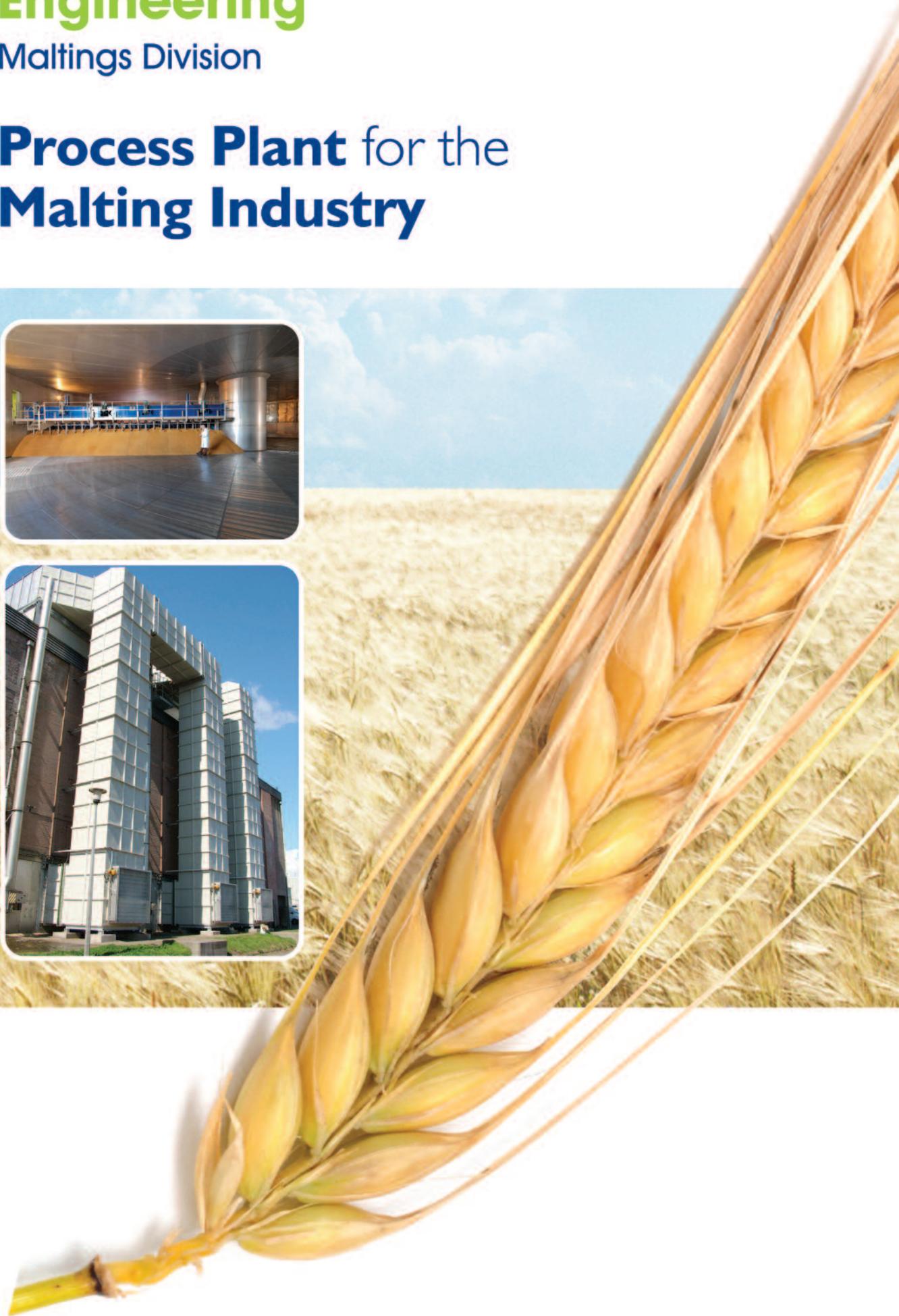
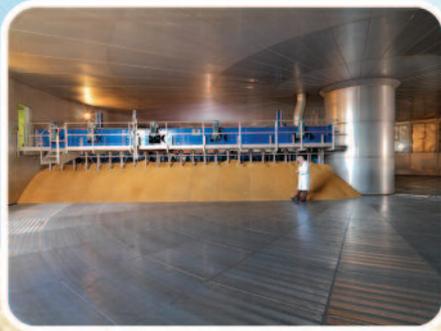




Don Valley
Engineering

Maltings Division

Process Plant for the Malting Industry





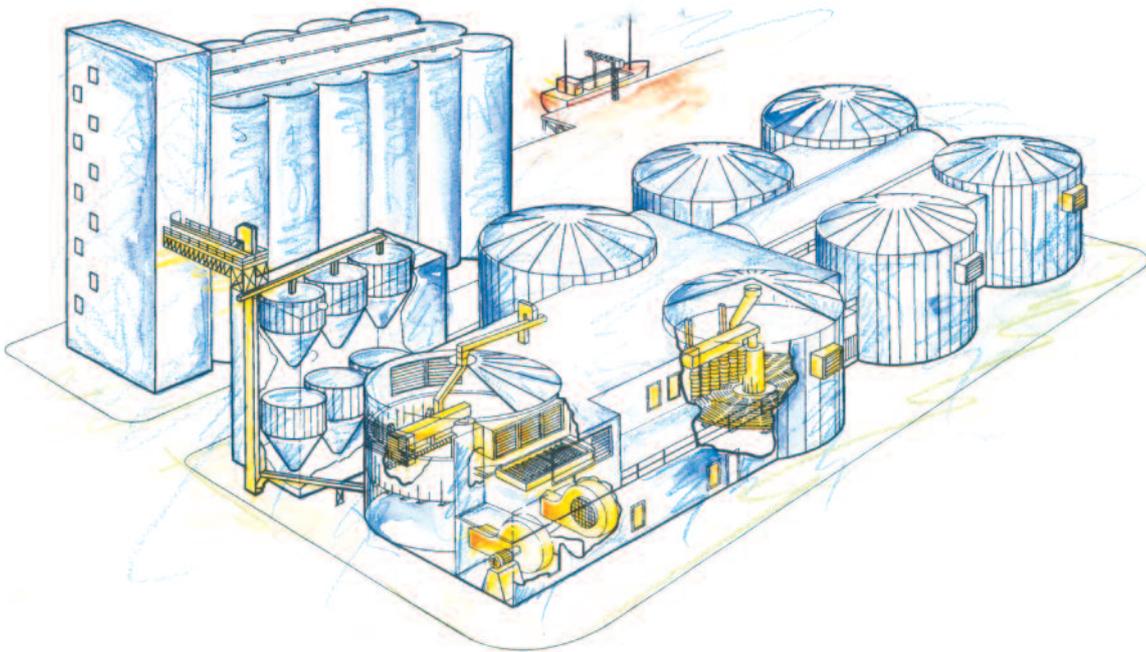
Don Valley Maltings Division

Don Valley Engineering is the leading UK provider of Process Plant and Support to the Malting Industry, and the only UK company which can provide complete in-house solutions for every aspect of Malting Plants right up to full turnkey 'design to operation' packages.

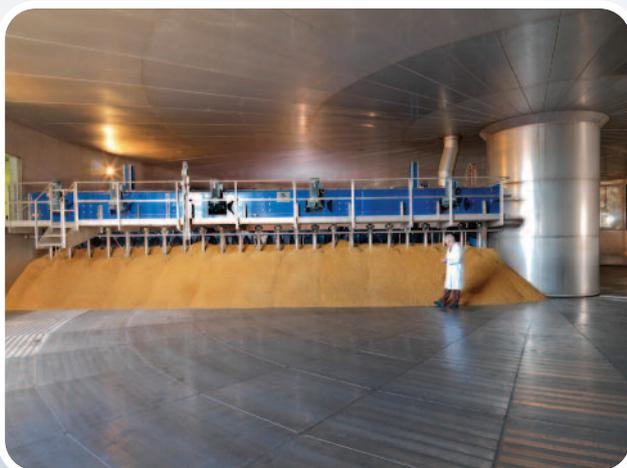
Our extensive experience, technical skills, resources, and flexible approach are such that we have the ability to adapt applications to suit customer or project needs.

Our Maltings Division specialises in all the following areas:-

- Intake & Storage
- Steeping
- Germination
- Kilning & Barley Drying
- Heat Recovery
- Storage
- Despatch
- Controls
- Effluent Treatment
- Floor Malting Equipment
- Engineering & Project Management Services Consultancy
- Maintenance & Site Services



Loader / Stripper / Turner in a 30 metres diameter Rotating Floor GKV



Heater House on a 120,000 tonne / annum Germinating Kilning Plant



Malting Plant

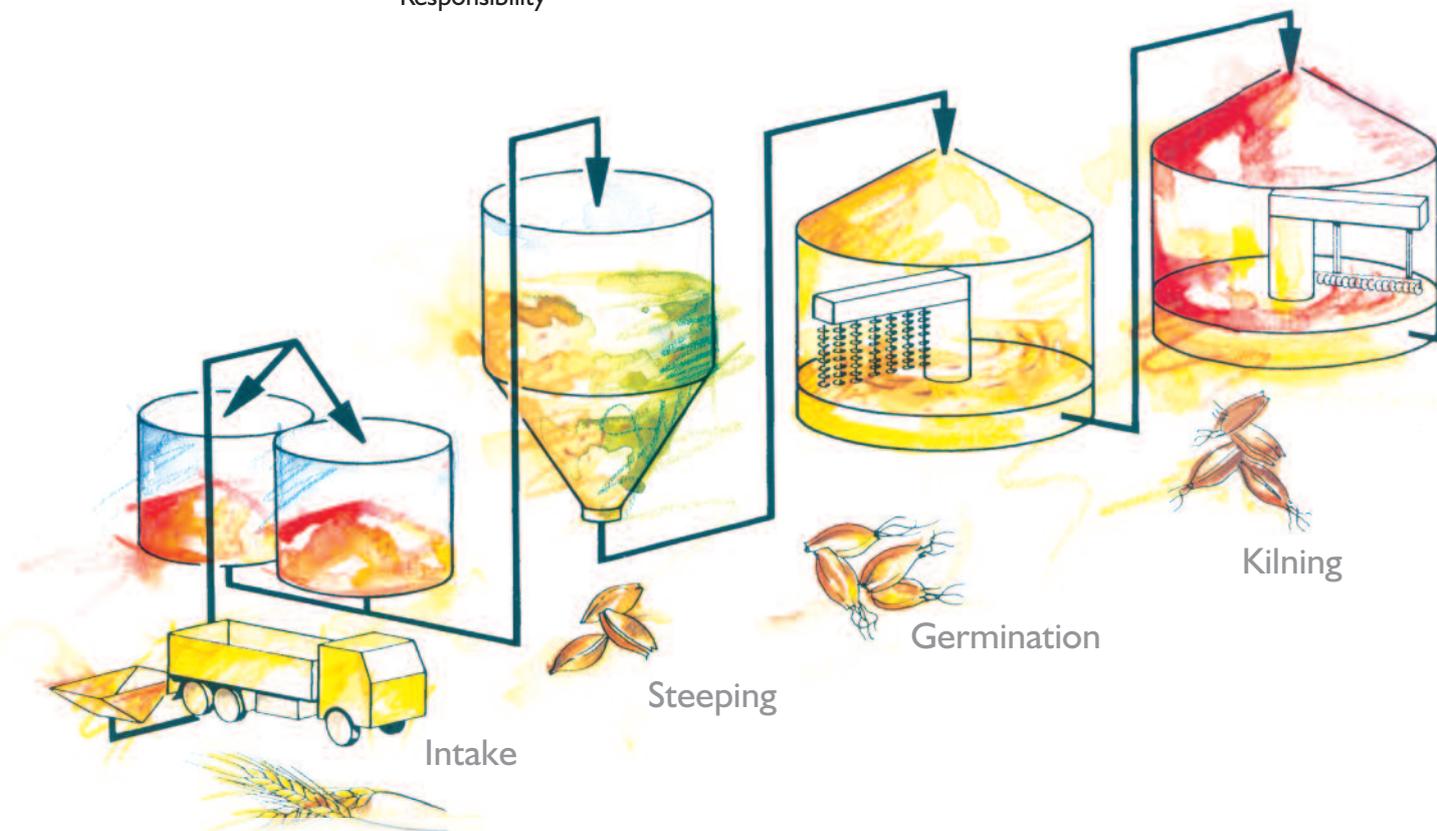
The in-house capability of Don Valley Group is extensive and flexible, the Company being equally adept in the design and supply of single items of plant or in the management of a turnkey project.

Our capabilities include:

- Preliminary Feasibility Studies
- Complete System Design & Supply
- Individual Equipment Design & Manufacture
- Equipment & System Installation & Commissioning
- Full Turnkey Project Responsibility

Between these extremes Don Valley Engineering's skills and experience can be tailored to suit every contract situation.

As joint venture partner, main contractor, sub-contractor or supplier, Don Valley has the resources and the proven ability to guarantee customer satisfaction.



▶ 30m Diameter Vessel during construction



▶ Belt Conveyor Handling Steeped Barley



The Malting Process

What is Malt?

The preparation of malt was established as a craft at the time of the Pharaohs and since that time the fundamental natural process has remained unchanged.

The dictionary states:-
"Barley or other grain prepared for brewing or distilling beer or whisky"

What is the Malting Process?

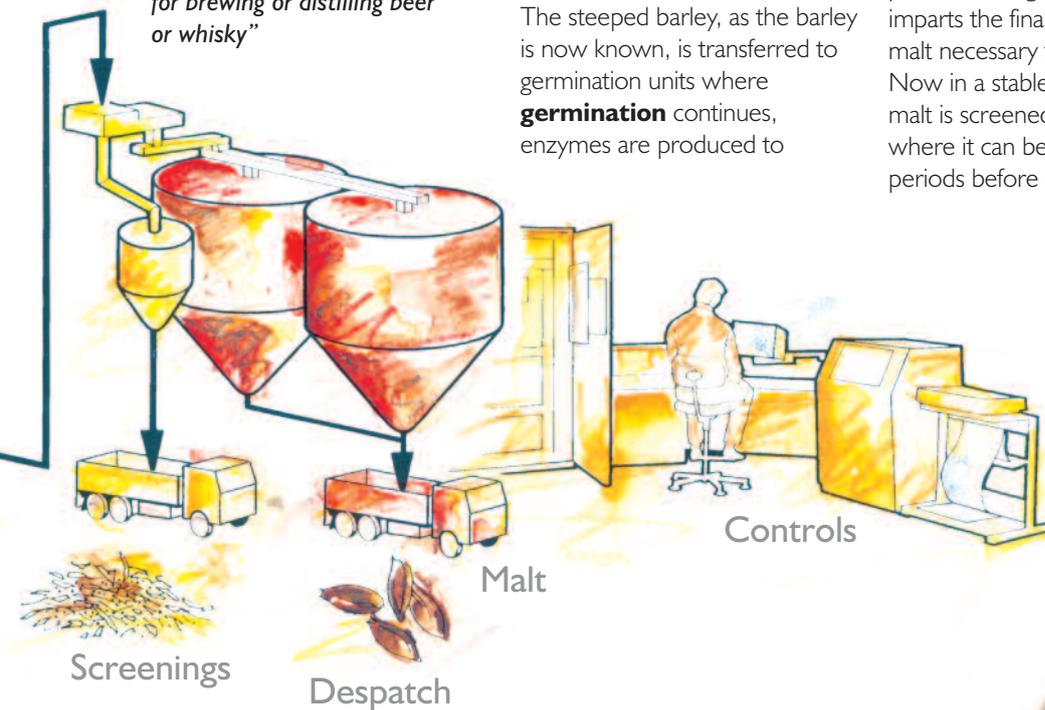
The complete process cycle can be divided into three stages:

Steeping where the moisture content of the barley is raised by immersion in water resulting in the start of the natural germination process.

The steeped barley, as the barley is now known, is transferred to germination units where **germination** continues, enzymes are produced to

partially break down the starchy material (endosperm) and a rootlet is formed.

Once the correct degree of modification has been achieved the green malt, as the barley is now known, is transferred to the **kilning** unit where the controlled drying and curing process halts germination and imparts the final colour to the malt necessary for its final use. Now in a stable condition, the malt is screened prior to storage where it can be held for long periods before despatch.



Heat Recovery System on 25 Tc Kiln



Double Kiln System



350 Tc 30m Diameter Germinating Kilning Vessels



Intake and Storage

Carefully selected barley consignments are delivered to malting plants mainly in bulk but sometimes in sacks.

High standards of handling and storage must be maintained to ensure that the quality of the malting barley.

Don Valley Engineering Intake Systems

Such systems normally incorporate:-

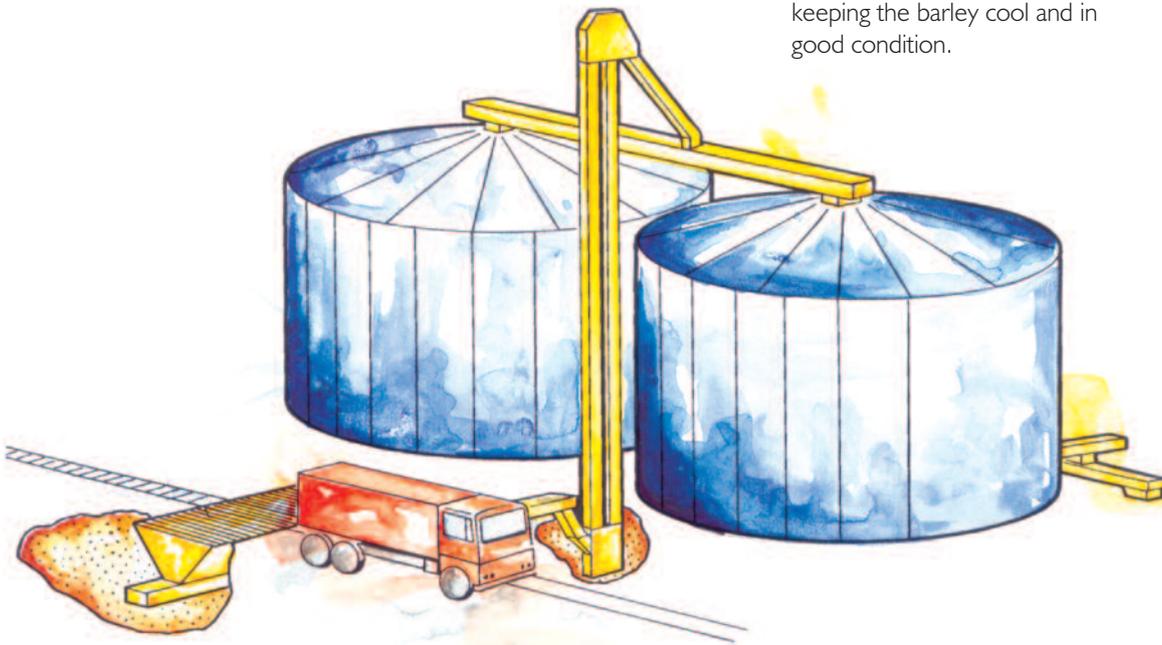
- Laboratory Sampling
- Weighing
- Rough Screening
- Artificial Drying - when necessary to a maximum moisture level of 12%
- Gentle transfer to bulk storage.

Don Valley Engineering Bulk Storage

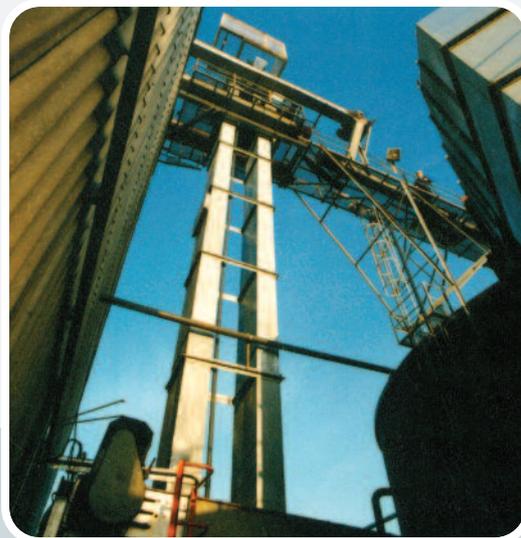
This can take various forms that include:-

- Nests of circular or rectangular bins in steel or concrete
- Flat bottom bins
- Horizontal storage sheds.

It is essential that during the storage period the quality of the barley is maintained, this often demands ventilation to assist in keeping the barley cool and in good condition.



- Intake Facilities
- Silos
- Conveying
- Batch Weighing
- Screening
- Drying



Steeping

The initial stage of the malting process is steeping where the dried and screened barley is immersed in water to initiate growth.

Moisture content increases from 12% to around 45% over a period of around 48 hours.

During periods of immersion it is important the grain is efficiently roused and that during rest periods efficient CO₂ extraction is present to ensure uniform treatment throughout the batch.

Don Valley has experience in the design and manufacture of both cylindro-conical steeps and flat bottomed vessels.

Our designs are based around hygiene, reliability and efficient use of energy and water.

Stainless steel is used wherever possible for a long lasting, hygienic finish.

Conical Steeps

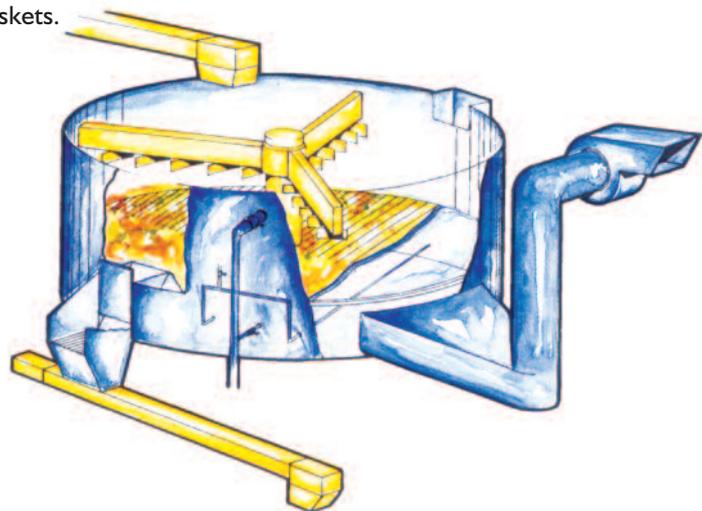
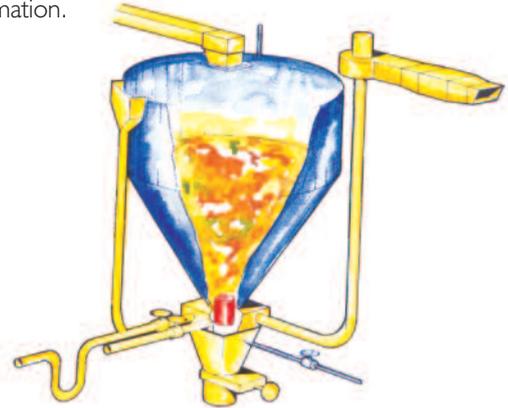
Don Valley can produce conical steeps up to 65 tonnes and 6.5m in diameter.

All our modern steeps incorporate the following features:-

- Fabricated from stainless steel.
- All internal joints fully welded to give a hygienic uniform finish.
- Filter baskets produced in wedge wire to give good airflow, drainage and longevity.
- Outlet service boxes are designed to be hygienic and can be supplied with in place cleaning services.
- Aeration systems to give reliable even rousing
- Overflow/skimming off boxes with removable wedge wire baskets.

Don Valley can supply all ancillary equipment including, pipework, valves, fans and control systems to give a full turnkey package.

We can upgrade existing systems to give improved airflows, better aeration or additional automation.



Flat Bottomed Steeps

Don Valley can produce flat bottomed steeps in excess of 250 tonnes and 20m in diameter.

Our flat bottomed steeps incorporate the following features:

- Modular construction wall panels for quick accurate erection on site

- Wedge wire or perforated plate floors
- Hygienic plenum chambers designed to minimise water usage.
- Rotary loader/discharger machines for even bed laying
- Single leaf or multi-vane dampers for accurate air conditioning control
- Underfloor aeration system giving even rousing

Don Valley can supply from complete turnkey vessels to retrofitting of discharger machines, in place cleaning systems or replacing vessel floors.



Germination Plant

During germination the grain continues to grow and starts to produce rootlets. The grain at this stage is known as 'green malt' and becomes more difficult and fragile to handle. During germination the respiration of the grain produces a considerable amount of heat and careful process control of air flow is required to maintain optimum conditions.

As rootlets grow, the grain requires gentle 'turning' to prevent the grain matting and pockets of CO₂ forming.

Germination can be carried out in circular vessels, rectangular, 'Saladin' boxes or on traditional grain floors.

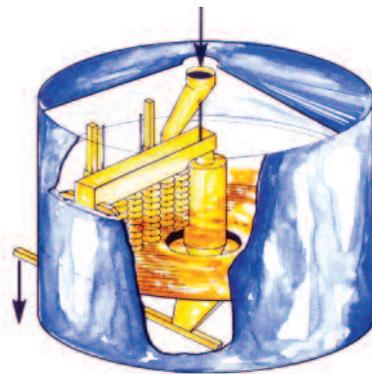
Don Valley Engineering can supply equipment to suit all these methods.

Saladin Boxes

Don Valley Engineering can supply new build saladin boxes or replacement machines and equipment to upgrade existing boxes.

We can supply:

- Complete Turnkey Plants
- Replacement Turner Machines
- Replacement Stripper Machines or Bulldozer /Turner Dischargers
- New Fans and Ducting
- Control Systems
- Replacement Grain Floors
- Malt Spray, Humidification and In Place Cleaning Systems
- Conveying Systems for Handling Green Malt and Steeped Barley.



Germination Floors

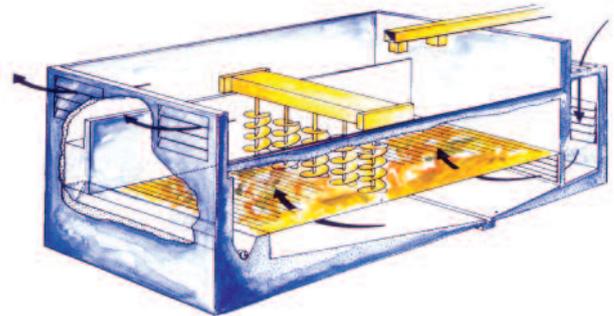
We can supply portable floor turner machines for traditional floor maltings.

Circular Vessels

DVE can supply fully automated state of the art circular germination vessels.

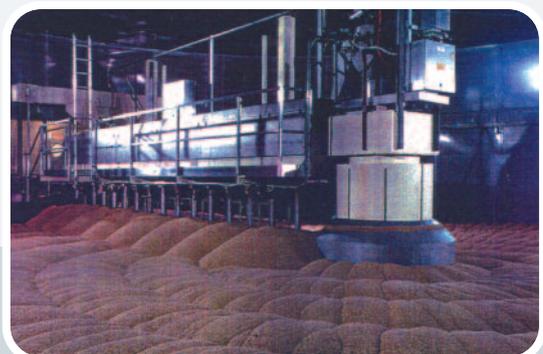
The circular design allows for improved airflow, faster simpler vessel construction and the option of rotating floor or rotating machines. Multi vessel towers can be accommodated.

Our vessels are fully stainless steel lined for hygiene and longevity. The modular construction allows for quick and accurate erection at site.



Germination Plant

- Complete Turnkey Plants
- New Stripper/Loader/Turner Machines
- Replacement Turner Machines
- New Fans & Ducting
- Control Systems
- Replacement Grain Floors
- Malt Spray, Humidification and Cleaning in Place Systems
- Conveying Systems for Handling Green Malt & Steeped Barley



Kilning Plan

After the required level of germination has been achieved, the grain is kilned to halt growth and add colour & aroma.

Over a period of 24-48hrs warm air is passed through the grain to reduce the moisture content down to around 2.5-6%. During kilning even airflow and close temperature control are vital to maintain quality and minimise energy use.

Don Valley Engineering can supply complete kiln plants, heat recovery systems, replacement floors or handling machinery.

Circular Vessels

DVE can supply fully automated state of the art circular kilning and combined germinating /kilning vessels.

The circular design allows for improved airflow, faster, simpler vessel construction and the option of rotating floor or rotating machines.

Our vessels are fully stainless steel lined for hygiene and longevity. The modular construction allows for quick and accurate erection at site.

Heating systems utilise modern indirect firing methods with heat recovery for cost effective operation.

We can supply:

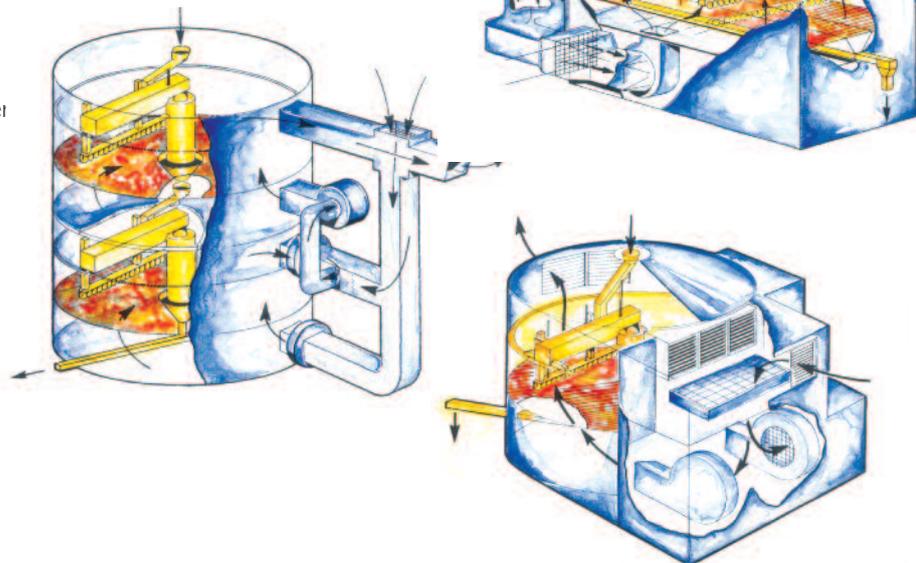
- Complete Turnkey Plants
- New Stripper/Loader Machines
- Replacement Loading Stripping Machines
- New Fans and Ducting
- Control Systems
- Replacement Grain Floors
- Heat Recovery Systems
- Conveying Systems for handling Green Malt and Malt in Culm.

Rectangular Vessels

DVE has extensive experience in the upgrading of existing rectangular kilns.

We can supply:

- Heat recovery systems
- Replacement grain floors
- Loading and stripping machines including special machines for traditional kilns such as bulldozer stripper/turners and tipping bucket turners.



Combined Germinating Kilning Vessels

Some clients prefer the improved hygiene conditions given by combined vessels.

DVE are able to accommodate these requirements. Our GKVs give good energy usage, clean conditions and good malt quality.

Double Deck Kilns

For clients who want to optimise energy use we can offer double deck kilning systems reusing exhaust air off one vessel to heat the other.

▶ Stainless Steel
Kiln /Loader Discharger



Despatch

After the kilning process the malt is screened to remove dust and culms (rootlets formed during germination) prior to storage in silos similar to those used for the initial barley intake.

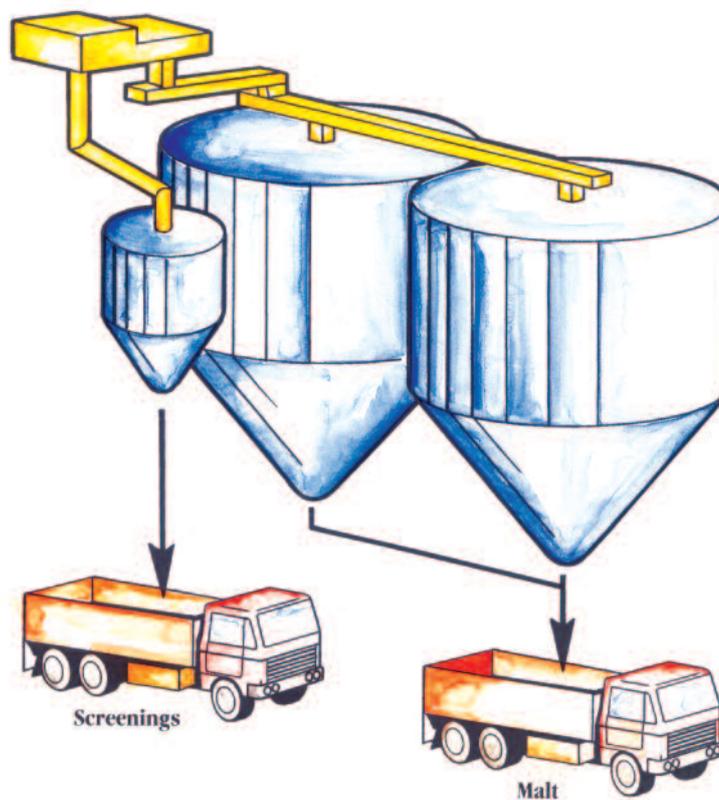
The culm and dust is a useful by-product for the cattle feed industry and is often converted into pellet form for ease of handling prior to despatch.

The malt for despatch, by bulk or sack to road, rail or sea is usually screened and weighed on extraction from the storage silos.

Don Valley supply all the various forms of equipment required, these include:-

screens, sieves, storage bunkers and silo conveying systems, road, rail or ship loading equipment.

Using their extensive handling experience Don Valley engineers design the system to suit the site and client needs.



- Silos
- Conveying
- Screening
- Weighing
- Bagging
- Container Loading





Glass Tube Heat Exchange Columns





Don Valley Engineering

Maltings Division

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Don Valley Engineering Group:



Maltings Plants, Industrial Screens,
Feeders and Centrifuges



Solutions in Bulk Materials Handling



Plant Installation, Relocation, Shutdowns

