Alternative and **Innovative Preservatives** for **Personal Care**

newtec MYUNGJIN

Innovative Challenges for Alternative Preservatives

How we develop:

MJ offers
Customized Product Development!

What we offer:

- Innovative and Effective Products
- Microbial Limit Test
- Antimicrobial Effectiveness Test
  - Challenge test (USP 51 method)
  - Zone of Inhibition Test for Antimicrobial Activity
- Microbial Identification Test
- Laboratory Reporting
- Technical Advising

Customized Development and Technical Support Services

We develop more customized products based on our expertise in antimicrobial solutions and functional additives. We also provide application-related technical support services and professional consultation.

New Challenges and Directions for Safer and Effective Alternatives

Our Products:

We are specialized in technology-intensive specialty chemicals to change the paradigm of products with its new, innovative and diversified solutions.

Preservatives

Innovative alternative preservatives excluding controversial and traditional substances

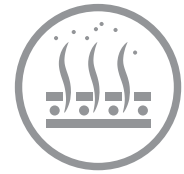
freshBIO series
Preservatives for personal hygiene products

Mtech series
Preservatives for cosmetics

Deodorizer

Deodorizer containing nature-derived ingredients

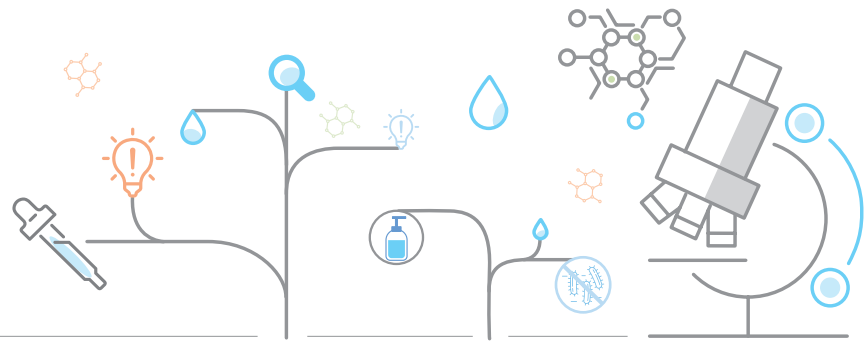
ProOdor



Facial Mask Solution

Facial mask solutions with bioactive features and ingredients

MFS_001 Beta



Preservatives Market

Traditional Preservatives	Health Concerns	Strict Regulations	Demand for Alternatives
Growing concern about safety issue of traditional preservatives	Increasing safety awareness of personal care goods and cosmetics	More stringent global regulations on cosmetic preservatives	Increasing demand for safe and effective alternative preservatives

Our Alternative Preservatives

	Features and Benefits
Skin irritancy	-P.I.I* of freshBIO GH10: 0.0 -P.I.I of Mtech CP01 / CP05: 0.0
Endocrine disruptor	-No endocrine disrupting properties
Toxicology & health concerns	-General cautions for handling chemicals -No references for cancer risk factors etc. -Cosmetic safety database(EWG*'s Skin Deep): Low level of hazard
Regulations	-All ingredients are registered as cosmetic and food additives -Compliance with global regulations

* P.I.I means Primary Irritation Index.
* EWG is a nonprofit environmental research organization.

*MYUNGJIN newtec's alternative preservatives offer :

- Stable and optimal formulations by considering their efficacy and balance
- Safer ingredient-based solutions after in-depth studies and scrupulous laboratory tests
- Solutions of globally proven ingredients

Preservatives for Personal Care

Product	Key active ingredient	IUPAC name	EC number	Non-listed preservatives *	Non-traditional preservatives *	Applications: wet wipes: Personal, Baby-care wipes	Applications: wet wipes: Makeup remover wipes	Applications: Leave-on: Cream, Lotion	Applications: Leave-on: Facial sheet masks	Applications: Rinse-off: Shampoo, Treatment, Conditioner	Applications: Rinse-off: Body wash, Hand wash	Antimicrobial Spectrum: Gram+/Gram- Bacteria	Antimicrobial Spectrum: Yeast	Antimicrobial Spectrum: Mold	Recommended use levels	pH range	Temperature during production	Physical Properties: Gardner color	Physical Properties: Odor	Physical Properties: Liquid color	Regulatory Compliance	Features and Benefits
P.I.I 0.0 * **Mtech CP01**	Tropolone Undecylenoyl Glycine	2-hydroxycyclohepta-2,4,6-trien-1-one 2-(undec-10-enoylamino)acetic acid	208-577-2 427-430-5	v	v			●				++	++	++	0.2 - 0.4%	2.5 - 7.5	Below 40 °C	1 - 6	Mild	Yellowish clear	•EU •CTFA •ASEAN •CFDA •JCIA •KFDA	- Moisturizer contained - Nature-identical ingredient based formulation - No irritation
P.I.I 0.0 **Mtech CP05**	Tropolone Caprylhydroxamic Acid	2-hydroxycyclohepta-2,4,6-trien-1-one N-hydroxyoctanamide	208-577-2 230-936-7	v	v			●	●	●	●	++	++	++	0.2 - 0.4%	2.5 - 7.5	Below 40 °C	1 - 6	Mild	Yellowish clear	•EU • CTFA •ASEAN •CFDA •JCIA •KFDA	- Broad antifungal effect - No irritation - Nature-identical ingredient based formulation
freshBIO PG50	Piroctone Olamine	1-hydroxy-4-methyl-6-(2,4,4-trimethylpentyl)pyridin-2-one	272-574-2		v					●	●	++	++	++	0.2 - 0.4%	5 - 10	Below 40 °C	1 - 6	Mild	Yellowish clear	•EU • CTFA •ASEAN •CFDA •JCIA •KFDA	- Chelating booster - Broad compatibility of charges
P.I.I 0.0 **freshBIO GH10**	C12-C14 Alkyldiaminoethylglycine HCL	–	–	v	v	●	●			●	●	++	++	++	0.2 - 0.4%	6 - 8	Below 40 °C	1 - 5	Aromatic	Yellowish clear	•EU • CTFA •ASEAN •JCIA • KFDA	- Compatible with both charges - Chelating booster - No irritation
freshBIO JCM	Cetylpyridinium Chloride	1-hexadecylpyridin-1-ium chloride	204-593-9		v	●	●					++	++	++	0.3 - 0.5%	3 - 8	Below 50 °C	1 - 3	Mild	Clear	•EU • CTFA •ASEAN •CFDA •JCIA • KFDA	- Compatible with cationic formulation - Cost effective
freshBIO TW12	Cetrimonium Bromide	hexadecyl(trimethyl)azanium bromide	200-311-3		v	●	●					++	++	++	0.2 - 0.4%	3 - 8	Below 50 °C	1 - 5	Mild	Clear	•EU • CTFA •ASEAN •CFDA •JCIA • KFDA	- Effective emulsifier - Cost effective
freshBIO LH10	Laurylpyridinium Chloride	1-dodecylpyridin-1-ium chloride	203-232-2	v	v	●	●			●	●	++	++	++	0.2 - 0.4%	4 - 8	Below 50 °C	1 - 3	Mild	Clear	•EU • CTFA •ASEAN •CFDA •JCIA • KFDA	- Compatible with cationic - Chelating booster - Boosting efficacy with EDTA-2NA
freshBIO LC20	Laurylpyridinium Chloride	1-dodecylpyridin-1-ium chloride	203-232-2	v	v					●	●	++	++	++	0.2 - 0.4%	4 - 8	Below 50 °C	1 - 5	Mild	Clear	•EU • CTFA •ASEAN •CFDA •JCIA • KFDA	- Compatible with cationic formulation - Chelating booster

*P.I.I 0.0 means that the result of primary skin irritation test is "Non Irritation".
*Non-listed preservatives mean preservatives formulated with general cosmetic ingredients rather than specified preservatives for cosmetics which is often restricted for use.
*Traditional preservatives include Methyl(chloro)isothiazolinone, Parabens, Phenoxyethanol, Polyhexamethylene biguanide, Iodopropynyl butylcarbamate, Benzalconium chloride, Chlorphenesin, Isopropyl methylphenol, Triclosan and etc.

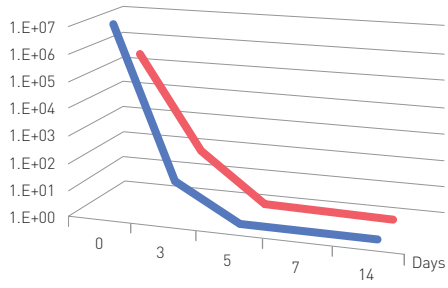
Deodorizer

Product	Key active ingredient	IUPAC Name	EC number	Applications: Air freshener	Applications: Hard-surface	Applications: Consumer	Oder Neutralization Test: Amine	Oder Neutralization Test: Mercaptan	Recommended use levels	Physical Properties: pH	Physical Properties: Liquid color	Physical Properties: Compatibility	Physical Properties: Temperature	Physical Properties: Solubility	Physical Properties: Odor	Features and Benefits
ProOdor WDA	Methyl Undecylenate	methyl (E)-undec-9-enoate	227-279-3	Hotel, Vehicle, Home	Kitchen, Bathroom	Fabric carpet	●	●	1.0 - 2.0%	5.5 - 7.5	Clear	surfactants and polar solvents	No-effect	water, alcohol and glycol	Mild herbal	- Plant-drived odor neutralizer

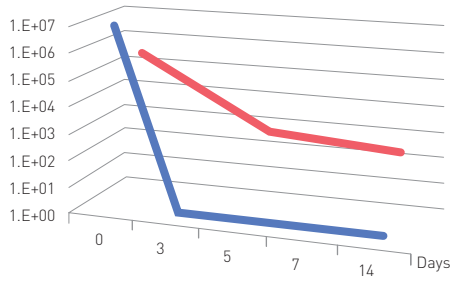
Antimicrobial Performance of Alternative Preservatives

Tested application: **facial mask sheets**

MYUNGJIN's
Mtech CP05 0.2%

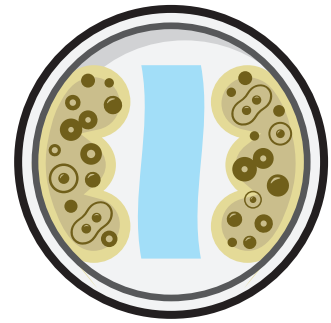


1,2-Hexanediol 2%

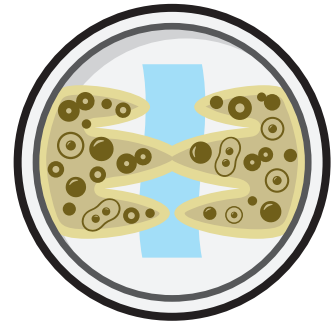


Bacteria Fungi

Mtech CP05 **0.2%**



Hexanediol **2.0%**

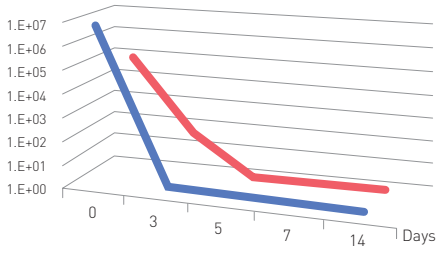


Zone of Inhibition Test for Antifungal Activity

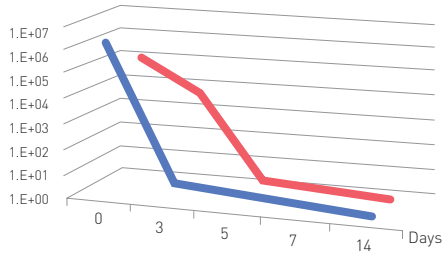
According to the results of effectiveness comparison, the **anti-bacteria effect** of our ***Mtech CP05*** 0.2% and Hexanediol 2% has turned out to be **similar**. On the other hand, our product, ***Mtech CP05***, has proven to be **superior** with regard to the **antifungal effect** which is crucial for long-term storage stability of cosmetics.

Tested application: **wet wipes**

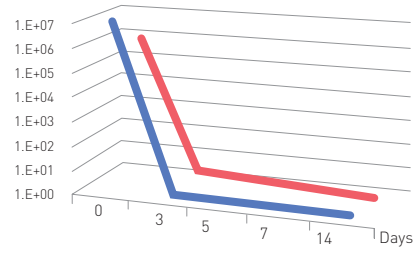
MYUNGJIN's
freshBIO LH10 0.2%



Phenoxyethanol 1.0%

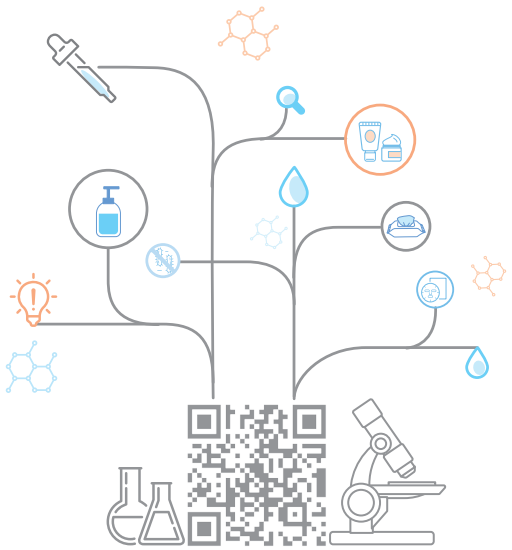


Methylisothiazolinone 0.01% + Sodium Benzoate + Potassium Sorbate



Bacteria Fungi

According to the results of effectiveness comparison, the **antimicrobial efficacy** of our ***freshBIO LH10*** and other traditional preservatives has turned out to be **similar**.



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