

A very Bohemian feel about this shot with the railway lines and the ornate chimney stacks.



Back to St Louis

We continue our look at A-B InBev's plant in Missouri

The 1891 brick brewhouse was designed by Edmund Jungenfeld and is still the centrepiece of the whole site. Romanesque in design complete with 'square crenelated towers and elaborate details' and standing six storeys high with a clock tower extending another two. The architects certainly followed Adolphus Busch's direction to "make this the finest brewhouse in the world."

by **Roger Putman**

The interior is dominated by a light well running nearly the height of the building and accentuated by a multi-storey hopvine chandelier climbing to the skylight which looks not unlike a

Victorian fruit and veg market or a mini Crystal Palace. The floors are imported tile and the wainscoting polished marble, while the stairs are polished brass and marble with silver plated railings. The exterior windows are decorated with either stained or embossed glass designs that included the A & Eagle trademark, hops, barley and other brewing related symbols. A veritable confection of just how buildings were decorated over a century ago.

In the visitors entrance lobby, America depicting a huge lady under the stars and stripes sitting in a cornucopia of fruit and grain cradling a bust of Columbus is a vast mural rescued from the 1893 World Fair in Chicago. Her sister Germania is at the end of the copper hearth; a rather austere Rheinmaiden obviously the inspiration for Madonna's conical chest covering! My minder Pier Scott and I made our way to the sixth floor with just a very short vertiginous peep down over the balcony to the ground floor with a glimpse of stainless brew vessels on each floor. We met Peter Kraemer in the oak panelled

corporate tasting room, certainly the most sumptuous I have ever been in. Peter explained that his post as VP in charge of supply for all 18 of AB InBev's North American plants also involved the malting plants, hops farms and aluminium can/lid manufacturing facilities. Samples of Budweiser from the 17 breweries over the world which brew it come here for assessment. A host of interesting worldwide AB InBev products filled the fridges behind posh book case doors. Woe betide a taster who spills any beer I thought. This standard of opulence does not stretch to the routine brewery panel room next door which is a much more modest affair.

Peter said that the water comes from the local supply which is carbon filtered only. The hardness is around 60ppm and some salts are added to the grist for some brands. The malt is both two and six row, it is delivered by rail separately and two trains arrive daily. The mills have a switch to alter the gaps as the flow changes from one to the other. Different brands have different percentages of the two malts but



A-B is around 60% self sufficient for malt with large maltings at Idaho Falls, Manitowoc in Wisconsin and Morehead in Minnesota.





Historic features of the brewhouse

Left: The 1891 brewhouse.

Above left: America welcomes visitors to the brewhouse.

Above right: Germania overlooks the copper hearth.



Above, from left:

The corporate tasting room on the sixth floor of the brewhouse.

Looking down past the mash vessels.

The famous hop chandeliers drop almost the full height of the building.

The light and airy sixth floor of the 1891 brewhouse.

overall the ratio is about 50:50. The continuing use of six row is said to promote what Mr Kraemer called a 'faster' beer, where you get the palate fullness but without any lingering astringency. A-B is around 60% self sufficient for malt with large maltings at Idaho Falls, Manitowoc in Wisconsin and Morehead in Minnesota. There is a barley breeding department at the Fort Collins plant with trial plots and glasshouses. Some 70% of the two row varieties used

were bred by A-B. The famous rice makes up around 30% of the grist of some brewstreams. Delivered mainly from Arkansas and Mississippi to the south, there is a 21 day shelf life and the earlier milling of the grain is temperature critical and the oil content must be kept below 1%. Hops mainly come from Yakima and Hallertau where A-B has a hop garden at Huell. There is also a 1700 acre yard in Idaho. All hops are pelleted and 60% are aroma types. There is a three stage



Brewing at St Louis

Right: The six Seeger malt mills need to grind 30,000lbs in 15 minutes.

Below: Mash vessels.



Above: The copper hearth of six vessels and a hoist to raise up the hop bin (inset) which is added to the copper manually.



Left: The cone of one of 35 ten-brew 6000bbl fermenters.

Above: A torpedo used to introduce beechwood chips into a maturation vessel.



Insulated yeast transportation vessels are dispatched to Budweiser plants throughout the world.



hopping regime but all are in by copper up for just a 30 minute boil.

The brewery building had been refurbished in 1984. Layers of paint were removed from the iron work and windows were unbricked. Some of the hop leaves from the long gone chandeliers were found in the paint shop which served as models for reconstruction. The redundant fifth floor malt weighers were left in place and apart from the stainless steel, the view must now be much as it was back 120 years ago.

Interestingly a degree of seismic protection is in place and the brewery's crisis management program aims to get back to 50% production within a week of any disaster. I questioned the earthquake intensity in St Louis but apparently the Mississippi ran backwards back in 1812. Admitted 150 miles further south, a sudden upthrust dammed the water and waves went back upstream which must have alarmed the boatmen somewhat!

The malt and rice mills are by Seeger. There are six three gap dry grind units and they all kick in to grind the 30,000lb grist charge. The 18 mash vessels/cookers and six coppers are by Enerfab of Cincinnati. The four 11.6m lauter tuns on two floors in a separate building linking the brewhouse to the old maltings are by Ziemann. The shallow ten inch bed allows a run off in 80 minutes. The mash agitators and the internal copper calandria are to a very specific A-B design which aims to maximise the required flavour in a delicately balanced product. With so much going on at one time, the whole plant is automated with Allen Bradley PLCs and Siemens Factory Link SCADA system which displays a series of 'adverse data points' for

operator information and action on each piece of equipment and each brew on its way through. Flow control of lauter tun run off is a particular challenge as the tubs are on two levels upstairs and the coppers are on the ground floor 100 metres away. The three operators in the control room each have six stacked flat screens to track operations and the guy in the hop room has a huge plasma screen so that he can keep up with some pretty complicated hop grists and deliver the charge to the copper in a single large green plastic bucket for each addition.

Mash

The mash is made close to the mills and is transferred hot to the mixers. The rice is boiled with 5% of the malt to gelatinise the starch and is added to the waiting mash and brings the temperature up to 65°C for saccharification. Highly attenuated brews do not get any help from Novozymes or Danisco but are mashed in at 42°C and programmed up to 61°C for three hours. After boiling, the wort is transferred to a remote whirlpool house with six vessels via a pipeline which contains one third of the brew. The chilled wort is held for two hours in one of 20 shallow conical bottomed cold settling tanks to remove the cold break. No copper finings are used. The wort at 15°C and 10°C is pitched for a seven day fermentation in ten brew 6000bbl conicals. The wort depth is 11m with an aspect ratio of 1.5:1. There are 37 of them pitched with Aber cell counters and each is fitted with a Solartron density meter to check present gravity. Green beer is then transferred to horizontal aging tanks which vary in size from 1400 (glass



lined Pfaudlers) to 3600bbl. There are 430 of them with a total capacity of a massive 670,000 bbls.

Beechwood chips

This is the home of the famous beechwood chip. They are not chips at all but lathes of beechwood some 18-in long, 1.5-in wide and 3/8-in thick (450mmx40mmx10mm). Peter Kraemer explained it was all about surface area. The chips are raked from 'torpedos' into the tanks via the bottom manway door with a second operator outside to push them through the doorway. The operator inside the tank rakes them to the back and sides to a maximum depth of about 400mm. The 3600bbl horizontal I inspected would take eight torpedos so there is a good deal of manual labour involved and of course they need to be removed again after maturation. The chips are processed for reuse by boiling for 45 hours with eight changes of water so the operation is utility intensive as well. Maturation takes three weeks at around 10°C. The primary fermentation leaves about 10% fermentable sugar so the chips

Budweiser people

Above left: Curator of collections Tracy Lauer and my minder Pier Scott from the PR department.

Left: Peter Kraemer, chief Brewmaster and VP Supply for ABI's North American zone shows me some beechwood chips.

Above: Mark Busso on the brewhouse panel.

Taking the heat

I mentioned last month how hot it was at the beginning of April. In June 2010 people were collapsing from heat exhaustion as temperatures stayed in three figures Fahrenheit (38°C). I am told that the British consul's office in St Louis during the nineteenth century was classed as a 'hardship station'. Staff were equipped with mosquito nets, pith helmets and they got an extra two months leave at home just as they would have in Africa or India!



Packaging

Top left: Eleven lines have been expertly crammed into the six stores of the 1917 Bevo building.

Top right: A three carousel KHS keg line operates at 850 kegs per hour.

Above left: The 22 finished goods palletisers across the road in the warehouse.

Above right: Rail cars take 60 odd pallets compared to a road trailer at 26.

provide a matrix to keep the yeast cells apart while the final attenuation point is reached. Beer is then centrifuged, cooled and finished mainly using silica hydrogel treatment before filtration.

Impressive

Packaging is impressive for the speed with which containers zip past as you can get right up close to the equipment and you appreciate the ingenuity in squeezing modern lines into a 1917 building with many supporting pillars. There is no visitor walkway to get a view of the layout so Operations Manager Joel Boisselle had his work cut explaining things to me above the general noise level.

There are five bottling lines, five can and a KHS three carousel (preclean, clean and fill) keg line which was operating at 837 half barrels per hour. There are five operators on each working small pack line and key machines are cunningly grouped together under a huge plasma screen known as the 'score card' to make a series of work

stations. The screen shows performance, fault reports and the rest of the program as packaging material can vary between individual States with regard to tax labelling and differing deposit schemes so some runs are short indeed. Around 500 SKUs are produced altogether. The bottle lines on the top floor use prepacked glass in 24 packs while below glass is depalletised and moved upstairs as singles just as the cans are on the fifth floor downwards. Fillers are electronically metered from Kronos or KHS with the usual wide choice of bottle size from 12 to 40 oz, wet glue or PSL label, glass or PET, crown or aluminium roll on screw cap and a range of finished pack collations. Robots are in evidence even taking carton flats from a storage box and stacking them in the magazine for use.

All packages are taken downstairs on a veritable Clapham Junction of conveyors and into the basement where they are taken under the street to 22 palletisers in the 380,000 square foot warehouse. At a

maximum capacity of 500,000 cases, Joel reckoned there were some 350,000 on the floor during my visit. Careful planning aims to direct load 60% of the output at the rate of 350 trailers a day so little actually goes into cold store. Road trailers are refrigerated only for the most distant journeys. Only 10% leaves in rail cars from two docks where the cars are shunted into the building in two lanes and can be loaded with 61 pallets compared to the usual 26 for a road trailer.

Historic buildings

The total staff for production is around 1000 but the plant can produce 20mhl. We have seen a sprawling site which was substantially laid out over 100 years ago, there is brewing in historic buildings and the manual aspects of using the beechwood chips but when you consider there are 97 passenger lifts on site it is small surprise that there are four people on the payroll just to maintain them. A huge site and a fascinating visit; I really enjoyed myself. ■