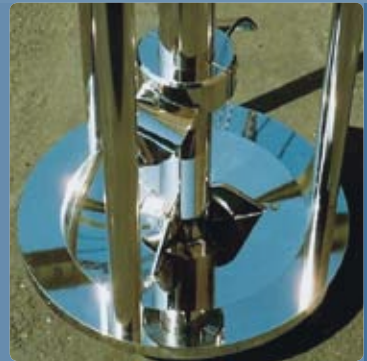




FILLWORTH

UK Process Equipment Manufacturer

Mixing and Process Solutions Worldwide



Company Profile

Fillworth is a UK company that specialises in manufacturing and supplying mixing equipment and engineering solutions to processing industries worldwide.

Overview

Fillworth has extensive experience in both solids and liquid mixing, as well as in the design of process equipment.

The company has evolved to become one of the UK's most advanced process equipment manufacturers.

We have successfully supplied machinery and completed projects in many regions of the world and across a wide range of market sectors.

The Fillworth philosophy is to provide customers with a high quality service to ensure that design, planning, construction and cost objectives are met, whatever project is being undertaken.

Customised Solutions

Fillworth's strength is that all of our machines are designed and engineered to work with the customer's individual requirements, product specifications and process conditions.

We engage in extensive consultation with the customer throughout the design and manufacturing stages to ensure that all relevant criteria are taken into account, resulting in the ideal process solution.

Mixing Solutions Worldwide



Setting up a Trial

We can offer existing and potential clients comprehensive trial facilities to develop mixing and processing applications, on the client's site or alternatively at our base in Tyne & Wear.

In addition Fillworth uses computer simulation facilities to guarantee that the most effective processing solution is established before a mixing project is undertaken.

Products and Services

Mixing Equipment Range
Batchchanger EMD
Fillmastic FM
Batchmaster VGM
Batchchanger FMD and Pan Press-out Unit
Batchranger FHDD
Batchranger FDD
Batchstar FMD
Batchstar HSD
Batchchanger HSD
Powder and Pigment Blenders

Services
Turnkey Process Plant
Food and Beverage
Batch and Plug Flow Reactors
Process Modules and Skid Units
Material Handling Systems
Heat Transfer Equipment
Pressure Vessels and Tanks
Structural Steel and Fabrication
Design and Engineering Services
European Service Backup

Product Sectors



Industry Sectors

Application Table

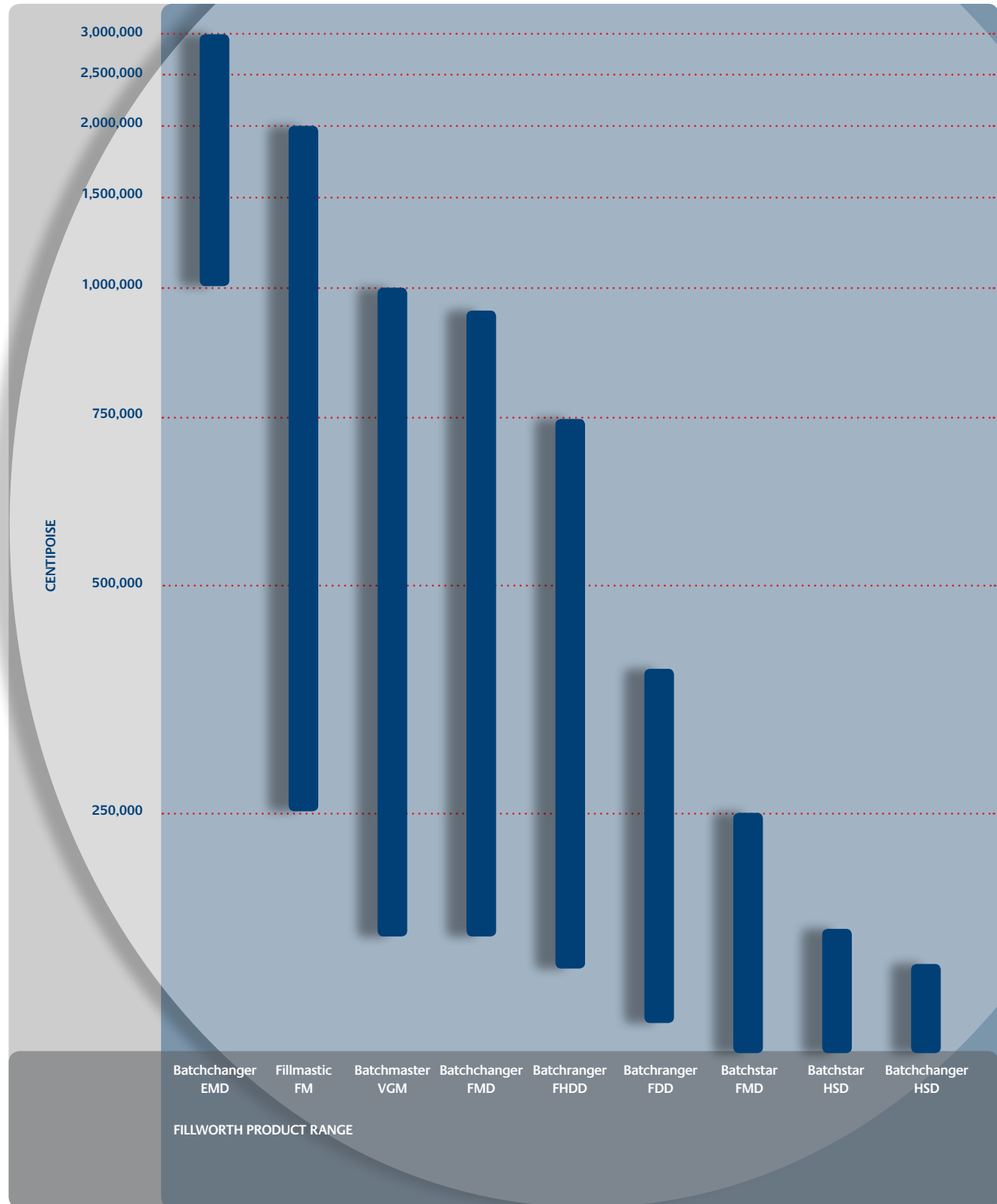
Product Matrix

	FILLWORTH PRODUCT RANGE									
	Batchchanger EMD	Fillmastic FM	Batchmaster VGM	Batchchanger FMD	Batchranger FHDD	Batchranger FDD	Batchstar FMD	Batchstar HSD	Batchchanger HSD	Powder & Pigment Blenders
Adhesives	•	•	•	•	•	•	•	•	•	
Aqueous Dispersions	•			•	•	•	•	•	•	
Bituminous Compounds		•	•	•	•	•				
Cosmetics	•	•	•	•	•	•	•	•	•	
Epoxies	•	•		•	•	•		•	•	
Fine Chemicals	•	•	•	•	•	•	•	•	•	
Food & Beverages	•			•	•	•	•	•	•	
Healthcare				•	•	•	•	•	•	
HMA's	•	•	•	•	•					
Inks			•	•	•	•	•	•	•	
Lubricants	•	•	•	•	•	•				
Mastics	•	•	•	•						
Paint & Surface Coatings			•	•	•	•	•	•	•	
Pastes	•	•	•	•						
Pharmaceuticals & Medicines				•	•	•	•	•	•	
Plastisols	•	•	•	•	•					
Polyurethanes			•	•	•	•	•	•	•	
Putties	•	•								
Reactives	•	•	•	•	•	•				
Resins		•	•	•	•	•	•			
Sauces				•	•	•	•			
Sealants	•	•	•	•						
Slurries					•	•	•	•	•	
Water & Wastewater		•	•		•	•	•	•	•	
Solids & Powder										•

Please Note: The table above gives a small insight into some of the different fields of application of our equipment. However if your product isn't mentioned, please contact our technical department.

Viscosity Chart

Range Finder



Application

Mixing Machines

Fillmastic - Model FM

Key Features

- Developed for use within the Mastic industry, the Fillmastic has evolved to process a huge range of high viscosity products up to 2 million Centipoise.
- Equipped with a triple action mixing system.
- High Shear Granulating Masticator to reduce large scale solid additions (e.g. rubber bales).
- Helical Anchor Stirrer to promote mass movement and heat transfer.
- Integrated Discharge Extruder which also supplements the mixing process.

Applications

- Mastics and Sealants
- Pastes and Putties
- HMA's and Heavy Adhesives

Options

- 205 - 10,000 Litre
- Heated / Cooled
- Fully Automated systems available
- Vacuum or Pressurised
- ATEX Rated
- Constructed in Stainless Steel and /or special alloys

- **Trial Facilities Available**



Batchmaster - Model VGM Vertical Glandless Mixing Machine

Key Features

- Developed to rapidly reduce granular or chipped materials into solutions utilising the unique fluid wedge mixing principle.
- Reduced production times and increased product Quality.
- Although Bottom Driven, the Batchmaster's unique dry well feature guarantees zero leakage.
- Developed for the solvent and water based adhesive industry, the Batchmaster has been successfully deployed in other market sectors such as Varnishes, Bituminous Solutions, Heavy Paints etc.
- Batch turndown to 10% of the maximum working volume.
- Up to 50% reduction in input power compared to conventional mixer dispersers.

Applications

- Adhesives and Sealants
- Inks, Colloids and Mill Base Paints
- Ceramic Tile Adhesive
- Plastisols and Resins

Options

- 205 - 10,000 Litre
- Heated / Cooled
- Fully Automated systems available
- Vacuum or Pressurised
- ATEX Rated
- Constructed in Stainless Steel and /or Special alloys

- **Trial Facilities Available**



Mixing Machines

Batchranger - Model FHDD and FDD

Key Features

- The Batchranger rotor stator disperser utilises Fillworth's unique Fluid wedge shear principle. The combination of an enclosed shear grid / stator and high pressure impeller have helped to reduce product mill passes up to 75%.
- Reduced production times and increased product Quality.
- A proven reduction in input power compared to conventional HSD dispersers.
- Available as a stand-alone hoist mounted Disperser or may be integrated into a Batch production machine aided by a slow speed helical anchor stirrer.

Applications

- Paints and Inks
- Foods and Beverages
- Resins and Adhesives

Options

- 205 - 10,000 Litre
- Heated / Cooled
- Fully Automated systems available
- Vacuum or Pressurised
- ATEX Rated
- Constructed in Stainless Steel and /or Special alloys

- **Trial Facilities Available**



Batchstar - Model FMD, HSD & FSRD

Key Features

- Available as a fixed vessel machine, models FMD and HSD are a combination mixer incorporating both the High Speed Disperser and the Helical Anchor Stirrer. May be upgraded with the addition of a second High Speed Disperser or incorporator resulting in a triple action mixing system.
- An advance in the paint and coatings industry, the FSRD (Self Raising Disc) has been developed to replace the costly hydraulic lift system in batch machines. Using internal radial fluid force, the high shear disc moves up and down the rotating shaft without a need for complex gland and bellows arrangements.

Applications

- Paints and Surface Coatings
- Food, Cosmetics and Healthcare
- PVA's, Varnishes and Plastics

Options

- 205 - 10,000 Litre
- Heated / Cooled
- Vacuum or Pressurised
- Fully Automated systems available
- ATEX Rated
- Constructed in Stainless Steel and /or Special alloys

- **Trial Facilities Available**



Mixing Machines

Batchchanger - Model EMD, FMD and HSD (With optional Pan Press-out Unit)

Key Features

- Specifically designed to offer batch flexibility. One machine can process multiple batch vessels or “change pans”.
- The Batchchanger range comprises three basic models. The HSD model is particularly suited to low viscosity dispersions. The mid-range FMD for medium viscosity compounds requiring more sophisticated mixing systems. The top range EMD with full Planetary mixing action for high viscosity pastes and “non-flowables”.
- The FMD and EMD range can be configured for use with multiple mixing tools for high viscosity pastes, multi-phase mixing and contacting, dispersion or emulsification. Tools may be combined to suit any particular application.

Applications

- Most Low to High Viscosity Products.

Options

- 205 - 1,500 Litre
- Heated / Cooled
- Vacuum or Pressurised
- Fully Automated systems available
- ATEX Rated
- Constructed in Stainless Steel and / or Special alloys

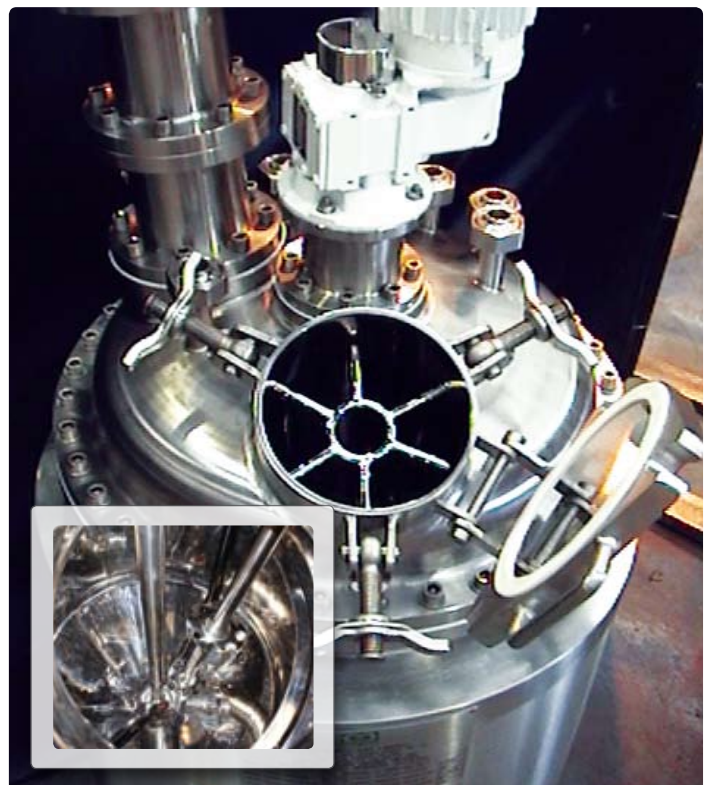
- **Trial Facilities Available**



Food and Pharmaceutical (Hygienic)

Key Features

- Developed to process a wide range of media and products from low viscosity medicines, aqueous solutions and consumable sauces to high viscosity gels, pastes and dough.
- Available as single batch mixing machines, flexible change pan systems or in-line, dynamic processing.
- All of Fillworth's hygienic mixing machines are configured for full CIP integration.
- Machines for processing solids, liquids, gas, or any combination of phase mixing.
- A wide range of mixing techniques are offered as single or multiple tool mixing systems: dispersion, emulsification, multi-phase mixing and blending are examples of some of the challenges undertaken.
- Machines are constructed throughout in 316L stainless steel. For extreme applications exotic alloys may be used for specific machine elements.
- Full Validation and Certification, IQ-OQ-PQ is available for all Fillworth Systems.
- **Trial Facilities Available**



Mixing Machines

Powder and Pigment Blenders

Key Features

- Developed to process a wide range of granular material from light particle aerosols to heavy pigments and cementaceous products.
- Intensifier Mixer / Dispersers for highly fluidised, fine particle macro-mixing.
- Plough Mixers for Diffusive Solids Mixing. Cutters, Intensifiers and Dispersers are available for agglomerate particles and powders.
- Ribbon Blenders for convective solids mixing and blending.
- Fillworth can also offer powder and solids handling systems to complement any dry blending or mixing operation.

Applications

- Most Solid Granular Products and Powders.

Options

- 205 - 5,000 Litre
- Heated / Cooled
- Vacuum or Pressurised
- Fully Automated systems available
- ATEX Rated
- Constructed in Stainless Steel, Carbon Steel and / or Special alloys
- *Trial Facilities Available*



Powder Blending

Laboratory Equipment

Key Features

- Covers the full Fillworth equipment range.
- Atex versions available.
- Sizes from lab scale to development pilot plant to production units.
- Fully serviced modular construction available.



Laboratory Equipment



Mixing Equipment for the Food and Beverage Industries

Designed and developed to process a wide range of foods stuffs and associated media, from low viscosity drinks, aqueous solutions and sauces to high viscosity gels, pastes and dough.

- Available as single batch mixing machines, flexible change pan systems or in-line processing.
- Vessels and Kettles can be designed for heating, cooling and vacuum applications.
- All of Fillworth's food mixing machines are configured for full CIP integration.
- Machines for processing solids, liquids, gas, or any combination of phase mixing are available.
- A wide range of mixing techniques are offered as single or multiple tool mixing systems; dispersion, emulsification, multi-phase mixing and blending are an example of some of the challenges undertaken.

- Machines are constructed throughout in 316L stainless steel.
- Fillworth Mixing Machines can be supplied as fully assembled pilot or production skid modules and comprise integrated vacuum, raw material charging and CIP facilities with fully automated, PLC based control systems.
- Mixing systems are complemented by a comprehensive range of processing equipment including liquid and solids transfer, heating / cooling systems, vacuum deaeration and pressure systems.
- Fillworth can also offer liquid filling systems to complement our comprehensive range of mixing equipment.



Turnkey Process Plant

Fillworth offer a diverse range of process engineering services.

- Fillworth are one of the leading suppliers of Process Plant and Mixing Equipment.
- Our philosophy is to provide clients with an unparalleled service, ensuring that design, planning, construction and cost objectives are met, in whatever market sector or project is been undertaken.

- Fillworth have extensive experience and knowledge of Mixing Systems, Heating Systems, Pipework, Structural Steelwork, Pumped Systems, and many aspects of Solids handling.



Key Services for Pharmaceutical, Food, Chemical and Coatings Industries

Front end feasibility studies

Design consultancy in process engineering

Process investigation

Detailed engineering design

Project management and control

Procurement services

Construction management

IQ, OQ and PQ validation

Hazard analysis Designs for hazardous areas



Process Modules and Skid Units

In the Process Industries, plant downtime is extremely costly and almost always disruptive.

- It is often less intrusive, cost effective and easier to control quality procedures if plant expansion modules are constructed off site.

These process modules can be assembled prior to delivery and include:

- Vessels
- Reactors
- Heat generating and transfer Equipment
- Pumps
- Valves
- Instrumentation

- All services can be installed on the skid with pipework, electrics and control system integration with existing processes minimised.
- Fillworth has the ability and experience to design, simulate, engineer, construct and commission all types of skid modules for integration into most chemical processes.

To understand Module Performance from all aspects of the engineering spectrums we undertake these interrogations.

Analysis Systems of Process Performance

Pressure Systems Analysis

FEA Structural Analysis

Process Simulation

CFD Flow Simulation

Heat Transfer System Analysis

Pipe Stress Analysis



Heat Transfer Systems

Most chemical processes require controlled heating or cooling systems. Reactions or mixtures at some point of the manufacturing cycle require heat transfer to produce the desired results.

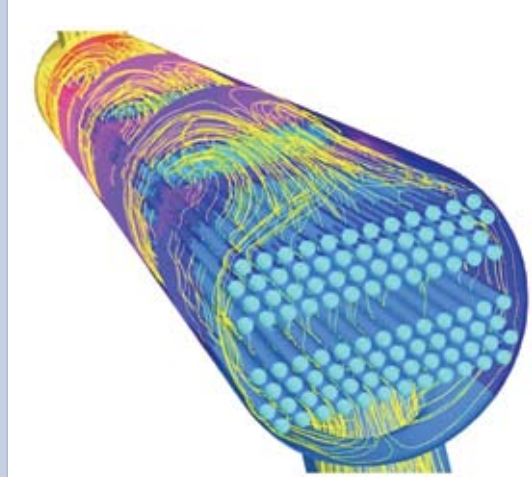
- Fillworth possesses the knowledge and expertise to design, rate, specify and construct a wide range of Heat Transfer equipment incorporating Shell and Tube Heat Exchangers, Plate Heat Exchangers, Condensers, Reboilers and Waste Gas Economisers.
- We design Heat Transfer equipment to

internationally recognised standards including **PD5500, TEMA and ASME VIII Division 1.**

- When designing Heat Transfer Equipment, it is essential for an effective process that the engineered solution presents optimal efficiency in the heat transfer system.

Fillworth uses a number of front end simulation methods to interrogate the process model and arrive at the most effective solution for the heat transfer system.

- Heat Transfer Analysis
- HT and Code Rating Software
- CFD Analysis



Pressure Vessels and Store Tanks

Fillworth possesses extensive experience in the rating, design and construction of Pressure Vessels, Storage Tanks and other Pressure Containing Equipment.

- Vessels are designed and constructed in many materials, including Exotic Alloys, Stainless and Carbon Steels.
- We adopt the Pressure Equipment Directive Vessel CE Standards including **PD5500:2006, BS EN13445, ASME VIII Division 1, AD-Merkblätter, Stoomwezen** as well as other internationally recognised publications.
- All Welders are qualified to the latest recognised standards including

BS EN287 and 288 and ASME IX.

Welders are trained, tested and certified by **Lloyd's EMEA.**

Software Analysis

Fillworth uses front end 3-D Mathematical Modelling, FEA Simulation and Computational Fluid Dynamics to design pressure vessels and pressure containing systems, offering the most effective solution to most processing conditions.

- **3-D Modelling Software**
- **FEA Analysis**
- **Heat Transfer Analysis**
- **Code Rating Software**
- **CFD Analysis**



Batch and Plug Flow Reactors

We design, construct, install and commission a comprehensive range of chemical reaction vessels from simple stirred batch reactors to complex plug flow operations.

- Reactors can be supplied up to 20,000 Litre capacity for a wide range of processes, pressures and temperatures and are produced in a broad range of carbon, stainless and exotic alloy steels.
- We manufacture custom-designed stirred reactors for use in laboratories, pilot plants, and full-scale production facilities.
- Using complex design software clients are presented with front end analysis of the process reaction kinetics by complex CFD

simulation and high end process modelling packages.

- Offering complete skid mounted, stirred reactor process systems complete with product loading, feed, reaction and receiving modules, mass balance and product analysis. We also offer a variety of controls from simple manual systems to advanced PC-based SCADA and DCS.
- Fillworth can also engineer the reactor support systems including Heating Equipment, Safety networks, vent scrubbers and discharge / handling equipment.



Material Handling Systems

Much of our process and plant engineering involves transporting raw materials in liquid, solid or granular states.

- Fillworth has successfully designed and installed material conveying systems by mechanical and pneumatic methods deploying Silos, Screw Conveyors, Rotary Valves and Blowing Seals, Weigh Feeders and Blowing Systems.
- Pneumatic Transfer systems have been installed using both Dense and Lean Phase propulsion methods.

We can provide a diverse range of engineering services in the field of material handling, including:

- **Front End Feasibility Studies.**
- **Design Consultancy in Material Handling Systems.**
- **Bulk Storage Methods.**
- **Material Conveying Systems.**
- **Pneumatic Transfer Systems.**
- **Liquid Pumping Systems.**
- **Detailed Engineering Design.**



Structural Steel Fabrication

As part of Fillworth's comprehensive portfolio, we can design and manufacture steel structures and special developed fabrications to complement our range of process plant and have frequently incorporated these into our turnkey operations.

- We are able to manufacture single components up to 10 tonnes. However, we may accommodate structural steel projects upwards of 500 tonnes if required.
- We fabricate and erect various forms of structural steel including large portal frames, trusses, tubular skeletal structures, process plant steel structures, offshore rig assemblies and lifting derricks.

- We have well equipped manufacturing facilities for all types of fabrication, including rolling, bending, shearing, cutting, mild, stainless and alloy steel welding and can produce varied works from simple structural steelwork to many forms of complex metal processing and fabrication.
- We are also able to design and process fabrications in exotic materials such as Hastelloy, Incolloy, Titanium and Super Stainless Steel
- Our engineers are fully qualified to design all types of steel structures and fabrications. Using state of the art software, we often use FEA analysis methods to offer the client peace of mind that the most effective engineered solution has been interrogated in full.





FILLWORTH

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