

GRP Sectional cold water storage tank

Quality tanks since 1973







Index

			Page
1.	Introduction		2
2.	Guide lines on locating tanks		3
3.	Guide lines on sizing tanks		4
4.	Guide Lines for different models o Modular Building Systems.	f tanks	5 6
5.	Data Sheets	i Insulated tanks	7
		ii Ball Valve housings	8
		iii Drip trays	8
		iv Divisions	9
		v Connections	10
6.	Base details	Metric	12
		Imperial *	13
7.	Capacity tables	Metric	14
		Imperial *	15
8.	Maintenance procedures		16
9.	Sample tender specifications		17
10.	One piece water tanks	i. Specifications	18
	•	ii. Maintenance	19
11.	Glossary of terms		20

Note:

Tanks must be installed and maintained strictly in accordance with our installation and maintenance Instructions.

Head Office: Ballyspillane Industrial Estate, Killarney, Co. Kerry, Ireland

Tel.: +353 64 - 6632421 Fax: +353 64 - 66 32777

Email: <u>sales@ie.tricel.eu</u>
Web: <u>www.ie.tricel.eu</u>

In accordance with Tricel (Killarney) normal policy of product development this specification is subject to change without notice.

^{*} All information in relation to imperial tanks is printed in blue

Introduction

Tricel (Killarney) is one of the foremost companies in the business of producing Glass Fibre Reinforced Plastic (G.R.P.) sectional water tanks.

Tricel (Killarney) is a group of companies headquartered in Ireland and is a global supplier of composite products and technology. Tricel (Killarney) has four core product groups: Building and Automotive Products, Sewage & Effluent Treatment Systems, Reinforced Compounds and Safety Products.

We are one of the few companies who possess the technical expertise and the advanced manufacturing facilities - not only to produce our tanks by hot compression moulding but also to produce in-house, the most important single element without which the term hot press moulding means nothing.

This element, an advanced composite known as Sheet Moulding Compound (S.M.C.) is manufactured in our Killarney Plant with all the necessary characteristics incorporated into the design and tested in advance.

Tricel (Killarney) has achieved a pre-eminent position in this field. Our experience in composite materials extends over 30 years, during which period we have grown to become a market leader - being in sole control of the key elements in the excellence of our product.

All our products are manufactured to ISO9001:2000

Range of Panels

Tank panels are available in both metric (1 x 1meter, 1 x 0.5 meter & 0.5 x 0.5meter) and imperial configurations (1.22 x 1.22 meter, 1.22 x 0.61meter & 0.61m x 0.61meter)









Guidelines for Locating Water Tanks

General

The following recommendations are generally for elevated tanks, as tanks at elevated positions can cause serious damage to the surrounding area in the event of wall, pipe or structural support failure resulting in water spilling out at a fast rate. Consideration must be given to minimise the effects of such an occurrence, in terms of the positioning of the tank and regular inspection for defects.

- Water tanks should be located so as to prevent water damage or consequential loss in the event of leakage howsoever occurring.
- All tanks which are located above water sensitive areas should have a bund wall around them with adequate evacuation ducts.
- All other tanks should have Condensation or Drip trays to prevent nuisance damage and to keep floors dry.

Over the years we have seen tanks fail due to age, lack of maintenance, failure of the structural supports underneath the tanks, contaminated water attacking the internal fittings, ball valve failure where overflows were not fitted, vandalism etc.

Water tanks on top of buildings

Water tanks located on top of any building should be sited at least 1.2 meters away from the edge of the building.

It would be preferable if the water tank was sited 1.5 times the height of the tank away from the edge of the building. In the event of failure, this would allow the water to spread itself over a much wider area before spilling over the edge of the building and possibly taking personnel or debris with it.

Handrails on tank roofs - Health & safety requirements

Handrails may be necessary to satisfy Health & Safety Regulations. The type of railing required is dependant on the tank height, distance from ground level, access etc. Please confirm which handrail arrangement is required so that we can make the necessary inclusion. We can supply and install ladders and railings, but we must be informed of the exact details prior to quoting the project. We assume that the end user is making his own arrangements unless we are informed otherwise.

Water tanks on elevated structures

For water tanks located on top of elevated structures, a walkway of at least 1 meter should be provided all round the water tank to allow for maintenance and inspection. This walkway should comply with health and safety regulations.

Potable water tanks

To comply with the Health & Safety Executive regulations on the Control of Legionellosis 1998, Cold Water Storage Tanks must be located in areas that are "readily accessible for cleaning".

Regular Maintenance and Inspections as required by Health & Safety Legislation.

Guidelines for sizing water tanks

Hotels 1045 Litres (actual capacity) per bedroom per day Offices 45 Litres (actual capacity) per person per day Schools 36 Litres (actual capacity) per person per day

House with 2 bathrooms 682 Litres (actual capacity) per day

The mains pressure must be sufficient to re-fill the tank while the premises are closed. In areas of low water pressure, the above figures would need to be increased. In our experience, the water pressure has been reducing gradually for the past number of years, particularly in the cities and in areas where there have been large developments.

Note: The above figures are based on Dublin Corporation Guide Lines. The minimum Requirements do not include for fire-fighting.

Nominal Versus Actual Capacity

Metric Imperial

Tank H Mgh t	% Loss in capacity for 51mm (2") Overflow	% Loss in capacity for 89mm (3
500	42	51
1000	21	26
1500	14	17
2000	11	13
2500	8	10
3000	7	9
3500	6	7
4000	6	7

Tank Height mm	% Loss in capacity for 51mm (2") Overflow	% Loss in capacity for 89mm (3
610 (2')	35	42
1220 (4')	17	20
1830 (6')	12	14
2440 (8')	9	10

The above figures are approximate and are based on a 51mm (2") and 89 mm (3 $\frac{1}{2}$ ") overflows. If a larger overflow is used, the percentage loss will be greater.



15150 x 4140 x 2000 mm 120,000 litre (26,000 Gallons) Tank Insulated to Format 30. Installed 1998.

Guidelines for different models of tanks



Standard tank: This tank is complete with internally flanged base, externally flanged side walls. All under water stays are Stainless Steel and all bolts are Galvanised to BS 729.

Light duty cover : Only suitable for indoor use, and for the storage of foul water. They are not designed to take Man weight.

Heavy duty cover: Suitable for Indoor and Outdoor Use, and for the storage of foul water. These tanks have internally flanged lid panels, similar to those used in the base.

Heavy duty cover and finished to Format 30: Suitable for Indoor, Outdoor use and for the storage of Drinking Water, as defined in our specification, Tricel (Killarney) Format 30 on page 6.

Note:

- To comply with current legislation all tanks that store water that may be used for drinking must be protected, they must meet the requirements set out in the water byelaws
- BS 6700 states that because any cold water tap is likely to be used to drink from, all such taps not directly connected to the mains shall be supplied only from tanks that are protected.
- Where drinking water has been stored in an inadequately protected tank, a water analysis should be considered and adequate protection installed.
- Tanks of over 1000 litres (220 gallons) shall be divided or have standby tanks to facilitate repairs and maintenance. It should also have a wash out pipe or drain out taps, these to terminate above an outside gully to prevent wastage.

• Tank insulation materials should not suffer permanent structural damage from contact with water generally Phenolic and Polyurethane closed cell foams comply. Where pipe cut outs go through insulation panels, bezels should be fitted to protect the exposed insulation from the ingress of moisture, insects and vermin and preserve the integrity of the insulation with a protective finish.

Types of bolts: Standard Tanks come complete with Bolts galvanised to BS 729, we recommend that Consultants specify Stainless Steel grade 316 S16 bolts under water.

Dividers: In any situation where there is only one water storage tank in a building and the capacity is greater that 1000 litres (220 gallons), BS 6700 states "To avoid interruption of the water supply when carrying out repairs or maintenance, the cistern shall be provided with compartments or standby cistern". Where drinking water is being stored, two separate tanks are recommended as it is difficult detect cross contamination from one side of a division wall to another.

Condensation trays: They should be used in any instance where condensation, drips from pipe work, or from the tank could cause nuisance damage or render floors wet and slippery. Ball valve housing: Enclosed chamber containing an access hatch above the level of the cover, permitting the level control mechanism to be mounted at a higher level than would otherwise be possible. The overflow(s) must be placed on the tank side wall and not on the Ball Valve Housing. Water must be kept below tank roof level. This is only necessary where very large ball valves are used.

Ladders: Where tank depth is 1.5 m or greater, internal and external ladders should be specified. If the tank is on a raised platform then ladders may be required on tanks lower than this height. Where the tank is 2m or more from the top of the tank to the finished floor level external ladders should be fitted with safety cages and comply to BS4211 1994.

Handrail: A handrail should be fitted enclosing all access points to the tank roof, where a tank is 2m or more from the top of the tank to the finished ground level.

Reverse base tanks: (Externally flanged base) These types of tanks allow the tank to be totally drained down, as the base is flat, they also allow access to all the bolts from outside the tank. 450 mm clearance is required underneath the tank for access to the base bolts.

The client shall ensure that potable water is not stored in tank compartments that are adjacent to compartments storing foul water due to risk of contamination.

Side access hatch





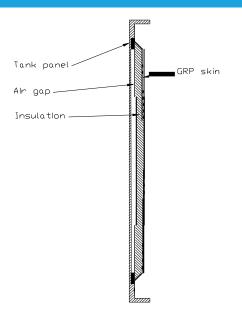
The Side Access Hatch has an opening of 600mm x 600mm. It is available as a 1000mm x 1000mm metric panel or as a 1220mm x 1220mm imperial module panel. The side access hatch is a useful choice when there are height restrictions on site. It also provides easier access to the inside of a tank, particularly when there is restricted space above the tank.

The Side Access Hatch comprises of three main components: panel, flange and flat hatch sheet. To open the hatch, the flat hatch sheet is simply unbolted from the flange. It can only be opened when the water level inside the tank is lower than the access hatch.

This Access Hatch was designed so that both the head of the bolt and the nut are accessible. This allows a wrench to be placed on the bolt head as well as the nut and prevents a scenario of the bolt simply spinning without opening.

Please note that the 'tank sealant' between the flat access sheet and the will need to be in good condition or replaced, prior to the reattachment of the flat access hatch.

Tanks insulated and finished to Format 30



Note: This is only an example of one type of insulation skin, there are different arrangements for different types of tanks.

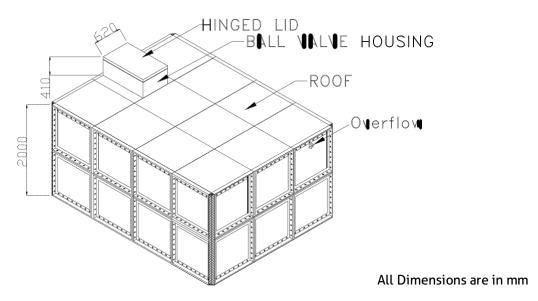
- Current legislation states that water hot or cold, in any premises that might be used for human consumption must be of potable quality.
- In addition to tank material specifications, there are now further requirements for lid design, the screening of vents, breathers, overflows, warning tell tale pipes and the provision of insulation which will help prevent freezing and also help keep water as cool as practicable, ideally less than 20°C.
- Format 30 is our description of tanks with Heavy Duty panel covers, complete with screened vents, overflows, warning pipes etc and having side wall and roof panels with a (u) value of 2.5 w/m²K, (tanks under 1m high have a slightly higher value). This value meets the requirements of section 30 of the water bye laws in the majority of situations. Tanks in boiler rooms etc may also need base insulation. The purchaser can specify extra requirements or thermal transmittance after considering the period of protection necessary, the tank location and the surrounding conditions.

Please Note: Insulation slows down but does not prevent heat loss or gain over protracted periods. Additional information is available in BS 7491 & BS 6700.

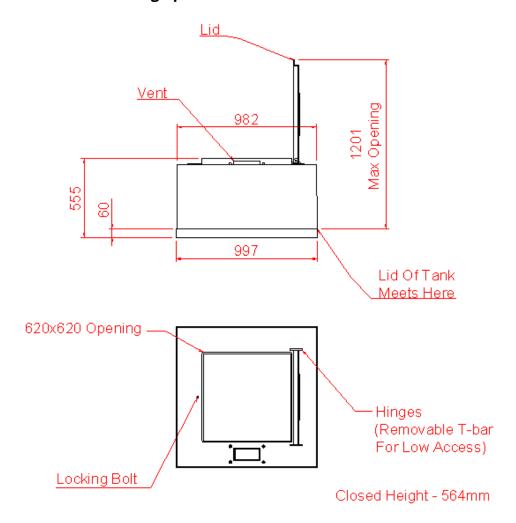


5150 x 4150 x 2000 mm 40,000 Litre (8,800 Gallons) Water Tank, Insulated to Format 30

Ball valve housing



Ball Valve Housing Specification



Isometric view of a Ball Valve Housing on a 4000 x 3000 x 2000 mm Sectional cold water storage tank. A Ball Valve Housing is an enclosed chamber containing an access hatch above the level of the cover, which leaves space for larger ball floats to raise up and shut off the water supply.

Specification

External Dimensions: 1000 x 1000 x 560 mm high

Space required: 1201 mm clearance space is required above the roof of the tank, i.e.

For a 2m high tank the room needs to be 3201 mm high.

Note: The overflow(s) must be placed on the tank side wall and not on the Ball Valve Housing. Water must be kept below tank roof level.

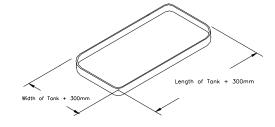
Condensation trays

We manufacture condensation trays to suit all sizes of Water Storage Tanks.

For Sectional cold water storage tanks, the tray extends round the tank by 150 mm. i.e. a sectional tank with external dimensions 4150 x 3150 mm will have a tray approximately 4300 \times 3300 mm.

Trays for large sectional tanks are joined on site.

Condensation trays should be water tested at time of testing tank.



Condensation Trays should be used in any instance where condensation, drips from pipe work or from the tank could cause nuisance damage or render floors wet and slippery.

A condensation tray is not a substitute for a bund wall or for tanking out a room.

APPROPRIATE OVERFLOWS MUST BE FITTED AS CLOSE AS POSSIBLE TO THE BASE OF THE DRIP TRAY. THESE MUST BE FITTED BEFORE THE TANK IS FILLED. TRAYS ARE DESIGNED TO HOLD A MAXIMUM OF 25MM OF WATER

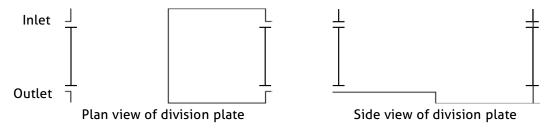
Tank divisions

In any situation where there is only one water storage tank in a building and the capacity is greater that 1000 litres (220 gallons), BS 6700 states "To avoid interruption of the water supply when carrying out repairs or maintenance, the cistern shall be provided with compartments or standby cistern". Where drinking water is being stored, two separate tanks are recommended as it is difficult detect cross contamination from one side of a division wall to another.

Division Types

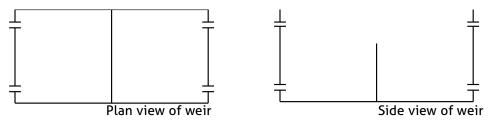
Division Plate

Construction of one or more panels within a tank which divides the tank into two separate compartments.



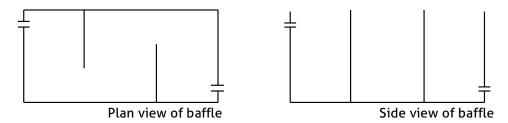
Weir

Construction of one or more panels within a tank, which divides the tank but to less than its full depth such that the contents can spill over from one side of the weir to the other.



Baffle

Construction of one or more panes within a tank, which partially subdivides the tank in order to increase the length of the flowpath between the inlet and the outlet from the tank.



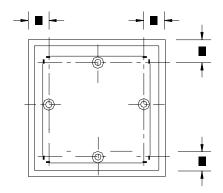
Maintenance on tanks with dividers

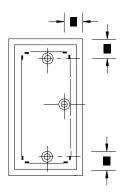
• Extra care should be taken during the maintenance of tanks with divisions, as maintenance staff will be working in an enclosed space, adjacent to a large volume of water in relation to the size of the space. (See Health & Safety Act)

Pipe connections for cold water storage tanks

- IIIIf the tank is to be drained down at a fast rate or by pumps etc, we should be contacted so that adequate vents can be placed on the tank. The standard vent is 2".
- III Connections of 100mm (4") nominal bore or over require studded flange pads to suit BS1962, table D&E flanges for pipework connections.
- III connections below 100mm (4") nominal bore may be made by cutting holes in situ. First determine whether single or double sided connections are required and cut hole in panel to suit external pipe diameter.
- If or connections over 50 mm (2") nominal bore use two flanges screwed BS21 taper thread, drilled to BS 10. Offer one flange to panel concentric with hole and transfer drill bolt holes into panel. Set one flange to external pipe and using appropriate gaskets, assemble external flanged pipe using other flange as an internal backing plate. Finally bolt up.
- If or double sided connections proceed as above, replacing internal flange with the required fitting, e.g. ball valve, strainer basket etc.
- If or connections of 50 mm (2") nominal bore or less proceed as above or alternatively use threaded flanges or backnuts (with rubber gaskets) on standard longscrew to BS 1387.

The figures below show hole diameter for in situ pipe fittings and minimum dimensions for the location of connections from panel edges.





Nominal bore diameter (mm/inch)	Nominal hole Size (mm/inch)	Dimension A (mm/inch)
12.7 (½)	22	158 (6 ½)
_19	28 (1 ³ /32)	161 (6 ³ /8)
25.4 (1)	35 (1 ³ /8)	167 (6 ⁵ /8)
31.7 (1 ¹ / ₄)	44 (1 ³¹ /32)	170 (6 ³ /4)
38.1 (1 ¹ /2)	50 (1 ³¹ /32)	177 (7)
50.8 (2)	61 (2 ¹³ /32)	186 (7 ³ /8)
63.5 (2 ¹ / ₂)	78 (3 ¹ /16)	193 (7 ⁵ /8)
76.2 (3)	90 (3 ⁹ /16)	202 (8)
89	105 (4 ¹ /8)	212 (8 ³ /8)

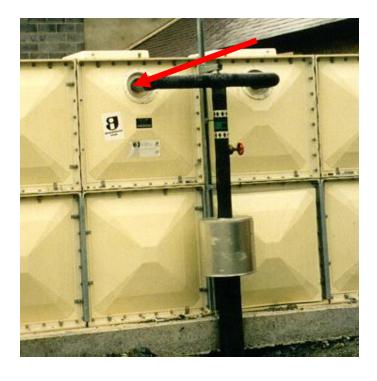
General notes

All pipe work must be self supporting. If welded or brazed-on flanges are used, all heat must be dissipated before connections are made to the tank. Holes may be cut with normal metal working tools.

Note: These figures only apply to Un-Insulated tanks

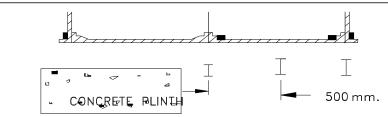
Pipe connections for insulated cold water storage tanks.

The areas where pipe connections can be made on insulated tanks are more restricted than in standard tanks, the picture below shows a recess in the insulation panel to allow for the pipe connection. Standard insulated tanks come with three insulation panels with recesses. More can be supplied if required. These are generally 190mm diameter



Base details /design considerations (METRIC)

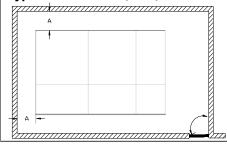
Tanks based on 1x1 & 1x.5 m panels



Standard base tanks (internally flanged base panels) may be laid directly on a concrete plinth having a trowelled finish, brushed clean and free from any local protuberances. It should be flat, level and not vary more than 6 mm in any 6 m, measured laterally or diagonally with a maximum variance of 2 mm per metre. The plinth must exceed the nominal tank dimensions by a minimum of 200 mm.

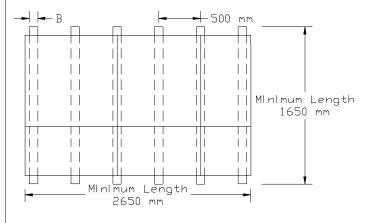
Tanks erected on elevated structures (RSJ beams or brick courses in one direction only). Bearers must be at 500 mm centres. Bearer length must exceed nominal tank dimensions by a minimum of 150 mm plus any extra for fixings. All bearer walls to be flat and level. For bearer width see chart below.

Typical Tank Room (Plan)



For dimension 'A' see chart below. This clearance should be on all sides of the tank, also a top clearance of 650 mm is required for standard access hatch to open. (This can be reduced to 450 mm provided that we are notified prior to dispatch). If the tank has to be pushed closer to any wall after assembly or if the working space is reduced (dimension 'A') at a later stage, by the building of walls etc, responsibility will rest with others.

Example: Tank where base is 2650 x 1650 mm



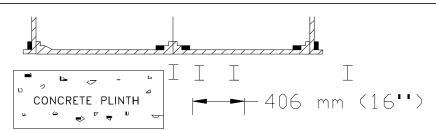
General Notes:

- 1. Tanks should not be placed above / beside water sensitive areas, unless there is adequate bunding.
- 2. Client to design suitable bearers to suit load conditions. Water load = $1000 \text{ kg/M}^3 + 20 \%$ for tank
- 3. Bearers can run in either direction.
- 4. It is necessary that the top of each bearer be flat, level and level with it's neighbouring bearers.
- 5. Deflection must not exceed 1/500th of the unsupported span of the bearers. The unsupported span can only be in one direction.
- 6. Adequate overflows should be fitted to prevent the tank from being pressurised.
- 7. Tanks in exposed places may be susceptible to movement in high winds, especially when empty. These may need to be anchored to the base, this work is to be carried out by others.

Working space and bearer width				
Tank Height	Dimension 'A'	Bearer Width 'B'		
Mm	Mm	mm		
500	450	75		
1000	450	100		
1500	500	100		
2000	600	150		
2500	650	150		
3000	700	150		

Base details /design considerations (IMPERIAL)

Tanks based on 1.22m x 1.22m & 1.22m x.61m panels

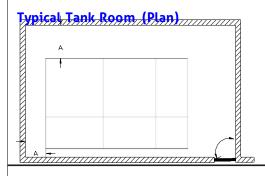


Standard base tanks (internally flanged base panels) may be laid directly on a concrete plinth having a trowelled finish, brushed clean and free from any local protuberances. It should be flat, level and not vary more than 6 mm in any 6 m, measured laterally or diagonally

with a maximum variance of $\, 2 \, \text{mm}$ per metre. The plinth must exceed the nominal tank dimensions by a minimum of 200 mm.

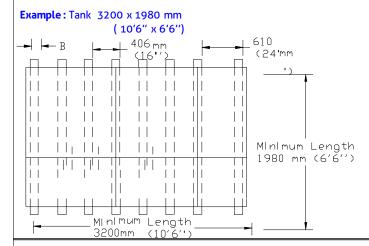
Tanks erected on elevated structures (RSJ beams or brick courses in one direction only). Bearers must be at 406 mm (16") centres. Where a half panel is used one bearer at 610 mm (24") centres is required. Bearer length must exceed nominal tank dimensions by a minimum of 150 mm plus any extra for

dimensions by a minimum of 150 mm plus any extra for fixings. All bearer walls to be flat and level. For bearer width see chart below.



For dimension 'A' see chart below. This clearance should be on all sides of the tank, also a top clearance of 650 mm is required for standard access hatch to open. (This can be reduced to 450 mm provided that we are notified prior to dispatch). If the tank has to be pushed closer to any wall after assembly or if the working space is reduced

(dimension 'A') at a later stage, by the building of walls etc, responsibility will rest with others.



General Notes:

- 1. Tanks should not be placed above / beside water sensitive areas, unless there is adequate bunding.
- 2. Client to design suitable bearers to suit load conditions. Water load = 1000 kg/M 3 + 20 % for tank. 3. Bearers can run in either direction.
- 4. It is necessary that the top of each bearer be flat, level and level with it's neighbouring bearers.
- 5. Deflection must not exceed 1/500th of the unsupported span of the bearers. The unsupported span can only be in one direction. 6. Adequate overflows should be fitted to prevent the tank from being pressurised. 7. Tanks in exposed places may be susceptible to movement in high winds, especially when empty. These may need to be anchored to the base, this work is to be carried out by others.

Working Space and Bearer Width

•		
Tank Height mm	Dimension 'A' mm	Bearer Width 'B' mm
610	450	75
1220	450	75
1830	500	75

Capacity tables - metric panels

Panel sizes available: 1m x 1m, 1m x .5m, .5m x .5m

Tank sizes given in this table are based on their external dimensions which are 150 mm greater than the internal dimensions.

Nominal capacities are calculated based on internal dimensions as follows INTERNAL LENGTH X WIDTH X HEIGHT IN $M = M^3 \times 1000 = Litres \div 4.546 = Gallons$.

External	External	1m		1.5		2m		2.5	
Length	Width	high		m		high		m	
m	m	litre	gallons	litres	gallons	litres	gallons	Litres	gallons
1.15	1.15	100	220	1500	330	2000	440	2500	550
1.65	1.15	150	330	2250	495	3000	661	3750	826
2.15	1.65	300	660	4500	991	6000	1322	7500	1651
2.65	1.15	250	550	3750	825	5000	1101	6250	1377
2.65	1.65	375	825	5625	1278	7500	1652	9375	2065
2.15	1.15	200	440	3000	660	4000	880	5000	1,100
2.15	2.15	400	880	6000	1,320	8000	1,760	10000	2,200
3.15	1.15	300	660	4500	990	6000	1,320	7500	1,650
3.15	2.15	600	1,320	9000	1,980	12000	2,640	15000	3,300
3.15	3.15	900	1,980	13500	2,970	18000	3,960	22500	4,949
4.15	1.15	400	880	6000	1,320	8000	1,760	10000	2,200
4.15	2.15	800	1,760	12000	2,640	16000	3,520	20000	4,399
4.15	3.15	1200	2,640	18000	3,960	24000	5,279	30000	6,599
4.15	4.15	1600	3,520	24000	5,279	32000	7,039	40000	8,799
5.15	1.15	500	1,100	7500	1,650	10000	2,200	12500	2,750
5.15	2.15	1000	2,200	15000	3,300	20000	4,399	25000	5,499
5.15	3.15	1500	3,300	22500	4,949	30000	6,599	37500	8,249
5.15	4.15	2000	4,399	30000	6,599	40000	8,799	50000	10,999
6.15	1.15	600	1,320	9000	1,980	12000	2,640	15000	3,300
6.15	2.15	1200	2,640	18000	3,960	24000	5,279	30000	6,599
6.15	4.15	2400	5,279	36000	7,919	48000	10,559	60000	13,198
6.15	5.15	3000	6,599	45000	9,899	60000	13,198	75000	16,498
6.15	6.15	3600	7,919	54000	11,879	72000	15,838	90000	19,798
7.15	1.15	700	1,540	10500	2,310	14000	3,080	17500	3,850
7.15	2.15	1400	3,080	21000	4,619	28000	6,159	35000	7,699
7.15	3.15	2100	4,619	31500	6,929	42000	9,239	52500	11,549
7.15	6.15	4200	9,239	63000	13,858	84000	18,478	10500	23,097
7.15	7.15	4900	10,779	73500	16,168	98000	21,557	12250	26,947
8.15	1.15	800	1,760	12000	2,640	16000	3,520	20000	4,399
8.15	2.15	1600	3,520	24000	5,279	32000	7,039	40000	8,799
8.15	3.15	2400	5,279	36000	7,919	48000	10,559	60000	13,198
9.15	1.15	900	1,979	13500	2,969	18000	3,960	22500	4,949
9.15	2.15	1800	3,960	27000	5,939	36000	7,919	45000	9,899
9.15	3.15	2700	5,939	40500	8,908	54000	11,878	67500	14,848
9.15	4.15	3600	7,919	54000	11,878	72000	15,838	90000	19,797
10.15	5.15	5000	11,013	75000	16,520	10000	22,026	12500	27,533

16.15	6.15	9600	21,145	14400	31,718	19200	42,290	24000	52,863
48.15	_		25,330	1.73 m		2.31 m		2.88 m	634,36
	External		3m		3.5		4m		1
	Length	l	high		m		high		
	m	m	Litres	gallons	litres	Gallons		gallon	S
	1.15	1.15	3000	660	3500	770	4000	880	
	1.65	1.15	4500	991	5250	1,155	6000	1,320	,
ľ	2.15	1.65	9000	1982	10500	2,310	12000	2,640	
	2.65	1.15	7500	1652	8750	1,925	10000	2,200	,
	2.65	1.65	11250	2478	13125	2,887	15000	3,300	,
	2.15	1.15	6000	1,320	7000	1,539	8000	1,760	,
	2.15	2.15	12000	2,640	14000	3,079	16000	3,520	
	3.15	1.15	9000	1,980	10500	2,310	12000	2,640	,
	3.15	2.15	18000	3,960	21000	4,619	24000	5,279	
	3.15	3.15	27000	5,939	31500	6,929	36000	7,919	
	4.15	1.15	12000	2,640	14000	3,080	16000	3,520	,
	4.15	2.15	24000	5,279	28000	6,159	32000	7,039	,
	4.15	3.15	36000	7,919	42000	9,239	48000	10,55	9
	4.15	4.15	48000	10,559	56000	12,319	64000	14,07	8
	5.15	1.15	15000	3,300	17500	3,850	20000	4,399)
	5.15	2.15	30000	6,599	35000	7,699	40000	8,799	
	5.15	3.15	45000	9,899	52500	11,549	60000	13,19	8
	5.15	4.15	60000	13,198	70000	15,398	80000	17,59	8
	6.15	1.15	18000	3,960	21000	4,619	24000	5,279	,
	6.15	2.15	36000	7,919	42000	9,239	48000	10,55	9
	6.15	4.15	72000	15,838	84000	18,478	96000	21,11	7
	6.15	5.15	90000	19,798	10500	23,097	12000	26,39	7
	6.15	6.15	10800	23,757	12600	27,717	14400	31,67	6
	7.15	1.15	21000	4,619	24500	5,389	28000	6,159	
	7.15	2.15	42000	9,239	49000	10,779	56000	12,31	9
	7.15	3.15	63000	13,858	73500	16,168	84000	18,47	8
	7.15	6.15	12600	27,717	14700	32,336	16800	36,95	6
	7.15	7.15	14700	32,336	17150	37,725	19600	43,11	5
	8.15	1.15	24000	5279	28000	6,159	32000	7,039)
	8.15	2.15	48000	10559	56000	12,319	64000	14,07	8
	8.15	3.15	72000	15838		18,478			7
	9.15	1.15	36000	7,919	31500	6,929	36000	7,919)
	9.15	2.15	54000	11,878	63000	13,858	72000	15,83	8
	9.15	3.15	81000	17,817	94500	20,788	10800	23,75	7
	9.15	4.15	10800	23,571	12600	27,717	14400	31,67	
	10.15	5.15	15000	33,039	17500	38,495	20000	43,99	5
	16.15	6.15	28800	63,436	33600	73,911	38400	84,47	
	48.15	24.15	3.45 m	759,91	4.03m	886,93	4.6m	1.1m	
_									

ACCESS FOR ERECTION:

Adequate space must be available for erection purposes and across the cover for access to the inside of the Tank. See assembly space requirements.

As a quick guide to space required:

Add 0.9 m to length and width of 0.5m & 1m high tanks.

Add 1m to length and width of 1.5m high tanks. Add

1.2 m to length and width of 2m high tanks.

Add 1.3 m to length and width of 2.5m high tanks. Add 1.4 m to

length and width of3, 3.5 & 4m high tanks.

Capacity tables - imperial panels

Panel sizes available: 1.22m x 1.22m, 1.22m x .61, .61m x .61m

Tank sizes given in this table are based on their external dimensions which are 150 mm greater than the internal dimensions.

Capacities are calculated based on internal dimensions as follows INTERNAL LENGTH X WIDTH X HEIGHT IN $M = M^3 \times 1000 = Litres \div 4.546 = Gallons$.

External	External	.61m		1.22		1.83m		2.44m	
Length	Width	high		m		high		high	
m	М	litres	gallons	Litres	gallons	litres	gallons	Litres	gallons
1.37	1.37	90	20	181	40	272	60	363	800
1.98	1.37	136	30	272	60	409	90	545	1200
1.98	1.98	204	45	409	90	613	135	818	1800
2.59	1.37	181	40	363	80	545	120	727	1600
2.59	1.98	272	60	545	120	818	180	1091	2400
2.59	2.59	363	80	727	160	1091	240	1454	3200
3.2	1.37	227	50	454	100	681	150	909	2000
3.2	1.98	341	75	681	150	1022	225	1363	3000
3.2	2.59	454	100	909	200	1363	300	1818	4000
3.2	3.2	568	125	1136	250	1704	375	2273	5000
3.81	1.37	272	60	545	120	818	180	1091	2400
3.81	1.98	409	90	818	180	1227	270	1636	3600
3.81	2.59	545	120	1091	240	1636	360	2182	4800
3.81	3.2	681	150	1363	300	2045	450	2727	6000
3.81	3.81	818	180	1636	360	2454	540	3273	7200
4.42	1.37	318	70	636	140	954	210	1272	2800
4.42	1.98	477	105	954	210	1432	315	1909	4200
4.42	2.59	636	140	1272	280	1909	420	2545	5600
4.42	3.2	795	175	1591	350	2386	525	3182	7000
4.42	3.81	954	210	1909	420	2864	630	3818	8400
4.42	4.42	1113	245	2227	490	3341	735	4455	9800
5.03	1.37	363	80	727	160	1091	240	1454	3200
5.03	1.98	545	120	1091	240	1636	360	2182	4800
5.03	2.59	727	160	1454	320	2182	480	2909	6400
5.03	3.2	909	200	1818	400	2727	600	3636	8000
5.03	3.81	1091	240	2182	480	3273	720	4364	9600
5.03	4.42	1272	280	2545	560	3818	840	5091	11200
5.03	5.03	1454	320	2909	640	4364	960	5818	12800
5.64	1.37	409	90	818	180	1227	270	1636	3600
5.64	1.98	613	135	1227	270	1841	405	2454	5400
5.64	2.59	818	180	1636	360	2454	540	3273	7200
5.64	3.2	1022	225	2045	450	3068	675	4091	9000
5.64	3.81	1227	270	2454	540	3682	810	4909	10800
5.64	4.42	1432	315	2864	630	4296	945	5728	12600
5.64	5.03	1636	360	3273	720	4909	1080	6546	14400
5.64	5.64	1841	405	3682	810	5523	1215	7365	16200

ACCESS FOR ERECTION:

Adequate space must be available for erection purposes and across the cover for access to the inside of the Tank. See assembly space requirements.

As a quick guide to space required:

Add 0.9 m to length and width of 0.61m & 1.22m high tanks. Add

1m to length and width of 1.83m & 2.44m high tanks.

Maintenance recommendations for sectional water storage tanks

Maintenance interval: Annually

Check list

- 1. All internal supports should be checked for corrosion, if corrosion is found it should be rectified immediately.
- 2. Check generally for leaks or drips.
- 3. Check that all pipe work connected to the tank is suitably braced.
- 4. Check that the structural supports under the tank are in good condition.
- 5. Check that overflows are fitted.
- 6. When cleaning the inside of the tank, do not interfere with the joint seals.
- 7. If overflow and/or air inlet screens are fitted, check that they have not become blocked.
- 8. If insulated check that insulation and the manhole is securely fixed and not damaged, if they are damaged then the tank is not in compliance with Byelaw 30.
- 9. If not insulated in accordance with Byelaw 30, ensure that people cannot consume water from the tank. We can advise on upgrading the tank to Byelaw 30 standard.
- 10. If there is a Condensation Tray with the tank, ensure that it has an overflow fitted and that it has not been damaged.
- 11. If there are ladders fitted to the tank, ensure that they have not been damaged and are securely fastened to the tank.
- 12. If the tank has a light duty cover and sited out of doors, check that the cover has not suffered structural damage. (This type of cover is not suitable for potable water or outdoor use).
- 13. If the area underneath / adjacent to the tank has become water sensitive check that the tank room is bunded with adequate escape ducts.
- 14. If the tank room is bunded, check that it is in good condition.
- 15. After maintenance of the tank is complete, ensure that the manhole seal is intact and the manhole is securely closed.

Maintenance on tanks with dividers

Extra care should be taken during the maintenance of tanks with divisions, as maintenance staff will be working in an enclosed space, adjacent to a large volume of water in relation to the size of the space. (See Health & Safety Act)

Note : Further information on the Health & Safety aspect, reference water quality is available in BS 6700.

Do not stand on internal stays while maintenance is being carried out.

Guidelines for tender specification

- 1. The cold water tank shall be sectional, constructed from panels which are either 1.22m (4 ft.) square or 1m (3.28 ft.) square using half and quarter panels where necessary.
- 2. Panels shall be hot pressed from specially formulated potable water grade of Glass reinforced plastic (G.R.P.)
- 3. All corner angles, gussets, divider carriers and roof supports shall be from the same material.
- 4. All underwater bolts, tie bars, joiners etc., shall be stainless steel grade 316 S16, external bolts shall be mild steel to BS 3692 and Galvanised to BS 729.
- 5. The lid shall be heavy duty, formed from panels as per base design, have vertical supports at each panel intersection.
- 6. All vents, warning pipes, overflows, shall have mesh screens of maximum 0.65mm x 0.65mm holes to protect contents.
- 7. The tank shall be insulated on the sides and lid. The insulation material shall be of rigid closed cell polyurethane foam, have a protective GRP skin securely fixed and sealed to the tank panel surface using a gasket type seal. All pipe cut outs shall have bessels of the same material securely fitted and sealed to both the outer skin and panel face. All insulation to be to Tricel (Killarney) Format 30 finish or approved equal.
- 8. Where the tank depth is greater than 1.5m (or the top of the tank is more than 1.5 m from the ground) Internal and External ladders shall be fitted in each compartment. Where the tank is 2m or more from the top of the tank to the finished floor level external ladders should be fitted with safety cages and comply to BS4211 1994. Internal ladders may be constructed from GRP or stainless steel. External ladders may be constructed from Aluminium.
- 9. A handrail should be fitted enclosing all access points to the tank roof, where a tank is 2m or more from the top of the tank to the finished ground level.
- 10. A divider shall be fitted to facilitate maintenance and repairs.
- 11. A side access hatch in each compartment situated on the lowest $1m \times 1m$ or $1220mm \times 1220mm$ panel.
- 12. The client shall ensure that potable water is not stored in tank compartments that are adjacent to compartments storing foul water due to risk of contamination.
- 13. The contractor shall ensure that the base supports conform to the tank manufacturer's recommendations.
- 14. Tanks to be commissioned and maintained in accordance with BS 6700.
- 15. The plumber should not leave the tank unattended during commissioning (first filling with water).
- 16. The Tank shall be manufactured to Format 30 specification by Tricel (Killarney) Ph. 00353 64-6632421) or approved equal.

One piece tanks

Tricel (Killarney) manufactures a variety of One Piece cold water storage tanks. These durable one piece constructions are easy to install and represent excellent value for money. They come in sizes from 45 to 4546 Litres.

One piece tanks can also be supplied insulated to Format 30, thus meeting Dublin Corporation requirements for break tanks.

The following sizes are EX stock

		THE TOLLOWI	31263 6	i C E/i Stocii		
Model	Length	Width	Height	Height if Insulated	Litres nominal	Gallons nominal
KP10	495	370	345	420	45	10
KP20 sq	610	485	445	520	91	20
KP25	1200	530	340	420	114	25
KP40 L	1041	546	457	457	182	40
KP40 sq	670	530	565	640	182	40
KP50	1216	545	457	545	227	50
KP70	1230	575	584	650	318	70
KP100	1448	740	610	685	454	100
KP150	1645	1075	545	610	682	150
KP200	1660	1055	690	765	909	200
KP250	1660	1055	845	920	1136	250
KP300	1660	1245	845	1015	1363	300
KP400	2545	1330	615	775	1818	400
KP500	1880	1375	1140	1300	2275	500
KP600	Dia 1830	Dia 1830	1240	1340	2730	600
KP800	2690	1830	1040	1040	3637	800
KP1000	2690	1830	1290	1290	4546	1000

- Insulated One piece tanks come complete with insulated covers.
- GRP covers and condensation trays are available for all sizes.
- When the tanks are installed space is required above the tanks for access.

Underground tanks insulated to Format 30.

KPU x 200	1645	1035	1285	1285	909	200
KPU x 500	2030	1500	1585	1585	2273	500
KPU x 800	2690	1830	1525	1525	3637	800
KPU x 1000	2690	1830	1775	1775	4546	1000
KPU x 1200	3169	1824	1775	1775	5455	1200
KPU x 2000	2125	1824	1775	1775	9092	2000

Underground tanks are suitable of 300mm of soil. All tanks have a ball valve box 500mm

Installation notes

- a. Ensure that the base of the cistern is adequately and uniformly supported over its whole area.
- b. Support and align the pipes so as not to distort the cistern, and do not over tighten the back nuts.
- c. Ensure that circular holes for fixing pipes have a clean edge, free from notches, and cut them with a hole saw or drill them with a sharp cutter.
- d. Position the cistern so that it is not in close proximity to any source of heat
- e. The tank should not be left unattended during commissioning.

Maintenance recommendations for one piece water storage tanks

Maintenance interval: Minimum of once yearly.

Check List

- 1. All internal supports should be checked for corrosion, if corrosion is found it should be rectified immediately.
- 2. Check generally for leaks or drips.
- 3. Check that all pipe work connected to the tank is suitably braced.
- 4. Check that the structural supports under the tank are in good condition.
- 5. If overflow and/or air inlet screens are fitted, check that they have not become blocked.
- 6. If insulated check that insulation and the manhole is securely fixed and not damaged, if they are damaged then the tank is not in compliance with Byelaw 30.
- 7. If not insulated in accordance with Byelaw 30, ensure that people can not consume water from the tank. We can advise on upgrading the tank to Byelaw 30 standard.
- 8. If there is a Condensation tray with the tank, ensure that it has an overflow fitted and that it has not been damaged.
- 9. If the tank has a light duty cover and sited out of doors, check that the cover has not suffered structural damage. (This type of cover is not suitable for potable water or outdoor use).
- 10. If the area underneath / adjacent to the tank has become water sensitive check that the tank room is bunded with adequate escape ducts.
- 11. If the tank room is bunded, check that it is in good condition.
- 12. After maintenance of the tank is complete, ensure that the manhole seal is in tact and the manhole is securely closed.

Note : Further information on the health & safety aspect, reference water quality is available in BS 6700.

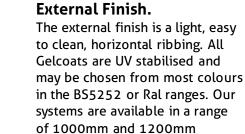
Modular building systems – Tank & equipment enclosures

The modular building system is constructed of GRP (fibreglass) modules to various sizes and colours to meet customers specifications.

Architecture.

Modular building systems can help you meet strict planning regulations, by hiding unsightly booster-sets, pumps, airconditioning systems & water tanks. These modular systems from Tricel (Killarney) can help blend roof-tops into a more natural surroundings.





to suit our customers requirements.



Fire Resistance.

Fire resistance materials to Class O, Class 1 or Class 2 can be offered as an option.

modules, with special modules

Glossary of terms

Sectional tank: Rectangular fixed container assembled from panels for the storage of water at atmospheric pressure and at a maximum temperature of 30 °C.

Note: This temperature is higher than is acceptable for drinking water, which should not normally exceed 20 °C.

Nominal Capacity: Volume contained in a tank, measured up to the top edge of the side walls.

Actual capacity: Volume contained in the tank up to the maximum working level, this can be between 10 and 50% less than the Nominal Capacity.

Bund Wall: Structure situated underneath water tanks. It's purpose is to protect the building from water damage. All water tanks located above areas that are water sensitive should be bunded.

Ball valve housing: Enclosed chamber containing an access hatch above the level of the cover, permitting the level control mechanism to be mounted at a higher level than would otherwise be possible.

Vent: Opening to the atmosphere to allow for the movement of air resulting from changes in the water level so that the water always remains at atmospheric pressure.

Warning pipe: Pipe so fixed that it's outlet, whether inside or outside a building, is in a conspicuous position where the discharge of water can be readily seen.

Overflow pipe: Pipe connected to the tank to discharge any overflow therefrom.

Division plate: Construction of one or more panels within a tank which divides the tank into two separate compartments.

Note: In any situation where there is only one water storage tank in a building, it is to be recommend that a weir or a division plate be used. This will facilitate maintenance of the tank without effecting the water supply to the building.

Weir: Construction of one or more panels within a tank, which divides the tank but to less than its full depth such that the contents can spill over from one side of the weir to the other. Baffle: Construction of one or more panels within a tank, which partially subdivides the tank in order to increase the length of the flowpath between the inlet and the outlet from the tank. Leakage test: The duration of the test should be a minimum of 24 hours, commencing at least 2 hours after the tank has been filled. The test shall be carried out within 10 days of erection unless

the manufacturer agrees to a longer period after assembly. The tank should be inspected at regular intervals and not deserted during commissioning (first filling with water). The leakage test is not carried out by Tricel (Killarney)

BS 7491 : Part 3 : 1994 : Glass fibre reinforced plastics cisterns for cold water storage. Part 3 Specification for sectional tanks.

BS 6700 : 1997 : Specification for design, installation, testing and maintenance of services supplying water for domestic use within building and their curtilages.

In accordance with Tricel (Killarney) normal policy of product development, this specification is subject to change without notice.

Note:

Tricel (Killarney) believe that the information contained in this brochure is accurate, and is printed for information only. No warrants, express or implied, are contained therein, nor does any legal liability attach to Tricel (Killarney) for any reason whatsoever. Property rights of the subject belong to Tricel (Killarney), and transfer of these rights is not granted by possession of this document.

Mar 14

TERMS AND CONDITIONS OF SUPPLY OF GOODS AND SERVICES

 Interpretation
 In The following definition
 Contract: the contract
 Customer of its order in INTERPRITATION

I The following definitions and rules of interpretation shall apply in these terms and conditions of supply (the "Conditions").

Contract the contract between the Customer and the Supplier for the sale of Goods and the supply of Services which results from: (i) submission by Customer of its order in respect of Goods and/or Services and the written acceptance of same by the Supplier on and subject to these Conditions; or (i cardier, the Supplier delivering the Goods and/or the Services to the Customer pursuant to Condition 3.1, both of which shall be deemed to expering corporate these Conditions by reference.

Customer the person, firm or company named in the Contract who purchases Goods and/or Services from the Supplier.

Customer's Equipment; any equipment, systems, cabling or facilities provided by the Customer and used directly or indirectly in the supply of the Service Customer. The purple the site preparation works to be carried out at the Delivery Address by the Customer and all Documents, information and mater provided by the Customer relating to the Goods and Services, including (without limitation) the information specified in the Installation and Maintena Instructions.

Instructions.

Delivery Address: shall have the meaning given in Condition 3.1;

Document: includes, without limitation, in addition to any document in writing, any specification, drawing, map, plan, diagram, design, picture or other image, tape, disk or other device or record embodying information in any form.

Goods: all goods manufactured or supplied by the Supplier or its agents, subcontractors, consultants and employees. Group: in relation to a company, that company, its subsidiaries (within the meaning of section 155 of the Companies Act 1963), its holding companies (within the meaning of section 155 of the Companies Act 1963) and any other subsidiaries of its holding companies.

Installation and Maintenance Instructions the Customer instructions concerning site preparation and facilities which are required by the Supplier in respect of delivery of the Goods and performance of the Services.

respect of delivery of the Goods and performance of the Services.

Services the installation and commissioning of Goods by the Supplier under the Contract together with any other services which the Supplier provides, or agrees to provide, to the Customer under the Contract.

Supplier Tierds (Killaney) or a member of its Group named in the Contract.

Supplier's Equipment: any equipment, including tools, systems, calbing or facilities, provided by the Supplier or its subcontractors and used directly or indirectly in the supply of the Goods or Services which is not the subject of a separate agreement between the Customer and the Supplier pursuant to which the Customer procures title to goods from the Supplier.

Yell value askled tax chargeable under Irish law for the time being and any similar additional tax.

1.2 Headings in these Conditions shall not affect their interpretation.

1.3 References in the Contract to "Conditions" are to the conditions set out herein.

1.4 A person includes a natural person, corporate or unincorporated body (whether or not having separate legal personality).

1.5 A neference to a statutor or statutory provision is a reference to it as it is in force for the time being, taking account of any amendment, extension, or re-enactment and includes any subordinate legislation for the time being in force made under it.

1.6 Any obligation in these Conditions on a person not to do something includes, without limitation, an obligation not to agree, allow, permit or acquiesce in that thing being done.

thing being don

2. APPLICATION OF CONDITIONS

2. APPLICATION OF COMBITIONS
2.1 These Conditions shall:

(a) apply to and be expressly incorporated into the Contract; and
(b) preval over any inconsistent terms or conditions contained, or referred to, in the Customer's purchase order, confirmation of order, acceptance of quotation, specification or other Document supplied by the Customer, or implied by law, trade, custom, practice or course of dealing.

The Customer hereby agrees and adknowledges that any purchase order, confirmation of order, acceptance of quotation, specification or other Document supplied by the Customer which contains terms or conditions that are inconsistent with these Conditions is supplied for the Customer's internal administrative purposes only and shall not conflict with or take precedence over these Conditions nor govern or apply to the Contract.

2.2 The Customer's purchase order or the Customer's acceptance of a quotation for Goods and Services which does not expressly incorporate these Conditions, constitutes an offer by the Customer to purchase the Goods and Services on these Conditions. A contract for the supply and purchase of Goods and Services will only be established when such purchase order or quotation has been accepted by the Supplier (a) either expressly by a written acknowledgement issued and executed by the Supplier, or

(b) if caller, by the Supplier delivening the Goods and/or the Services to the Customer pursuant to Condition 3.1.

2.3 Quotations are given by the Supplier on the basis that no Contract shall come into existence except in accordance with Condition 2.2. Any quotation is valid for a period of 30 days from its data, unless the Supplier with ways is sooner.

2.4 All samples, drawings, descriptive matter, specifications and advertising issued by the Supplier and any descriptions or illustrations contained in the Supplier's

ол а распол от сму пол из сми; шисех ше смирние winterws и sooner.

2.4 All samples, drawings, descriptive matter, specifications and advertising issued by the Supplier and any descriptions or illustrations contained in the Supplier's catalogues or brochures are issued or published for the sole purpose of giving an approximate idea of the Goods and Services described in them. They shall not form part of the Contract and this is not a sale by sample by the Supplier.

3. Delivery of the Goods shall only take place (i) on delivery by the Supplier of the Goods to the Customer's place of business or the location identified by the Customer in writing for the purposes of delivery (the "Delivery Address"); or (ii) when the Goods have been collected from the Supplier's premises by a carrier or agent acting no behalf of the Customer for the purposes of delivery, whichever is applicable.

3.2 Any dates specified by the Supplier for delivery of the Goods and performance of the Service are intended to be an estimate only and time for delivery or performance may not be made of the essence by notice from the Customer. If no dates are so specified, delivery shall wish a reasonable time.

3.3 Subject to the other provisions of these Conditions, the Supplier shall not be liable for any costs, changes, changes or expenses caused directly or indirectly by any delay in the delivery of the Goods and Or Services (see not if caused by the Suppliers, on shall any delayers) and the Contract unless such delay exceeds 180 days and is due to the fault of the Supplier.

3.4 If for any reason the Customer fails to accept delivery of any of the Goods or Services on time because the Customer fails to accept of the Goods and propriate Customer Inputs, instructions, licences or authorisations:

3.4 If for any reason the Customer fails to accept delivery of any of the Goods or Services when they are enady for delivery, or the Supplier is unable to deliver the Goods or Services on time because the Customer has not provided appropriate Customer Inputs, instructions, licences or authorisations:

(a) risk in the Goods shall pass to the Customer (including for loss or damage caused by the Supplier's negligence);

(b) the Goods shall be deemed to have been delivered, and

(c) the Supplier may store the Goods until delivery actually takes place, whereupon the Customer shall broid and expenses (including, without limitation, storage and insurance).

3.5 The Customer shall provide at the Delivery Address and at its expense adequate and appropriate equipment and manual labour for unloading the Goods.

4. NON-DELIVERY

4.1 The quantity of any consignment of Goods as recorded by the Supplier on despatch from the Supplier's premises shall be conclusive evidence of the quantity received by the Customer on delivery unless the Customer can provide conclusive evidence proving the contrary.

4.2 The Supplier shall not be liable for any non-delivery of Goods (even if caused by the Supplier's negligence) unless the Customer gives written notice to the Supplier of the non-delivery within 3 days of the date when the Goods would in the ordinary course or events have been received by the Customer.

4.3 Any liability of the Supplier for non-delivery of the Goods shall be limited to replacing the Goods within a reasonable time.

5. RSss/Trust

. RISK/TITLE

5. RISS/TITLE
5.1 The Goods are at the risk of the Customer from the time of delivery pursuant to Condition 3.
5.2 Ownership of the Goods shall not pass to the Customer until the Supplier has received in full (in cash or cleared funds) all sums due to it in respect of: (a) the Goods and the Services; and
(b) all other sums which are or which become due to the Supplier or any other member of its Group from the Customer on any account.
5.3 Until ownership of the Goods has passed to the Customer, the Customer shall:
(a) hold the Goods on a fiduciary basis as the Supplier's bailer;
(b) not sell, fet on hire, mortgage, charge, feelage, transfer as security or part with possession of the Goods or purport to do so;
(c) store the Goods (at no cost to the Supplier) separately from all other goods of the Customer or any third party in such a way that they remain readily identifiable as the Surnolier's romeerty.

(b) not sell, let on hire, mortgage, charge, pledge, transfer as security or part with possession of the Goods or purport to do so;
(c) store the Goods (at no cost to the Supplier) separately from all other goods of the Customer or any third party in such a way that they remain readily identifiable as the Supplier's property;
(d) not destroy, deface or obscure any identifying mark or packaging on or relating to the Goods; and
(e) maintain the Goods in a condition satisfactory to the Supplier and keep them insured on the Supplier's behalf for their full price against all risks to the reasonable satisfaction of the Supplier. Or request the Customer shall: (o) produce the policy of insurance to the Supplier, or (ii) demonstrates its compliance with this Condition to the reasonable satisfaction of the Supplier.
5.4 The Customer's right to possession of the Goods shall terminate immediately if the Customer.
(a) has a bankruptcy or insolvency order made against him/it or makes any arrangement or composition with his/its creditors, or otherwise takes the benefit of any statutory provision for the time being in force for the relief of insolvent debtors;
(b) convenes a meeting of his/its creditors (whether formal or informal), or takes any steps to enter into liquidation (whether voluntary or compulsory) except a solvent voluntary liquidation for the purpose of a bona-fide reconstruction or amalgamation, or has a liquidation orly, receiver, or an administrator or appointed over the whole of its assets or undertaking or any part thereof, or documents are filed with any court of competent jurisdiction for the appointment of a liquidation, receiver or an administrator over the whole of its assets or undertaking or any part thereof, or documents are filed with any court of competent jurisdiction for the appointment of a liquidation or the purpose of a bona-fide reconstruction or amalgamation in or amalgamation in the purpose of a bona-fide reconstruction or amalgamation in or han

5.6 Until ownership of the Goods has passed to the Customer, the Customer hereby grants the Supplier, its agents and employees an irrevocable licence at any time to enter any premises where the Goods are or may be stored in order to inspect or repair or replace (at the Customer's cost) the Goods, or, where the

customer's right to possession has terminated, to recover them.

Where the Supplier is unable to determine whether any Goods are the goods in respect of which the Customer's right to possession has terminated, the customer shall be deemed to have sold all goods of the kind sold by the Supplier or any other member of its Group to the Customer in the order in which they were invoiced to the Customer. 5.8 On termination of the Contract, howsoever caused, the Supplier's (but not the Customer's) rights contained in this Condition 5 shall remain in effect.

5.8 On termination of the Contract, howsoever caused, the Supplier's (but not the Customer's) rights contained in this Condition 5 shall remain in effect.
6. LIABLITY AND IDENDITY
6.1 The Supplier makes no express or implied warranty, representation or undertaking and assumes no responsibility whatsoever concerning the quality, nature or fitness for purpose of the Goods and Services. The Supplier accepts no ilability whatsoever for any direct, indirect or consequential loss or damage suffered by any person or entity as a result of any defects in or unifors for purpose of the Goods and Services.
6.2 Without prejudes to Condition 6.1, the Supplier (at it sole discretion) may elect to repair or replace free of charge any part or parts of the Goods and Services which are considered by the Supplier to be defective or unif for purpose due to fault in design, installation, inferior materials or fault in manufacture for which it is responsible (the "Supplier Opinor"). The Supplier will only exercise the Supplier Opinor if the Customer notifies the Supplier in writing within three months of the date of delivery pursuant to Condition 3 that the Goods or Services are defective or unifit for purpose.
6.3 If the Customer is a consumer, the Customer's legal rights in relation to Goods or Services that are faulty or not as described are not affected by the provisions of this Condition 6. Advice about a consumer's legal rights is available at wawx.consumerche)a:
6.4 This Condition 6 sets out the entire financial liability of the Supplier (including any liability for the acts or omissions of its employees, agents, consultants, and subcontractors) to the Customer in respect of It.
(a) any breach of the Contract, including any deliberate breach of this Contract by the Supplier, its employees, agents or subcontractors;
(b) any use made by the Customer of the Goods and Services or any part of them; and
(c) any representation, statement or tortious act or omission (including

on law are, to the fullest extent permitted by law, excluded from the Contract.

6.5 All warranties, conditions and other terms implied by statute or common la 6.6 Nothing in these Conditions limits or excludes the liability of the Supplier:

6.6 Nothing in these Conditions limits or excludes the liability of the Supplier:

(a) for death or personal injury resulting from negligence;
(b) for any other matter which it would be illegal for the Supplier to exclude or attempt to exclude its liability;
(c) for fraud or fraudulent misrepresentation; or
(d) under implied conditions as to title contained in section 12 of the Sale of Goods Act 1893.

6.7 The Customer undertakes that:

(a) its hall use the Goods strictly in accordance with the user manuals and weight, capacity and/or use specifications which are supplied in connection with the Goods (the "Specifications"); and
(b) it shall not exceed, deviate from, or use the Goods in any manner in contravention of or otherwise than in accordance with the Specifications.

6.8 If the Customer uses the Goods in any manner otherwise than in accordance with the Specifications, the Supplier shall be exempt from any and all liability howsoever arising for any direct, indirect or consequential losses and damages suffered by any person or entity as a result of such use.

6.9 The Customer unconditionally and irrevocably agrees to indemnified the Supplier from and against all and any losses, costs, claims, liabilities, damages, demands and expenses suffered or incurred by the Supplier and arising from any claim brought by any person or entity against the Supplier bossoever arising from or in connection with: (b) the Contract; (ii) the supply of Goods and Services pursuant to the Contract; (iii) the Customer's use of the Goods.

use of the Goods.

7. HEALTH & SAFETY INSTRUCTIONS, MANUALS AND PRODUCT LITERATURE

7.1 The Customer hereby agrees and acknowledges that safety information, manuals and product literature is available to it concerning the steps to be taken by the Customer hereby agrees and acknowledges that safety information, transported safely and without risk to the health of the Customer, its agents, subcontractors, consultants, officers and employees. The Customer must immediately contact the Supplier if it is not in possession of such safety information, manuals or product literature and must refrain from using the Goods for any purpose whatsoever until it is in receipt of has read and understands such safety information, manuals or product literature. The Supplier hereby agrees and acknowledges that certain Goods are sold in containers which may have

ons of safe use as part of their cor ner identification and labelling. The Customer hereby agrees to comply in full with any

hazard information and conditions of safe use as part of their container identification and labelling. The Customer hereby agrees to comply in full with any such information and conditions of safe use.

7.2 The Supplier shall use reasonable endeavours to observe all applicable health and safety rules and regulations, and any other reasonable security requirements that apply at the Customer's premises and that have been communicated to the Supplier under Condition 7.3(b), provided that it shall not be liable if, as a result of such observation, it is in breach of any of its obligations under these Conditions.

7.3 The Customer shall:

7.3 The Customer shall:

(a) before and during the supply of the Services, be responsible (at its own cost) for safely preparing and maintaining the relevant premises for the purpose of delivery of the Goods and Services, including identifying, monitoring, removing and disposing of any hazardous materials from such premises in accordance with all applicable laws;

(b) inform the Supplier of: (i) all health and safety rules and regulations and any other reasonable security requirements that apply at the relevant premises set out in Condition 7.3(a); and (ii) all of the actions taken by the Customer in satisfaction of its obligations under Condition 7.3(a); and (c) ensure that all of the Customer's Equipment is in good working order and suitable for the purposes for which it is used in relation to the Services and conforms to all relevant standards or requirements and codes of industry practice.

8. LUSTOMER'S OBLICATIONS IN RELATION TO THE GOODS AND SERVICES

8.1 The Customer shall:

The Customers statu.

(d) co-operate with the Supplier in all matters relating to the delivery of the Goods and Services;
(b) provide the Supplier, its agents, subcontractors, consultants and employees, in a timely manner and at no charge to the Supplier, with access to the Customer's premises, office accommodation, data and other facilities as set out in the Installation and Maintenance Instructions and as reasonably required

Outstorner's premises, orince accommonation, data and other facilities a set out in the institution and shantenance instituctions and as reasonably required by the Supplier, in a timely manner, such Customer In-put and other information as the Supplier may require and ensure that such Customer In-put and information is accurate in all material respects;

(d) in relation to the Services and before the date on which the Services are to commence, obtain and maintain all necessary licences and consents and comply with all relevant legislation in connection with:

(i) use of the Supplier's Equipment:

(ii) use of the Susplier's Equipment;

(iii) use of Usatomer In-put and

(iii) use of the Customer's Equipment, insofar as such licences, consents and legislation relate to the Customer's business, premises, staff and equipment; and

(e) promptly inspect and test the Goods and Services when notified by the Supplier that they are ready for use.

8.2 The Customer shall be liable to pay to the Supplier, on demand, all reasonable costs, charges or losses sustained or incurred by the Supplier (including, without limitation, any direct, indirect or consequential losses, loss of profit and loss of reputation, loss or damage to property and those arising from injury to or death of any person and loss of opportunity to deploy resources deswhere) arising directly or indirectly from the Customer's fraud, negligence, failure to perform or delay in the performance of any of its obligations under the Contract, subject to the Supplier confirming such costs, charges and losses in writing.

8.3 Terms specific to sales of moulking

3 Terms specific to sales of moulding (d) The Customer shall pay the guoted cost of any tool which is specially bought or made by the Supplier for the purpose of the order placed by the Customer and no part of such payment by the Customer shall be refunded. Any such moulding tools shall, unless otherwise agreed in writing between the Customer and the Supplier, remain in the possession of the Supplier who shall keep them in reasonable repair, provided always that the Supplier may dispose of such moulding tools if they have not been used for three consecutive years.

(b) If the Supplier holds moulding tools for the purpose of the sale of Goods or the supply of Services hereunder, such moulding tools will be kept fully insured by the Customer. The Supplier shall not be required to maintain any insurance in respect of such moulding tools and nor shall the Supplier be liable or for any loss whatsoever which may arise therefrom.

9. CHARGES AND PAYMENT
9.1 In consideration of the supply of the Goods and the Services by the Supplier, the Customer shall pay the charges as set out in the relevant invoice for the

9.1 In consideration of the supply of the Goods and the Services by the Supplier, the Customer shall pay the charges as set out in the relevant invoice to true Goods and the Services.

9.2 The Supplier shall be entitled to issue an invoice to the Customer for the Goods and Services on delivery of the Goods in accordance with these Conditions.

9.3 The total price for Goods and the Services shall be paid in full and in cleared funds by the Customer to a bank account nominated in writing by the Supplier (without deduction or set-off) on the date of issue of the Supplier's invoice, unless credit terms have been agreed in the Supplier.

9.4 Without prejudice to any other right or remedy that it may have, if the Customer fails to pay the Supplier on the due date, the Supplier may:

(a) claim interest under the European Communities (Late Payment in Commercial Transactions) (Annendment) Regulations 2014;

(b) suspend all Services until payment has been made in full; and/or

(c) suspend services or delivery of goods under any other contract with the Customer or any other member of its Group.

9.5 Time shall be of the essence in respect of payment for Goods and Services.

9.6 All sums payable to the Supplier under the Contract shall become due immediately on its termination, notwithstanding any other provisions contained in these Conditions. This Condition 9.6 is without prejudice to any agint whatsoever belonging to the Supplier to claim interest under law or the Contract.

9.7 The Supplier may, without prejudice to any other rights it may have, set off any liability of the Customer to the Supplier (or any other member of its Group) against any liability of the Supplier (or any other member of its Group) tagainst any liability of the Supplier (or any other member of its Group) to the Customer.

10.1 The Supplier reserves ownership of and copyright in all drawings, data or specifications which it prepares in relation to the Goods and Services (the "Materials").

10.1 The Suppler reserves ownership of and copyright in all crawings, usas to specifications which is proposed in the Material's for any purpose whaterover, including, but not limited to, for the purpose of procuring estimates or quotations.

10.3 Before the date of delivery of the Goods and performance of the Services the Customer shall ensure that it has secured permission from all relevant persons for the purposes of enabling the Supplier to use any Customer. Documents and the Customer In purpose of the Gustomer because the supplier to the Supplier and tools, drawings, specifications and data supplied by the Supplier to the Customer for ending the Supplier's Equipment) shall, at all times, he and remain as between the Supplier and the Customer the exclusive property of the Supplier, but shall be held by the Customer in safe custody at its own risk and maintained and kept in good condition by the Customer until returned to the Supplier, and shall not be disposed of or used other than in accordance with the Supplier's written instructions or authorisation.

accordance with the Supplier's written instructions or authorisation.

11. TERMINATION

11.1 Without prejudice to any other rights or remedies which the parties may have, either party may terminate the Contract without liability to the other immediately on giving notice to the other if:
(a) the other party commits a material breach of any of the terms of the Contract and (if such a breach is remediable) fails to remedy that breach within 30

immediately on giving notice to the other if:
(a) the other party commits a material breach of any of the terms of the Contract and (if such a breach is remediable) fails to remedy that breach within 30
days of that party being notified in writing of the breach; or
(b) the other party suspends, or threatens to suspend, payment of its debts or is unable to pay its debts as they fall due or admits inability to pay its debts or
(being a company) is deemed unable to pay its debts within the meaning of section 214 of the Companies Act 1963; or
(c) the other party suspends or ceases, or threatens to suspend or cease, to carry on all or a substantial part of its business.

11.2 On termination of the Contract for any reason:
(a) the Customer shall immediately pay to the Supplier all of the Supplier's outstanding unpaid invoices and interest and, in respect of Goods and Services
supplied but for which no invoice has been submitted, the Supplier may submit an invoice, which shall be payable immediately on receipt by the
Customer.

Customer, (b) the Customer shall return all of the Goods and the Supplier's Equipment. If the Customer fails to do so, then the Supplier may enter the Customer's permises and take possession of such Goods and Supplier's Equipment. Until they have been returned or repossessed, the Customer shall be solely responsible for their safe keeping; and (c) the accrued rights and liabilities of the parties as at termination and the continuation of any provision expressly stated to survive or implicitly surviving termination, shall not be affected.

12. FORCE MAJEURE

FORCE MAJEURE
The Supplier shall have no liability to the Customer under the Contract if it is prevented from, or delayed in performing, its obligations under the Contract or from carrying on its business by acts, events, omissions or accidents beyond its reasonable control, including (without limitation) strikes, lock-outs or other industrial disputes (whether involving the workforce of the Supplier or any other party), failure of a utility service or transport network, act of God, war, riot, civil commotion, malicious damage, complaines with any law or governmental order, rule, regulation or direction, accident, breakdown of plant or machinery, fire, flood, storm or default of suppliers or subcontractors.
VARIATION 13. VARIATION

13.1 The Supplier may, from time to time and without notice, change the Goods and Services supplied by it in order to comply with any changes in the Supplier's methods of production or any applicable safety or statutory requirements.

13.2 Subject to Condition 13.1, no variation of the Contract or these Conditions or of any of the Documents shall be valid unless it is in writing and signed by or on behalf of the Supplier and the Customer. WAVEER
I A waiver of any right under the Contract is only effective if it is in writing and it applies only to the circumstances for which it is given. No failure or delay
by a party in exercising any right or remedy, under the Contract or by law shall constitute a waiver of that (or any other) right or remedy, nor preclude or
estrict its further exercise. No single or partial exercises of such right or remedy shall preclude or restrict the further exercises of that (or any other) right or

specifically provided otherwise, rights arising under the Contract are cumulative and do not exclude rights provided by law.

14.2 Univers specifically provided orderwise, against arising under the Contract are cumulante and no not exclude against provided by law.

If any provision of the Contract (or part of any provision) is found by any court or other authority of competent jurisdiction to be invalid, unenforceable, that provision or part-provision shall, to the extent required, be deemed not to form part of the Contract, and the validity and enforce the other provisions of the Contract shall not be affected.

16. ENTHER AGREEMENT

16. ENTIRE AGREEMENT
16.1 The Contract and these Conditions constitutes the whole agreement between the parties and supersedes all previous agreements between the parties relating to the sale of Goods and Services by the Supplier.
16.2 Each party acknowledges that, in entering into the Contract, it has not relied on, and shall have no right or remedy in respect of, any statement, representation, assurance or warranty (whether made negligently or innocently).

representation, assurance or warranty (whether made negligently or inno 16.3 Nothing in this Condition shall limit or exclude any liability for fraud. 17. ASSIGNMENT

17. ASSIGNMENT

17.1 The Customer shall not, without the prior written consent of the Supplier, assign, transfer, charge, mortgage, subcontract, declare a trust of or deal in any other manner with all or any of its rights or obligations under the Contract.

17.2 The Supplier may at any time assign, transfer, charge, mortgage, subcontract, or deal in any other manner with all or any of its rights under the Contract and may subcontract or delegate in any manner any or all of its obligations under the Contract to any third party or agent.

17.3 Each party that has rights under the Contract is acting on its own behalf and not for the benefit of another person.

18. NO PARTNERSHIP OR AGENCY

Nothing in the Contract is intended to, or shall be deemed to, constitute a partnership or joint venture of any kind between any of the parties, nor constitute any party the agent of another party for any purpose. No party shall have authority to act as agent for, or to bind, the other party in any way. any party t

any party the agent of another party to early purpose. No party shall have authority to act as agent tor, or to bind, the other party an any way.

19. NOTICES

19.1 Any notice required to be given under the Contract shall be in writing and shall be delivered personally, or sent by pre-paid post, recorded delivery or by commercial courier to the other party and for the attention of the person specified in the Customer's purchase order or the Supplier's quotation or confirmation of acceptance or as otherwise specified by the relevant party in writing to the other party. Any notice hereunder shall be deemed to have been duly received if delivered personally, when left at that address or, if sent by pre-paid post or recorded delivery, at 900mm on the second working day after posting, or if delivered by commercial courier, on the date and at the time that the courier's delivery receipt is signed.

19.2 This Condition 19 shall not apply to the service of any in any proceedings or other documents in any legal action.

19.3 Communications in relation to the Contract may be given by email to the address specified in the Customer's purchase order or the Supplier's quotation or confirmation of acceptance save that any notice required to be given under the Contract shall not be validly served if sent by e-mail.

20. GOVERNING LAW AND JURISDICTION

20.1 The Contract, and any dispute or claim arising out of or in connection with it or its subject matter or formation (including non-contractual disputes or claims). And the governed by, and constructed in accordance with, the law of Ireland.

20.2 The parties irrevocably agree to submit to the exclusive jurisdiction of the courts of Ireland to settle any dispute or claim that arises out of, or in connection with, the law of Ireland.

20.2 The parties irrevocably agree to submit to the exclusive jurisdiction of the courts of Ireland to settle any dispute or claim that arises out of, or in connection with, the Contract or its subject matter or formation (including non-contractual

THE SUPPLIER OR THE SUPPLIER'S REPRESENTATIVES)
21.1 In circumstances where the Customer is a consumer (i.e. a natural person, as against a company, who is acting for purposes which are outside of his or her trade, business craft or profession), the Customer's rights (including his or her right to return the Goods) pursuant to the Contract are supplemented by his or her statutory consumer rights (including those consumer specific rights which are contained in the Supplier's Orline Terms and Conditions of Supply, a copy of which is available at www.et.racle.uo or nequests by the Customer's Orl further information concerning the Customer's rights as a consumer, copy of which is available at please see www.consumerhel