

BUILT ON EXPERTISE

construction additives from innospec

innospec 

Innospec is a global supplier of specialty chemicals.

We have a strong portfolio of additives and technically advanced solutions for use in the Construction industry. We are also well known in the oilfield, fuel, refinery, power, agrochemical, mining, personal and home care sectors for our expertise and innovative technologies.

From the production of plasterboard, on-site plaster and mortar applications (drymix), the formulation of concrete admixture and tunneling, we have the products to improve efficiency, performance and provide significant benefits to each of these applications.

Our focus has been to provide a complete range that can support the manufacturers of Building and Construction products. We want to provide the end-customers with a choice of options for achieving a desired result, whether this means improved workability, reduced setting times or specific foaming characteristics.

Our range spans foaming agents, foam stabilizers, air entraining agents, superplasticizers, emulsifiers and defoamers and includes well-known brand names like MILLIFLUID®, MILLIFOAM®, NANSA® and EMPICOL®.

As you would expect from an organization that operates across 23 countries with over 2000 employees, we have a wealth of knowledge and experience to draw on. We invest heavily in researching and developing the new technologies

that help solve everyday problems. Our world-class laboratories are equipped with state-of-the-art equipment and manned by top-level scientists. Our customers benefit from the strength of our manufacturing capabilities and distribution facilities.

We understand our customers and the issues they face. That is why we are committed to developing strong customer relationships built on trust and working closely to develop shared solutions to complex technical problems. Our aim is to deliver a fast, flexible, reliable and customer-focused service at all times.

The following pages explore our range and have been split into additives for plasterboard, dry mix, concrete and tunneling applications.

Contents

Additives for gypsum plasterboard	4
Additives for drymix	6
Additives for concrete	8
Concrete admixture formulations	8
Lightweight concrete	10
Concrete mould release agents	10
Additives for tunneling	15

Our foaming agents provide engineered solutions for manufacturing plasterboards with different properties. A required core structure and board property can be achieved simply by selecting the optimal chemistry for a specific formulation, process condition or customer application.

In addition to the foaming agents we can provide a powder surfactant to aid gypsum grinding and a liquid fluidizer to complete our product portfolio for manufacturers of gypsum plasterboard.

Product Name	Description	Appearance	Activity, %	Benefits
--------------	-------------	------------	-------------	----------

High coalescence foaming agent

MILLIFOAM® PB 710	Formulated anionic surfactant	Liquid	40	Foaming agent for use in the production of lightweight gypsum plasterboard to achieve low density boards.
MILLIFOAM® PB 715	Formulated anionic surfactant	Liquid	40	Foaming agent for use in the production of lightweight gypsum plasterboard to achieve low density boards and improve fluidity of gypsum slurry.
MILLIFOAM® PB 758	Formulated anionic surfactant	Liquid	40	Foaming agent for use in the production of lightweight gypsum plasterboard to achieve low density boards. <i>*Available for US market only.</i>

Medium coalescence foaming agent

MILLIFOAM® PB 682	Formulated anionic surfactant	Liquid	35	Foaming agent for use in the production of gypsum plasterboard to achieve medium density boards.
-------------------	-------------------------------	--------	----	--------------------------------------------------------------------------------------------------

Low coalescence foaming agent

MILLIFOAM® PB 523	Formulated anionic surfactant	Liquid	28	Low active foaming agent for use in the production of gypsum plasterboard to achieve standard density boards.
MILLIFOAM® PB 523/MB	Formulated anionic surfactant RSPO certified MB	Liquid	28	Low active foaming agent for use in the production of gypsum plasterboard to achieve standard density boards.
MILLIFOAM® PB 561	Formulated anionic surfactant	Liquid	55	High active foaming agent for use in the production of gypsum plasterboard to achieve standard density boards.

Gypsum grinding aids

NANSA® HS80/s	Sodium alkyl benzene sulphonate	Powder	80	Improves wetting and grinding efficiency in ball-mill accelerator preparation.
NANSA® HS85/s	Sodium alkyl benzene sulphonate	Powder	85	Improves wetting and grinding efficiency in ball-mill accelerator preparation.

Fluidizer

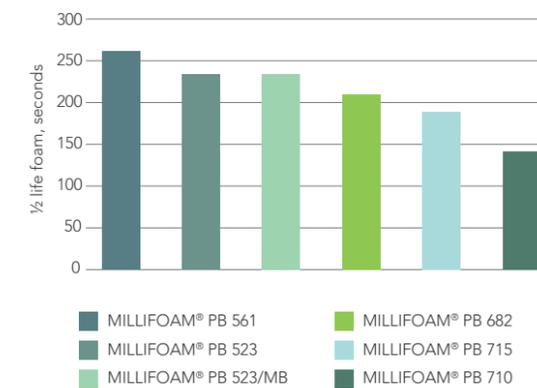
MILLIFLUID® C	Calcium naphthalene sulphonate condensate	Liquid	40	Prevents agglomeration of gypsum particles and reduces energy consumption by reducing high levels of water.
---------------	-------------------------------------------	--------	----	-------------------------------------------------------------------------------------------------------------

MILLIFOAM® PB

Our gypsum foaming agents are sold under the registered brand name MILLIFOAM® PB and can be supplied as RSPO certified MB (Mass Balance).

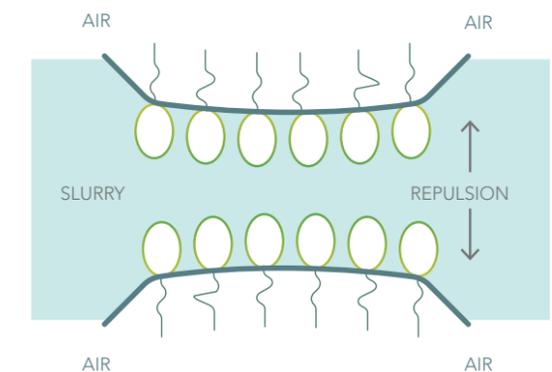
The range helps to stabilize gypsum plasterboard through three key chemical phenomena. Firstly, the repulsion of surfactant 'head groups' retains the thickness of the lamellar and reduces bubble film drainage. Secondly, rapid diffusion of the surfactant to the expanded surface reinforces film thickness, preventing natural deformation of the film. Thirdly, a densely packed surfactant film can reduce diffusion of gas through the liquid interface and help prevent bubble destruction.

Degree of coalescence MILLIFOAM® PB series by measuring degree of coalescence



Method: Foam obtained from mixing 300ml water solution containing 0.12% of active foaming agent for 60 seconds.

Stabilization of foaming agent phenomena



We supply a range of air entraining agents and superplasticizers for mortar and plaster applications. Our air entraining agents reduce the weight of the plaster and mortar, enhance crack resistance and increase the insulating properties of plaster after drying. They also improve the flow properties of the mortar and plaster slurry.

Product Name	Description	Appearance	Activity, %	Benefits
Air entraining agent				
EMPICOL® 0045/B	Sodium alkyl sulphate	Powder	92	Provides controlled incorporation of air, homogenous distribution of micro-pores and reduce crack formation of plaster after drying.
EMPICOL® LX/A	Sodium alkyl sulphate	Powder	92	Provides controlled incorporation of air, homogenous distribution of micro-pores and reduce crack formation of plaster after drying.
EMPICOL® LZ/SM	Sodium alkyl sulphate	Powder	92	Provides controlled incorporation of air, homogenous distribution of micro-pores and reduce crack formation of plaster after drying.
NANSA® LSS495/H	Sodium alpha olefin sulphonate	Powder	92	Improves mortar workability and reduces crack formation of plaster after drying in hot climates.
NANSA® HS80/S	Sodium alkyl benzene sulphonate	Powder	80	Provides strong foam in hard water salt conditions and reduces mortar setting time.
NANSA® HS85/S	Sodium alkyl benzene sulphonate	Powder	85	Provides strong foam in hard water salt conditions and reduces mortar setting time.

Superplasticizer

DEHSCOFIX® 151	Calcium naphthalene sulphonate condensate	Powder	92	Improves workability and compressive strength of mortar jobs by reducing the amount of water needed.
DEHSCOFIX® 158	Sodium naphthalene sulphonate condensate	Powder	90	Improves workability and compressive strength of mortar jobs by reducing the amount of water needed.
DEHSCOFIX® 161	Sodium naphthalene sulphonate condensate	Powder	88	Improves workability and compressive strength of mortar jobs by reducing the amount of water needed.

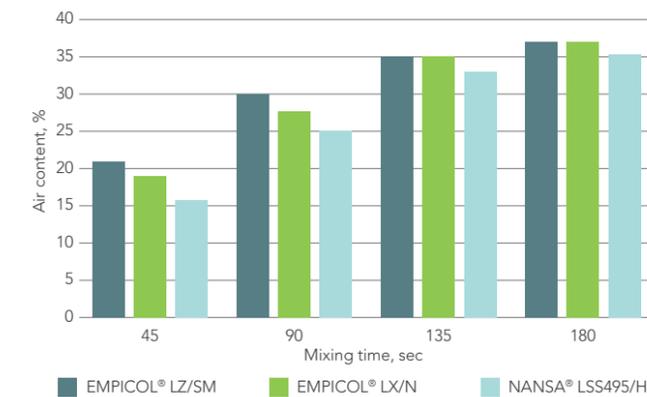
EMPICOL® and NANSA®

Our high performance air entraining agents are sold under the registered brand names EMPICOL® and NANSA®. They work by harnessing the ability of surfactants to lower surface tension in aqueous media by adsorption at the interface. This leads to better mortar workability together with improved anti-shrinkage properties, better sag resistance, water retention and frost resistance. The dosage is usually between 0.01% and 0.03% by weight of cement. The amount of air introduced is dependent on the type of plaster or mortar and on the mixing device used.

EMPICOL® LX/N and EMPICOL® LZ/SM are our high-performance air entraining agents. They offer fast foam generation and high foam stability with evenly distributed air voids in plasters.

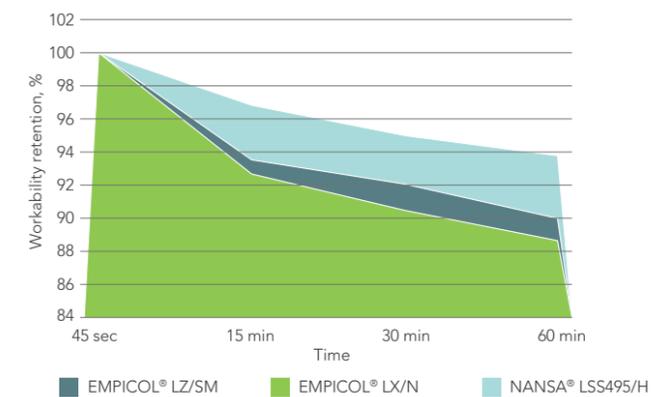
NANSA® LSS495/H delivers better overall performance than traditional sodium lauryl sulfates. It is not sensitive to calcium salts. It is also non-hygroscopic and enables faster wetting of solid particles in the dry admixture. It is very efficient at producing controllable, strong and stable micro foam which in turn leads to enhanced mortar and plaster workability over time.

Air content of EMPICOL® LZ/SM, EMPICOL® LX/N and NANSA® LSS495/H as a function of time



Mixture composition: EN 196-1 sand = 1350g, water/cement ratio = 0.61, water retention/air entraining agent (10/1 weight ratio) = 0.2% by weight of cement. Relevant standard test method: BS 4551 and BS EN 1015.

Workability retention of EMPICOL® LZ/SM, EMPICOL® LX/N and NANSA® LSS495/H over time



Mixture composition: EN 196-1 sand = 1350g, water/cement ratio = 0.61, water retention/air entraining agent (10/1 weight ratio) = 0.2% by weight of cement. Relevant standard test method: BS 4551 and BS EN 1015.

Our products for the concrete industry are designed around delivering reliable and effective air management solutions. We offer a high performance defoamer, air entraining agents, foam stabilizers and superplasticizers for use in concrete admixture formulations. We also supply foaming agents specifically for lightweight concrete applications. Completing the range are our mould release agents for the manufacture of precast concrete.

Concrete admixture formulations

We have a wide range of high performing products for use in concrete admixture formulations.

Product Name	Description	Appearance	Activity, %	Benefits
--------------	-------------	------------	-------------	----------

Air entraining agent

EMPICOL® LX28/U	Sodium alkyl sulphate	Liquid	28	Provides excellent foaming and detergency properties to a broad spectrum of formulations. Increases freeze-thaw resistance.
EMPICOL® ESB 3/MX	Sodium alkyl ether sulphate	Liquid	28	Provides excellent foaming and detergency properties to a broad spectrum of formulations. Increases freeze-thaw resistance.
EMPICOL® ESC 3/Z	Sodium alkyl ether sulphate	Liquid	28	Provides excellent foaming and detergency properties to a broad spectrum of formulations. Increases freeze-thaw resistance.
EMPIMIN® LR28/X	Sodium alkyl sulphate	Liquid	28	Provides excellent foaming and detergency properties to a broad spectrum of formulations. Increases freeze-thaw resistance.
EMPIMIN® SDD/O	Disodium alkyl ethoxy sulphosuccinate	Liquid	40	Provides excellent foaming and detergency properties to a broad spectrum of formulations. Increases freeze-thaw resistance.
NANSA® LSS38/AS	Sodium alpha olefin sulphonate	Liquid	38	Provides excellent foaming and detergency properties to a broad spectrum of formulations. Increases freeze-thaw resistance.

Defoamer

DEHSCOFIX® WL660	EO/PO polymer	Liquid	100	Enhances formulation with polycarboxylate superplasticizer.
------------------	---------------	--------	-----	-------------------------------------------------------------

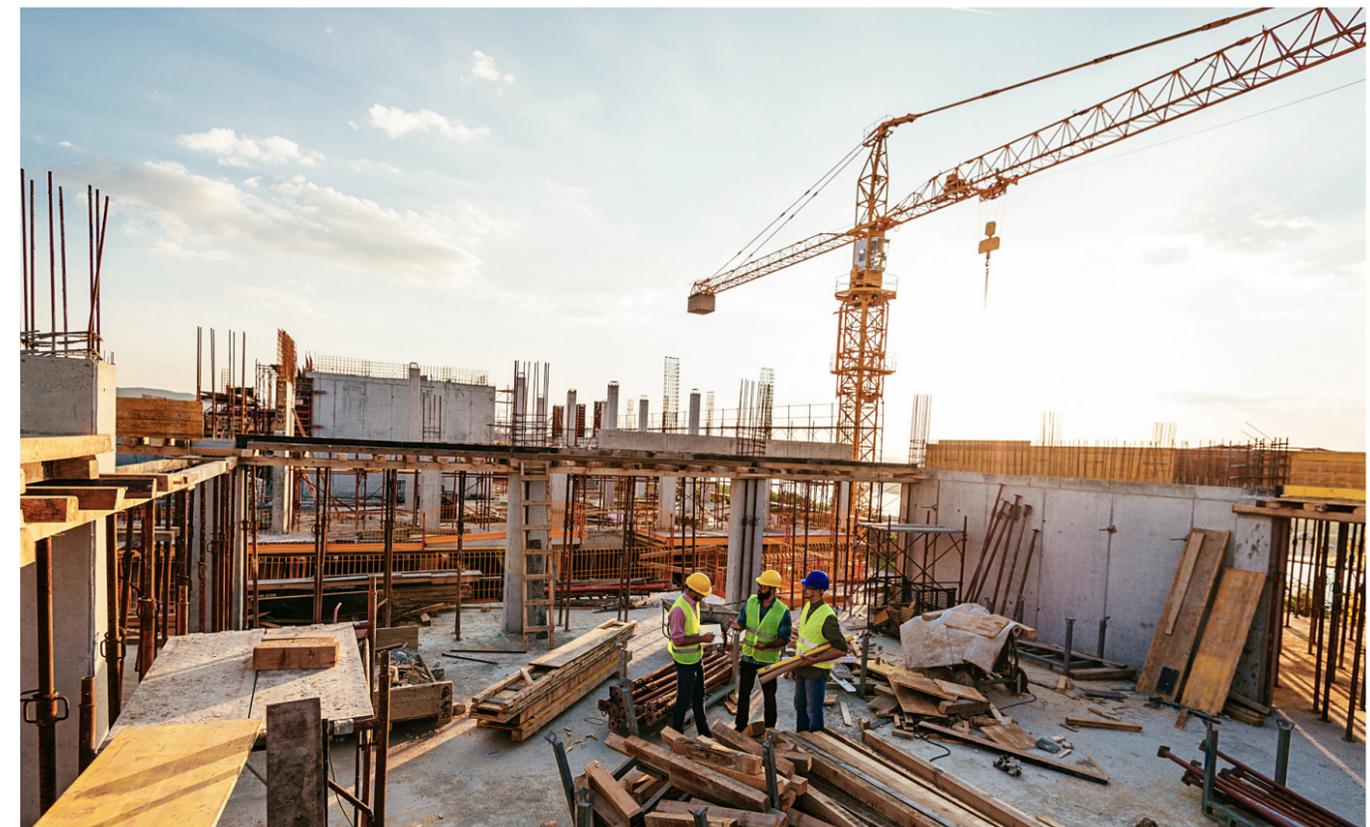
Foam stabilizer

EMPIGEN® BS/FE	Cocoamido propyl betaine	Liquid	31	Improves foam stability of primary air entraining agent, hence improving freeze-thaw resistance.
EMPIGEN® OB	Lauramine oxide	Liquid	30	Improves foam stability of primary air entraining agent, hence improving freeze-thaw resistance.
EMPIGEN® OS/A	Cocoamido propyl amine oxide	Liquid	30	Improves foam stability of primary air entraining agent, hence improving freeze-thaw resistance.
EMPILAN® 2502	Coconut diethanolamide	Liquid	80	Improves foam stability of primary air entraining agent, hence improving freeze-thaw resistance.

Product Name	Description	Appearance	Activity, %	Benefits
--------------	-------------	------------	-------------	----------

Superplasticizer

DEHSCOFIX® 108	Sodium naphthalene sulphonate condensate	Liquid	40	Improves concrete workability and compressive strength by reducing the water demand of a concrete mix.
DEHSCOFIX® 158	Sodium naphthalene sulphonate condensate	Powder	90	Improves concrete workability and compressive strength by reducing the water demand of a concrete mix.
DEHSCOFIX® 161	Sodium naphthalene sulphonate condensate	Powder	88	Improves concrete workability and compressive strength by reducing the water demand of a concrete mix.
DEHSCOFIX® 101	Calcium naphthalene sulphonate condensate	Liquid	40	Improves concrete workability and compressive strength by reducing the water demand of a concrete mix.
DEHSCOFIX® 151	Calcium naphthalene sulphonate condensate	Powder	92	Improves concrete workability and compressive strength by reducing the water demand of a concrete mix.



Lightweight concrete

Our highly concentrated foaming agents are used for formulating lightweight cementitious materials (mortar, concrete, grout) to produce Controlled Low Strength Materials (CLSM). The foaming agents are suitable for use in combination with various types of air pressure foam generating equipment.

Product Name	Description	Appearance	Activity, %	Benefits
Foaming agent				
MILLIFOAM® CLS 100	Formulated anionic surfactant	Liquid	56	Provides highly stable foam in low density lightweight cementitious formulations.
MILLIFOAM® CLS 200	Formulated anionic surfactant	Liquid	33	Provides highly stable foam in low density lightweight cementitious formulations.
MILLIFOAM® CLS 300	Formulated anionic surfactant	Liquid	55	Provides highly stable foam in low density lightweight cementitious formulations.

Concrete mould release agents

Concrete mould release agents are used to prevent the adhesion between fresh concrete and the mould or formwork made by plywood, steel or aluminium and to enhance surface finishing of concrete. We supply a wide range of emulsifiers that can be used in water-based formulations of concrete mould release agents. Our emulsifiers include a broad range of Hydrophilic Lipophilic Balance (HLB) values. This allows formulators to select the best product for a specific application.

Product Name	Description	HLB	Appearance	Activity, %	Benefits
Non ionic emulsifier					
EMPILAN® KR 2.5	Alcohol ethoxylate	8.2	Liquid	100	Provides excellent stability of the emulsion.
EMPILAN® KCL 7/90	Alcohol ethoxylate	12.1	Liquid	90	Provides excellent stability of the emulsion.
EMPILAN® KCL 9/85	Alcohol ethoxylate	13.3	Liquid	85	Provides excellent stability of the emulsion.
EMPILAN® KCL 11/90	Alcohol ethoxylate	14.2	Liquid	90	Provides excellent stability of the emulsion.



Concrete mould release agents (cont)

Product Name	Description	HLB	Appearance	Activity, %	Benefits
--------------	-------------	-----	------------	-------------	----------

Non ionic emulsifier (cont)

EMPILAN® KI 6	Alcohol ethoxylate	11.4	Liquid	100	Provides excellent stability of the emulsion.
EMPILAN® KI 6.5	Alcohol ethoxylate	11.8	Liquid	100	Provides excellent stability of the emulsion.
EMPILAN® KI 8	Alcohol ethoxylate	12.7	Liquid	100	Provides excellent stability of the emulsion.
EMPILAN® KBE 2	Alcohol ethoxylate	7.6	Liquid	100	Provides excellent stability of the emulsion.
EMPILAN® KBE 3	Alcohol ethoxylate	8.0	Liquid	100	Provides excellent stability of the emulsion.
EMPILAN® KLA 6	Alcohol ethoxylate	10.0	Liquid	100	Provides excellent stability of the emulsion.
EMPILAN® KT 7/80	Alcohol ethoxylate	13.2	Liquid	90	Provides excellent stability of the emulsion.
EMPILAN® KA 5/90	Alcohol ethoxylate	5.0	Liquid	90	Provides excellent stability of the emulsion.
EMPILAN® EGMS	Ethylene glycol monostearate	-	Flakes	100	Provides excellent stability of the emulsion.
EMPILAN® EGDS	Ethylene glycol distearate	-	Flakes	100	Provides excellent stability of the emulsion.
DEHSCOFIX® CO 70	Castor oil ethoxylate	7.0	Liquid	100	Provides excellent stability of the emulsion based vegetable oil formulations.
DEHSCOFIX® CO 115	Castor oil ethoxylate	11.3	Liquid	100	Provides excellent stability of the emulsion based vegetable oil formulations.
DEHSCOFIX® CO 130/F	Castor oil ethoxylate	13.0	Paste	100	Provides excellent stability of the emulsion based vegetable oil formulations.

Product Name	Description	Appearance	Activity, %	Benefits
--------------	-------------	------------	-------------	----------

Anionic emulsifier

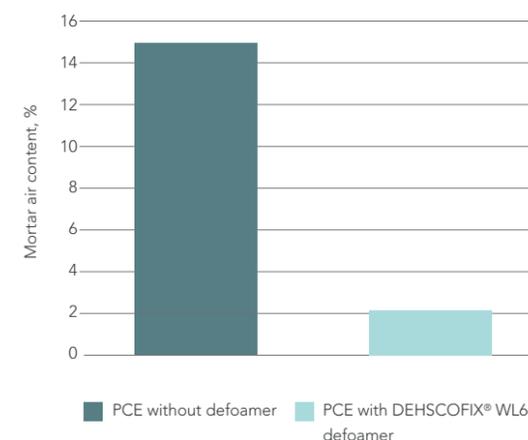
NANSA® EVM 70/2E	Calcium dodecyl benzene sulphonate	Liquid	70	Provides stability of emulsion for mineral oils formulations
------------------	------------------------------------	--------	----	--------------------------------------------------------------

DEHSCOFIX® WL660

Defoamers are crucial components in the formulation of polycarboxylate ether (PCE) superplasticizers. One side-effect of using a PCE superplasticizer is that they pull an excess of air into the concrete slurry. Conventional defoamers, such as non-ionic surfactants with low HLB values, silicon derivatives, dibutyl phosphates and alkyl phtalates are generally added to reduce the amount of air in the concrete. These defoamers may not be compatible with the polycarboxylate ether solution and this can lead to the formation of a hazy product which can then separate, usually on top of the PCE superplasticizer solution.

As a result of this insolubility, the concrete industry has been forced to use separate tanks to store the PCE superplasticizer solution and the conventional defoamer. The two components are only mixed immediately before they are incorporated into the concrete slurry. An alternative to separate storage would be to premix the PCE superplasticizer solution and the conventional defoamer in a tank that is stirred continuously to prevent the base separation of the two components.

Mortar air content with and without DEHSCOFIX® WL660 defoamers



PCE Superplasticizer with conventional defoamer



PCE Superplasticizer with DEHSCOFIX® WL660 defoamer

Included in our range is a speciality defoamer for use in conjunction with PCE superplasticizers called DEHSCOFIX® WL660. Unlike conventional defoamers, it can be mixed with PCE superplasticizers in the desired ratios in advance. The result is a crystal clear, isotropic solution that has the required shelf life. It is recommended that the amount of DEHSCOFIX® WL660 is from 5wt% to about 10wt% based on the active weight of the PCE superplasticizer solution.



We offer a range of soil conditioning agents for Earth Pressure Balance (EPB) tunneling applications. Alongside our foaming agents we supply foam stabilizers and a catalyst for foam cavity filling. Selecting the correct foam profile ensures the job of soil extraction can be completed in a safer and more efficient manner, especially when operating under extreme site conditions, we can work together to create tailor made foaming agent formulations.

Product Name	Description	Appearance	Activity, %	Benefits
--------------	-------------	------------	-------------	----------

Formulated foaming agent

MILLIFOAM® T-900	Formulated anionic surfactant	Liquid	55	Provides excellent foam expansion and foam stability (ready-to-use formulated foaming agent).
------------------	-------------------------------	--------	----	-----------------------------------------------------------------------------------------------

Foaming agent

EMPICOL® 0758	Sodium alkyl sulphate	Liquid	40	Provides excellent quick foam volume and foam expansion. Low freezing point foaming agent.
EMPICOL® LX28/U	Sodium alkyl sulphate	Liquid	28	Provides excellent foam volume and foam expansion.
EMPICOL® ESB70	Sodium alkyl ether sulphate	Paste	70	Increases foam volume and improves foam stability.
EMPICOL® ESB 3/MX	Sodium alkyl ether sulphate	Liquid	28	Increases foam volume and improves foam stability.
EMPICOL® ESC 3/Z	Sodium alkyl ether sulphate	Liquid	28	Increases foam volume and improves foam stability.
EMPIMIN® SDD/O	Disodium alkyl ethoxy sulphosuccinate	Liquid	40	Increases foam volume and improves foam stability.
NANSA® LSS38/AS	Sodium alpha olefin sulphonate	Liquid	38	Increases foam volume and improves foam stability.

Foam stabilizer

EMPIGEN® BB	Lauryl betaine	Liquid	30	Improves foam stability in foaming agent formulations (co-surfactant).
EMPIGEN® BS/FE	Cocoamido propyl betaine	Liquid	31	Improves foam stability in foaming agent formulations (co-surfactant).
EMPIGEN® OB	Lauramine oxide	Liquid	30	Improves foam stability in foaming agent formulations (co-surfactant).
EMPIGEN® OS/A	Cocoamido propyl amine oxide	Liquid	30	Improves foam stability in foaming agent formulations (co-surfactant).
EMPLAN® 2502	Coconut diethanolamide	Liquid	80	Improves foam stability in foaming agent formulations (co-surfactant).

Catalyst

ELTESOL® PA-65	Phenol sulphonic acid	Liquid	65	Acts as a catalyst for phenolic foam used for cavity filling.
----------------	-----------------------	--------	----	---------------------------------------------------------------

For inspiration, ideas or further information, please contact us:

Innospec Performance Chemicals

Americas

Tel: +1 704 633 8028

Europe, Middle East and Africa

Tel: +44 (0) 151 350 6982

Asia-Pacific

Tel: +65 6336 6286

Email: construction@innospecinc.com

www.innospecinc.com



The facts stated and the recommendations made are based on our own research and/or the research of others, and are believed to be accurate. No guarantee of their accuracy is made, however, and unless otherwise expressly provided by law or in written contract, the materials are sold without warranties, expressed or implied, in particular without guarantee as to suitability for particular purpose. Innospec assumes no responsibility for injury or damage to users or third parties. Recipient agrees to assume all risk and liability whether used singly or in combination with other materials.

V1: 12 2019