

Product Information

dermosoft® 688**The Product: dermosoft® 688**

This multifunctional active consists of p-anisic acid, known for its masking and flavoring function. The organic acid can complement the regulation of the pH and shows strong fungicidal activity. In combination with other **dermosoft®** types, there is no need for conventional preservatives.

This material is a petrochemically derived substance, nature identical to the aromatic compound found in anise seed or Indian basil (for the natural alternative see **dermosoft® 688 eco**).

CHARACTERISTICS

- INCI: p-Anisic Acid
- Appearance: White crystalline powder
- Cosmetic functions:
 - Masking
 - pH-regulating
 - Fungicidal activity
 - Anti-inflammatory ^{1 2} (see Literature Review on penultimate page)
- Ideal complementary combination with other organic acids
- Synergistic boosting effect in combination with antimicrobial surface active substances
- Suitable for all types of emulsions and surfactant based products
- Recommended pH range: 4.0 – 5.5
(in some cases possible to raise the pH up to 6.5 – see “Proof of Performance”)
- pH depending solubility and performance
- Solubility of p-anisic acid: ~0.3 g/l at 20°C in water (see MSDS 9.1)

DOSAGE

Product Concept	Dosage
Emulsions	0.05 – 0.4 % + co-actives*
Surfactant based products	0,05 – 0.4 % + co-actives**

Note: the lower the pH, the lower the required dosage

* In emulsions, it is required to combine with complementary antibacterial substances and boosting actives for full antimicrobial protection of the product.

** In surfactants, the combination with complementary organic acids is recommended.

ANTIMICROBIAL EFFICACY

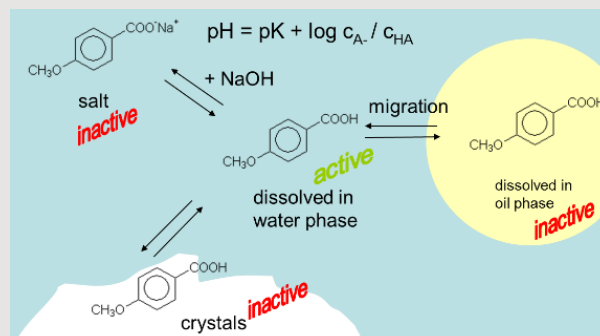
Gram +	Gram –	Yeast	Mould
+		+	++

Legend: + = good, but needs a co-active | ++ = very good alone

How to work with dermosoft® 688

pH dependent water solubility and efficacy

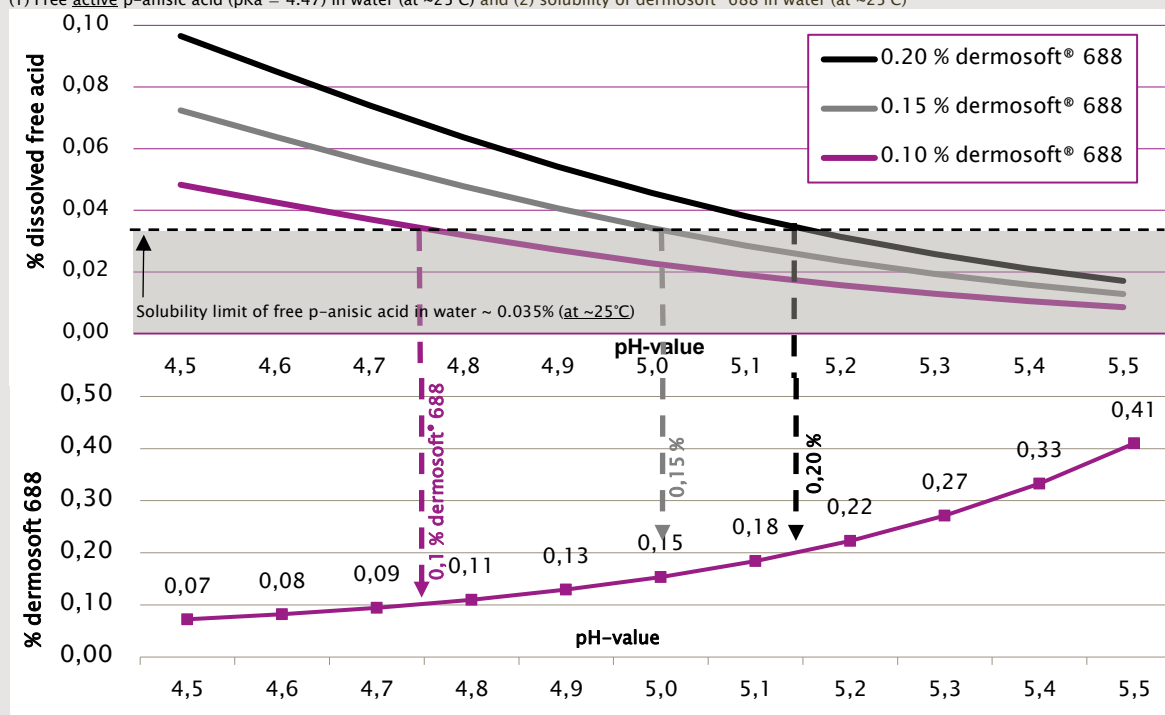
dermosoft® 688 is a solid material with limited, pH-dependent water solubility. Only the dissolved free acid is antimicrobially active. Solid, not dissolved residues of the raw material might cause recrystallization in the formulation over time. It is recommended to check carefully, that the raw material is completely dissolved.



Finding the correct dosage

We demonstrate the solubility of the raw material in pure water. These values can be determined by calculation on a theoretical basis. When oils, surfactants or glycols are included in the formulation, the solubility may increase. Thorough stability and challenge testing is mandatory. Consider the dependency between the pH, the concentration and the solubility of p-anisic acid. Moreover the temperature also influences the dissolution and recrystallization of the material.

(1) Free active p-anisic acid (pKa = 4.47) in water (at ~25°C) and (2) solubility of dermosoft® 688 in water (at ~25°C)



Calculated, theoretical graphs to show how much of the material can be introduced in pure water

Lower pH

- less **dermosoft® 688** can be dissolved
- more free acid will be in the solution
- more antimicrobial activity of the material
- consider solubility limit and recrystallization

Higher pH

- more **dermosoft® 688** can be dissolved
- less free acid will be in the solution
- less activity of the material

MANUFACTURING PROCEDURE (LABORATORY SCALE)

Incorporation into emulsions:

a) Direct solution in hot aqueous phase

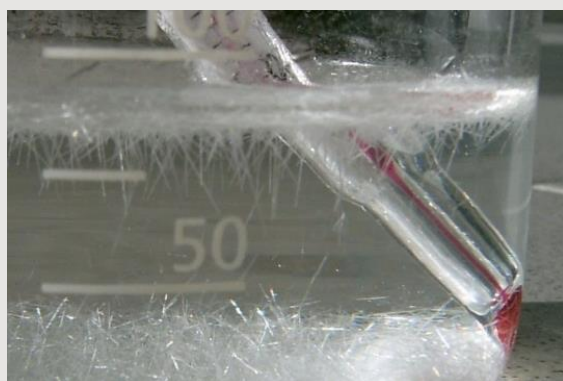
1. Mix all parts of the aqueous phase that are clear water-soluble. Leave out electrolyte sensitive materials as well as components that cause turbidity and the gelling agents.
2. Add **dermosoft® 688** to the aqueous phase and heat to 80°C.
3. Stir vigorously.
Optional use of a homogenizer to improve the solubilization process.
4. Keep temperature up and stir until the raw material is completely dissolved.
This may take a longer period of time (min. 15 minutes).
Note: The pH of the solution will be ~3.
5. Add the remaining components of the aqueous phase.
6. Continue your formulation process. At the end, adjust the pH to the required level of 4.0–5.5.

Glycols or other water-soluble facilitate the process.

b) Solution with neutralization (with the help of e.g. NaOH)

1. Mix all parts of the aqueous phase, which are clear water soluble. Leave out electrolyte sensitive materials as well as components that cause turbidity and the gelling agents.
2. Add **dermosoft® 688** to the aqueous phase. Preferably, heat to 80°C.
3. Neutralize to above pH 8 with the help of Sodium Hydroxide. Continue stirring and wait until the Anisic Acid is completely dissolved.
4. Add the remaining components of the aqueous phase and continue your formulation process.
5. At the end of the formulation process, adjust the pH to the recommended level of 4.0–5.5.

Convenient and rapid process. Note: higher electrolyte concentration.



Extreme case of recrystallization of anisic acid in water

Recommendation:

Make sure there are no undissolved residues of the **dermosoft® 688** material in the water phase before you continue your formulation process. Otherwise, the residues may induce a recrystallization process in the final formulation, leading to these kind of needle crystals

INCORPORATION INTO SURFACTANTS

Dissolve **dermosoft® 688** directly in the concentrated alkaline surfactant base and continue as usual.

ALTERNATIVE FOR COLD PROCESS FORMULATIONS: PREPARATION OF A PRESOLUTION

This procedure allows you to produce short-term stable concentrates of **dermosoft® 688**. These can be easily introduced into your formulation, also at low temperatures.

Stored at room temperature, these concentrates are stable for several days or weeks. It is not recommended to store over a longer period of time (due to risk of irreversible crystallization).

The way to prepare this presolution is the following:

Presolution of dermosoft® 688 (10%) in glycerol/water (laboratory scale)

Recommended for all kinds of formulations. Compared to a), there is a slightly higher electrolyte input for the final formulation due to the higher pH.

Phase	Ingredient	INCI	Supplier	%
A	Glycerin	Glycerin	diverse	30.00
	dermosoft® 688	p-Anisic Acid	Evonik	10.00
B	Deionised Water	Aqua	diverse	56.50
	Sodium Hydroxide (>99%)	Sodium Hydroxide	diverse	3.50
				100.00

MANUFACTURING PROCEDURE:

1. Mix Glycerin with **dermosoft® 688** (A).
Separately, prepare a solution of Sodium Hydroxide and water (B). *Attention: Consider safety measures when working with concentrated Sodium Hydroxide.*
2. Heat up A and B. Add B to A under stirring.
Caution: Mixture B may become hotter than 100 °C.
3. Dissolve the solid material under stirring. It may take 30 minutes for the particles to dissolve.
4. Allow to cool down. Resulting pH: 10–12.

Specification values: Appearance: Colorless to light yellow solution. pH 10.0 – 12.0.

Take 1 % of these solutions for 0.1 % **dermosoft® 688** in your formulation.

FORMULATION ADVICE

What to do if dermosoft® 688 is forming needle crystals?	Increase the pH value of the formulation (note the reduction of antimicrobial efficacy)
	Lower the concentration of dermosoft® 688
	In emulsions, increase the polarity of the oil phase
Improve solubility	Add solubilizer, Glycerin or other glycols
Boost antimicrobial performance	Combine with bactericidal organic acids (dermosoft® 700B) and surface active antimicrobials (dermosoft® Octiol or dermosoft® GMCY MB)
Working at final formulation pH higher than 5.5	Combine with higher dosages of surface active boosters and choose a higher dosage of dermosoft® 688
Appropriate dosage depending on pH	pH 4.0: start at 0.05% pH 6: up to 0.4 %

APPLICATION IDEAS

Perfectly suitable for all kinds of emulsions, rinse-off products and tonics.

For more formulation ideas visit us at:

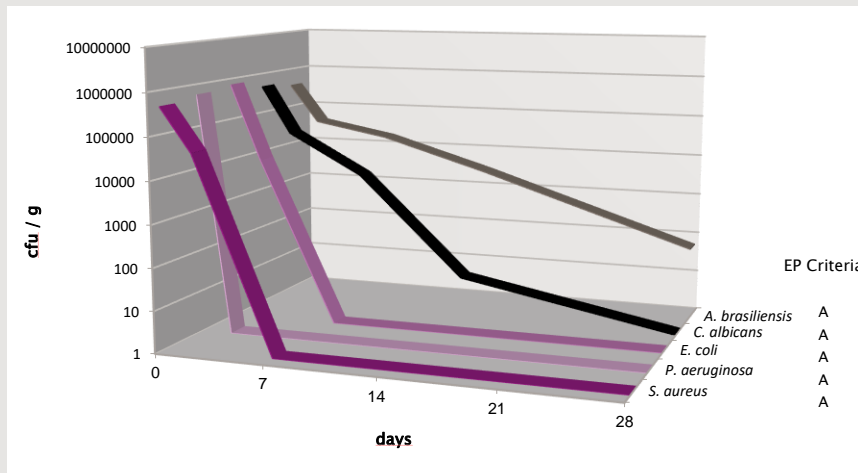
<https://www.dr-straetmans.de/en/products/>

Proof of Performance

MICROBIOLOGICAL CHALLENGE TESTS

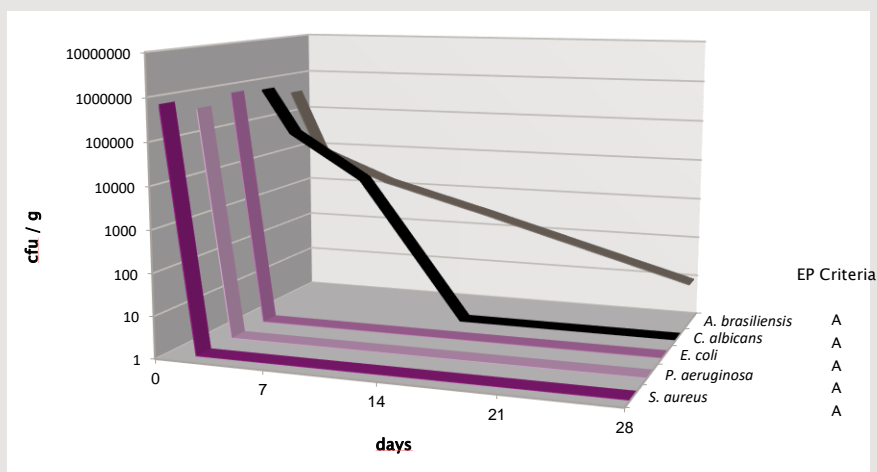
Antimicrobial efficacy in combination with other organic acids and boosting wetting agents

Basic emulsion with 0.2 % dermosoft® 688, 0.5% dermosoft® 700B and 0.3% dermosoft® GMCY MB (pH 5.5)



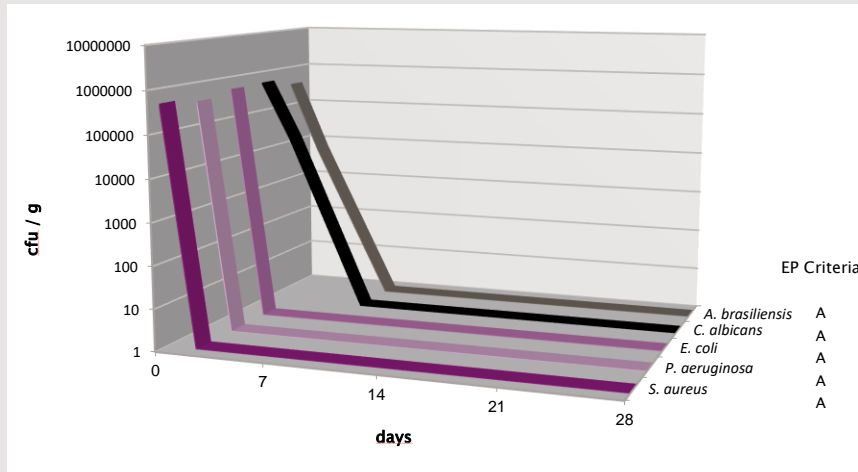
Ideal in combination with the wetting agent dermosoft® Octiol

Basic O/W emulsion with 0.2 % dermosoft® 688 and 0.5% dermosoft® Octiol (pH 5.3)



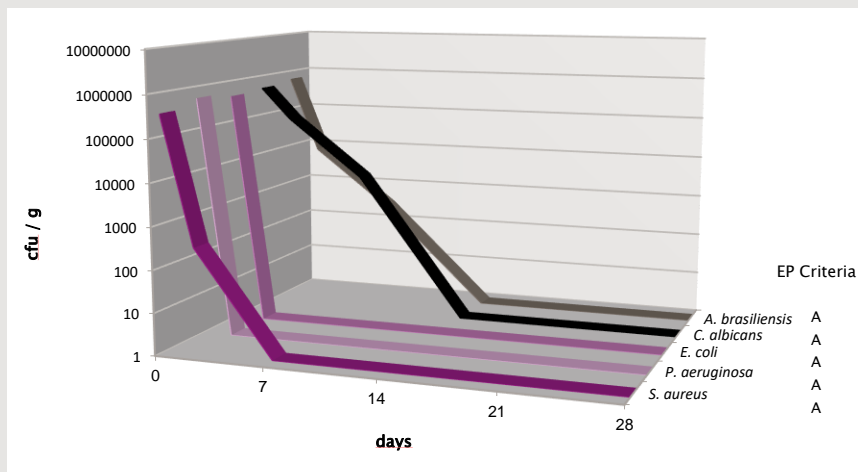
The combination with wetting agents enables a good performance even at higher pH

Basic emulsion with 0.4 % dermosoft® 688 and 2% dermosoft® Octiol (pH 6.4)



In rinse-off formulations, it is ideal to combine with other organic acids

Body Wash formulation with 0.2 % dermosoft® 688 and 1.0% dermosoft® 700B (pH 5.0)



TRADE INFORMATION

International Approval*	EU, USA, Canada, Australia, China, Japan, Korea
Packaging	25 kg
Shelf life (stored in original container)	60 months

* Information is based on our best knowledge and reviewed for the most requested regions only. We recommend to check current regulatory requirements in individual target countries. For more information, refer to Product Data Record (PDR) document chapter 5.

LITERATURE

Jänichen J. (2014). "React fast, with safe alternatives". *Cossm* September, 20–21.

Thiemann A., Jänichen J. (2014). "The formulator's guide to safe cosmetic preservation". *Personal Care Europe* November, 39–43.

Anti-inflammatory activity of p-anisic acid described in the following literature:

¹ Singh, N. et al. (2006). "Crystal Structures of the Complexes of a Group IIA Phospholipase A₂ with Two Natural Anti-inflammatory agents, Anisic Acid, and Atropine Reveal a Similar Mode of Binding". *PROTEINS*, 64, 89–100.

² Chen, S. (2011). "Natural Products Triggering Biological Targets– A Review of the Anti-Inflammatory Phytochemicals Targeting the Arachidonic Acid Pathway in Allergy Asthma and Rheumatoid Arthritis". *Current Drug Targets*, 12, 288–301.

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