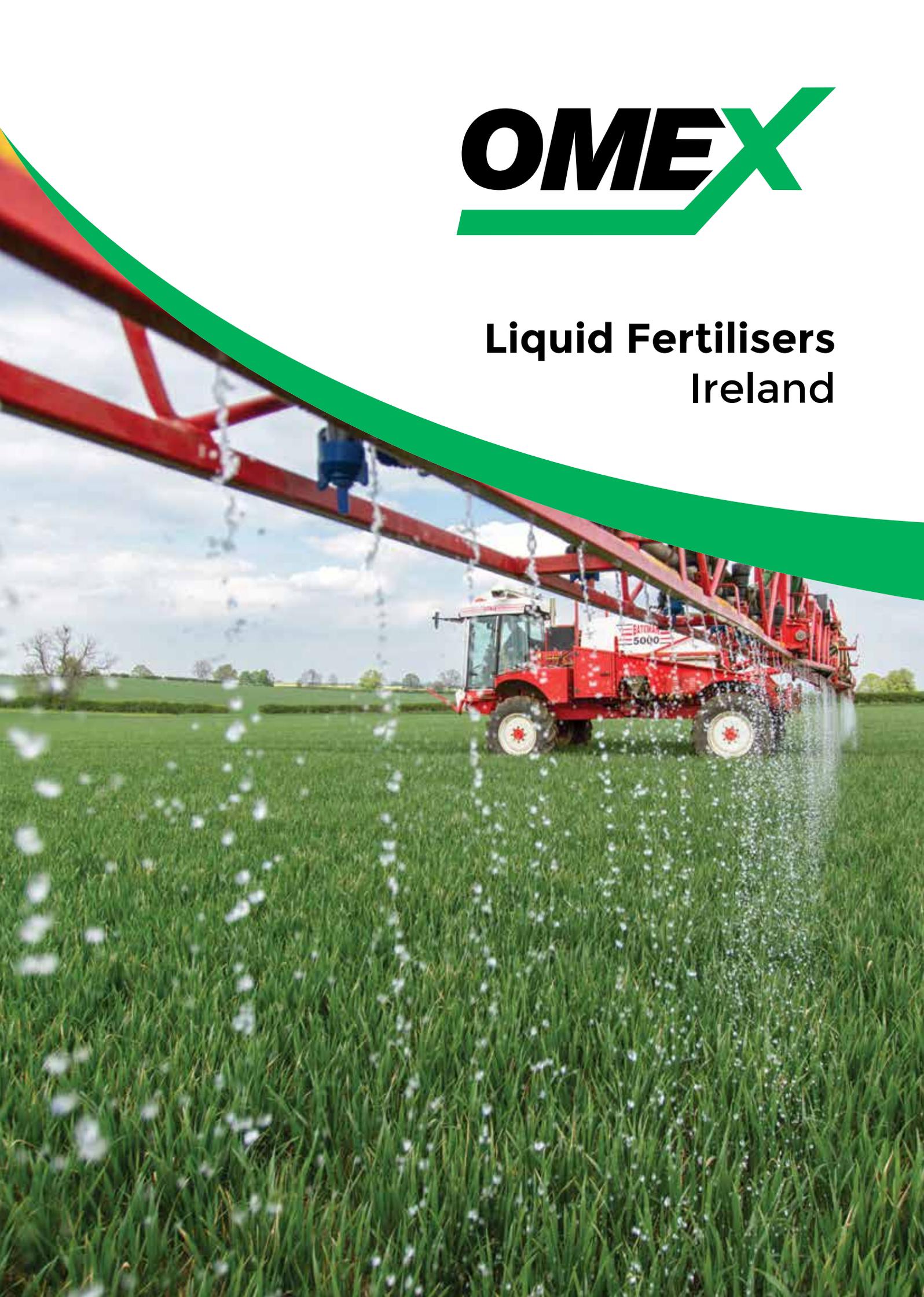




Liquid Fertilisers Ireland



OMEX operates throughout the world manufacturing liquid fertilisers and foliar health promoters for the agricultural, horticultural and amenity sectors. Specialist knowledge of fluid dynamics has also allowed OMEX to expand into producing wastewater treatments and deicers.

The OMEX solution fertiliser range, Nitroflo[®], includes some of the most concentrated liquid nitrogen fertilisers available in the UK. They are delivered for farmer application and offer many advantages over conventional solid fertiliser in terms of accuracy, consistency and ease of use, environmental impact and increased yield potential.

www.omex.co.uk

OMEX Agriculture is a major manufacturer of liquid fertilisers in the UK. OMEX offers the farmer a “Total Crop Nutrition” package through its range of unique suspension fertilisers, solution fertilisers, foliar nutrients, health promoters and SAP testing services.

OMEX Horticulture offers a complete nutrition and advisory service to growers in the soft fruit, top fruit, ornamental, protected salads and turf & amenity sectors.

OMEX Environmental is at the cutting edge of anaerobic digestion, developing bio-available micronutrient supplements to maximise the efficiency of AD plants. OMEX Environmental also develops and markets a range of nutrients and neutralisers for all types of waste water. The company also supplies deicing agents for airport runways, roads, bridges and car parks.

OMEX Agrifluids markets speciality fertilisers in over sixty countries around the world, working closely with distributors to provide excellent

technical solutions to growers. The product range includes foliar fertilisers, plant health promoters, biostimulants, organic fertilisers and soluble powders.

OMEX Agriculture Inc (Canada) manufactures and markets speciality fertilisers throughout Canada and the northern states of the USA. Providing a complete range of seed primers, starters and foliar, the programmed approach to crop nutrition produces maximum yields in short growing seasons.

Agrifluids Inc (USA) based in Selma, California, Agrifluids Inc manufactures a range of foliar fertilisers and fertigation products.

OMEX Agrifluids do Brasil Ltda provides a wide range of crop nutrient products for application via soil, seed and the crop canopy, specialising in crop health promotion and optimising plant nutrition.

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Benefits of Nitroflo® Liquid Fertiliser

The OMEX Nitroflo liquid fertiliser range includes some of the most concentrated products available in the UK and Ireland.

They are delivered for farmer application and offer many advantages over conventional solid fertiliser application in terms of accuracy, consistency and ease of use. By using OMEX Nitroflo Liquid Fertilisers, farmers save time, protect the environment and maximise crop yields.

All OMEX liquid fertilisers are supplied in bulk, eliminating packaging and the need to recycle waste, and provide major handling and storage advantages over solid fertilisers.

Potential Fixed Cost Savings

Perhaps one of the best times for a farmer to consider converting to liquid fertiliser is when the farm sprayer or spreader is due for renewal. It is at this point that there is an opportunity to consider the effective utilisation of labour and machinery and the respective fixed costs.

Low-Labour Application System - Liquid fertiliser offers a low-labour application system compared with solid fertiliser:

- No offloading with a forklift
- No storage in a secure building
- No re-loading and carting to field
- No dust, no bag disposal
- No wastage (unused fertiliser is returned to the tank)
- No need for a second man to re-load the spreader

Wider Tramlines - Some solid products will not spread accurately over 24m, so if tramline widths are increased beyond 24m, liquid fertiliser will provide a more accurate application. Wider tramlines effectively increase the area cropped and reduce the time required for application.

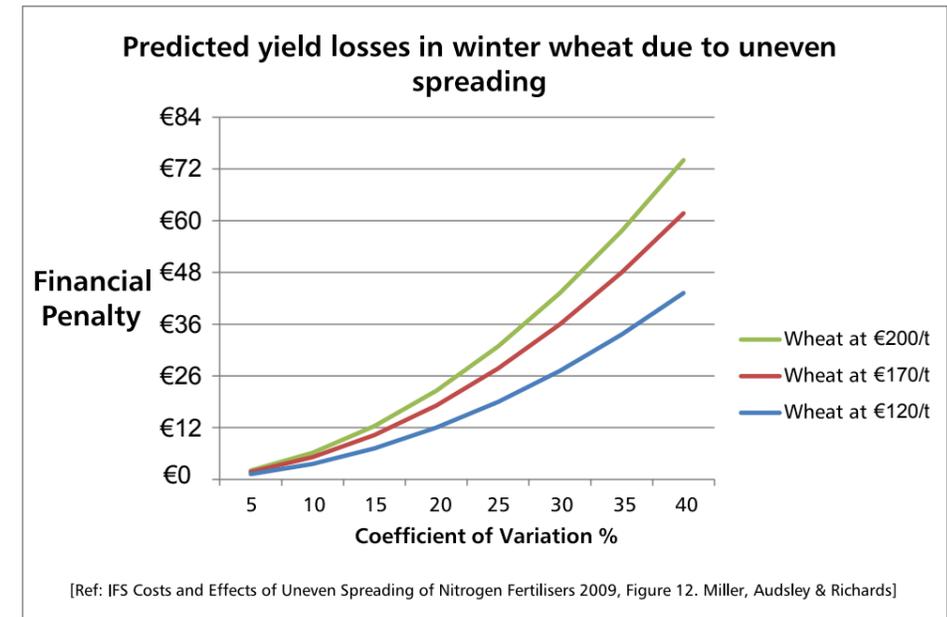
Low Cost Storage - Liquid nitrogen does not have to be stored inside a farm building. Low cost GRP storage tanks are available through rental schemes (see Tank Storage Scheme). Different OMEX products can be stored in a tank at different times of the year.



Accuracy

Accuracy of Application -The accuracy of application of nitrogen fertiliser has a major impact on gross margins. Variability across a spreading width is referred to as the coefficient of variation (CoV). The graph shows the impact on gross margin as the CoV increases for winter wheat. It is not uncommon for solid spreaders to operate with CoVs of 30-40% if they have not been calibrated or maintained, and 20% is a common average figure. It is only above 20% CoV that striping becomes visible, by which time the financial loss is potentially €20/ha.

Nitroflo is applied by sprayer with an average CoV of 5%, consequently, application of Nitroflo could improve gross margins by €15/ha compared with a spinning disc spreader.



Productivity of Field Margins

Managing field headlands to make sure they are as productive as the centre of the field is a constant challenge. Not least is application of nitrogen up to the field margin. The graph (right) is a typical example of the pattern of nitrogen application that is measured from a **spinning disc spreader** on 36m tramlines. Even with a deflector vane system in operation, application drops from 100% of the target rate to almost 0% across the outside 8m, leading to a significant under-application at the field margins.



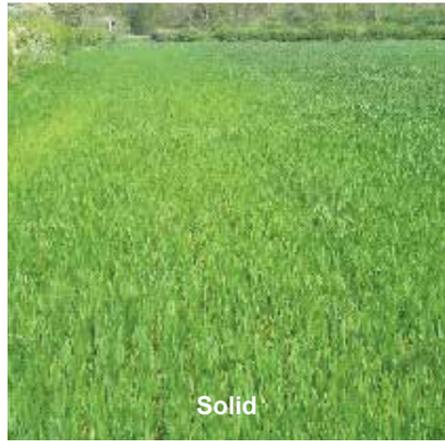
Yield loss from the outside 8m of a field has been shown to be 3.5t/ha of winter wheat and 10t/ha of potatoes when nitrogen is applied through a spinning disc spreader. The outside 8m of a 6ha field represents 7% of the field, so the yield loss would be 1.47t, worth €250 (wheat at €170/t). A farmer growing 100ha of winter wheat could be losing over €4,000 across the outside 8m of his fields.

Field Margin Yield Loss from solid N					
Average Field Size		% Area in Outside 8m	Outside 8m WW (t)	Yield Loss 100ha WW	€ Loss at €170/t
37ac	15ha	5.0%	3.5	17.50	€2,975
25ac	10ha	5.5%	3.5	19.25	€3,275
20ac	8ha	6.0%	3.5	21.00	€3,570
12.5ac	5ha	7.5%	3.5	26.25	€4,460
10ac	4ha	8.5%	3.5	29.75	€5,060

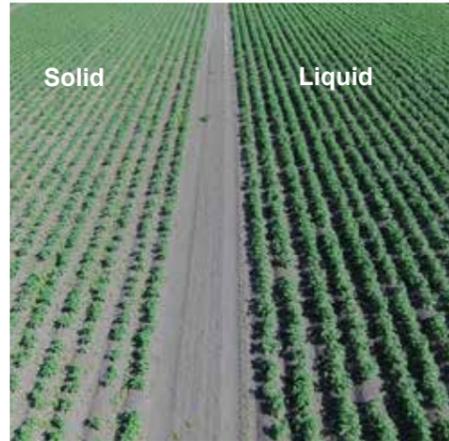
By using Nitroflo, it is possible to apply the full rate of nitrogen right up to the field margin: no compromise to yield, no environmental risk.

The visual impact of using solid N on field margins, compared to liquid nitrogen accuracy:

Winter Wheat



Potatoes



Winter Wheat

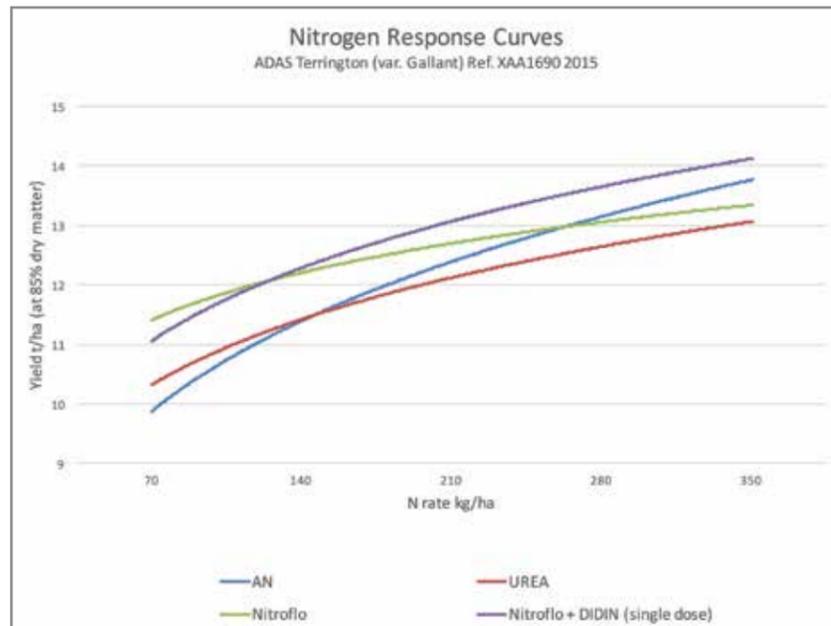


Potatoes



Three Sources of N

Replicated plot trials by independent organisations have demonstrated the yield advantage of liquid nitrogen, compared to solid ammonium nitrate and urea. These yield benefits are a result of the blend of nitrogen sources in Nitroflo, which supply a balanced delivery of nitrogen to the crop, along with the superior application accuracy. The visual impact of liquid vs solid application is particularly evident in dry spring seasons when solid nitrogen is not available to the crop when needed.



Application

Nitroflo can be applied across a range of weather conditions including situations when solid nitrogen or agrochemicals could not be applied. Nitroflo can be applied during rainfall, if ground conditions allow. It can be applied in breezy conditions because, unlike spray from a fan jet, the wind will not cause drift of a vertical stream and booms can be lowered to just above crop height. It is best to avoid damp leaf conditions (for example when a dew is lifting) since the nitrogen can spread on the leaf and be absorbed rapidly; in these conditions some scorch is possible.

Less Pollution Risk - By using Nitroflo it is possible to apply the full rate of nitrogen right up to the field margin without losing fertiliser beyond the boundary into the hedge bottom or close to dykes etc. This significantly reduces the risk of polluting water courses without incurring a yield loss along the field margin. Furthermore, since only 25% of the nitrogen sources is nitrate N there is much less risk of leaching shortly after application than with CAN.



More Crop Available in Dry Conditions - As soon as Nitroflo is applied to the soil it is drawn into the soil. So, even in the driest of springs, nitrogen starts becoming available to plants shortly after application.

Use Existing Sprayer - Nitroflo can be applied through any farm sprayer. The only conversion required is to fit suitable nozzles. There are various types of jets available off the shelf, they all apply a stream of Nitroflo - a method proven to minimise the risk of crop scorch. The best jets are those that apply even quantities in vertical streams across the full boom width, because they remove any variability caused by gradient and boom height. Consequently OMEX recommends the OMEX Streambar.

Nitrogen & Sulphur Together - By using one of the Nitroflo-S formulations, the farmer can apply nitrogen and sulphur together. The sulphur is included in sulphate form making sure both nutrients are available when needed. The range of sulphur grades allow the farmer to fine tune the sulphur application in season if required.

This picture was taken by OMEX customer Andrew Burden. Both fields are winter wheat, both had the same amount of N applied the same day, solid fertiliser was applied to the far field, whilst OMEX Nitroflo was applied to the field in the foreground.

Application Guidelines

Do	Don't
Do apply when the crop is wet or in the rain	Don't apply when the crop is just damp and drying off – this may lead to a smear of nitrogen drying on the leaf, leading to too much leaf uptake
Do apply in the dry	Don't apply in wind once feathers of small droplets are being blown from the main stream, or if the wind has caused leaf bruising
Do apply in wind so long as streams are not being deflected by wind	Don't go above 2 bar pressure unless you really have to
Do keep forward speed slow and pressure low	Don't apply in the heat of the day or when >20°C between max and min is expected
Do apply in the evening or early morning if possible	Don't apply to the flag leaf (or leaf 2 if possible)
Do plan to complete your applications by GS32 (2nd node on stem detectable) on cereals	In sequence: Don't apply agrochemicals first – they are likely to de-wax the leaves and increase to risk of foliar uptake of N. Leave a 5 day gap if possible
In sequence: Do apply fertiliser first and agrochemicals second. Leave a 2 day gap if possible	Don't dilute liquid nitrogen, it increases the risk of scorch
Do keep grazing stock out for 5 days if there has been no rain	

Products

OMEX Nitroflo® Range

For many leading UK farmers, liquid nitrogen has become their main top-dressing source. OMEX Nitroflo® is one of the most concentrated liquid nitrogen formulations, and is now available in Ireland. Liquid fertilisers offer a valuable means of optimising crop nutrition and reducing fixed costs, which is why, every year, more farmers are switching to OMEX Nitroflo.

Benefits:

- ✓ Accurate application up to field margins (€23/ha added value)
- ✓ Three sources of nitrogen - ammonium, nitrate and urea - so the best balance between availability to crop when needed and reduced risk of loss through leaching
- ✓ Effective across a full range of crops, including grass & forage crops
- ✓ No off-loading costs as Nitroflo is pumped directly into holding tanks on-farm (saving €1/ha)
- ✓ No bag disposal (saving €1.00/ha)
- ✓ Silage grass - faster response to application after first cut, especially in dry conditions
- ✓ Improved application accuracy. Tests show that application by granular spreader often vary by 20% across the spread width. Farm sprayers are unlikely to vary by more than 5%
- ✓ Better utilisation of time and labour - Nitroflo can be applied in less favourable conditions, when applying solid fertilisers or crop spraying would not be possible
- ✓ Higher work rates. It takes just a couple of minutes for one man to load the sprayer with Nitroflo
- ✓ An opportunity to upgrade sprayer and increase tramline widths, increasing the cropped area, work rates and accuracy of top-dressing

Frequently Asked Questions and Comments

- **Q** "Isn't liquid fertiliser often associated with scorch?"
A Current application methods have virtually eliminated scorch and by following a few simple guidelines, scorch is not a problem
- **Q** "Surely liquid nitrogen is too expensive?"
A The price of OMEX liquid nitrogen has for many years been competitive against calcium ammonium nitrate (CAN)
- **Q** "Liquid nitrogen is corrosive."
A All nitrogen fertilisers can be mildly corrosive to unprotected steel. By cleaning down a sprayer after applying fertiliser, the sprayer condition will deteriorate no more than if it was used for conventional spraying alone
- **Q** "There is a risk of urea volatilising in warm weather."
A The Nitroflo range contains liquid urea which rapidly enters the soil and is stabilised, reducing the risk of ammonia losses compared to solid urea
- **Q** "Isn't it expensive to convert to liquid?"
A The cost of converting should be as little as the cost of a concrete plinth and bund for a storage tank and a set of nozzles. The storage site will be assessed by OMEX to establish where is best to site the tank. The sprayer supplier will confirm whether any modifications are necessary to the sprayer

All fertilisers, including liquids, have to be invoiced by a guaranteed weight. Therefore, and to avoid confusion, all OMEX fertilisers are sold by weight and easy to use conversion charts are provided to give application volumes.

The range includes:

Nitroflo 30 - the most concentrated liquid nitrogen. The nitrogen source in Nitroflo is UAN - 50% of N sourced from urea, 25% from ammonium N and 25% from nitrate N.

Nitroflo 26+S - containing nitrogen and sulphur; for top-dressing sulphur responsive crops in the spring during periods of rapid growth. The sulphur source is sulphate.

Nitroflo 24+S - containing nitrogen and a higher level of S than Nitroflo 26+S. The sulphur source is sulphate.

Nitroflo 22+S - containing nitrogen and a higher level of S than Nitroflo 24+S. The sulphur source is sulphate.

Nitroflo 20+S - containing a higher level of sulphur; for deficient areas and crops with a high demand for sulphur, such as oilseed rape. The sulphur source is sulphate.

Nitroflo 30+Didin - allows growers to use just a single application to meet a crop's entire nitrogen requirement, saving application costs, improving yields and reducing nitrogen losses.

For application charts see page 17, or ask for a copy of the handy application chart

Product	Analysis w/w		SG	Approx Analysis w/v		
	N	S		N	S	
Nitroflo 30	30%		1.30	39%		390kg/1000 litre
Nitroflo 26+S	26%	2%	1.28	33.3%	2.5%	333kg N + 26kg S/1000 litre
Nitroflo 24+S	24%	3%	1.27	30.5%	4.0%	307kg N + 38kg S/1000 litre
Nitroflo 22+S	22%	4%	1.26	28%	5%	279kg N + 50kg S/1000 litre
Nitroflo 20+S	20%	5%	1.25	25%	6%	252kg N + 63kg S/1000 litre
Nitroflo 30+Didin	30%		1.30	39%		390kg N/1000 litre + Didin



Nitroflo® on Grass

Nitroflo can be used instead of solid N on all types of grass. These are the key advantages:

- Post cut or grazing, grass will respond to Nitroflo more quickly than solid N
- Daily gain in dry matter is larger when using Nitroflo
- Even in drought conditions new growth following uptake of N can be seen within 36 hours
- All the benefits of accurate application still apply in grass
- Nitroflo S contains sulphur in a form that is immediately plant available

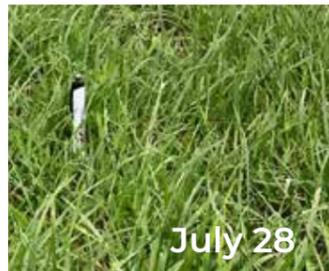
Nitroflo S v Urea

A New Zealand style grazing dairy unit in the UK applied OMEX Nitroflo S on the same day as urea on adjoining grazing paddocks. The pictures below, taken at the same time, show the difference in DM production following application of Nitroflo Liquid Nitrogen.



Silage Grass

Leamlara, Co. Cork - The picture sequence below shows a field after second cut silage. The crop was cut on 16 July, picked on 17 July, then grazed for two days. On 20 July OMEX Nitroflo S was applied at a rate of 112kg/ha N (90 units/ac). Despite the drought, uptake of N was very rapid and a visual difference could be seen within two days.



Didin®

Didin is a unique nitrogen stabiliser. When added to fertiliser or organic manures and applied to the soil it controls the release of crop-available nitrogen. It allows nitrogen to be applied in a single dose, eliminating the need for repeated applications, saving both time and money. It increases yields and dramatically improves the value of winter-applied slurry.

- Reduces growing costs
- Reduces nitrate leaching
- Improves value of slurry
- Improves yield and quality
- Simplifies nitrogen management
- Reduces carbon footprint of fertiliser applications



Didin in the Soil

Ammonium and urea based nitrogen fertilisers need bacteria to convert them from being relatively immobile to the highly mobile and plant available nitrate form. Didin inhibits the activity of the soil bacteria that convert this ammonium-N into nitrate-N, helping reduce nitrate leaching and creating a phased release of crop available nitrogen. As soil temperatures increase and crop growth begins, Didin progressively releases more nitrate nitrogen into the soil. After the inhibition has ceased the Didin is totally converted to plant-available nitrogen, leaving no residues in the soil.

Didin with Organic Manures and AD Digestate

Didin helps convert slurry, manure and the digestate from anaerobic digestion from being waste products into valuable fertilisers. It conserves the nitrogen through the winter, reducing the risk of nitrate leaching and phases the release of nitrate during the following spring and summer, reducing the requirement for additional nitrogen top-dressing. It also helps reduce losses of nitrous oxide following de-nitrification in waterlogged soils and increases grass yield and quality.

Application

For use on grassland and most winter and spring grown crops including cereals and potatoes, the normal method of application is incorporation in liquid fertiliser. If applying to soil prior to application of solid fertiliser or slurry/FYM, apply in 200-400 litres/ha water (see label for specific volumes).

Fertiliser	Timing	Soil Type	Rate l/ha
Liquid Nitrogen (Nitroflo)	Spring	Light	12.5
		Medium	10
		Heavy / Organic	6
Granular / liquid urea	Spring	Light	10
		Medium	8
		Heavy / Organic	6
Calcium ammonium nitrate (CAN)	Spring	Light	12.5
		Medium	10
		Heavy / Organic	8
Placed fertiliser	Spring	All types	6
Slurry / FYM / AD digestate	Autumn	All types	25 - 20
	Winter	All types	20 - 15
	Spring	All types	15 - 10

Didin is available pre-mixed in all OMEX liquid fertilisers in 20 litre drums and in 1000 litre IBCs for mixing on farm.

Trial Results and Yield Benefit

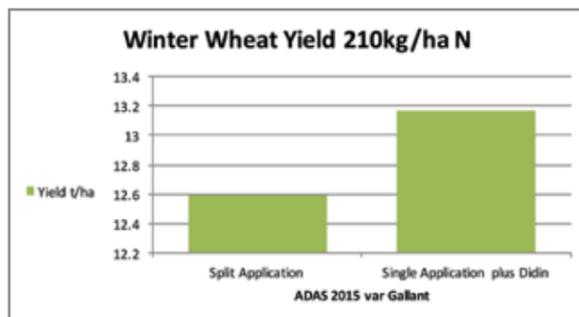
Trials by a wide range of organisations over many years have shown consistent yield advantages in crops treated with Didin. By including Didin with any nitrogen applications, the nitrogen is used more efficiently by the crop helping improve yield and quality by reducing nitrogen losses and optimising nitrogen delivery to the crop.

Crop	Number of trials	Average yield increase - t/ha	Average yield increase - %
Silage Maize	8	6.4	13.6%
Sugar Beet	19	1.8	3.0%
Potatoes	8	2.9	7.9%
Cereals	16	0.45	7.7%
Grassland	8	0.60	13.3%

Didin for Cereals

A single top-dressing with Didin allows the full season's nitrogen requirement to be applied in one simple application, at any time from the end of January to the end of March. The nitrogen is gradually released as plant-available nitrate at a rate at which the crop can use it. Leaching losses of nitrate are minimised and the risk of denitrification losses of nitrous oxide is also significantly reduced. Since the nitrate for the crop is released from the soil, crop nutrition is maintained at an ideal level, regardless of dry or wet conditions. Conventional applications may remain on the surface in dry conditions, leading to nitrogen deficiency. In conditions when it is too wet to apply nitrogen the crop can also become deficient. With Didin, the nitrate is released gradually and consistently through all conditions, maintaining crop growth.

Extensive trials on winter wheat have shown that, in addition to application cost savings, the single nitrogen application with Didin produces an average yield increase of 0.5 t/ha, compared to split nitrogen application.



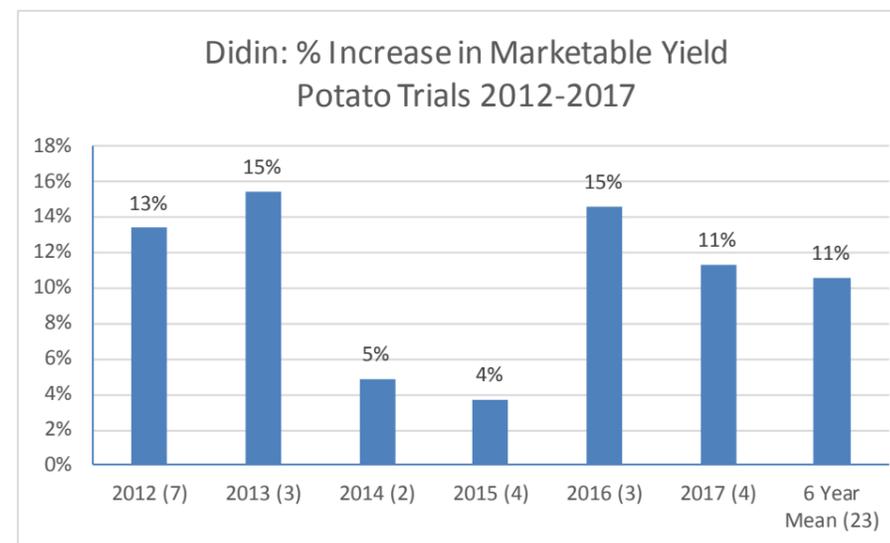
The field of winter oats below, received 120kg/ha of N with Nitroflo. The left half as a split dose, the right half as a single dose with Didin. On assessment, both halves are at the same growth stage, the difference is the flag leaves of the Didin treated half were on average 5cm longer and also wider.



Didin for Potatoes

Potatoes respond particularly well to application of stabilised nitrogen since most of the crop nitrogen requirement is applied immediately prior to planting. Crop uptake of the nitrogen does not start until 6-8 weeks later and, during wet spring conditions, some of the nitrogen applied can be leached beyond the shallow crop roots. The crop is also often heavily irrigated and the use of Didin helps prevent nitrate nitrogen being leached by excessive rates of irrigation.

In UK trials over six years Didin treated potatoes have consistently outperformed conventionally treated crops. The marketable yield increase is 11%, with a significant return on investment.



23 trials over 6 years (2012-2017), 13 varieties

Additional Cost, Didin 10 l/ha	€ 45/ha
Mean Additional Marketable Yield	6.235 t/ha (+10%)
Value of additional Yield	€842/ha*
Increased Profit	€ 797/ha
Return on Investment	18:1

* Ex farm average price €135/€



Sulphur

Sulphur is a vital element for plants and is required in similar amounts to phosphate in most crops.

Sulphur deposition has decreased dramatically over the last 30 - 40 years due to emission controls. Deficiencies of this vital element are now visible in many crops and currently modeled at less than 4 kg/ha S per year throughout most of Ireland so most crops will benefit from applications of fertiliser containing sulphur.

Responses to sulphur vary accordingly to soil type, with high yield responses of over 25% possible from winter wheat on sandy soils. The level of response is affected by over winter rainfall on loam and coarse silty soils, with high rainfall increasing the likelihood of a significant yield increase. Clay, fine silts and organic soils have a lower likelihood of yield responses, except in areas with medium to high winter rainfall, where there is a medium chance of a yield response.

How much to Apply

The continued reduction in sulphur deposition means that many rural areas in Ireland currently only receive less than a 4 kg/ha of S from the atmosphere. The following recommendation take this into account.

Oilseed Rape

Most oilseed rape crops require a minimum 40kg/ha S sulphur. Crops therefore require an application of around 40kg/ha of S.

Cereals

Cereals require approximately 25kg/ha S of sulphur. Crops therefore require approximately 20 kg/ha S sulphur.

Maize

Historically, maize was grown in rotations with often large inputs of manure and slurry, which usually provided sufficient sulphur for the crop. With maize being increasingly grown outside livestock areas it is important to consider the sulphur requirement of the crop with an application of 20-30 kg/ha S particularly on light soils.

Vegetables

Most brassica crops have a relatively high requirement for sulphur and adequate levels of sulphur are required for improved taste in a number of vegetable crops. Sulphur is also required to ensure efficient nitrogen utilisation in vegetable crops, with deficiency often resulting in reduced nitrogen responses. Application of 15 kg/ha S is recommended in responsive situations.

Grassland

Sulphur deficiency reduces the yield and quality potential of grassland and is exacerbated by high forage removal rates. Responsive crops require approximately 15 kg/ha S. Top-dressing with Nitroflo S provides immediately available sulphur to supply the crops needs.



Sulphur deficiency (right) in oilseed rape



Sulphur deficiency in winter wheat

Solution Compound Fertilisers

OMEX solution compound fertilisers are true compounds; every drop contains the complete analysis. They cannot segregate and as a result every square centimetre of soil is guaranteed to receive the required ratio of nitrogen, phosphate and potash. Solution compounds are ideal for placement on potatoes and other crops, where the fertiliser can be very accurately placed in the soil.

NPK Solutions

The OMEX solution compound range offers accurate application of fertiliser for a wide range of situations, from pre-drilling to post-emergence. Most requirements can be supplied from the standard range of compounds, however OMEX also offers a custom blending service, providing an almost infinite range of analyses if necessary.

Placement

The close positioning of fertiliser in relation to crop roots can have a significant effect on the nutrient use efficiency of the fertiliser. Placement with solution fertilisers offers significant advantages over solid placement; precision positioning is guaranteed and the nutrients are all fully dissolved, offering rapid crop response. Handling is minimised, with pumps carrying out all transfers without bag handling and disposal. Placement of liquid compound fertiliser on potatoes can increase yields by 10-15%. Liquid nitrogen placement for vegetable and salad row crops results in more rapid and even establishment of transplants and provides prolonged nitrogen response for long-season crops. Starter doses of nitrogen and phosphate for crops such as maize can dramatically improve establishment rates.

Starter Fertiliser

Liquid nitrogen, with or without phosphate, applied with cultivation drills and sub-soilers can significantly improve the establishment of oilseed rape and phosphate can help enhance rooting. Since the phosphate is fully water soluble it is more accessible to the plant at the peak time for early root development. Application of low doses of nitrogen and phosphate helps establishment but does not remove the need to replace nutrients taken up throughout the life of the crop, otherwise soil reserves will be depleted.

Combined Drilling with Liquid Fertiliser

Most modern drills can be adapted to allow a liquid fertiliser applicator to be fitted, providing the opportunity to place starter fertiliser in the row or surrounding the seed of any drilled crop. OMEX NPK solutions can be applied alone or in conjunction with micronutrients or phosphites, as required by the crop. The system allows for complete flexibility whilst providing the best possible environment for plant establishment.

Precision Farming

OMEX solution fertilisers offer the ideal fertiliser delivery system for variable rate application. Modern flow controllers can simply be upgraded to provide variable rate fertiliser application, based on application maps from a number of sources; active crop sensors, remote sensing, soil testing or from an agronomist's field experience. Many of the UK's most innovative precision farmers use liquid fertilisers due to the ease of controlling the application rates and the ability to automatically regulate individual boom sections.

Starter Fertilisers

Minimum cultivation establishment techniques for oilseed rape offer an ideal opportunity to place a starter fertiliser in the root zone of the establishing plant.

To ensure that the crop gets off to a good start, it needs feeding. The best way to do this is to place a starter fertiliser precisely where it is required, effectively creating a nutrient rich seedbed for the crop. OMEX solution fertilisers offer the most effective means of accurately placing nutrients with 100% solubility in the right place for the emerging seedling.

OMEX liquid starter fertilisers are also ideal for placement on drills for other crops, such as cereals, maize, and sugar beet.

Advantages of OMEX liquid starter fertilisers

- Major saving in autumn nitrogen requirement, up to 75%
- All of nitrogen captured by crop, reducing risk of leaching loss
- Fully soluble phosphate
- No dust, no blockages
- Precise targeting of nutrients
- Low rates of fertiliser applied across the field

Products and Recommendations

Tables below show application rates in l/ha to apply 20-60kg of N:

Products and Recommendations

Nitroflo 30: contains 39 kg nitrogen per 100 litres product.
For use where only nitrogen is required.

OMEX 17-3.5-0: contains approximately 21 kg nitrogen and 4 kg phosphorus per 100 litres product.
For use where a phosphate starter effect is required.

OMEX 14-6-0: contains approximately 17 kg nitrogen and 7.5 kg phosphorus per 100 litres product.
Provides greater starter effect.

OMEX 7-9-0: contains approximately 9 kg nitrogen and 11 kg phosphorus per 100 litres product.
Traditional starter fertiliser, provides full starter rate of phosphate.

Nitroflo 30		Percent of Field Covered by Fertiliser Bands				
kg/ha Applied In the Band		10%	20%	25%	33%	50%
N	P	Application rate l/ha				
30		8	15	19	31	38
40		10	21	26	34	51
50		13	26	32	42	64
60		15	31	38	51	77
Nitroflo 30N		39 kg N per 100 litres of product				

14-6-0		Percent of Field Covered by Fertiliser Bands				
kg/ha Applied In the Band		10%	20%	25%	33%	50%
N	P	Application rate l/ha				
30	13	18	35	44	71	88
40	17	24	47	59	94	118
50	22	29	59	74	118	147
60	26	35	71	88	141	176
14-6-0		17 kg N & 7.5 kg P per 100 litres of product				

17-3.5-0		Percent of Field Covered by Fertiliser Bands				
kg/ha Applied In the Band		10%	20%	25%	33%	50%
N	P	Application rate l/ha				
30	6	14	29	36	57	71
40	8	19	38	48	63	95
50	10	24	48	60	79	119
60	12	29	57	71	94	143
17-3.5-0		21 kg N per 100 litres of product 4 kg P per 100 litres of product				

7-9-0		Percent of Field Covered by Fertiliser Bands				
kg/ha Applied In the Band		10%	20%	25%	33%	50%
N	P	Application rate l/ha				
20	25	22	44	56	73	111
30	37	33	67	83	110	167
40	50	44	89	111	147	222
50	62	56	111	139	183	278
7-9-0		9 kg N per 100 litres of product 11 kg P per 100 litres of product				

Application Charts

Application Chart Nitroflo 30: 30% N

kg/ha N	units/ac N	l/ha	galls/ac
25	20	64	6
30	24	77	7
35	28	90	8
40	32	103	9
45	36	115	10
50	40	128	11
55	44	141	13
60	48	154	14
65	52	167	15
70	56	180	16
75	60	192	17
80	64	205	18
85	68	218	19
90	72	231	21
95	76	244	22
100	80	256	23
105	84	269	24
110	88	282	25
115	92	295	26
120	96	308	27
125	100	321	29
130	104	333	30
135	108	346	31
140	112	359	32
145	116	372	33
150	120	385	34
155	124	397	35
160	128	410	37
165	132	423	38
170	136	436	39
175	140	449	40
180	144	462	41
185	148	474	42

Specific Gravity (SG): 1.30
Please note that the SG varies slightly with temperature

Apply with appropriate nozzles
Avoid application during very windy weather or when the leaf is damp
Do not apply on a rime frost or following severe frost

Application Chart Nitroflo 26+S: 26%N + 2%S

kg/ha N	METRIC		IMPERIAL		
	kg/ha S	l/ha	units/ac N	units/ac S	galls/ac
25	2	75	20	2	7
30	2	90	24	2	8
35	3	105	28	2	9
40	3	120	32	2	11
45	3	135	36	3	12
50	4	150	40	3	13
55	4	165	44	3	15
60	5	180	48	4	16
65	5	195	52	4	17
70	5	210	56	4	19
75	6	225	60	5	20
80	6	240	64	5	21
85	7	255	68	5	23
90	7	270	72	6	24
95	7	285	76	6	25
100	8	300	80	6	27
105	8	316	84	6	28
110	8	331	88	7	29
115	9	346	92	7	31
120	9	361	96	7	32
125	10	376	100	8	33
130	10	391	104	8	35
135	10	406	108	8	36
140	11	421	112	9	37
145	11	436	116	9	39
150	12	451	120	9	40
155	12	466	124	10	41
160	12	481	128	10	43
165	13	496	132	10	44
170	13	511	136	10	45
175	13	526	140	11	47
180	14	541	144	11	48
185	14	556	148	11	49

Specific Gravity (SG): 1.28
Please note that the SG varies slightly with temperature

Apply with appropriate nozzles
Avoid application during very windy weather or when the leaf is damp
Do not apply on a rime frost or following severe frost

Application Chart Nitroflo 24+S: 24%N + 3%S

kg/ha N	METRIC		IMPERIAL		
	kg/ha S	l/ha	units/ac N	units/ac S	galls/ac
25	3	82	20	3	7
30	4	98	24	3	9
35	4	115	28	4	10
40	5	131	32	4	12
45	6	148	36	5	13
50	6	164	40	5	15
55	7	180	44	6	16
60	8	197	48	6	18
65	8	213	52	7	19
70	9	230	56	7	20
75	9	246	60	8	22
80	10	262	64	8	23
85	11	279	68	9	25
90	11	295	72	9	26
95	12	312	76	10	28
100	13	328	80	10	29
105	13	344	84	11	31
110	14	361	88	11	32
115	14	377	92	12	34
120	15	394	96	12	35
125	16	410	100	13	37
130	16	427	104	13	38
135	17	443	108	14	39
140	18	459	112	14	41
145	18	476	116	15	42
150	19	492	120	15	44
155	19	509	124	16	45
160	20	525	128	16	47
165	21	541	132	17	48
170	21	558	136	17	50
175	22	574	140	18	51
180	23	591	144	18	53
185	23	607	148	19	54

Specific Gravity (SG): 1.27
Please note that the SG varies slightly with temperature

Apply with appropriate nozzles
Avoid application during very windy weather or when the leaf is damp
Do not apply on a rime frost or following severe frost

Application Chart Nitroflo 22+S: 22%N + 4%S

METRIC		IMPERIAL			
kg/ha N	kg/ha S	l/ha	units/ac N	units/ac S	galls/ac
25	5	90	20	4	8
30	5	108	24	4	10
35	6	126	28	5	11
40	7	144	32	6	13
45	8	162	36	7	14
50	9	180	40	7	16
55	10	198	44	8	18
60	11	216	48	9	19
65	12	234	52	9	21
70	13	253	56	10	22
75	14	271	60	11	24
80	15	289	64	12	26
85	15	307	68	12	27
90	16	325	72	13	29
95	17	343	76	14	31
100	18	361	80	15	32
105	19	379	84	15	34
110	20	397	88	16	35
115	21	415	92	17	37
120	22	433	96	17	39
125	23	451	100	18	40
130	24	469	104	19	42
135	25	487	108	20	43
140	25	505	112	20	45
145	26	523	116	21	47
150	27	541	120	22	48
155	28	559	124	23	50
160	29	577	128	23	51
165	30	595	132	24	53
170	31	613	136	25	55
175	32	631	140	25	56
180	33	649	144	26	58
185	34	667	148	27	59

Specific Gravity (SG): 1.26
Please note that the SG varies slightly with temperature

Apply with appropriate nozzles
Avoid application during very windy weather or when the leaf is damp
Do not apply on a rime frost or following severe frost

Application Chart Nitroflo 20+S: 20%N + 5%S

METRIC		IMPERIAL			
kg/ha N	kg/ha S	l/ha	units/ac N	units/ac S	galls/ac
25	6	100	20	5	9
30	8	120	24	6	11
35	9	140	28	7	12
40	10	160	32	8	14
45	11	180	36	9	16
50	13	200	40	10	18
55	14	220	44	11	20
60	15	240	48	12	21
65	16	260	52	13	23
70	18	280	56	14	25
75	19	300	60	15	27
80	20	320	64	16	28
85	21	340	68	17	30
90	23	360	72	18	32
95	24	380	76	19	34
100	25	400	80	20	36
105	26	420	84	21	37
110	28	440	88	22	39
115	29	460	92	23	41
120	30	480	96	24	43
125	31	500	100	25	45
130	33	520	104	26	46
135	34	540	108	27	48
140	35	560	112	28	50
145	36	580	116	29	52
150	38	600	120	30	53
155	39	620	124	31	55
160	40	640	128	32	57
165	41	660	132	33	59
170	43	680	136	34	61
175	44	700	140	35	62
180	45	720	144	36	64
185	46	740	148	37	66

Specific Gravity (SG): 1.25
Please note that the SG varies slightly with temperature

Apply with appropriate nozzles
Avoid application during very windy weather or when the leaf is damp
Do not apply on a rime frost or following severe frost

Application Charts - Solution Compound Fertilisers - Metric

OMEX 16-0-7			
kg/ha N	kg/ha P	kg/ha K	l/ha
10	0	4	54
20	0	8	108
30	0	13	162
40	0	17	216
50	0	21	269
60	0	25	323
70	0	29	377
80	0	33	431
90	0	38	485
100	0	42	539
110	0	46	593
120	0	50	647
130	0	54	700
140	0	58	753
150	0	63	808
160	0	67	862
170	0	71	916
180	0	75	970
190	0	79	1024
200	0	83	1078

Specific Gravity (SG): 1.16

OMEX 15-1.5-6			
kg/ha N	kg/ha P	kg/ha K	l/ha
10	1	4	56
20	2	8	111
30	3	13	167
40	4	17	222
50	5	21	278
60	6	25	333
70	7	29	389
80	8	33	444
90	9	38	500
100	10	42	556
110	11	46	611
120	12	50	667
130	13	54	722
140	14	58	778
150	15	63	833
160	16	67	889
170	17	71	944
180	18	75	1000
190	19	79	1056
200	20	83	1111

Specific Gravity (SG): 1.20

OMEX 14-3-6			
kg/ha N	kg/ha P	kg/ha K	l/ha
10	2	4	58
20	4	8	115
30	7	12	173
40	9	17	230
50	11	21	288
60	13	25	346
70	15	29	403
80	17	33	461
90	20	37	518
100	22	42	576
110	24	46	634
120	26	50	691
130	28	54	749
140	30	58	806
150	33	62	864
160	35	67	922
170	37	71	979
180	39	75	1037
190	41	79	1094
200	43	83	1152

Specific Gravity (SG): 1.24

Application Charts - Solution Compound Fertilisers - Metric

OMEX 9-1-8			
kg/ha N	kg/ha P	kg/ha K	l/ha
10	3	11	93
20	7	22	187
30	10	33	280
40	13	44	373
50	17	56	467
60	20	67	560
70	23	78	654
80	27	89	747
90	30	100	840
100	33	111	934
110	37	122	1027
120	40	133	1120
130	43	144	1214
140	47	156	1307
150	50	167	1401
160	53	178	1494
170	57	189	1587
180	60	200	1681
190	63	211	1774
200	67	222	1867

Specific Gravity (SG): 1.19

OMEX 7-9-0		
kg/ha N	kg/ha P	l/ha
4	5	47
8	10	94
12	15	141
16	20	189
20	25	236
24	30	283
28	35	330
32	40	377
36	45	424
40	50	471
44	55	518
48	60	566
52	65	613
56	70	660
60	75	707
64	80	754
68	85	801
72	90	848
76	95	895
80	100	943

Specific Gravity (SG): 1.22

OMEX 7-3-8			
kg/ha N	kg/ha P	kg/ha K	l/ha
10	4	12	115
20	9	24	230
30	13	36	346
40	17	48	461
50	22	60	576
60	26	71	691
70	30	83	806
80	35	95	922
90	39	107	1037
100	43	119	1152
110	48	131	1267
120	52	143	1382
130	57	155	1498
140	61	167	1613
150	65	179	1728
160	70	190	1843
170	74	202	1959
180	78	214	2074
190	83	226	2189
200	87	238	2304

Specific Gravity (SG): 1.24

OMEX 10-2-7.5			
kg/ha N	kg/ha P	kg/ha K	l/ha
10	5	9	83
20	10	18	167
30	15	27	250
40	20	36	333
50	25	45	417
60	30	54	500
70	35	63	583
80	40	72	667
90	45	81	750
100	50	90	833
110	55	99	917
120	60	108	1000
130	65	117	1083
140	70	126	1167
150	75	135	1250
160	80	144	1333
170	85	153	1417
180	90	162	1500
190	95	171	1583
200	100	180	1667

Specific Gravity (SG): 1.20

OMEX 10-0-8			
kg/ha N	kg/ha P	kg/ha K	l/ha
10	0	8	83
20	0	17	167
30	0	25	250
40	0	33	333
50	0	42	417
60	0	50	500
70	0	58	583
80	0	67	667
90	0	75	750
100	0	83	833
110	0	92	917
120	0	100	1000
130	0	108	1083
140	0	117	1167
150	0	125	1250
160	0	133	1333
170	0	142	1417
180	0	150	1500
190	0	158	1583
200	0	167	1667

Specific Gravity (SG): 1.20

OMEX 9-4-7.5			
kg/ha N	kg/ha P	kg/ha K	l/ha
10	4	8	89
20	9	17	178
30	13	25	267
40	17	33	356
50	22	42	444
60	26	50	533
70	30	58	622
80	35	67	711
90	39	75	800
100	43	83	889
110	48	92	978
120	52	100	1067
130	57	108	1156
140	61	117	1244
150	65	125	1333
160	70	133	1422
170	74	142	1511
180	78	150	1600
190	83	158	1689
200	87	167	1778

Specific Gravity (SG): 1.25

OMEX 3.5-4.5-8			
kg/ha N	kg/ha P	kg/ha K	l/ha
4	5	10	93
8	10	19	186
12	15	29	278
16	20	38	371
20	25	48	464
24	30	57	557
28	35	67	649
32	40	77	742
36	45	86	835
40	50	96	928
44	55	105	1020
48	60	115	1113
52	65	125	1206
56	70	134	1299
60	75	144	1391
64	80	153	1484
68	85	163	1577
72	90	172	1670
76	95	182	1763
80	100	192	1855

Specific Gravity (SG): 1.24

OMEX 14-6-0		
kg/ha N	kg/ha P	l/ha
5	2	30
10	4	59
15	7	89
20	9	118
25	11	148
30	13	177
35	15	207
40	17	236
45	20	266
50	22	295
55	24	325
60	26	354
65	28	384
70	30	413
75	33	443
80	35	472
85	37	502
90	39	531
95	41	561
100	43	590

Specific Gravity (SG): 1.21

OMEX 17-3.5-0		
kg/ha N	kg/ha P	l/ha
5	1	25
10	2	49
15	3	74
20	4	98
25	5	123
30	6	147
35	7	172
40	8	196
45	9	221
50	10	245
55	11	270
60	12	294
65	13	319
70	14	343
75	15	368
80	16	392
85	17	417
90	18	441
95	19	466
100	20	490

Specific Gravity (SG): 1.20

Application Charts - Solution Compound Fertilisers - Imperial

OMEX 16-0-7			
u/ac N	u/ac P	u/ac K	galls/ac
10	0	4	6
20	0	8	12
30	0	13	18
40	0	17	24
50	0	21	30
60	0	25	36
70	0	29	42
80	0	33	48
90	0	38	54
100	0	42	60
110	0	46	66
120	0	50	72
130	0	54	78
140	0	58	84
150	0	63	90
160	0	67	96
170	0	71	102
180	0	75	108
190	0	79	114
200	0	83	120

Specific Gravity (SG): 1.16

OMEX 15-1.5-6			
u/ac N	u/ac P	u/ac K	galls/ac
10	1	4	6
20	2	8	12
30	3	13	19
40	4	17	25
50	5	21	31
60	6	25	37
70	7	29	43
80	8	33	49
90	9	38	56
100	10	42	62
110	11	46	68
120	12	50	74
130	13	54	80
140	14	58	87
150	15	63	93
160	16	67	99
170	17	71	105
180	18	75	111
190	19	79	117
200	20	83	124

Specific Gravity (SG): 1.20

OMEX 14-3-6			
u/ac N	u/ac P	u/ac K	galls/ac
10	2	4	6
20	4	8	13
30	7	12	19
40	9	17	26
50	11	21	32
60	13	25	38
70	15	29	45
80	17	33	51
90	20	37	58
100	22	42	64
110	24	46	71
120	26	50	77
130	28	54	83
140	30	58	90
150	33	62	96
160	35	67	103
170	37	71	109
180	39	75	115
190	41	79	122
200	43	83	128

Specific Gravity (SG): 1.24

Application Charts - Solution Compound Fertilisers - Imperial

OMEX 9-1-8			
u/ac N	u/ac P	u/ac K	galls/ac
10	1	9	10
20	3	19	21
30	4	28	31
40	6	37	42
50	7	46	52
60	9	56	62
70	10	65	73
80	12	74	83
90	13	83	94
100	14	93	104
110	16	102	114
120	17	111	125
130	19	120	135
140	20	130	145
150	22	139	156
160	23	148	166
170	25	157	177
180	26	167	187
190	27	176	197
200	29	185	208

Specific Gravity (SG): 1.19

OMEX 7-9-0		
u/ac N	u/ac P	galls/ac
4	5	5
8	10	10
12	15	16
16	20	21
20	25	26
24	30	31
28	35	37
32	40	42
36	45	47
40	50	52
44	55	58
48	60	63
52	65	68
56	70	73
60	75	79
64	80	84
68	85	89
72	90	94
76	95	100
80	100	105

Specific Gravity (SG): 1.22

OMEX 7-3-8			
u/ac N	u/ac P	u/ac K	galls/ac
10	4	12	13
20	9	24	26
30	13	36	38
40	17	48	51
50	22	60	64
60	26	71	77
70	30	83	90
80	35	95	103
90	39	107	115
100	43	119	128
110	48	131	141
120	52	143	154
130	57	155	167
140	61	167	179
150	65	179	192
160	70	190	205
170	74	202	218
180	78	214	231
190	83	226	244
200	87	238	256

Specific Gravity (SG): 1.24

OMEX 10-2-7.5			
u/ac N	u/ac P	u/ac K	galls/ac
10	2	8	9
20	4	15	19
30	7	23	28
40	9	30	37
50	11	38	46
60	13	45	56
70	15	53	65
80	17	60	74
90	20	68	83
100	22	75	93
110	24	83	102
120	26	90	111
130	28	98	121
140	30	105	130
150	33	113	139
160	35	120	148
170	37	128	158
180	39	135	167
190	41	143	176
200	43	150	185

Specific Gravity (SG): 1.20

OMEX 10-0-8			
u/ac N	u/ac P	u/ac K	galls/ac
10	0	8	9
20	0	17	19
30	0	25	28
40	0	33	37
50	0	42	46
60	0	50	56
70	0	58	65
80	0	67	74
90	0	75	83
100	0	83	93
110	0	92	102
120	0	100	111
130	0	108	121
140	0	117	130
150	0	125	139
160	0	133	148
170	0	142	158
180	0	150	167
190	0	158	176
200	0	167	185

Specific Gravity (SG): 1.20

OMEX 9-4-7.5			
u/ac N	u/ac P	u/ac K	galls/ac
10	4	8	10
20	9	17	20
30	13	25	30
40	17	33	40
50	22	42	49
60	26	50	59
70	30	58	69
80	35	67	79
90	39	75	89
100	43	83	99
110	48	92	109
120	52	100	119
130	57	108	129
140	61	117	138
150	65	125	148
160	70	133	158
170	74	142	168
180	78	150	178
190	83	158	188
200	87	167	198

Specific Gravity (SG): 1.25

OMEX 3.5-4.5-8			
u/ac N	u/ac P	u/ac K	galls/ac
4	5	10	10
8	10	19	21
12	15	29	31
16	20	38	41
20	25	48	52
24	30	57	62
28	35	67	72
32	40	77	83
36	45	86	93
40	50	96	103
44	55	105	114
48	60	115	124
52	65	125	134
56	70	134	145
60	75	144	155
64	80	153	165
68	85	163	175
72	90	172	186
76	95	182	196
80	100	192	206

Specific Gravity (SG): 1.24

OMEX 14-6-0		
u/ac N	u/ac P	galls/ac
5	2	3
10	4	7
15	7	10
20	9	13
25	11	16
30	13	20
35	15	23
40	17	26
45	20	30
50	22	33
55	24	36
60	26	39
65	28	43
70	30	46
75	33	49
80	35	53
85	37	56
90	39	59
95	41	62
100	43	66

Specific Gravity (SG): 1.21

OMEX 17-3.5-0		
u/ac N	u/ac P	galls/ac
5	1	3
10	2	5
15	3	8
20	4	11
25	5	14
30	6	16
35	7	19
40	8	22
45	9	25
50	10	27
55	11	30
60	12	33
65	13	35
70	14	38
75	15	41
80	16	44
85	17	46
90	18	49
95	19	52
100	20	55

Specific Gravity (SG): 1.20

Other Solution Compound Fertiliser Analyses also available

Analysis - % w/w				Analysis - % w/v		
N	P	K	SG	N	P	K
16	0	3	1.14	18	0	4
15	1.5	3	1.18	18	2	3.5
12.5	2	7	1.20	15	2	8.5
12	2	4	1.18	14	2	4
11.5	3.5	7	1.24	14	4	8
11.5	1.5	7.5	1.20	14	2	9
11	1.5	4	1.18	13	2	5
10.5	3	7	1.24	13	4	9
10	15	0	1.38	14	20	0
9	1	5	1.17	10.5	1.5	6
8.5	2	4	1.18	10	2.5	5
8	3.5	8	1.24	10	4	10
6.5	4	8	1.24	8	5	10
6	3	8	1.23	7.5	3.5	10
5.5	3	9	1.24	6.5	4	11
5	3.5	8	1.24	6	4.5	10
4.5	3	9	1.23	5.5	3	11
3	3.5	9	1.23	3.5	4	11
2	2.5	10	1.23	2.5	3	12

w/v analyses are approximate

Application Bars & Nozzles

A range of streamer caps and streamer bars are available for applying liquid nitrogen to emerged crops. They vary from simple caps to advanced, self-contained streamer bars. Check with suppliers for latest prices

Spraying Systems (TeeJet) Jet Stream

A simple cap producing 3 divergent vertical streams. Rate is altered by varying pressure and metering disc.

Lechler FD Fertiliser Nozzle

A novel, low pressure deflector nozzle, producing a horizontal fan pattern of coarse droplets with no 'fines'. Even distribution (no streams) and flexible application rates (operate at pressure of 2-4 bar).

Spraying Systems (TeeJet) Stream Jet

A 5-stream jet which produces a 'rain-effect' pattern across the boom. Recent change is that the jet body is now integral with metering disc, so different coloured bodies are used for different rates; no need to change metering discs.

Hypro Fastcap® ESI

6-stream cap, with streams directed down onto crop, claimed to produce a low-atomisation stream of nitrogen. Supplied as nozzle+metering orifice with two nozzles required to cover most application rates. Supplied in a box of 6 nozzles.

Hardi Quintastream

Produce 5 semi-vertical streams, each stream engineered to create an accurate and even application on the crop. They come with Hardi jet bodies but can be adapted to Teejet bodies by removing the nozzle insert from the body and mounting in a Teejet cap. Rate altered by changing restrictor with tool that comes with jet. Different coloured bodies for different rates.

Umbrella Jets

Produces a 'rain-effect' of low pressure, large droplets from a semi-circle of outlets at the base of an extended nozzle body giving a wide range of application rates simply by varying pressure.

CFM Streamer Bar

A channel-fed bar, with 4 vertical streams per bar. Rate is altered by varying pressure and selecting restrictor that is simple to change.

BFS Streamer Bar

A channel-fed bar, with 4 vertical streams from each ½m spacing bar. Application rate is altered by varying pressure and rotating a wheel in the body of the bar to required metering orifice.

OMEX Streambar

The OMEX Streambar produces 4 vertical streams from each bar, ensuring even coverage across the full boom regardless of the bars height above the ground. Each stream is fed individually to ensure the output from all four streams are identical even with the bar tilted. A wide range of application rates can be achieved and are changed using the built in slider.

Spraying Systems (TeeJet) SJ7-VR: A half umbrella pattern with 7 streams and a variable rate restrictor for use with flow-based controllers. Restrictor is based on reliable EPDM elastomer and allows rate to vary with speed or variable rate map, without the need to change jets.

Spraying Systems (TeeJet) SJ3-VR: 3 Divergent streams with a variable rate restrictor, only for use with flow based controllers. No need to change metering discs or settings and restrictor provides constant resistance to allow rates to be changed on the move.

Pentair (Hypro) ESI variable rate nozzle: Variable restrictor based on integral variable orifice. Produces 6 divergent streams from novel unique nozzle body. Correct pattern overlap at 3 boom heights provides flexibility. Single nozzle covers wide range of application rates and allows rate to be changed in operation, ideal for variable rate application.

Please check with suppliers for latest prices

Accu-Rate Dribble Bars

Features

- Constant streams of optimum droplets and even placement across boom
- Constant application on uneven ground
- Ability to apply from 90 - 2200 l/ha without stripping down
- Made from high quality material

Uses

- Integrated metering or disk metering system
- Suits application to cereals, grassland and brassica crops
- High accuracy dribble bar for all liquid fertiliser application
- Easily fitted to most sprayers

Benefits

- Avoids scorching and minimises crop damage
- Saves time in the field
- Long term use with reliable application
- Provides accurate application 100% of the time



OMEX Streambar

Stream bars are the most efficient and accurate method of applying nitrogen to crops and the OMEX Streambar is one of the most convenient and cost-effective bars available. Stream bars apply liquid nitrogen and sulphur in a vertical stream, allowing nitrogen to be applied at the full rate right up to the field boundary. The vertical pattern means boom height is not restricted, allowing booms to run low in windy conditions and ensuring that the pattern is not affected by undulating ground. Each of the four outlets on the bar is fed independently from the restrictor, so the rate remains completely consistent across the bar on sloping ground.



Storage Tank Schemes

Rental Scheme for 30m³, 40m³ and 50m³ GRP and 50 Tonne Steel Tanks

	30m ³	40m ³	50m ³	50 Tonne Steel
Farmer Qualification				
New customer to OMEX Nitroflo	✓	✓	✓	✓
Minimum number of tonnes of Nitroflo per annum	50	100	120	100
OMEX to Supply				
One tank, complete with fully lockable filling valve, inspection and cleaning access hatch, sight gauge, fixing ties and locks	30,000 litre (approx 37 tonne capacity)	40,000 litre (approx 50 tonne capacity)	50,000 litre (approx 60 tonne capacity)	38,000 litre (approx 50 tonne capacity)
Tank delivered and off loaded on farm	✓	✓	✓	✓
Drawings showing dimensions of tank plus foundations if required	✓	✓	✓	✓
The Scheme				
Year one free of charge	✓	✓	✓	✓
An annual rental (payable in advance)	€500	€700	€800	€700
A retrospective rebate of €4.00 per tonne will be paid per annum on Nitroflo range only	Up to the value of €500	Up to the value of €700	Up to the value of €800	Up to the value of €700
Farmer to Supply				
An accessible site for tank	✓	✓	✓	✓
Concrete foundation and bund for tank	✓	✓	✓	✓
Roofing felt layer beneath tank	✓	✓	✓	X
Bolts and fixing are customers responsibility	✓	✓	✓	X
Planning permission (if required)	✓	✓	✓	✓

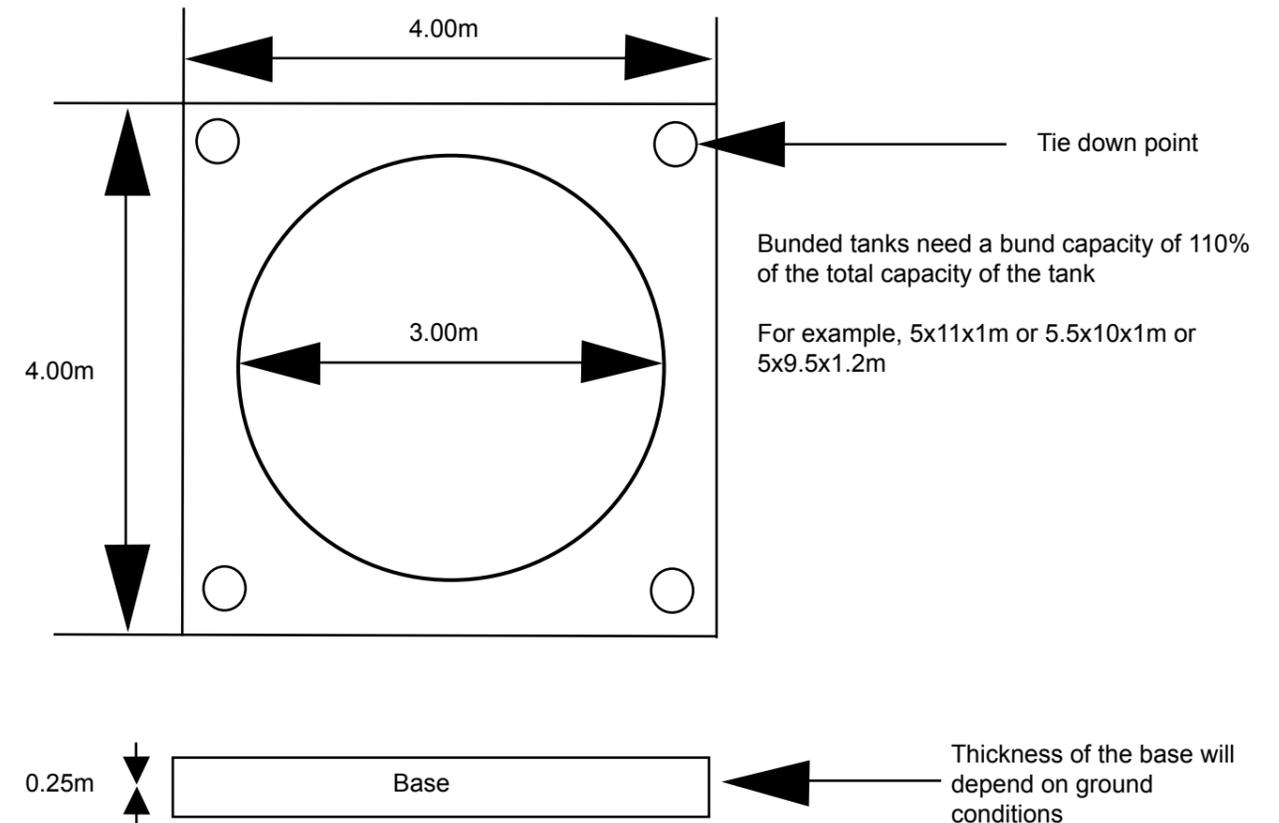


OMEX Agriculture reserve the right to uplift the tank if annual off take falls below 50 tonnes for the 30m³ and 40m³, and 100 tonnes for the 50m³ and 50 Tonne steel tank or rental is unpaid. The farmer is responsible for paying crane hire for the removal of the tank.

Purchase option for 30m³, 40m³ and 50m³ GRP Tanks

	30m ³	40m ³	50m ³
Purchase Cost			
GRP tank (ex delivery)	€5,000	€7,000	€8,000
Included			
One GRP tank, complete with fully lockable filling valve, inspection and cleaning access hatch, sight gauge, fixing ties and locks	30,000 litre (approx 37 tonne capacity)	40,000 litre (approx 50 tonne capacity)	50,000 litre (approx 60 tonne capacity)
Tank delivered (charges apply) and off loaded on farm	✓	✓	✓
Drawings showing dimensions of tank plus foundations if required	✓	✓	✓
The Scheme			
Farmer to purchase tanks from OMEX	✓	✓	✓
A retrospective rebate of €4.00 per tonne against OMEX Nitroflo products only	✓	✓	✓
To be paid annually, for 10 years maximum	✓	✓	✓
Cumulative rebate up to the purchase price of the tank	✓	✓	✓
Tank maintenance and security is purchaser's responsibility	✓	✓	✓
Farmer to Supply			
An accessible site for tank	✓	✓	✓
Concrete foundation and bund for tank	✓	✓	✓
Roofing felt layer beneath tank	✓	✓	✓
Bolts and fixing are customers responsibility	✓	✓	✓
Planning permission (if required)	✓	✓	✓

Please contact your local distributor if you are considering storage.

Installation Guidelines - Base for GRP Vertical Tank 30m³/40m³/50m³

The base for the storage tank needs to be a flat smooth concrete slab, 4m square and 150mm to 250mm thick, depending on ground conditions. If the concrete is not smooth a layer of sand or folded roofing felt should be used to level and protect the base of the tank. The tanks must be bolted down by the customer with 4 x 16mm rawbolts through the stainless steel ties provided immediately after delivery. The hole in the tie is 18mm diameter. Site the tank with holding ties in each corner of the slab.

All tanks must be situated within a waterproof bund capable of holding 110% of the tank capacity. If more than one tank is being installed within the bund please contact OMEX for bund dimensions.

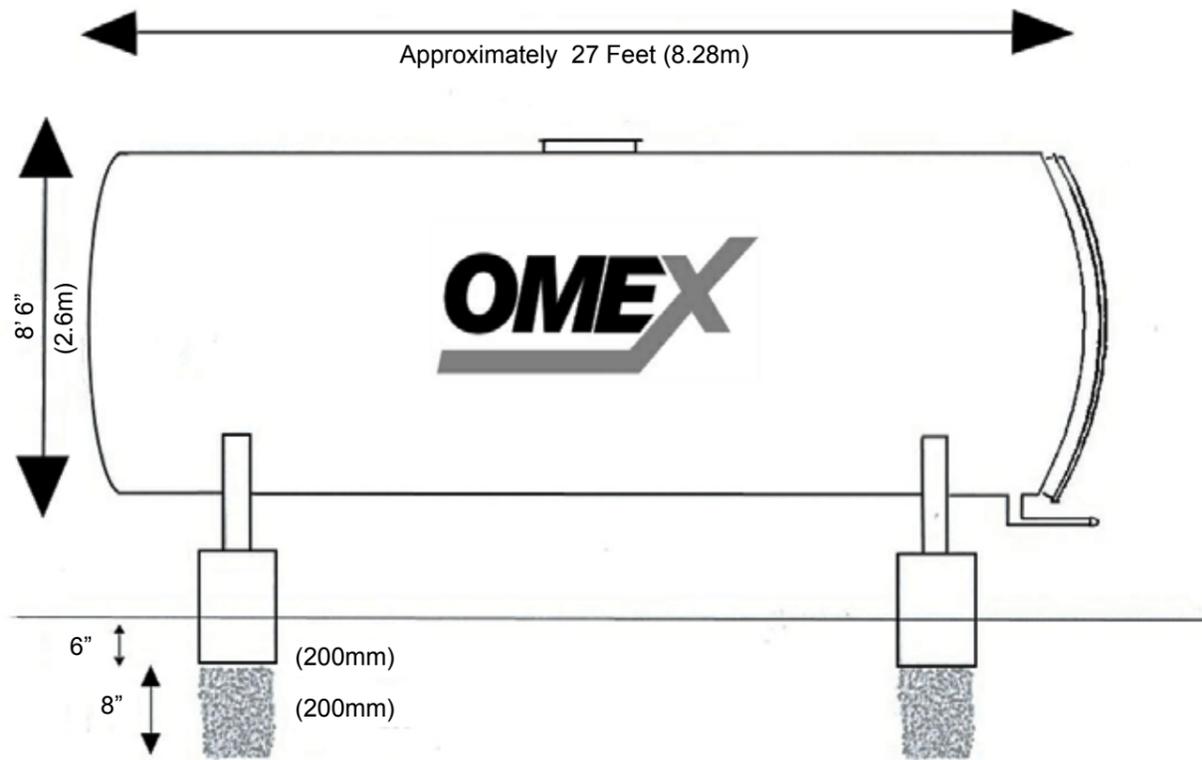
Tank Dimensions

30m³
Diameter - 3m
Height - 4.6m

40m³
Diameter - 3m
Height - 6.02m

50m³
Diameter - 3m
Height - 7.39m

Installation Guidelines - Base for Steel Storage Tanks

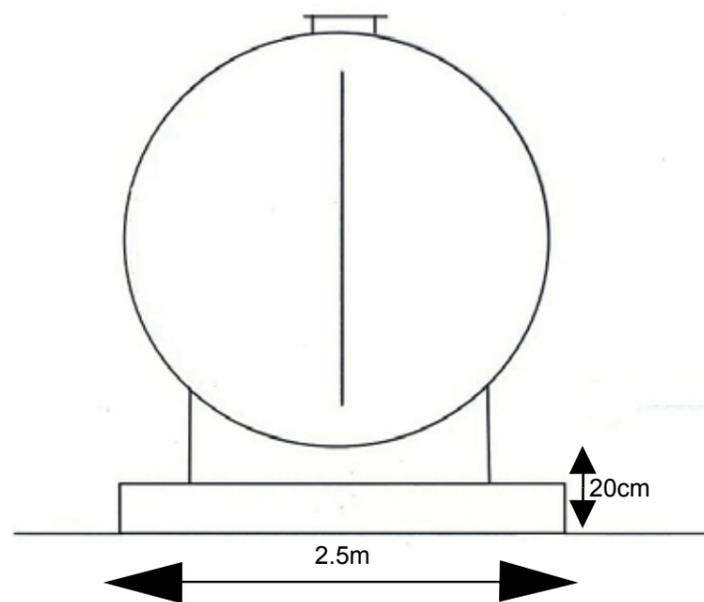


Site requires two foundation strips situated within the waterproof bund that is 110% of tank capacity (0.5m) x (2.5m) x (150mm) deep of 1:2:4 concrete at 5m centres. These need to be on 200mm of consolidated hardcore. To raise the tank build up with concrete blocks.

Siting Requirements

Planning permission may be required in some areas. A bund wall of 110% of tank capacity and sealed base is required.

- Outlet pipe can be turned to suit the site
- Valves should be locked with valve sleeve at all times when unattended
- Padlocks and locking sleeves will be provided with the tank when installed



PROTECTING THE ENVIRONMENT

THE ESSENTIALS FOR STORING SOLID AND LIQUID FERTILISERS



Losses from stored fertiliser may:

- seriously damage water quality
- lead to substantial fines for pollution

Today, farm storage of fertilisers is covered by Codes of Practice to prevent water pollution. Unless farmers adhere to these codes, enforcement action could be taken or new legislation imposed.⁽¹⁾ This leaflet summarises your obligations under the Codes.

Adhering to the codes is not daunting. Often a little time spent on inspection, planning and a small investment in maintenance will avoid large fines, upset neighbours and loss of reputation.

Footnote

1. The Anti-Pollution Works Regulations 1999, www.legislation.gov.uk or from The Stationery Office, T: 0870 6005522
2. Code of Practice for the Prevention of Water Pollution from the Storage and Handling of Fluid and Solid Fertilisers – free from Agricultural Industries Confederation, T: 01733 385230 or from website www.agindustries.org.uk
3. The Dangerous Substances (Notification and Marking of Sites) Regulations 1990, www.legislation.gov.uk, The Stationery Office, T: 0870 6005522

GENERAL GUIDELINES FOR ALL STORES

- Site all stores as far from watercourses or surface water drains as possible – never less than 10m.
- Site at least 50m from any well, borehole, or aquifer outcrop where risk of groundwater contamination is high.
- Provide secondary containment for storage where contamination risk is high.
- Ensure good well constructed vehicular access.
- Keep an inventory of fertiliser stored – type, volume, delivery.
- Make all storage as secure as possible with consideration given to lighting and fencing.
- Site all stores away from public access to minimise interference or vandalism.
- Ensure operators are trained in use and emergency procedures.
- Obtain Code of Practice for the Prevention of Water Pollution from the Storage and Handling of Fluid and Solid Fertilisers⁽²⁾ – the definitive reference.

SOLID FERTILISER STORAGE

Solid fertilisers, provided the storage area is well-sited and constructed, are a low risk of watercourses. The main risk occurs in the event of a fire, if contaminated firewater escapes.

PERMANENT STORES

Siting

- Locate away from heat sources to minimise fire risk.
- Site away from combustible materials eg fuels, oils, hay, straw and wood.
- Ensure sites are level and not prone to flooding.
- Ensure indoor storage is on smooth, firm, dry, impermeable concrete floors.
- Avoid prolonged outdoor storage but where unavoidable ensure it is protected from rain and sunlight with shrink wrapping and/or sheeting.
- Keep storage areas clean and rodent free.
- Handle all bags with care eg fit pipes on sharp forklift tines.

- Re-bag damaged bags immediately.
- Sweep up spillage and dispose of sweepings in slurry pits or spread thinly on growing crops.
- Do not use sawdust as an absorbent.
- Notify the Fire Authority and Health & Safety Executive if 25 tonnes, or more, of ammonium nitrate is stored at any one time.⁽³⁾
- Develop contingency plans to contain contaminated firewater and prevent entry to drains or watercourses.

TEMPORARY FIELD STORAGE

- Do not store within 10m of ditch, watercourse or land drains.
- Return unused bags to a permanent store as soon as possible.

FLUID FERTILISER STORAGE

Farmers share a duty of care for siting, use and maintenance, even when fertiliser suppliers provide tanks.

Using tanks

- Ensure tanks, pipework and valves are fit for purpose, ie resistant to corrosion.
- Ensure all tank fittings are tamper-proof. Lock all valves shut when not in use.
- Ensure delivery companies are aware of emergency procedures.
- Ensure tank, pipework and valves are in good condition before deliveries are made.
- Check tank has sufficient capacity before delivery.
- Avoid overfilling.

Maintaining tanks

- Have tanks, pipework and valves inspected internally and externally, for damage and corrosion at least annually by a suitably qualified technician.
- Carry out any necessary remedial work immediately.
- Undertake additional checks at

the start of the season and when deliveries are made to and from the tank⁽⁴⁾. If in doubt do not use the tank or bowser.

- Drain down and flush through all pipework at the end of each season.
- Keep a maintenance record.

PERMANENT STORAGE

- Conduct an environmental risk assessment⁽⁵⁾. Advice is available from the Environment Agency.
- Construct secondary containment where environment assessment shows high risk. Use of reinforced masonry or concrete is recommended and provision should be made for at least 110% of tank capacity. Properly designed and constructed earth embankments may be an acceptable alternative. All pipes, valves and sight gauges should be within the containment area. (NB As a last resort, the Environment Agency can issue a works notice requiring secondary containment in high risk locations⁽¹⁾).
- Tanks must be on a solid, stable concrete base of footing to take the full tank weight.

- Consider additional stabilisation against high winds for GRP tanks.

BOWSERS AND MOBILE TANKS

- Temporary storage can pose a significant hazard to watercourses. Thus suitable siting is crucial before filling or dispensing. Transport around the farm needs careful consideration. Roadways and tracks must be able to withstand fully laden bowsters passing over or being parked on them.
- Ensure bowsters and all fittings are fit for purpose and protected from corrosion.
- Ensure bowsters are set down on level, solid ground before delivery is made.
- Provide sufficient support beneath parking legs to carry loaded weight without it sinking into the ground or becoming unstable.
- Ensure all hatches and manholes form a watertight seal when closed.
- Do not move laden bowser unless all hatches, lids and valves are closed and locked.
- Open hatches slightly, when emptying bowsters, to avoid a vacuum which could cause the tank to crumple and collapse.

CODE OF PRACTICE FOR THE PREVENTION OF WATER POLLUTION FROM THE STORAGE AND HANDLING OF FLUID FERTILISERS

PART 3 - USERS 2014

DEALING WITH SPILLAGES, EMERGENCY PROCEDURES AND STAFF TRAINING

DEALING WITH SPILLAGES

- Contain any spillage wherever possible.
- Use inert absorbent materials, eg sand or earth, for liquid spills (not sawdust).
- Block gullies, drainage systems or other routes to watercourses.
- Do NOT hose down a spillage.

EMERGENCY PROCEDURES

- Identify routes to vulnerable watercourses and groundwater on your farm.
- Establish and test emergency procedures.
- Devise spillage, emergency and firewater procedures to provide containment areas near tanks, bowsters or stores.

- Consider blocking drains and damming watercourses as well as providing drain-blocking mats or drain bungs.
- Use leak-sealing putty on tanks and pipework for temporary repair.
- Inform and train everyone likely to become involved in dealing with a spillage or fire.
- Identify who to contact in the event of a spillage, loss or fire.
- Ensure all have access to important telephone numbers, eg local Environment Agency Office, fertiliser supplier and emergency services.
- Report any significant spillage to the farmer, the supplier and Environment Agency.

Footnote

(4) Instructions for inspecting condition of fluid fertiliser tanks (free) – Agricultural Industries Confederation 01733 385230 or from website: www.agindustries.org.uk.

(5) Risk assessment guide on siting storage facilities (free) – Agricultural Industries Confederation 01733 385230 or from website: www.agindustries.org.uk.

FURTHER INFORMATION

Code of good agricultural practice; 'Protecting our Water, Soil and Air' Download free from www.defra.gov.uk/publications or hard copy (£12.50) from www.tso.co.uk

The Environment Agency

Pollution Prevention Guidance Notes:

PPG2 – *Above ground oil storage tanks* – for containment wall information

PPG18 – *Pollution prevention measures for the control of spillages and fire fighting runoff* – for more detailed information about storing chemicals.

Policy and practice for the protection of groundwater

Ground Water Vulnerability Maps



PRODUCED IN CONSULTATION WITH

Working in partnership to prevent pollution

Environment Agency – 24 hour Emergency Hotline 0800 807060

For non-emergency general advice, phone 03708 506506





PART 3 – USERS

This Code of Practice for the Prevention of Water Pollution from the Storage and Handling of Fluid Fertilisers (hereafter referred to as the 'Code') is in three parts:

PART 1 – SUPPLIERS

PART 2 – TANKER DRIVERS

PART 3 – USERS

The Code is published and recommended by the Agricultural Industries Confederation (AIC). The information is given in good faith and does not imply the acceptance of any legal liability or responsibility whatsoever, by AIC or by individual AIC members for the consequences of its use or misuse or in any particular circumstances.

PREFACE

As a user of fluid fertilisers, you are handling materials which, if spilled in quantity, can be very damaging to the water environment. This Code of Practice has been drawn up to help you to reduce the risk of causing water pollution as a result of losing fluid fertiliser during storage or handling at the farm.

There is clear economic benefit to the user in reducing losses of nutrients to the wider environment, whether from accidental spillage, poor management practices or vandalism. Any of these could result in water pollution which could have serious consequences, both legal and financial. The costs of pollution clean-up and any fish restocking for example would be charged to the polluter or relevant parties. With some forethought and planning for emergencies you should be able to answer the question: 'What would be the consequences of a major spillage of fluid fertiliser at your site?' You must know your site and the surrounding drainage system and what to do and how to react to an accident or emergency so as to minimise the chances of causing pollution.

Preplanning is essential so that you avoid having to deal with a real incident unprepared. Pollution of surface waters by fertiliser is a serious matter but at least it is possible to monitor it directly and carry out remedial action, albeit at some cost. If a major spillage of fluid fertiliser onto the ground is allowed to soak away, any groundwater contamination will be impossible to monitor except by costly techniques and may be impossible to remedy. Pollution of groundwater is potentially very serious because this water can be used

extensively for public drinking water supplies and for industrial and agricultural use. The environment agencies in England, Wales, Scotland and Northern Ireland have identified all groundwater resources and have specific policies for the protection of sources through the control of activities and development in close proximity to source extraction boreholes. Groundwater resources and extraction boreholes are valuable and expensive assets. It is essential that those storing and handling fluid fertilisers are aware of the vulnerability of nearby groundwater sources so that this can be taken into account when siting storage facilities and drawing up emergency plans. The objective must be to ensure that pollution is prevented and that in the event of a major spillage, fluid fertiliser is not allowed to soak through the soil directly, or by way of drains and soak-aways in these vulnerable areas.

If you require further more specific information about the sensitivity of your site with respect to the water environment the environment agencies are always pleased to offer advice. AIC also publishes a **Code of Practice for the Prevention of Water Pollution from the Storage and Handling of Solid Fertilisers**.

Please request a complete copy of the code if required.

PART 3 – USERS

3.1 INTRODUCTION

3.1.1 This 'Code of Practice for the Prevention of Water Pollution from the Storage and Handling of Fluid Fertilisers, (Part 3, [Users])' is a practical guide to help users avoid loss or spillage of **fluid fertiliser** which could cause water pollution.

3.1.2 This Code is without prejudice to any legal obligations safety requirements or other codes of practice.

3.1.3 Following this Code is not a defence against a charge of causing pollution, although it should reduce the chance of pollution occurring and will help provide proof of due diligence and good working practice.

3.1.4 Users should ensure that they carry adequate insurance cover against liability for pollution.

3.1.5 This Code does not cover guidance for the appropriate usage of **fluid fertiliser**. Reference should be made to Protecting Our Water, Soil and Air: a Code of Good Agricultural Practice (Defra - England), Prevention of Environmental Pollution from Agricultural Activity (Scottish Government - Scotland), and the Code of Good Agricultural Practice (DARD – Northern Ireland), and also to published fertiliser recommendations. See Fertiliser Manual (Appendix 1).

3.1.6 This Code has been drawn up in consultation with the Environment Agency England, Natural Resources Wales, the Scottish Environment Protection Agency and the Northern Ireland Environment Agency. (Appendix 1)

3.2 DEFINITIONS

For the purposes of this Code, the term:

3.2.1 '**User**' shall mean the farmer, grower, application contractor and organisation or individual responsible for the end-use of fluid fertilisers. Delivery and transportation on the public highway is covered in part 2 of this Code.

3.2.2 '**Supplier**' shall refer to the manufacturer, importer, distributor, merchant, haulier or other organisation or individual who supplies the **user** with **fluid fertiliser**.

3.2.3 '**Tanker Driver**' shall mean the driver of any vehicle designed to transport and deliver liquid fertilisers in bulk or semi bulk Intermediate Bulk Containers (IBCs)

3.2.4 '**Fluid Fertiliser**' shall include all solution fertilisers (otherwise known a liquid fertilisers), suspension fertilisers and aqueous ammonia solutions not exceeding 34% ammonia Organic-based fluids containing plant nutrients such as farm slurries, AD Digestate, sewage sludges or other effluents are expressly excluded.

3.2.5 '**Bund**' shall mean a strongly constructed secondary containment with impermeable walls and floor.

3.2.6 '**Watercourse**' shall include all surface water whether coastal water, estuary, lake, pond, river, stream, canal and field ditch, (even when dry), unless it is a containment ditch.

3.2.7 '**Groundwater**' shall be defined as water which is below the surface of the ground in the saturation zone and in direct contact with the ground and/or water held in underground rock formations (aquifers). For the purposes of this Code it is considered that pollution of **Groundwater** could result from incidents occurring where such aquifers outcrop at or near the soil surface, or occurring within 50 metres of a water abstraction borehole, or where no protection of the underlying water exists e.g. where there are soakaways, swallow holes or quarries.

3.2.8 '**Major Spillage**' shall refer to a spillage which cannot be controlled and/or which involves significant loss of the spillage causing pollution of a **watercourse** or of **groundwater**.

3.3 GENERAL PRINCIPLES

3.3.1 Fluid fertilisers can be applied to a field very accurately, thereby avoiding unwanted and potentially damaging applications to field margins, hedge bottoms or ditches. As with all nutrient sources, including solid fertilisers and organic manures and wastes, care must be taken with their storage, transfer and transportation. Detailed guidelines are given but attention is drawn to six main points:

- Fixed or mobile stores must be sited with care,
- Any spillage which occurs must be properly dealt with to avoid pollution,



<ul style="list-style-type: none"> • Stores, valves and pipework must be properly maintained and inspected, and records kept, • Bowsers or tankers, before being moved, must have their hatches/ lids securely closed. • Valves must be secured so that they can only be opened by authorised personnel, • There must be a spillage contingency plan. Know what to do in an emergency. 	<p>3.4.4 Existing sites, and preferably all new sites, should be in areas where groundwater vulnerability is low and not in highly sensitive areas. Sensitive areas are in the proximity of boreholes, wells, springs, aquifer outcrops, soak-aways, swallow holes, quarries or within 50 metres of abstraction for potable supply. For further guidance on groundwater protection contact the appropriate environment agency (Appendix 1) or refer to the Environment Agency web-based resource 'What's in your backyard' (See Appendix 1).</p>
<p>3.3.2 All procedures, equipment and installations should be designed to avoid any spillage of fluid fertilisers.</p>	
<p>3.3.3 In the event of such spillage, appropriate procedures and resources should be in-place to prevent the pollution of watercourses or groundwater.</p>	<p>3.4.5 Where permanent storage tanks are unavoidably sited in a high-risk position, serious consideration should be given to the provision of appropriate bunding (Appendix 1).</p>
<p>3.3.4 Frequent inspections and regular maintenance should be made of all pipework, valves, tanks, bowsers, lagoons, hard-standing, bunds (if provided) and security systems to minimise the risk of accidental leakage or failure. Records should be kept of this maintenance and inspection.</p>	<p>3.4.6 Consideration should be given as to where any spilled fluid fertiliser would flow in the event of an accident during loading or unloading, or if the store were to develop a leak or be vandalised. Fire-fighting run-off also presents a risk. The total potential spillage must be capable of containment in an impermeable area. Where such areas are on the outcrop of an aquifer, the need to protect groundwater must be considered.</p>
<p>3.4 SITING OF FLUID FERTILISER STORAGE TANKS, LAGOONS AND BOWSERS</p>	
<p>3.4.1 Suitable siting of storage tanks, lagoons and bowsers is critical to avoid potential pollution of watercourses or groundwater in the event of any spillage.</p>	<p>3.4.7 The potential route of any escaping fluid fertiliser should be channeled to a suitable impermeable area by means of permanent soil banks and/or kerbs where necessary. Care should be taken to prevent any spilled fluid fertiliser from running down a road and thus into drains. Soil is a better and more absorbent temporary barrier than sand.</p>
<p>3.4.2 Good, well-constructed vehicular access for large delivery and off-take vehicles is essential. An impermeable hard-standing should be provided at the point of delivery to enable any minor spillage to be contained.</p>	<p>3.4.8 Care needs to be taken in every case with the appropriate siting of tankers, mobile tankers or bowsers. Tankers, mobile tanks and bowsers should all be sited so as to minimise the risk of any spillage of fluid fertiliser entering a watercourse or groundwater, even though such siting may be only temporary.</p>
<p>3.4.3 It should not be assumed that existing sites are correctly sited, even if no pollution problems have arisen. No site should extend to within 10 metres of a watercourse or a drain leading to a watercourse. Bunding of tanks is always recommended</p>	<p>3.4.9 No fluid fertiliser shall be received into bowsers supported on parking legs unless these legs are resting on made-up roadway or concrete of known and adequate thickness, or are resting on a support of suitable size and thickness, to support the loaded weight of the bower without it sinking into the ground and becoming unstable.</p>



<p>3.4.9 No fluid fertiliser shall be received into bowsers supported on parking legs unless these legs are resting on made-up roadway or concrete of known and adequate thickness, or are resting on a support of suitable size and thickness, to support the loaded weight of the bowser without it sinking into the ground and becoming unstable.</p>	<p>3.5.5 All outlet/inlet valve(s) and sight tubes/gauges should be positioned or protected so that they are not vulnerable to vandalism or accidental damage, particularly from passing vehicles. All valves should be inoperable when unattended, and on bunded tanks should be wholly within the bund. Sight tube valves/gauges should be fitted, closed and locked when not in use, and inside any bund.</p>
<p>3.4.10 The user has a responsibility to consider and advise on the correct siting of any tankers or bowsers, including those supplied by a haulier or application contractor. The user should take into consideration the location of surface water drains and land drains. The user must take care to ensure that when laden tankers or bowsers are being moved on their property they are not driven so close to a watercourse or causeway that the bank is unable to support the weight. Weak bridges must be avoided.</p>	<p>3.5.6 With the exception of aqueous ammonia, fluid fertilisers may be stored in lagoons suitably designed and constructed with impermeable walls, floor and cover.</p> <p>3.5.7 Users should conduct a thorough, formal and recorded check of all tanks, bowsers and lagoons at least once a year, in addition to normal everyday observation, for damage or corrosion which might give rise to leakage or failure. Appropriate measures should be taken to repair the storage if necessary and records kept of all inspections and repairs. Advice on inspection and maintenance should be sought from the supplier of the fluid fertiliser.</p>
<p>3.4.11 Fluid fertiliser stores should be sited away from public access to minimise the risk of vandalism, with the outlet(s) and sight gauges securely locked or inoperable when unattended. The stores should be made as secure as feasible, with consideration given to deterrent lighting.</p>	
<p>3.5 FLUID FERTILISER STORAGE</p>	
<p>3.5.1 Fluid fertilisers may be stored in suitable above-ground tanks or, with the exception of aqueous ammonia, in suitably designed lagoons (see 3.5.6). They should not be stored in unsupported flexible containers.</p>	
<p>3.5.2 Permanently-sited tanks and fittings must be fit for the purpose, must be of a suitable material resistant to corrosion and must be sited on a base or footing designed to support the weight of the full tank.</p>	<p>3.6 DELIVERIES AND TRANSFERS</p> <p>3.6.1 A tanker driver delivering fluid fertiliser, who considers the condition of the store, valves, pipework, access or siting inappropriate, may refuse to off-load the delivery.</p>
<p>3.5.3 The outside of steel tanks should be protected against corrosion with a suitable paint.</p>	<p>3.6.2 The user should be satisfied that the supplier of fluid fertiliser is operating in accordance with this Code, Part 1, [Suppliers], and has drawn up adequate emergency procedures for use in the event of a major spillage occurring during fluid fertiliser transfer onto farm. The user should ensure that they are able to assist as necessary to contain any spillage and to avoid pollution of any watercourse or groundwater. Routinely supply and use drip trays.</p>
<p>3.5.4 Tankers, mobile tanks or bowsers should be fit for the purpose and should be of a suitable material resistant to corrosion. All hatches should have covers which provide a watertight seal when closed. No laden mobile tank or bowser should be moved unless all hatches, lids and valves are securely closed.</p>	<p>3.6.3 The user should draw up procedures for use in the event of a major spillage occurring on farm at times other than during delivery by the supplier. These procedures may involve the assistance of the supplier and of the appropriate environment agency. An emergency plan could usefully include drainage and potential containment points.</p>



<p>3.6.4 The user should ensure that, if fluid fertiliser is to be delivered into a mobile bowser or road tanker supported on parking legs, these legs are resting on a made-up roadway or concrete of known and adequate thickness, or on a support of suitable size and thickness, to carry the loaded weight of the bowser without it sinking into the ground and becoming unstable.</p>	<p>3.7.2 In the event of a minor spillage such as a leaking hose or valve the procedure should be as follows:</p> <ul style="list-style-type: none"> • wearing goggles and gloves, stop the leak, • where practicable contain the spillage and mop it up. Do not wash down with water unless specifically advised to do so. • effect repair if possible or inform employer/supplier <p>Tel No. 00 44 1526 396000</p>
<p>3.6.5 All hatches, lids and valves should be securely closed before tankers or bowsers are moved, and valves should be inoperable or locked when unattended.</p>	
<p>3.6.6 Tankers or bowsers should not be filled to capacity, so as to allow for the expansion of contents in warm weather.</p>	<p>3.7.3 Records should be kept of all reported incidents involving spillage resulting from any major spillages occurring at the site.</p>
<p>3.6.7 While ideally users should be present during deliveries, they should ensure that, in their absence, the delivery tanker driver is able to operate all relevant valves so that they can nevertheless remain in-operable before and after delivery.</p>	
<p>3.6.8 The person undertaking any transfer of fluid fertiliser must be aware of all relevant procedures and be capable of taking appropriate action in the event of an incident. They shall remain present and monitor pipework and the receiving tank at all times during the transfer of fluid fertiliser. Drip trays should be used where available.</p>	
<p>3.7 EMERGENCY PROCEDURES FOR DEALING WITH A SPILLAGE INCIDENT AT THE USER'S SITE, (TANKER, BOWSER OR STORAGE TANK):</p>	
<p>3.7.1 Take appropriate action to minimise the spillage and to prevent the pollution of watercourses/groundwater, perhaps using earth barriers/dams. Do not wash down with water unless specifically advised to do so. Immediately contact the appropriate environment agency, or contact the supplier of the fertiliser and your employer (if not self-employed) and request that the appropriate environment agency be informed. Remain on site until released by the fertiliser supplier/your employer.</p>	

APPENDIX 1

SOURCES OF INFORMATION

Containment Systems for the Prevention of Pollution:

Secondary, tertiary and other measures for industrial and commercial premises. CIRIA (C736)
www.ciria.org.uk

Protecting our Water, Soil and Air: a Code of Good Agricultural Practice for Farmers, Growers and Land Managers, Defra, 2009.

The Stationery Office, ISBN 978 0 11 243284 5
www.gov.uk/government/publications/protecting-our-water-soil-and-air

Prevention of Environmental Pollution from Agricultural Activity

The Scottish Government, 2005, ISBN 0 7559 4106 3.
www.scotland.gov.uk/Publications/2002/06/14968/7848

Code of Good Agricultural Practice

DARD, 2008, ISBN 978 1 84807 068 4.
www.dardni.gov.uk/cogap

Fertiliser Manual (RB209) 8th Edition, 2010

The Stationery Office, ISBN 978 0 11 243286 9
www.gov.uk/government/publications/fertiliser-manual-rb209

SRUC Technical Notes: Fertiliser Series

www.sruc.ac.uk

Eurocode 2. Design of concrete structures. Liquid retaining and containing structures

BS EN 1992-3:2006
www.techstreet.com/products/1278297

Groundwater protection: Principles and practice (GP3)

www.environment-agency.gov.uk/research/library/publications/144346.aspx

Recommendations for Safe Storage and Handling of Wet Process Phosphoric Acid, (Phosphoric Acid Produced from Sulphuric Acid), 1991

EFMA, Avenue E Van Nieuwenhuyse 4, B-1160, Brussels
www.fertilizerseurope.com

Hazardous Properties of Ammonia, 1990

EFMA, Avenue E Van Nieuwenhuyse 4, B-1160, Brussels
www.fertilizerseurope.com

Code of Practice for the Prevention of Water Pollution from the Storage and Handling of Solid Fertilisers

Agricultural Industries Confederation, 2009, Confederation House, East of England Showground, Peterborough, PE2 6XE
www.agindustries.org.uk

Guidance for the Preparation of Safety Data Sheets for Fertilizer Materials 2008

EFMA, Avenue E Van Nieuwenhuyse 4, B-1660, Brussels
www.fertilizerseurope.com

FACTS

For details of the FACTS Scheme and its qualified advisers in crop nutrition
 Tel: 01335 343945
www.basis-reg.com/facts

THE ENVIRONMENT AGENCY ENGLAND

Free emergency incident telephone number: 0800 80 70 60
 General enquiries: 03708 506506
www.environment-agency.gov.uk

NATURAL RESOURCES WALES

Free emergency incident telephone number: 0800 807060
 General enquiries: 0300 065 3000
www.naturalresourceswales.gov.uk

SEPA

Free emergency incident telephone number: 0800 807060
www.sepa.org.uk

NORTHERN IRELAND ENVIRONMENT AGENCY

Free emergency incident telephone number: 0800 80 70 60
www.doeni.gov.uk

ENVIRONMENTAL PROTECTION AGENCY IRELAND

National Environmental Incident telephone number: 1850 365 121
www.epa.ie

Photocopy this form to create your own records



FLUID FERTILISER STORAGE TANK ENVIRONMENTAL RISK ASSESSMENT FOR SPILLAGES

This assessment should be completed for all existing or proposed installations

Storage tank sited at

(use field or yard name if relevant)

Tank owner

Owner's address

(if different from location)

Date of assessment

Assessed by

Tank construction *(delete as appropriate):* GRP/Steel/Other (please specify)

Max tank capacity litres gallons

Manufactured by

Date manufactured

Date installed

Maintained and serviced by

HAZARD	✓ YES HIGHER RISK	x NO LOWER RISK
Tank situated where any spillage could enter an open drain, gully or loose fitting manhole cover draining to a ditch, watercourse, lake, pond, land drains or soakaway?		
Is the tank situated over ground or a hard surface that would convey any spillage into a ditch, watercourse, lake, pond, land drains, soakaway or to within 50 metres of a borehole, well or spring?		
Is the tank situated on a free draining, permeable surface?		
Is the tank situated in a position where it can not be observed during delivery or take off?		
Are there any other potential hazards individual to the site that could result in unacceptable environmental damage?		

One or more ticks in the Yes column indicate that the storage tank is at a higher risk. You are recommended to ensure that the tank is provided with adequately designed and constructed secondary containment system which should also enclose ancillary equipment such as the fill and draw off pipework connections.

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TANK INSPECTION CHECKLIST

Tank Location: _____

CHECK	Condition score			Repair required		Comments
	1	2	3	Yes	No	
Visible external corrosion						
Visible corrosion of welded seams						
Plastic tanks damaged, cracked or crazed						
Damp areas on outside of tanks (These may indicate pinhole leaks)						
Tank label						
Condition of inlet valve	Internal					
	External					
Condition of outlet valve	Internal					
	External					
Condition of glass support						
Condition of sight of glass valves						
Condition of tank paint work						
Security locks on fittings: (Inlet/outlet valves, delivery hatches, vent pipes and sight glass valves)						
Total Score						

Secondary Containment System Inspection Checklist (if installed)

CHECK	Condition score			Repair required		Comments
	1	2	3	Yes	No	
Floor of secondary containment system						
Walls of secondary containment system						
Roof of secondary containment system						
Housekeeping inside secondary containment system)						
Drainage outlet						
Adequate to contain 110% capacity of tank						
Total Score						

Secondary Containment System: An impermeable structure around a storage tank and ancillary equipment to allow the contents of the tank to be contained should a leak or spill occur. These systems may take various forms. For example: earth embankments, a brick bund or a metal bund. The ideal capacity of a secondary containment system should be a minimum of 110% of the tanks capacity.

Tank Inspection Score Indicators

Score	Priority	Condition
1-13	No repairs required	1
13-26	Some repairs required	2
26-39	Immediate repairs required	3

Secondary Containment System Inspection Score Indicators

Score	Priority	Condition
1-6	No repairs required	1
6-12	Some repairs required	2
12-18	Immediate repairs required	3

Guidelines for Action

Condition	Examples of faults found
1	Near perfect condition: Paint intact, no paint blisters. No corrosion of tank or valves. No cracks in secondary containment. Tanks supports in good condition. Tank is clearly labelled. Locks on all fittings, eg inlet and outlet valves and sight glass valve. No drainage outlet. No repairs required.
2	Adequate condition: Paint system flaking, but still adequate. Slight corrosion of tanks and valves. Some cracks in secondary containment system. Slight cracking around supports. Label is unclear or in wrong position. Locks only on some fittings. External drainage outlet with control valve. Some repairs required.
3	Bad condition: Paint system flaking badly, pitted or corroded; paint system ineffective. Tank and valves corroded. Secondary containment system badly cracked and retaining liquid. Cracked tank supports. Tank unlabelled. No security locks fitted. Bund ineffective. Immediate repairs required.

Signature: _____

Date: _____

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Lincoln • LN3 5TP

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