

KEY PRODUCTS

UNLOCKING BREWING SOLUTIONS



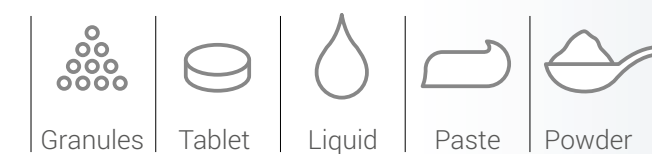
Quality, Consistency & Support



Quality, Consistency & Support

- Supporting the brewing industry for over 130 years
- Consulting brewers, qualified scientists and food grade manufacturers
- Product range that will streamline your process, increase efficiency and troubleshoot
- Comprehensive brewing laboratory providing analytical and microbiological services
- Supply over 90% of the British Brewing Industry
- Comprehensive and growing global efforts
- Work throughout the industry; small, large, craft, regional and international
- Experts in clarification, stabilisation, flavour modification and product consistency

Key to Product Formats



All pack sizes are in kilograms

Contents

2 3	Water Treatments
4 5	Wort Clarification
6	Foam Control
7	Stabilisation
8 9	Enzymes
10	ALDC for those about to hop...
11	Yeast Nutrients
12	A fining guide for vegan fining Super F!
13	Beer Clarification
14	Liquor Analysis
15	Gluten Analysis
16	Distributors

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Water Treatments

The essential building blocks of great beer; our water treatments will assist through the brewing process and complement the full flavour of your chosen beer styles.

- **Control pH throughout the brewing process**
- **Tailored ionic compositions highlights desirable beer flavour attributes**

Create tailored brewing liquor with our classic treatments. We have been supporting brewers with water treatments since our founding in 1887. Our laboratory provides bespoke analysis and treatment recommendations, which can be used to create traditional and craft beers.

Alkalinity reduction using food grade acids



AMS

An acid blend formulated to effectively reduce water alkalinity whilst adding useful chloride and sulphate ions. Use of AMS will also help to prevent scale build up in your water tanks.

AMS | Liquid | 12.5 25 200 1000 KG



TIP - Can be used to create nearly any style when used in conjunctions with the correct salt blends.



Lactic Acid

Organic acid used to reduce alkalinity without adding sulphate and chloride ions.

Lactic Acid | Liquid | 25 240 1200 KG



TIP - Can also be used for minor corrections in brewing pH and can be used at higher levels for beer souring.



CONTACT
export@murphyandson.co.uk
to arrange a free
water consultation
with our expert
technical team.

Brewing Salts



DWB

A classic salt blend most suited to Pale Ale styles.

DWB | Powder | 20 KG



TIP - Brewing salts vary in solubility so mixing evenly through the grist is the best way to ensure optimal use for reactions during mashing.

TIP - The use of calcium chloride with DWB will increase versatility as it adjusts the chloride sulphate ratio making it more suitable for darker beer styles, promoting full, sweet and roast characteristics.



DWB stands for Dry Water Burtonisation. Being able to replicate the gypsum rich waters of Burton became fundamental to the spread of Pale Ale beer styles away from the city which made the beer famous.

Wort Clarification

Carrageenan based kettle finings (historically referred to as copper finings) are described as the ultimate processing aid! Manufactured from selected seaweeds and in partnership with carefully audited farmers, these products provide multiple benefits.

- Protein removal - providing consistent particle levels
- Improved beer stability and brighter final beer
- Improved, consistent and vigorous fermentations
- Longer filtration runs for all filter types, including cross-flow
- Cleaner yeast for repitching with less trub
- Reduces processing time



Protafloc [Granules]

Food grade semi refined kettle finings which are added 10 minutes from the end of the boil. Optimised use at 1-5g/HL provides all the benefits above. Suitable for most brewers-an economical and highly effective product.

Protafloc | Granules | 2 20 KG

TIP - 'Cold break' checks can be performed in-house to validate effectiveness. Contact our team for further info.



Protafloc [Tablets]

Tabletted semi refined kettle finings added at the end of the wort boil. Optimised use typically 1/2 to 2 tablets per HL will provide the benefits above. Popular with smaller brewers, they are extremely convenient and easy to use with fast dispersal and solubilisation.

Protafloc | Tablets | 2 25 KG

TIP - Our laboratory and technical teams can support you with full optimisations, this is a typical requirement when there's a change in raw materials or equipment e.g. new season malt or new brewhouse equipment.



Koppakleer [Tablets]

Koppakleer is a fully refined tablet, meaning the exact dose is easy to measure and dissolve. Unlike other products, it can be added to the whirlpool, dosing tanks or kettles at flameout as it does not have to be boiled to dissolve it. This keeps the activity higher.

Koppakleer is added to the hot side only to dissolve and disperse. The action is in the cold side - in the fermenter. Koppakleer contains large, negatively charged molecules called kappa carrageenan which bind to the positively protein in the cold break as it form. As large molecules fall faster in liquids, the rate of sedimentation is greatly increased.

Koppakleer | Tablets | 2 25 KG



Koppakleer [Granules]

Koppakleer Granules are a refined grade carrageenan product which is added to the wort in the kettle to enhance protein removal as the wort cools.

Koppakleer requires only a short period of boiling to disperse and can be added to the whirlpool when it's not possible to interrupt the boil or open the kettle.

Produces brighter worts, reducing the amount of finings required later.

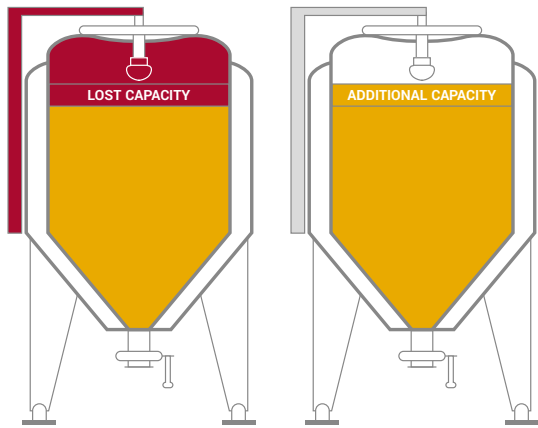
Koppakleer | Granules | 2 15 KG



Foam Control

Beer foam stability is a critical part of most beer styles. However, with many complex factors contributing and impeding beer foam, stability can be very difficult to achieve.

- **Increases vessel utilisation**
- **Improved hop utilisation**
- **Prevents losses and unhygienic spillages**
- **Can reduce cleaning demands caused by excessive foam**
- **Can be used to reduce foaming of detergents during CIP**



Using Murphy's Antifoam increases the volume of wort that can ferment in each vessel, increasing production capacity, lowering losses, and preventing unhygienic spills.

Stabilisation

Colloidal stability of packaged beers is of vital importance to ensure that the appearance and taste of your finished beer is the same from when it is first packaged right until the end of its shelf life. Our beer stabilisers can be used on their own to reduce haze forming polyphenol levels or in conjunction with protein reducing stabilisers.

- **Protects against chill and permanent haze**
- **Insoluble in all beer types**
- **Dust free handling**
- **No negative impact on foam stability**
- **No negative impact on flavour**
- **Compatible with all filtration techniques**



Antifoam



Although it may be a surprise to some, correct antifoam use actually improves final beer foam! Our food grade formulation has versatile applications and is highly effective at low rates. It can be used in the kettle or fermentation vessels and is classed as a processing aid, as it does not carry over to the final product with standard beer processing and usage rates.

Antifoam FD20PK | Liquid | 5 20 25 200 1000 KG



TIP - Our antifoam is concentrated so a 1 in 10 pre-dilution with water makes our antifoam very economical.



PGA Solution



Enhances foam stability of beers with a naturally high level of foam inhibitors and improves foam cling to the side of the glass. PGA (Propylene Glycol Alginate) Solution is a specially prepared food grade propylene glycol alginate derived from brown seaweed.

PGA Solution | Liquid | 25 200 600 1000 KG



TIP - PGA protects beer foam against contaminants at dispense e.g. dirty glasses.



Pristine PVPP



Pristine PVPP (Polyvinylpyrrolidone) is a beer stabiliser suitable for single use application. This product can be used on its own to reduce haze forming polyphenol levels or in conjunction with protein reducing stabilisers.

Pristine PVPP can be added on FV to Conditioning Tank (CT) transfer, or on transfer from CT to filtration. After slurring, it can also be added to the kieselguhr dosing tank.

Pristine PVPP | Powder | 20 KG



TIP - This product can also be used as a Tank Stabiliser.



Pristine PRO



Pristine PRO is a silica hydrogel designed for removing protein causing haze from beer. It can be used on its own or in combination with Pristine PVPP which removes polyphenols. Protects against chill and permanent haze.

Pristine PRO | Powder | 20 KG



Enzymes

Murphy & Son work with global leaders in enzyme manufacture, to provide an extensive range of brewing solutions. The enzymes we supply have been fashioned through controlled fermentations from select microorganisms to produce natural biological catalysts.

Enzymes are biological catalysts that speed up the rate of chemical reactions. They are highly specific in their function, so different enzymes are used at different stages of the brewing process to bring about a range of effects. These include making wort more fermentable, reducing wort viscosity, breaking down haze forming proteins and cutting maturation time by preventing the formation of diacetyl.



Brewers Clarex and Brewers Clarity

A simple to use, convenient and cost-effective enzyme stabilization option, which helps brewers maintain clarity through shelf life. Clarex/Clarity are also widely used in the production of gluten free beers by reducing gluten under the regulatory threshold.

- Prevents chill and permanent haze from forming by hydrolysing “haze sensitive proteins”
- Highly selective with no impact on foam stability
- Convenient addition to cold wort
- It can be used to prevent the need for expensive cold conditioning
- Reduces gluten levels

*Brewers Clarity is the small pack version of Brewers Clarex; the same enzyme available in handy 1Kg packs to suit the needs of smaller breweries.

Brewers Clarex | Liquid | 5 20 KG

Brewers Clarity | Liquid | 1 KG

TIP - 1-3 g/Hl added upstream is typically all that is required and many brewers find this much more convenient to use than traditional stabilisers.



AMG



The glucoamylase enzyme is used to convert dextrins into fermentable sugars. This enzyme is popular with brewers aiming to produce “low carb” super dry beers and “Brut IPA” styles, as well as distillers looking to increase alcohol yield.

AMG (amyloglucosidase/glucoamylase) | Liquid | 1 5 KG



TIP - Although optimum temperatures are suited to mashing, the enzyme will still work at fermentation temperatures. Thus, addition into the fermentation vessel will ensure complete dryness. For example, a 55° gravity wort (~13.75 Plato) will produce a beer of ~7.2% ABV.



ALDC

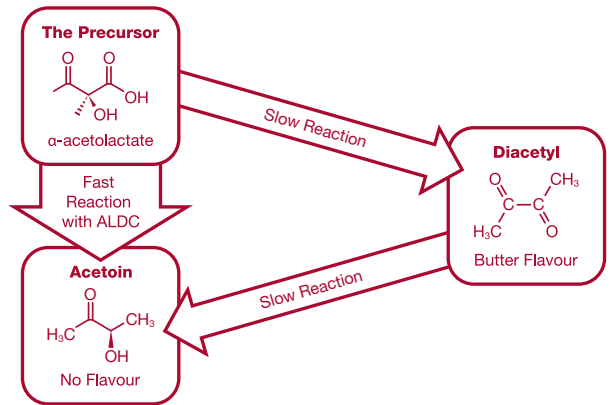


Bypass the formation of diacetyl by using ALDC! A simple addition makes it possible to consistently control a troublesome area of brewing and so, consistently prevent one of the most common flavour complaints. Diacetyl is expensive to measure and control, so bypassing its formation altogether has become very popular with brewers, especially those brewing lagers and dry-hopped pale ales.

ALDC (Alpha Acetolactate Decarboxylase) | Liquid | 1 25 KG



TIP - Our laboratory can measure diacetyl (and total VDKs), email them on laboratory@murphyandson.co.uk to find out more.



Trizyme



Although many maltsters do a fantastic job, uneven modification can still cause many issues in the brewery. Poor run off, haze and filtration issues can occur even when malt analysis seems to be within specification. Trizyme is a blend of Alpha amylase, proteases and B-glucanases. This broad spectrum enzyme cocktail effectively counteracts the issues encountered in the brewery as a result of poor malt modification.

Trizyme | Liquid | 1 5 25 KG



TIP - Trizyme can be an extremely useful aid when processing difficult adjuncts such as wheat, rye and unmalted barley.



ALDC-for those about to hop...

Brewers and beer lovers alike love the fantastic array of flavours and aromas that can be accomplished through dry hopping. An aroma compound not so commonly appreciated by brewers and beer lovers are Vicinal Diketones (VDKs). VDKs include Butane2, 3-Dione (Diacetyl) and Pentane2, 3-dione which are commonly described as buttery, butterscotch cream & toffee notes. It's pleasant with popcorn and other tasty snacks but not so popular with beer.

Often described as an off-flavour, especially for pale lagers and hoppy ales, for some beers a level of Diacetyl is acceptable or even desirable. There are breweries with a minimum limit built into their specifications! Whether a house flavour or an off flavour, most brewers are looking to control this flavour active aroma to fit the profile of the beer brewed. Not an easy task especially with a flavour threshold that can be under 100 ppb.

Variations on a commonly used simple test for VDKs are described below;

- Take 2 x 100 ml samples of beer from maturation.
- Cover both with foil or Petri-film.
- Leave one sample at room temperature.
- Heat the other sample to 65 °C and hold for 20 minutes.
- Cool the sample back to 20 °C.
- Smell and taste both samples the heating converts the precursors into the aromatic VDKs.
- Continue maturation if levels are unacceptable in one or both.
- When aromas are acceptable in both samples it is generally deemed ready for further processing.

Although a useful test to help monitor Diacetyl rests and maturation requirements, it is very dependent on the sensory skills of the individual or team. Even when training is completed, sensitivities can vary dramatically between individuals and can be influenced by external factors such as colds, food and drink consumption, smoking and even the time of day. The most accurate test is performed by GC analysis and is therefore only available to breweries with the most sophisticated lab facilities.

Many brewers, especially in the US, are utilising the alpha-acetolactate-decarboxylase enzyme as a simple convenient control measure.

Prevention is better than cure - ALDC bypasses the formation pathway

- Reduces Diacetyl production.
- Shortens maturation requirements.
- Ensures efficient production of beer.
- Ensures flavour standards are met.

"Hop Creep"

- Hops exhibit low levels of enzymatic activity.
- Dry hopping can produce more fermentable sugars over time.
- The renewed availability of fermentable sugars can result in further yeast activity and VDK production.

Use of ALDC can prevent VDKs reoccurring as a problem in dry hopped beers.

VDK's can also occur as a result of microbial contamination so the use of ALDC is no substitute for strict hygiene controls.

The enzymatic activity of hops makes attenuation control even more critical especially when secondary fermentation is employed. The below attenuation limit test can be very useful although the slow enzymatic action of the enzymes from the hops can still cause problems with over carbonation in the package.

Attenuation limit test

This test can be employed to wort taken before fermentation.

- Fill a 750 ml sanitised flask with wort.
- "Overpitch" with a heaped teaspoon of the brewing yeast culture used.
- Add a cotton stopper and shake vigorously.
- Store at room temperature (~20 °C) and allow to ferment, measuring the gravity every 24 hours.
- Keep shaking intermittently or use a stirrer.
- When the gravity results stabilise for 48 hours the attenuation limit has been reached.
- The results can be used to modify the mashing regime to make the wort fermentable.

For those about to hop...we can help you!

Contact techsupport@murphyandson.co.uk / 0115 978 5494 for further support



Yeast Nutrients

Brewers' yeast is a complex, domesticated and single-celled organism, which has diverse nutritional needs. Our formulated yeast nutrients, provide nutrients which supplement those present in wort to keep this wonderful microorganism healthy and improve fermentation performance and consistency.

With correct yeast handling and storage, reusing yeast can result in significant savings and quality benefits, however to ensure the best results a yeast food is always recommendable. Following on from which, many flavour defects in beer result from poor yeast health. So, making sure your yeast has everything it needs is paramount.



Yeast Vit



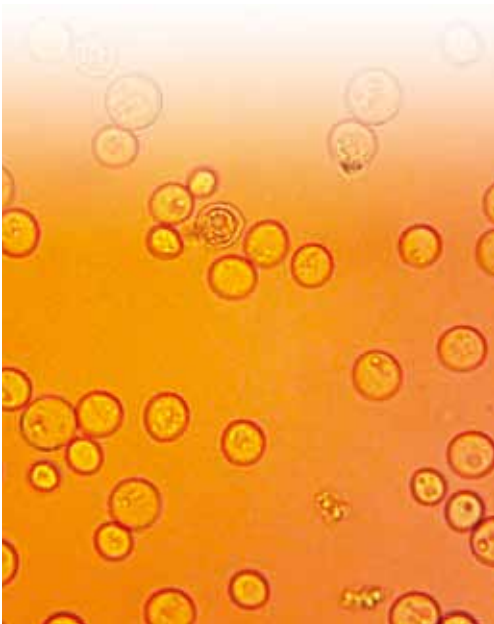
A comprehensive formulation that includes amino acids, vitamins and trace elements, so comprehensive that it can be used with even the most nutritionally deficient worts!

- Better storage viability
- Shortened lag phase
- Consistent fermentation
- Consistent flocculation

Yeast Vit | Powder | 5 25 KG



TIP - Poor yeast health can also have a negative impact on membrane filtration.



Zetolite (Copper)



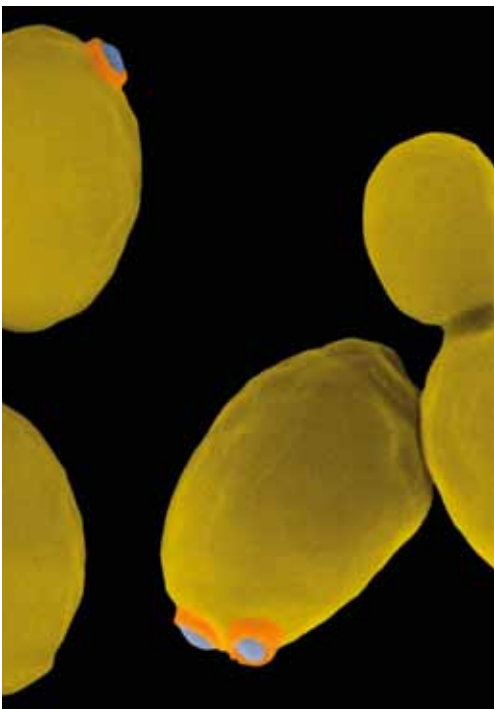
Sulphur aromas in beer can form an essential part of beer styles, however sulphur off flavours can be very damaging to a beer brand. Zetolite 63 rapidly reduces these off flavours and as the zeolite carrier is insoluble it is easily removed from the beer when the desired flavour profile is reached.

- Reduces H2S and DMS off flavours in the fermented product
- Concentrated powder product
- Is a processing aid (not an additive)

Zetolite | Powder | 500 G 10 KG



TIP - The product should be slurried with a small amount of water or the product to which it is to be added. It should be added to fermenter or conditioning tank and mixed in with a minimal amount of aeration.



Inorganic ions are required by yeast for optimum fermentations and growth, however one size does not fit all. So, along with our formulated products, we are also able to offer bespoke options. Please contact our technical team for further information and advice, via techsupport@murphyandson.co.uk

A fining guide for vegan fining Super F!

Optimising Super-F

We recently made our rapid-action, vegan fining Super F available to purchase without an optimisation by our laboratory! However, we still strongly recommend you carefully optimise before use! So, we thought it advantageous that we go through the basics of a successful Super F optimisation.

First of all, the materials you require to optimise are as follows:

- 3L measuring jug
- 500ml measuring jug
- Pipette with 0.1 ml graduations
- 5 x 500ml glass bottles
- Refrigerator set to 4°C
- Microscope kit and Haemocytometer

Super F Optimisation Method:

- Set up the glass bottles with the specified dose rates and clearly label the bottles.
- Take a 2.5 L sample of beer post fermentation and perform a yeast count.
- Measure 500ml into each bottle and seal, invert three times to mix and refrigerate for 24 hours.
- Very carefully remove the beer from the fridge and set on a bench with a light source behind the samples.
- Select the rate which has the best clarity along with a compact sediment.
- If you cannot measure haze it might be good to develop a grading system for your records e.g. A-F A=Brilliantly bright F= Very Turbid/Dull.
- Yeast counts for the best sample can validate that the bulk of the yeast has been removed.

The recommendation for dose rates to optimise to are as follows:

Super F Dosage (pints per barrel)	Dosage ml/HL	Trial Dose ml/500ml	Rate Guide
0	0	0	Control
0.17	60	0.3	Low
0.35	122	0.6	Low/medium
0.45	157	0.8	Medium/High
0.62	217	1.1	High

When using Super F we always recommend that you optimise regularly. For the majority we’ve found the best results to be between 0-5°C and when the product is used in conjunction with optimised auxiliary finings and carrageenan use. Last but not least, your yeast count should be 1-8 million cells/ml of viable yeast.

Got a question about Super F we haven’t answered here?

Email us on techsupport@murphyandson.co.uk

Beer Clarification

Finings agents have been used for centuries to produce bright and clear beer. Finings can be used on their own or to supplement and improve the efficiency of filtration or centrifugation. Murphy & Son manufacture a range of products to suit different brewing challenges and our team are happy to help find the best option for you.



Super F



A blended formulation of silica and polysaccharides designed for the rapid sedimentation of yeast, protein and other haze forming particles. Primarily used in tank to supplement or replace centrifugation or filtration.

- Fast, effective protein and yeast reduction
- Low dose rates
- Suitable for heavily dry hopped beer styles
- Vegan friendly manufacturing process
- Stable at ambient temperatures
- Consistent clarity without centrifugation and filtration

Super F | Liquid | 5 25 200 KG



TIP - Best results achieved below 5°C and even works well with dry hopped beer, if the bulk of hop solids are removed prior to addition.

We also have a wide range of Isinglass & Auxiliary finings in our range which could be a good fit for your brewery.

Contact us via export@murphyandson.co.uk for more information.

Liquor Analysis

Love your water as much as you love your beer. Water is the primary ingredient in your brand and represents 95% of your beer. How much do you understand it's natural variations?

How much do you spend on your water each year compared to your malt and hops? The impact of your liquor is massive!

Don't leave the reputation of your beers to chance - we're here to help.

Our liquor analysis service is backed up by our skilled laboratory team who are equipped with an arsenal of brewing, chemistry and microbiological qualifications to help you experiment with new styles for your brewing portfolio.

- Understand the trends in your water supply
- Have confidence in your beer flavour consistency
- Learn how to adjust your liquor chemistry to differentiate your beers in the market place



We take care
of everything for you

Once your liquor sample has been received by our on-site team of specialists, we will analyse the sample and send you back a comprehensive report detailing their findings.

Book a complimentary liquor analysis
with our specialists at
laboratory@murphyandson.co.uk

Gluten Analysis

Gluten Free Brewing can be a difficult extra process to handle but with careful management in the brewery and a few relatively minor tweaks, it is possible to produce great tasting beers with no noticeable changes in character.

With an increasing number of people moving away from food and drink containing gluten, when done well, this can be a great success for any brewer and provide a greater range of beer for people following such a diet to enjoy!

The current recognised test for gluten in the beer is the ELISA (Enzyme Linked Immunosorbant Assays) R5 competitive test. We use this test in our accredited laboratory to test antibodies for gluten in beer.

- Make your beer accessible to more markets
- Testing is conducted in an accredited laboratory
- Have confidence in the minimum gluten threshold of your beer

TIP - For extra help with gluten management, our enzyme Brewers Clarity on page 8 will help you maintain clarity and minimum gluten threshold throughout your shelf life.

Once your gluten samples arrive with our on-site team of specialists, we will analyse them and send you back a comprehensive report detailing their findings.



Ready to go gluten free?

Contact laboratory@murphyandson.co.uk for more details.

Distributors

We have a worldwide network of trusted partners stretching across five continents and numerous countries, in order that we can provide brewers with the same quality products and service no matter what their location.

Today, you will find Murphy & Son Ltd in the UK and Murphy & Son Inc in the US, alongside distributors in Canada, Chile, China, Japan, Mexico, New Zealand and anywhere in the heart of Europe.

Country	Company Name	Email	Website
UK	Murphy & Son Ltd.	export@murphyandson.co.uk	murphyandson.co.uk
USA	Murphy & Son Inc.	sales.us@murphyandson.com	brewing-products.com
Argentina	Brewing Ingredients	ventas@brewing.com.ar	
Australia	Gladfield Malt	auorders@gladfieldmalt.com	
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Cambodia / Laos / Malaysia Myanmar / Philippines / Singapore Thailand / Vietnam	Jebesen + Jensen	ingredients@jjsea.com	
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Chile	Navarro Y Cia Ltd	francisco.oryan@navarroycia.cl	navarroycia.cl
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Taiwan	Giff Chemicals Co., Ltd	kenny.giff@msa.hinet.net	
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