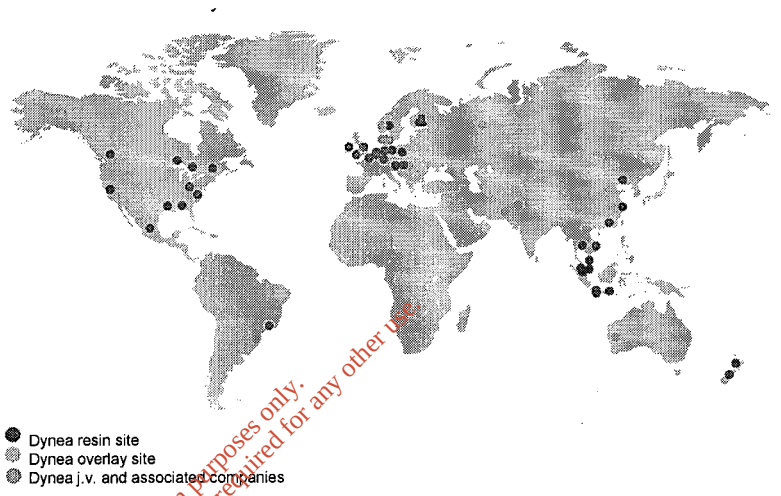
SECTION A NON-TECHNICAL SUMMARY

Company Profile

The production site of Dynea Ireland Ltd. is located at Marino Point, Cobh, Co. Cork. Dynea Ireland (then operating as Dynochem Ireland Ltd.) commenced resin and formalin production in mid 1997 and 1998 was the first full year of production. Dynea is a multinational company with its headquarters in Helsinki. The company was formed by the merger of two multinational companies, Dyno Industrie, a Norwegian chemical company and Neste Chemicals, a Finnish state owned chemical company, in 2000. The Dynea group of companies is now owned by the Finnish company *Dynea Oy*.

Dynea is a global leader in creating high value adhesion and surfacing solutions for the wood working industry and industrial applications and, in 2003, had combined revenues of approximately €1.0 billion. With 54 production units in 24 countries in Europe, the Americas and Asia Pacific, Dynea employs some 3,200 persons.



On a Worldwide basis, Dynea's product portfolio is concentrated in the following areas:-

- **Wood based panels**
- Dynea's resins are used to bond wood chips, fibers, strands and veneers to produce wood based panels such as plywood, particle board, MDF, OSB and LVL.
- **Overlays**
  Dynea offers overlays for both industrial as well as decorative applications. Overlays enhance the surfaces of wood based panels, furniture and flooring.
- **Interior wood applications**
- Dynea adhesives for interior wood applications are used to make parquet, veneers, kitchen cabinets, furniture and tabletops.
- **Impregnation**
  Dynea resins are used to impregnate papers for decorative, industrial and technical laminates.
- **Construction industry**
- Dynea also serves the construction industry with resins and binders for such applications as insulation wools, glass-fibre tissues and phenolic foams.
- **Engineered wood applications**
- Dynea adhesives are used to manufacture engineered wood products such as laminated beams, joists, posts and other wood supports for construction.
- **Transportation components and engineering**

- Dynea's products find use in the production of brake linings, oil and air filters, foundry castings, grinding wheels and various other coated abrasive products, tires, advanced composites, etc.
- **Specialty adhesives**
- Customers use our specialty adhesives to produce packaging, printing, labeling, and shoes, among other things.

A number of products are manufactured at the Marino Point site in the following categories:

- Formalin solution – 50%
- Urea Formaldehyde Panelboard Resins for the domestic market
- Melamine Urea Formaldehyde Panelboard Resins for the domestic market
- Urea solution for the domestic market
- Urea Formaldehyde Industrial Resins for the domestic market
- Melamine Formaldehyde Impregnating Resin for the UK market
- Urea Formaldehyde Impregnating Resin for the UK market

The raw materials for the process are methanol, urea and melamine. The plant has the capacity to produce approximately 100,000 Tonnes per annum of liquid resin.

An Integrated Pollution Control Licence (No. 34) was granted to the company by the Environmental Protections Agency on the 14th of March 1997.

Site Summary

Dynea currently employ 33 people with 2 contractors. The production areas operate on a continuous basis so a 5-team continuous 12-hour shift system is in operation. At night and at weekends there will be between 3 and 8 people on site. The normal maximum on site, including contractors and drivers, is 22 people. During a major shutdown this may rise to 40 people.

The site is located on Great Island within Cork Harbour and approximately 3.5km north of the town of Cobh on a peninsula known as Marino Point as can be seen in Figure 1. The town of Passage West is about 1,000m across the water to the south-west of the plant. The main road to Cobh (R624) is approximately 400m east-south-east of the site. The site is constructed on land reclaimed from the harbour at the time of the construction of the, now closed, IFI facility. Dynea's site occupies 6 acres on the north-west corner of the former IFI site, opposite the eastern end of Little Island (Carrigrenan).

The plant was built to manufacture urea formaldehyde, melamine urea formaldehyde and melamine formaldehyde resins for the panelboard, paper impregnation, firelighter, and glass fibre tissue industries, primarily within Ireland. These resins are sold as liquids (in bulk). The resin is dispatched to customers in bulk road tankers.

The annual output is approximately 80,000 tonnes of resins and 34,000 tonnes of 50% formaldehyde.

Dynea have the largest share of the market for the supply of resins or adhesives to the wood processing industry in Ireland.

The Dynea site is leased from the former IFI company (new ownership structure not formally in place at time of writing), some of whose facilities are shared, including:

- Jetty.
- Fire water storage
- Security

Production takes place throughout the year with downtime only for maintenance.

Methanol is converted to formaldehyde gas on site and this is then absorbed in water to form a 50% formalin solution. The methanol is stored in a bulk tank with a capacity of 4,500m³ and this is refilled from ships which berth at the jetty. A continuously welded line joins the jetty and the methanol tank. The methanol tankers which arrive at the jetty are typically at the end of a two port run and so have only the quantity for delivery to Dynea Ireland on board. The offloaded amount is typically in the order of 3,000 tonnes with the ships being typically having a capacity of 6-7kT.

Urea is also imported by ship from, typically, Russia or Poland (or other Baltic states). The quantity discharged tends to be in the order of 4,500 tonnes. This urea is either offloaded at the former IFI jetty (preferred option) or offloaded and stored on behalf of Dynea Ireland by a shipping agent somewhere in the Cork region.

Dangerous Chemicals
The following dangerous chemicals are stored or produced on site.

1. Formaldehyde
2. Methanol
3. Biphenyl(Dowtherm A)
4. Diphenyl Ether(Dowtherm A)
5. Hydrogen Gas
6. Dimethyl ether
7. LPG
8. Diesel

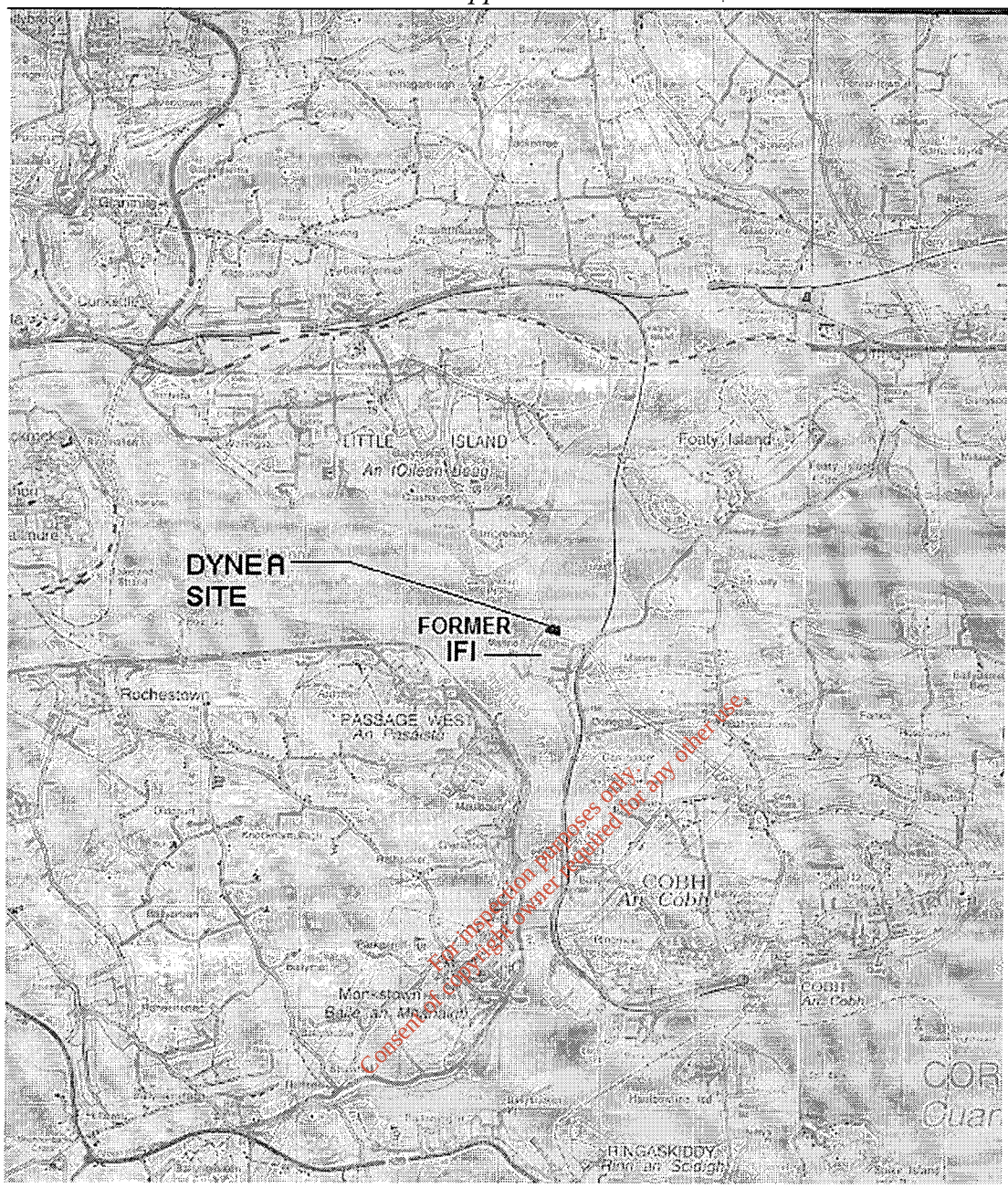


FIGURE 1: SITE LOCATION

Plant Operations

Loading of Resin Road Tankers

Resin tankers are loaded from the bulk tanks at the resin loading bay located immediately to the north of the tank farm. Resin out loading takes place through a manifold connected to each of the resin tanks. The operator monitors the operation from either the screen in the control room or a local display on the loading bay. A high level switch ensure that spills do not take place. If, despite this, a spill takes place, absorbent materials are provided to stop the resin getting as far as the loading area drains which are themselves isolated from the surface water system. The resin is non-hazardous but will result in an excessive nutrient loading if allowed to enter a watercourse. All surface waters collected from the Dynea site are tested before discharge. Approximately 10 tankers with 25 Tonne loads leave the site each day.

Loading of Methanol Road Tankers

Approximately 5 methanol road tankers leave the site each week with 24 Tonne loads. These tankers are filled at the methanol filling station where an operator is on duty at all times during the loading operation.

The tanker is earthed by connection to an earthing/earth proving system. The amount to be filled is keyed into the flow meter and the filling operation is begun. If a fire alarm is triggered during this operation, the methanol pump feeding the loading area will shut off and a deluge system is triggered which floods the area with fire fighting foam.

Jetty installation and Operation

The jetty is a T-head type which protrudes into the river lee estuary. The jetty effectively contains two operational areas, one area is associated with handling bulk solids whereas down river end is associated with liquids or gaseous compounds and it is here where methanol will be unloaded. Methanol is a flammable liquid so great care is taken in its handling. A breakaway coupling at the connection between the ship and the shore contains slam shut valves which will close in the event of an emergency stop being activated, thus ensuring that large spills will not occur. The offloading is constantly monitored by flowmeters at either end of the methanol line to ensure that a leak will be detected immediately and the flow cut off. The methanol line is subject to the highest international inspection standards.

Urea is also unloaded at the jetty whereby a crane is brought onto the jetty and road tankers are loaded and urea is taken off the jetty to storage. The ships that dock at the jetty would contain approximately 4000 tonnes of urea. Urea is non hazardous and the risk associated with it is from a major spillage. This would have the effect of an increased BOD loading in the harbour. The safety checks on the jetty are similar to unloading methanol.

Methanol Bulk Storage

There is a high level transmitter and high level float switch on the tank which will trip the pumps on the jetty and methanol transfer will stop. This in turn will sound the fire alarm on the jetty. There is a nitrogen blanket above the methanol floating roof. This blanket is supplied from a nitrogen compressor. There is also a backup nitrogen skid for the times that the nitrogen compressor is unavailable. A nitrogen regulator on top of the tank regulates the nitrogen flow to the tank. In the unlikely event that the floating roof sticks there is pressure/vacuum relief on the tank. The tank is earthed for protection during electrical storms. There is also a flame arrester on the tank. There are five foam pourers positioned around the tank. The tank is in a bund with a sufficiently large capacity to contain all its contents in the unlikely event of a spillage.

Formalin Bulk Storage

Formalin solution 55% concentration is pumped to two designated tanks (T402, T403) in the tank farm. These tanks are made of 304L Austenitic Stainless Steel. These tanks have a capacity of 300m^3 The tanks supply the reactors with formalin at approximately 50% concentration .The dilution is carried out using distillate produced (waste) during resin manufacture. The tanks are lagged and are kept at a temperature of 50°C; this is to prevent the formation of paraformaldehyde, a solid material which will block the pipes etc. The tanks contents are mixed using agitators in the tanks (A402, A403). The vents from each of the formalin tanks are fed into a scrubber system which removes formaldehyde vapours to the distillate tank (T408). This vent is tested bimonthly for Formaldehyde content, Methanol and

Dimethylether. The tank is located in a bund which will contain the contents of a formalin tank in the unlikely event of a spill.

Resin Manufacture

Urea is brought on site by lorry and trailer from the urea store at the former IFI. This urea is then stored in Dynea's urea store. The capacity of the Dynea store is approximately 800 tonnes. Melamine is bought in from a number of international suppliers in 25kg, 500kg and 1,000kg bags. Formalin is stored in from the storage tanks T402 and T403. Three batch reaction vessels are used with approximate capacities of 25T, 75T and 75T for reactors 1, 2 and 3 respectively.

Resin is manufactured by first bringing 50% formalin in to the reactor. This is then adjusted to a more neutral pH before the addition of urea or melamine or both. The reactions are acid and temperature catalysed so, once the raw materials are mixed, the temperature is increased to approximately 90°C and the pH is dropped to approximately 5.5. The pH drop is carried out using ammonium sulphate which reacts in the presence of formaldehyde to form sulphuric acid. The progress of the reaction is typically tracked by viscosity as the formation of the polymer chain results in an increase in the viscosity of the product in the reactor. When the end-point is about to be reached, cooling is applied and 28% Sodium hydroxide is added to bring the pH back up to neutral. The resin is then pumped to the tank farm.

Bulk Tank Farm

There are 19 bulk tanks in the tank farm ranging in size from 300m³ (main resins and formalin) to 75m³ (small scale resins and distillate) with a smaller GRP tank for the storage of diethylene glycol. Most of the tanks are carbon steel with the exception of the sodium hydroxide and formalin storage tanks (due to the corrosive nature of these materials).

Formox process

Methanol is vaporised in the vaporiser at a temperature of approx 130°C. This methanol is atomised and mixed with incoming air. It passes from here into the Formox reactor.

Formaldehyde is produced in the FORMOX process by the direct oxidation of methanol. The reaction is carried out with the aid of a catalyst which consists of balls, granules or rings containing molybdenum and iron oxides.

The gases which leave the converter are cooled in an aftercooler where low pressure steam is produced. The gas then enters an absorber where the formaldehyde is absorbed into water to produce up to 55% formaldehyde solution. The product solution contains small amounts of formic acid and unreacted methanol (less than 1%).

Warehouse

The warehouse is used mostly for the storage of melamine in 500kg, 1,000kg and 25kg bags. Engineering materials are also stored there as are smaller volumes of other raw materials and process chemicals such as ammonium sulphate, caprolactam, sodium sulphite and Dowtherm oil in 200 litre drums.

Energy

Dynea Ireland' energy use is taken from two sources, electricity (from the ESB network) and gas (from Bord Gáis). Electricity usage in 2005 was 7,244,785kW/hr and gas consumption was 1,245,825kw/hr.

Drainage

All plant surface water is collected in Basin 1 where it is sent to the wastewater treatment plant. The plant generates no liquid effluent streams – all wastewater generated is as a results of rainwater collection. A combination of grab sampling and continuous analysers is in place to ensure compliance with the plant's Integrated Pollution Control (IPC) Licence). A new wastewater treatment plant is currently undergoing pilot scale work before the full upgrade is built.

Emission Points

The principal emission points from the site are as follows:

Air

Catalytic convertor (this equipment treats the emissions from the formox process and resin reactors). The catalytic convertor emissions will principally be methanol, formaldehyde, dimethyl ether and carbon monoxide.

Formalin tank scrubber (a water scrubber on the vent for the formalin storage tanks).

Water

All surface water on site is sent to the wastewater treatment plant and treated there before being pumped to outfall via Basin 2.

Monitoring of Emissions

Air

Grab samples of the air emissions are taken every two weeks and are monitored for

- Formaldehyde
- Methanol
- Dimethyl ether

These tests are carried out in a laboratory subject to the demands of ISO9001 and ISO14001 with all methods being subject to strict validation to ensure confidence in the results obtained.

Continuous analysers are in place at the catalytic convertor emission point which measure carbon monoxide and total hydrocarbon emissions. These results are stored on the server which is subject to regular backup.

Both sets of measurement are subject to an annual validation check against the results of an external company.

Formaldehyde is classed as toxic to both humans and plant life. The point at which toxic effects are likely to occur is far higher than that at which the plant discharges, even at the emission stack exit point. The volumes of any of these materials being emitted poses no threat as the assimilative capacity of the receiving environment far exceeds the amount which is being discharged (see, particularly, section I and its attachments.

Emissions from the absorber tower and resin reactors are directed into the catalytic converter where they pass over a platinum catalyst bed and are heated beyond their degradation point, thus destroying them (see section F and its attachments).

Water

The grab and composite samples are analysed for the following parameters:

- Biochemical Oxygen Demand (BOD)
- Chemical Oxygen Demand (COD)
- Total Suspended Solids (TSS)
- Total Nitrogen
- Formaldehyde
- Ammonia
- pH
- Phosphorous
- Oils, Fats and Grease

These tests are carried out in a laboratory subject to the demands of ISO9001 and ISO14001 with all methods being subject to strict validation to ensure confidence in the results obtained.

Water passing from the wastewater treatment plant to Basin 2 is analysed by a continuous analyser. The continuous analyser is a Siemens Aquascan system designed for the analysis of liquid effluents from a plant. The unit analyses the following parameters:

- Biochemical Oxygen Demand (BOD)
- Chemical Oxygen Demand (COD)
- Total Organic Carbon (TOC)
- Total Suspended Solids (TSS)
- Ammonia
- pH
- Conductivity
- Turbidity
- Colour
- Sample Temperature

The principal pollutant in the water effluent stream from the site would be nitrogenous compounds as urea is the main source of contamination of the surface water (no effluent stream actually being produced by the plant). Work is ongoing to prevent this material being collected in the main drainage system and it is instead being segregated and used within the production process. The main environmental effect of ammonia would be its initial toxicity to aquatic life. It and other nitrogen compounds act as a nutrient source in watercourses and could result in algal growth at or downstream from the point of discharge if the concentration and duration were great enough and if the receiving water was of a sufficiently small volume. In the case of the discharges from Dynea, neither the concentration nor duration of the discharge poses any threat as they are of a very limited volume and concentration and are being discharged into a large body of water which has an extremely large capacity to receive such materials (see, particularly, section I and its attachments).

Waste

Waste is tightly controlled on site and the only waste generated by the process is that resulting from filtration of the resin as it is being transferred from the reactors to storage vessels. Small lumps of resin gather here and are transferred to a covered skip. This waste is currently

landfilled following hardening but a system has been put in place to recover this waste for reuse within the process.

See Section H and attachments.