

# Micro Brewery & Brewpub



Allbest Creative Development Ltd. (ALLBEST)

# Preface



We have been manufacturing micro-brewery & brewpub as a leading manufacturer of brewing equipments in China for over ten years, and have produced more than 700 sets of micro-breweries and brewpubs in both China and abroad. We offer a total solution for microbreweries and brewpubs.

Our success rely on the comprehensive formula of our basic package which includes all the necessary equipments and information, tailored to the needs of the individual clients. Furthermore, our company has more than 110 specialized brewmasters, including some German brewmasters) who ensure that the clients can brew the quality beer.

Developed a Production Brewery Service Program through our long-term experience and practice, which will offer the client a better service in terms of pre-planning of the project, satisfaction of requirement, lowing the cost of the project, taking full use of local conditions, after-sale service and technical consulting, etc.



# Micro-Brewery or Brewpub (100 – 2,000 L Per Day)



Our breweries give the guaranty to manufacture the best lager beer, Weizen beer and beer specials by using decoction and infusion brewing methods. We produce alternative external surfaces depending on the customer needs. Wood and copper clad vessels generate a warm traditional look for the brewpub with an open public aspect. Alternatively, there is polished stainless steel where a practical hygienic finish may be required. All of the internal surfaces of the plant are constructed in stainless steel and self –cleaning for easy operation and maximum hygiene.



## ***Brewhouse***

**Brewhouse** consists of the brewing vessels such as mash tun, lauter tun, whirlpool, and in some cases, cold liquor tank & hot liquor tank. This is the area in which the actual brewing takes place. An average brew will take about six hours to be completed and this area is the most highly visible area to customers.

Some brewhouses leave the brewhouse exposed to the public, separated by only a low knee wall. It should be noted that this area does produce some noise (primarily from the pumps), odour from both the mashing procedure and the boil, heat and at certain points, waste water from vessel cleaning.

It would be wise to take safety into considerations when exposing the brewery to the public. In the case of the brewhouse it is important that this room be under positive pressure to allow for proper evaporation during the boil.

From a visual standpoint, the brewing vessels are usually orientated so that the front of the vessels and the stairs of the platform face the public. The back of the vessels are oftentimes aligned along a wall to allow the mechanical supplies to be supported. The equipment should be placed where there is enough room to access all sides of the vessels for daily sanitation and occasional maintenance, a minimum of 0.5m should be provided.

The brewhouse area will generate waste water and as such, a trench drain running in front of the brewing vessels should be installed. The floor should be pitched 1/8" - 1/4" to the drain and covered with a suitable covering to stand up the anticipated high temperature, both acidic and alkaline cleaning solutions.



Brewhouse walls and ceilings should be of materials that will withstand a wet environment and not harbor bacterial growth. The brewhouse should be considered a manufacturing area and as such, sufficient lighting should be provided to allow for safe and efficient working conditions.

It is a good idea to install a drop down "trouble light" over the brewhouse platform to allow for interior tank inspection.

A water house, completed with spray nozzle, should also be provided at the platform for use during the actual brew. The brewhouse will require an input of malted barley per batch and its storage area should be such that it is readily accessible yet not exposed to excessive moisture or temperature.

The typical small brewery will receive malt shipments in 25Kg bags, in lots of 50 to 500Kg.

It is important that the malt storage area is adequate to allow for rotating of inventory. The brewhouse will also generate spent grains (wet barley) which will need to be taken from the brewing area and either dumped or held for pick up. The grain will spoil quickly and cannot be stored in the brewing area. If at all possible an exit to the outside from this area would be preferred, over having to transport the grains through a public area and then to the outside.

As a food preparation area, the brewhouse should include a hand sink as well as a larger sink for washing parts, etc. An emergency eye wash and/or an emergency shower are also good ideas.

A safe area for storing and dispensing cleaning chemicals should also be included. These compounds should not be stored with other restaurant cleaning supplies. In the absence of a separate lab area, a stainless steel counter should be included electrical supply to allow for product measuring and testing. All floor obstructions in all areas should be minimized when ever possible.

## ***Fermentation & Lagering Area***

After brewing, the product is transferred to the fermentation & lagering area where it will be held from 14 to 28 days. The emphasis on this area should be on sanitation, such that all surfaces should be washable. Carbon dioxide will be created, and vented from this area. This area should also have a properly covered adequately pitched floor emptying into a trench drain run in front of the vessels.

Placement should also allow for access around the vessels. These vessels are normally connected to a coolant line and will require that the lines are properly supported from a wall or overhead.

All electrical outlets should have moisture resistant covers.

The distance from the brewhouse to the fermentation area should be kept to a minimum to allow for a direct transfer of product (through either flexible brewers hose or stainless steel piping).

The area should be located close to the bar area to allow for efficient transfer and dispense of product. In the case of brewpubs, the tanks will be connected directly to the tap (draft) lines by way of a beer python.

This area will also require a CO2 source, with an individual secondary regulator for each tank.

## ***Mechanical & Electrical Considerations***

This will consist of the electrical service, water filtration, steam boiler (if required) and glycol chiller. The chiller and boiler both generate heat and will require adequate ventilation and make up air. The water filter will occasionally require back flushing and should have access to a drain.

Many breweries locate certain mechanical components close to their intended use, for example, the boiler could be located close to the brewhouse to allow for a minimal piping run of steam and condensate. The glycol chiller will primarily supply the fermentation and/or bright tanks and as such, will be more economical to install in close proximity areas.

The basic electrical: mash control counter (electrical heater or steam boiler, hot water pump, mash pump, wort pump, agitator), fermentation control counter (CIP pump, glycol or alcohol pump and so on), refrigerating control counter

In addition, you will need adequate lighting in all working area, receptacles will be needed in the lab area to service small scales, meters, etc. These numbers do not take into account keg racking, washing, filling, any packaging or filling lines.

Basic brewery water: A minimum of 1" line delivering 10.5 GPM @ 40 p.s.i. will be required. This amount is based on the wort cooling demand. The type of water and the ambient temperature of the water can effect these requirements.

It should be noted that the customer is also responsible for providing and installing all water piping throughout the brewery. In addition, the glycol chilling system which the customer is also responsible for, is best constructed of copper and will vary in sizing and length based upon its location.

Please remember these are an outline of basic requirements and your exact system may vary somewhat. It is recommended that in an effort to solicit accurate bids from trades, the customer secure a set of Installation drawings complete with customer / contractors responsibilities from our Brewing Services.

## ***The feature of the equipment:***

All of our tanks and systems offer the latest designs and safety features for pressurized and un-pressurized vessels and storage tanks. Such features include:

- All sanitary stainless steel design and construction ( 316L, 304 or other steels available)
- Sanitary welded joints and seams with a micro polish finish
- Optional micro polish finishes include: 0.2  $\mu$  m, 0.4  $\mu$  m, 0.8  $\mu$  m.
- Stainless steel pressure relief valves, fixed or adjustable
- Stainless steel valving and outlets
- Shadow-less manways with sanitary finishes (swing inward or swing outward doors)
- Site glass gauges for level and volume checks
- Dish bottom tanks, conical bottom or custom bottoms and outlets
- Racking Arm outlets ports for fermentation and yeast propagation vessels
- Gycol Jacketed and Insulated tanks for cooling and temperature control
- Steam Jacketed and Insulated tanks for heating and temperature control
- Stainless valves, piping and manifold designs

We can offer complete tank and system controls for any critical parameter of your process, including: Glycol chilling and cooling controls-- solenoid, check valve, or pressure sensor actuated Steam or other heating controls-- globe, gate, pressure sensors, or solenoid actuated Water flow controls, backflow preventers-- filtration systems and controls Programmable digital controllers for valves, solenoids-- temperature, pressure and flow controls PC controlled systems-standard or custom software control packages, Other control features and options available-semi automated or automated.

We provide HDWP series and special design and manufacturing.



# Equipment in series

P A R T	type	HDWP-1000L		HDWP-500L		HDWP-300L		HDWP-150L	
	name	qt	Outer side(mm)	qt	Outer side(mm)	qt	Outer side(mm)	qt	Outer side(mm)
B R E W H O U S E	Water filter	1	φ 400	1	φ 400	1	φ 400	1	φ 400
	Water tank	1	φ 1200×1500	1	φ 1200×1200	1	φ 880×1200	1	φ 920×1700
	mill	1	1000×1500×1700	1	400×600×1200	1	400×600×1200	1	400×600×1200
	Mash & boil tun	1	φ 1600×2580	1	φ 1200×2180	1	φ 1000×1900	1	φ 820×1900
	Lauter & Whirlpool tun	1	φ 1600×2580	1	φ 1200×2180	1	φ 1000×1900	1	φ 820×1900
	Plate heat exchanger	1	300×800×800	1	300×600×600	1	300×500×600	1	300×400×600
	manifold	1 set		1 set		1 set		1 set	
	Oxygen saturator	1		1		1		1	
F E R M E N T I N G	Unitank	8	φ 1600×2480	8	φ 1200×2480	8	φ 1000×2100	8	φ 800×1900
	Bright beer tank	3	φ 1200×2480	3	φ 1000×2100	3	φ 800×1900	3	φ 800×1900
	CIP system	1 set		1 set		1 set		1 set	
	manifold	1 set		1 set		1 set		1 set	

C H I L L E R	refrigerator	1	1500×1200×1200	1	1200×1000×1000	1	1000×1000×800	1	1000×1000×800
	alcohol case	1	1200×1100×900	1	φ 1200×1900	1	φ 1200×1900		φ 920×1700
	Ice water tank	1	900×1500×1700	1	φ 1400×1500	1	φ 1200×1800		φ 920×1700
	pipe	1 set		1 set		1 set		1 set	
Electrical counter	3	1800×800×600	3	600×400×1600	3	600×400×1600	3	600×400×1600	
pump	4		4		4		5		
valves	1 set		1 set		1 set		1 set		
Tap & hose	3		3		3		3		
Area of layout(sq.m)	50		35		30		20		
Electrical power (using electrical heating)	70 KW		45KW		35KW		25KW		

# Beer



We features beer brewed from the great traditions of Germany, England and Czechoslovakia. We also offer special styles with influences from around the world. Each of our beers is produced from the finest barley and hops in the world and includes only four basic ingredients: Barley, Hops, Yeast and Water. No additive or preservatives are used, because the beer are handcrafted in small batches and kept cold, no preservatives or pasteurization are required. The customers are guaranteed a fresh and natural pint of beer every time!

we can brew other special beer tailored to our customers and expectations

We recommend three kinds of beer that are very popular in the world:

1. Pilseners beer
2. Munich dark beer
3. Weizen beer



## *Pilsener beer*

A classic Pilsener, has a gravity of around 12 Balling and is characterized by the hoppiness of its flowery aroma and dry finish (with Perle Hops for bittering, Saaz Hops for aroma and bottom fermentating) . This style is typical of many quality German, Czech, and Dutch beers, Light gold in color, well-hopped but balanced with a rich malty aftertaste, full bodied with a clean dry finish. European Lager is always a pleasure, well carbonated with a rich, creamy head.



## *Munich dark beer*

Means "Munich-style". In international brewing terminology, this indicates a dark-brown lager, a style developed in Munich (although another Bavarian town, Kulmbach, also has a long tradition of dark lagers). In Munich, such a brew is clearly identified by the word Dunkel ("dark"), and classic examples have an alcohol content of around 5 percent by volume. Bavarian brewers in general also impart their own distinctively malty accent to their everyday, lower-gravity (alcohol content around 3.7) pale beers. This beer style is known for its rich maltiness, with the great body and flavor of dark malt and grain. The color is very dark brown with a light tan creamy head. The malt is balanced with high quality European hop varieties.



## *Weizen beer*

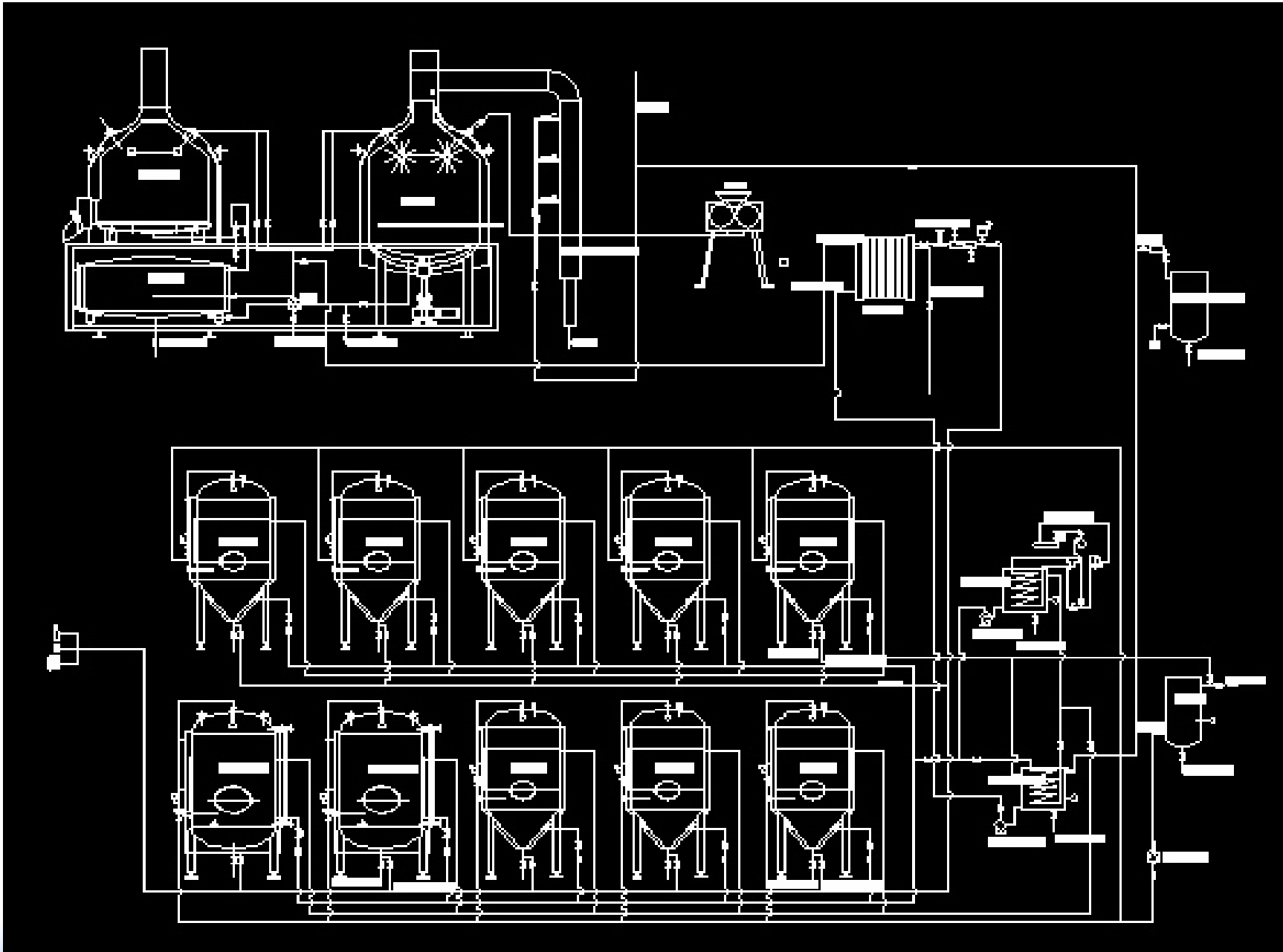
The German term for "white" beer, implying a pale brew made from wheat. In the north, a special renown is enjoyed by Berliner Weisse, a style in its own right. A different style of Weissbier is made in the south, with a more conventional alcohol content (usually a little over 5 percent by volume), a higher proportion of wheat (at least 50 percent) and a yeast (again top-fermenting) that produces a tart, fruity, spicy palate, sometimes with notes of cooking apples and cloves. Often, instead of Weissbier, the southerners prefer the term Weizen (a similar-sounding word but it means, quite simply "wheat"). If the beer is sedimented with yeast, it may be prefixed Hefe-. Southern wheat beers are also produced in dark versions (these Dunkel Weizen brews have a delicious complex of fruitiness and maltiness), and in Export and Bock strengths. Weizenbock is sometimes served as a Christmas beer.

The popular Bavarian Weizenbier is brewed from 2/3 wheat and 1/3 barley. It is lightly hopped, well carbonated, and light in body. The color is light gold with a creamy white head. Great as a refreshing drink in warm weather, this style is known for its crisp, clove-like flavor.





# Process Flowchart of Brewpub



## Description of Process:

The main ingredients of quality beer is malted barley. The malting process take place before breweries purchase barley. It involves wetting (steeping) and sprouting the barley. This will help brewers in their attempt to covert the starch to sugar in the brew process. Then the barley is dried, or sometimes even roasted, in a highly controlled manner. This gives the malted barley its specific characteristics such as color and flavor. Dark malts have been roasted longer or at higher temperatures than light malts. Only the finest domestic and imported malted barleys are used in our company.

To start the brewing process, bags of various types of malts are dumped into the malt mill and cracked open (not ground) between two adjustable steel rollers to create “grist”. The internal starch is exposed, while the husk is left intact (this will be important later in the lautering process). The grist is then transferred to the mash tun. As the grist fall into the mash tun, the brewer stirs the mixture with a paddle to provide thorough mixing with water. The mash remains in the mash tun for several hours while the starch of the grain is converted into simple sugars. Certain enzymes in the grain which is controlled by the temperature of water are responsible for this conversion. Heating of the mash by vapour or electricity can get the necessary temperature. The sugary liquid tapped throughout the mash is called wort.

The next priority is to get this wort over to the kettle without bringing too much of the grain particles with it. The grain husks (which were left intact in the milling process) makes a bed on a perforated screen midway through the vessel. Both of these working together act as a “double filter bed”, the wort seeps through the bed and the screen and is pumped over to the kettle (leaving the other particle of the grain behind). This process is called lautering. More hot water is sprayed over the bed through a washing ball. This is called sparging. Sparging helps free any sugars trapped in the husks and grain bed to get the best utilization from mash.

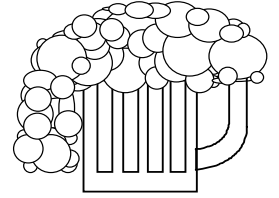
Once the wort is pumped over to the mash kettle, it is brought to a full boil. Hops are added to impart bitterness, flavor and the aromatics of the beer and also act as a natural preservative. When the boil is complete (about 90 min), the wort is rapidly pumped in a circular motion, or “whirlpooled”. This results in the hops residue and other protein sediment settling in a cone pile in the bottom of the whirlpool kettle. Some people also call this a “hop island”. The phase of this is to separate the solids from the wort which is important in the transfer of the wort to a fermentor.

The wort is then pumped from the whirlpool kettle through a plate heat exchanger where cold water cools it from near boiling to approximate 8° C. The water that passes through the heat exchanger is heated as it cools the hot wort and is stored in the hot water tank. This hot water is later used for cleaning or brewing. From the plate heat exchanger, the wort is pumped through hoses to one of fermentors. Brewer’s yeast is “pitched”, or introduced to the wort, as the wort is being transferred to the fermentor. This is the time when the fermentation begins. The yeast consumes a portion of the sugars in the wort and converts them to alcohol, carbon dioxide and yummy beer flavors (basically a huge yeast orgy of eating and reproduction). The primary fermentation takes about seven days. When primary fermentation is complete, the fermenting temperature is lowered which causes most of the yeast to “fall asleep”, or flock out and settle to the cone-shaped bottom of the fermentor. The temperature is controlled by cool alcohol or glycol circulation in the jacket of the fermentor during fermentation.

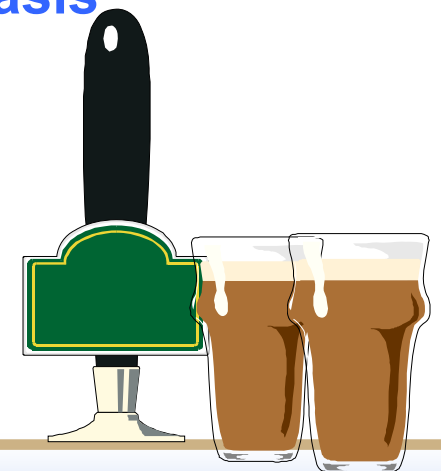
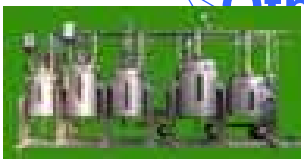
When the yeast has settled out, it is either harvested into a sterile stainless steel bucket and used for a future brew, or it is thrown out. Then the beer is transferred to a large tank or is in the unitank where it matures for a period of two to four weeks. This allows the final flavors to develop and any sediment or yeast to settle out. Keeping appropriate pressure makes the beer saturated by CO<sub>2</sub> during the lager.

After sufficient lagering aging, the beer is either filtered to a bright beer tank (if it is a brighter beer) or just transferred to a dispensing tank.

# Service



- **Production Brewery Service Program and project planning**
- **Process and mechanical engineering**
- **Deliver profitable solutions tailored to our customers needs and expectations.**
- **Assemble a team of appropriate personnel to provide the optimal solution.**
- **Fabricate and provide first rate machinery and equipment**
- **Training program**
- **Guaranteed operational efficiencies and performance targets.**
- **Guaranteed on time delivery**
- **Technical supervision for installation or on turnkey basis**
- **Providing specialized brewmasters (including German brewmasters)**
- **After-sale service and spare parts**
- **Other as requested**



# 1. INSTALLATION

## 1.1. Installation supervision

It is your option to decide to hire your own contractor to complete the installation of the utility lines, such as gas, water, glycol piping, electrical. In this case we assemble the brewery, including the brewhouse vessels and the manifold, and provides technical assistance to build the utility lines and connect them to the brewery. The installation is followed by the training session, usually a live operation, to complete a test batch. During this operation, your brewer will learn the specifics related to our system.

## 1.2. Installation on turnkey basis

In addition to Installation Supervision, we offer actual installation of the complete brewery. This service assumes the presence of all necessary utilities at the time our installation work starts. The turnkey installation assures knowledgeable and efficient project implementation based on our broad experience, and also allows our customer to control potentially runaway costs by less experienced subcontractors. Our turnkey installation includes: steam piping from the boiler to the brew house, glycol piping from the condensing unit (s) to all tanks, insulation of pipes offering different options, such as “budget”, “deluxe”, etc. Our glycol piping may include a number of convenience options, such as flow indicators for each tank to be cooled , solenoid valve bypasses for manual override when necessary, safety features, and many others.

We also offer to do all electrical work related to the temperature control of brew house, fermenters, storage tanks, whatever is run by 24V power. Depending on the location and the local code, we may offer electrical wiring of motors and pumps as well. Building carbon-dioxide, nitrogen, air or oxygen lines for carbonation, pressurization and aeration purposes is also available. Our specialists will build all the necessary, professional support construction to hold the glycol, water, steam and electrical lines.

As a summary, by granting the turnkey installation option to us, you will control costs, rely on expertise, and assure timely completion of the entire project, guaranteed by a single company.



## 2. TRAINING

On site training include:

- ◆ Raw materials/Grist calculations/hop calculations
- ◆ Milling
- ◆ Mashing theory and practice
- ◆ Wort production
- ◆ Wort boiling
- ◆ Hop additions
- ◆ Wort cooling
- ◆ Primary fermentation
- ◆ Plant cleaning and sterilization
- ◆ Yeast handling
- ◆ Beer maturation
- ◆ Filtration
- ◆ Bright beer tank operation
- ◆ Packaging
- ◆ How to prepare an operating manual
- ◆ Record keeping

Also supplied is a spreadsheet for grist formulation, water treatment, hop additions, mashing and hot liquor temperature calculation, mash loading of mash tun screen, operating mash bed depths, mash and sparge liquor calculations, basic product costing.

### 3. PREPARATION OF EQUIPMENT

We will constantly verify during equipment manufacture the following:

- ✓ A suitable quality of stainless is being used.
- ✓ Internal welds ground to brewing standard
- ✓ Argon used in pipe welding
- ✓ Mash tun correctly designed and sized to give effective bed depth when in operation. Given the clients product gravity requirement
- ✓ Insulation is suitable to minimize stress corrosion
- ✓ All vessel sizes with regard to batch size. (e.g. The headspace is sufficient to operate effectively for the required batch size)
- ✓ Pumps of suitable for clients beer type.
- ✓ Valves are suitable for their application.
- ✓ Positioning and type of thermocouples to be suitable for tank operation for clients brew length and beer type.
- ✓ Cooling jackets suitably positioned for the required operating procedures.
- ✓ Sample cocks suitable for cleaning and sterilization.
- ✓ Heat exchanger suitable for wort cooling given mains water summer temperature
- ✓ Primary ,secondary, or tertiary filtration if required to achieve necessary shelf life.
- ✓ Design of fixed pipe work is well suited for in place cleaning.

## 4. RAW MATERIALS

Help given with sourcing the correct high quality raw materials required to produce a quality product.

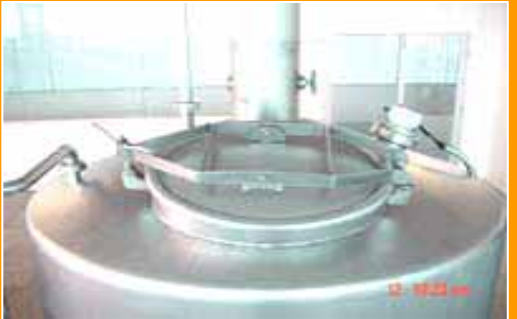
## 5. START UP

- Plant inspection
- Snagging list preparation
- Pre use degreasing procedures
- Calibration procedures
- Water brew
- Start up -first brew
- Modification of operating procedures resulting from above
- Brewhouse training. Operating procedures, recipes.

## 6. FERMENTATION

- ◆ Yeast off
- ◆ Transfer of beer to maturation
- ◆ Temperature regime for maturation
- ◆ Filtration
- ◆ Treatment of beer post fermentation
- ◆ Packaging of beer
- ◆ Post brewhouse training.
- ◆ Basic, suitable quality control procedures for raw materials and products.
- ◆ Procedures to reduce BOD and COD during plant operation. Reducing the effluent load on the waste water discharge

# Photo Gallery











# Services

- **Advanced and reliable technology & engineering**
- **Procurement, manufacture, and delivery of the goods**
- **Project management**
- **Construction, installation, and commissioning**
- **Technical service**
- **Training program**
- **Service after completion of the project**
- **Financing assistance and export credit**
- **Other services and functions upon request**



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