® SD 260	●	●	●	●	●	●	●	●	●
BREAK-THRU® SP 133	●	●	●	●	nt	●	●	●	nt
BREAK-THRU® S 200	●	●	●	nt	nt	●	nt	nt	nt
BREAK-THRU® S 233	●	●	●	nt	nt	●	nt	nt	nt
BREAK-THRU® S 301	●	●	●	nt	nt	●	●*	●*	●*
BREAK-THRU® S 255	●	nt	nt	nt	nt	●	●*	nt	nt
ANTIFOAMS									
BREAK-THRU® AF 5503	●	●	●	●	●	●	nt	nt	nt
BREAK-THRU® AF 9902	●	●	●	●	●	●	nt	nt	nt
BREAK-THRU® AF 9903	●	●	●	●	●	●	nt	nt	nt
TEGO® Antifoam N	●	●	●	●	●	●	nt	nt	nt
EMULSIFIERS									
BREAK-THRU® EM 05	●	●	●	●	nt	●	nt	nt	nt
BREAK-THRU® EM V 20	–	nt	nt	●	nt	●	●*	nt	nt
TEGO® SML 20	–	nt	nt	●	nt	●	●*	nt	nt
TEGO® STO 85 V	–	nt	nt	●	nt	●	●*	nt	nt
DISPERSING AGENTS									
BREAK-THRU® DA 646	●	●	nt	●	nt	●	●*	●*	●*
BREAK-THRU® DA 647	●	●	nt	●	nt	●	nt	nt	nt
TANK-MIX ADJUVANTS									
BREAK-THRU® MSO MAX	●	●	●	●	●	●	●	●	●
BREAK-THRU® SP 133	●	●	●	●	●	●	●	●	●
BREAK-THRU® S 301	●	●	●	●	●	●	●	●	●
BREAK-THRU® S 240	●	●	●	●	●	●	●	●	●
BREAK-THRU® S 255	●	●	●	●	●	●	●	●	●
BREAK-THRU® S 233	●	●	●	●	●	●	nt	nt	nt
BREAK-THRU® OE 446	●	●	●	●	●	●	nt	nt	nt
BREAK-THRU® SF 420	●	●	●	●	●	●	nt	nt	nt
BREAK-THRU® Vibrant	●	●	●	●	●	●	nt	nt	nt

Biocompatibility test of Tank mix additives are tested at the rates recommended on the labels.

- = accelerated storage tests at 40°C with: 80% additives + 20% microbe on solid carrier
- * = final fermentation broth was supplemented with the respective additive to an end concentration of 1%. CFU tested over 4 weeks at RT
- nt = not tested yet
- = not compatible



Europe | Middle East | Africa

Evonik Operations GmbH
Goldschmidtstraße 100
45127 Essen
Germany
Phone +49 201 173-2665
Fax +49 201 173-1990
www.evonik.com

Asia | Pacific

Evonik Specialty Chemicals Co., Ltd.
55, Chundong Road
Xinzhuang Industry Park
Shanghai, 201108
PR China
Phone +86 21 6119-1125
Fax +86 21 6119-1406

The Americas

Evonik Corporation
P.O. Box 34628
Richmond, VA 23234
USA
Phone +1 804 727-0700
Fax +1 804 727-0855

This information and any recommendations, technical or otherwise, are presented in good faith and believed to be correct as of the date prepared. Recipients of this information and recommendations must make their own determination as to its suitability for their purposes. In no event shall Evonik assume liability for damages or losses of any kind or nature that result from the use of or reliance upon this information and recommendations. EVONIK EXPRESSLY DISCLAIMS ANY REPRESENTATIONS AND WARRANTIES OF ANY KIND, WHETHER EXPRESS OR IMPLIED, AS TO THE ACCURACY, COMPLETENESS, NON-INFRINGEMENT, MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR PURPOSE (EVEN IF EVONIK IS AWARE OF SUCH PURPOSE) WITH RESPECT TO ANY INFORMATION AND RECOMMENDATIONS PROVIDED. Reference to any trade names used by other companies is neither a recommendation nor an endorsement of the corresponding product, and does not imply that similar products could not be used. Evonik reserves the right to make any changes to the information and/or recommendations at any time, without prior or subsequent notice.



www.evonik.com/break-thru

Inv.-Nr.: 22-2022