

Cask pyramids at St. James's Gate Brewery, Dublin, 1948.

Kegs and casks

A worldwide review of options for brewers

For brewers, casks and kegs are not the sexy end of the business – that remains the preserve of marketing and sales who now have most of the fun and biggest budgets. However, the ‘tubs’ into which brewers put their beer are a fundamental financial aspect of the business.

by **Paul Buttrick**
Beer Dimensions

Kegs and casks can now be more expensive than the beer that goes into them. Procuring them, getting maximum use out of them

and not losing them is moving higher up the agenda.

The suppliers

The market for casks is obviously a lot smaller because the style is unique to the UK. Cask beer from smaller local breweries is still thriving with SIBA reporting an 8% rise in sales, whilst the major brewers have all but abandoned the segment. If you consider that Boddingtons was selling 10,000 barrels of cask beer a week in the mid 1990s, will we see Tetley cask bitter falter in the same way with the Leeds brewery shutting next year? There remains a small but still significant segment of the market open for independent and microbrewers.

So how is the keg market in 2009? Like in all business, much has changed since 2007. About eighteen

months ago, I was helping a beer company buy 50-litre kegs. Most manufacturers said that their production facilities were fully booked for weeks, sometimes months ahead, with global brewers buying in large numbers. The cost of stainless-steel was rocketing due to demand in developing countries and Sterling was riding high against the euro and dollar. Then the credit crunch hit and everything began to change. Stainless steel prices dropped from \$33,000 per metric tonne down to \$10,000 by the end of 2008 (although they are gradually increasing again), the pound went

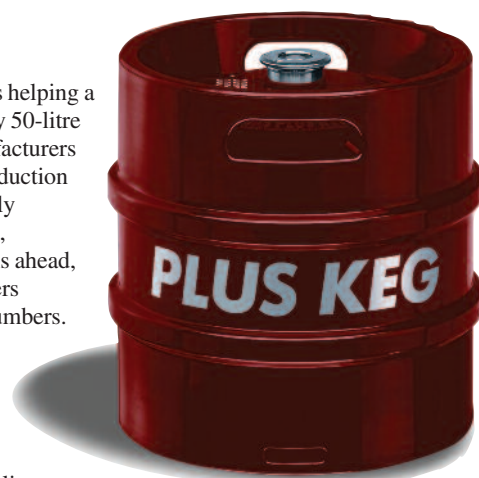


Figure 1: A red polyurethane-coated Schaefer PLUS KEG showing potential for marketing.

Photo: Morrow Bros. Ltd



Figure 2: Potential for marketing and designed for stacking, a Franke Finn keg with polyethylene chimes.
Photo: Franke Keg Services Ltd

into free fall. In the UK the effect of the smoking ban was felt and the 'on trade' market fell by 8.9% in the year up to March 2009 (BBPA UK beer Barometer). An even more disturbing figure shows that on-trade beer sales have fallen nearly eight million barrels (around 33%) in the last ten years. The price of recycled stainless steel mirrored the fall in new steel prices from over £2000/mt to nearer £500/mt. Global sales of

kegs in 2007/8 were about four million containers, over £200 million sales, but estimates for 2009 suggest sales will fall by three quarters and keg manufacturers are having a torrid time. As long as there is cash available, I am told it is an excellent time to buy new kegs, but as steel suppliers cut back supply along with other parts suppliers, the lead times for delivery to the manufacturers could become a major factor in the decision exercise again.

The keg market is dominated by European owned companies which construct items in stainless-steel like Franke-Blefa (Germany) part of the global Franke Group in Switzerland, which also manufactures stainless-steel kitchens and washrooms etc ; Portinox (Spain), Thielman AG KG, and Comet NV (Belgium) are all independent subsidiaries of the Dutch Teka Group ; Maisonneuve, a family owned French company

Figure 3 below: A radio frequency device on a keg head.

Figure 4 right: Bright orange banded E-casks – it is not easy to miss these!



founded in 1939, is also one of Europe's leading tanker producers, manufacturing some 300 tankers a year. German-owned Schaefer manufactures all kinds of industrial containers. Kammac, the remaining UK keg manufacturer is a company set up to service the FMCG industry and includes logistics and manufacturing functions.

The cask market is confined to the UK, so is small in comparison to kegs. Annual cask sales are about 80-100,000 per year. There are fewer players than there used to be, with Kammac and Maisonneuve being the main suppliers. A smaller company, Hereford Casks Ltd., supplies approximately one thousand 9- and 4.5-gallon hand-fabricated stainless-steel casks a month to independent customers, many of them micro-brewers. Hereford Casks also offer cask repair as a service to their customers. Cypherco Ltd are manufacturing plastic casks which, due to lower cost and weight, are popular with many micro breweries. This company supplies plastic kegs to the US market and has recently added 30- and 50-litres sizes to its portfolio.

Keg specifications

Until I was involved in buying kegs, it seemed perfectly simple to me – a keg is a keg. As long as you knew what size you need, and how many, all you had to do was ring up a supplier, sort out the best delivery and price to suit your requirement and that was that. No way!

Although there is some



Figure 5: An image showing a section of the PET Ecokeg
Photo: Ecokeg Europe Ltd

standardisation, there are many variations – what type of spear do you want? What safety system do you want? Then you come onto the type of finish – brush or polished? The size and position of rolling rings, thickness of metal on the keg body, thickness of metal on the chimes. Have you considered polyurethane coating (Schaefer Pluskeg :Figure 1) or polyethylene chimes (Franke Finn Keg: Figure 2) to make your keg easily identifiable and give marketing value – it also perhaps makes them less attractive to steal! There was a lot more involved than I first thought.

With new and further flung manufacturers coming into the



market, the BBPA Keg and Cask Committee has been reconvened. This committee was originally set up by the Brewer's Society (now BBPA) in the 1990s to establish a minimum best practice standard for container specifications. The committee is chaired by Paul Hancox of Kammac, and the whole supply chain is represented. No date has been fixed for the final report which will include generic test criteria (new plastic products will also be included) and will be a useful aid to anyone buying kegs. This committee, in conjunction with the BBPA, is also considering further guidance in relation to pressure testing of both new and old containers.

Imports from China

Higher prices and longer lead times, led brewers to look to other markets for less expensive kegs, China being one of these and there are a number of Chinese manufacturers currently offering a range of different sized casks and kegs. Some brewing companies who bought containers from China in the past had quality problems dealing with inexperienced manufacturers. Sovereign Beverage Company Ltd (SBC), based in Blackburn, researched eleven manufacturing companies over 12 months before forming a business relationship with a Chinese factory.

It then took SBC a further year of visits and testing samples to produce a container that was suitable for the European market. Its plants have full ISO 9001-2000 certification for the EU and all have in place quality, ethical and environmental processes to meet the required standards. As with any factory, having these procedures and accreditations in

place does not guarantee a product will be what is required without continuous external auditing both on product and plants.

The price of Chinese containers is not as low as some people expect, because the price of stainless-steel is set at a global rate, and transport costs from China are high. However, these less than expected savings would amount to considerable sums when multiplied by a number of thousand containers.

An alternative to buying

Trenstar came into the market through their expertise in using Radio Frequency Identification (RFID: Figure 3) The idea was to purchase and pool the keg population of a number of breweries and then manage the collection, checking and delivering the empties back to the brewery for refilling. The benefit was that capital was released back to the breweries and a fixed price would be paid to Trenstar each time a container was filled. The concept on which Trenstar was based was attractive, and a good start was made with S&N, Coors and Carlsberg joining the scheme. The pooling concept, with differing keg and spear populations, coupled with individual companies' requirements meant that the cost benefits expected were not realised and Trenstar withdrew from the market in May 2007. Another area which did not reach its full potential was keg tracking, although the RFID concept is

still successfully used by some companies but in a more limited way.

Moving the 'pay per fill concept' on

Some of the ideas on which Trenstar was based live on in ECasks Ltd., a business working mainly with local and regional breweries in the more healthy but smaller cask ale segment. ECasks is a division of Close Brewery Rentals (CBR) which in



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Figure 6: An Ecokeg being filled on a standard keg filling line
Photo: Ecokeg Europe Ltd



Figure 7: A KeyKeg in white board packaging, showing PET beer sphere and keg connector
Photo: Lightweight Containers



Figure 8: A PET KeyKeg on dispense in a beer cellar.
Photo: Lightweight Containers

turn is a subsidiary of Close Brothers Group plc, one of the UK's leading merchant banks. CBR operates a field-based container rental system, whereby brewers rent a fixed number of casks or kegs over a contracted period, most commonly five years, for a fixed monthly fee. The arrangement is essentially 'off balance sheet'. The containers are owned and branded as the property of CBR, but carry the brewery's identification band, so the brewing company is able to offset rental against taxable profits and redeploy the released capital elsewhere. CBR also supplies a tracking system to all its customers to help look after the containers and takes a proactive stance in trying to reduce losses. A new idea developed by CBR has been the introduction of the brewery name and telephone number instead of the colour band on a container, which, with the proliferation of small breweries has become confusing (especially if you are colour-blind!). CBR can also arrange a buy and lease back facility for an existing container population, and provides leasing for other plant – a recent example is with brewery equipment supplied by Microdat.

Rental agreements with brewers are also being introduced for kegs. Portinox, through its repair facility in the UK at Leeds has successfully arranged rental agreements with a UK brewer and this type of agreement now falls into its portfolio of supply for new containers as an optional source.

The rental concept moved one step further with another division of ECasks. This business is designed for brewers who are looking to expand by supplying wholesalers and events

outside their area but do not wish to risk, or have the cost of recovering, their own casks. The idea is 'fill and forget' and incurs a single fill rental. The brewery contacts ECasks who deliver the required number of casks (Figure 4) to the brewery site for filling. The filled casks are sent to the wholesaler by the brewery, and ECasks recovers the empty casks from the wholesaler after they are collected from the customers. Casks are simpler and with well specified containers bought by ECasks, the pooling problems encountered with kegs at Trenstar do not exist. The casks used by ECasks are easily recognisable by their bright orange bands and contain a RFID which logs cask movements. This does not currently include tracking to accounts, but data on fill locations, frequency and dates gives good management information. The basic cost is currently £5.80 for a standard cask and £6.30 for a cleaned cask. ECasks has approximately 120 customers, while CBR has slightly more.

A deposit scheme

The idea of charging customers a deposit for casks and kegs was on the cards when Jeremy Browne last looked at large pack in this magazine in 2007. It is more attractive when losses and scrap metals prices are high, but with these being significantly lower than two years ago, the pressure has eased a little. Work has been carried out under the auspices of the BBPA and there have been timely updates over the last two years, but there has not been a full industry agreement.

The BBPA is working with the industry to a workable solution – easy to talk about, but the practicalities are complex and it is not easy to satisfy the various groups who have their own priorities and vested interests. Although a workable scheme is said to exist, it has been left to individual companies to implement if they wish – something I cannot see being taken up individually without losing competitive advantage. The driving force for a deposit system is likely to be directly proportional to the value of scrap stainless steel; when prices go up again, losses will rise as will pressure from the brewers for such a scheme.

The BBPA has also worked on more easily achieved 'best practice' guidance documents. 'Keg and Cask Supply Chain Best Practice' technical circular No.418, was

published in July 2007 aimed at brewers and suppliers and work is currently looking at extending this to wholesalers and pub companies, with a document due for publication this summer.

Keg Watch

Keg Watch is well known to the UK brewing industry and has over 450 members from micros through to international brewers and cider makers. Its aim is to improve the recovery of kegs, casks and gas cylinders outside the normal distribution loop and to reduce the risk of loss due to theft. With regular reports of thefts, Keg Watch attach great importance to liaison with police forces and other agencies and a number of prosecutions have been secured. A data base of scrap yards accredited to destroy containers is in place and held by Keg Watch and the BBPA. Keg Watch also operates a confidential 24-hour Keg Line and website for use by people having information regarding at 'risk' containers etc.

Plastic and 'one way'

There are a number of companies now involved with developing plastic containers for beer. A keg supplier said to me that plastic kegs will always be difficult to sell, because brewers expect to be able to 'buy a plastic container that has the performance of a metal container for a 'fiver'. There are numerous 'take home' draught beer containers on the market, but these are under 30 litres so are outside the scope of this article. There have been two approaches, one is to produce a plastic keg which looks and performs like a metal keg, leader in this field is Ecokeg. Other people are looking at a model based on a PET sphere such as KeyKeg and PetKeg.

Ecokeg was founded in 2003 in Australia to commercialise the non-returnable keg technology owned by Carlton United Breweries Ltd (Fosters) There are licences in Europe and Asia and a manufacturing site at Tenbury Wells in the UK. The keg is 30 litres, with a 38-litre version soon to come on stream and consists of a high density polyethylene (HDPE) shell with a PET inner bottle (Figure 5). The assembled keg weighs 3.4 kg, 7.2 kg less than a stainless-steel keg of the same volume. The keg has an extruded PET spear with an acetyl valve and nitril seals, which can suit a variety of keg connectors. The

PET container has a working pressure of 3.5 bar, a test pressure of 5.5 bar and has achieved drop test results equivalent to metal kegs. Having satisfied brewers on physical specifications, the next question is likely to be about taste. PET has been used for beer for many years, and air ingress is prevented with the addition of 'Amosorb' (an active oxygen scavenger) into the PET monolayer. The 'shelf life' of beer in an Ecokeg is about six months in a controlled environment. There are over thirty customers across Europe currently using Ecokegs, with beer being sent to Russia, Eastern Europe, the USA and Australia.

Ecokegs are supplied cleaned, pressurised and ready to fill and have the advantage of being able to be filled on a standard brewery keg line (Figure 6), except that it 'thuds' quietly instead of 'clangs' like a metal keg. Potential users can trial the concept without investing in a specialized filling line and committing themselves longer term.

All parts of the keg are made of recyclable material, with the PET body having the advantage of being a single monolayer and the carbon footprint of the Ecokeg's lifecycle is approx 10% of an equivalent stainless steel keg, mainly due to the energy required to smelt and recycle steel.

Cost is still the biggest driver, and a 30-litre Ecokeg is significantly cheaper than an equivalent stainless steel keg. In simplistic terms, steel kegs would have to be lost on a regular basis to compete, but when the supply chain cost of finding and returning a keg from deepest Russia for cleaning and refilling is taken into account, the figures become more attractive. It may be a long time, if ever, until plastic kegs are used to replace steel kegs in a domestic market, but they are already a serious consideration for export.

An alternative technology is based on an approach using a PET sphere (Figure 7). Lightweight Containers, a company based in Holland, leads a consortium of specialist companies which manufacture and market the KeyKeg which was introduced at Brau in November 2006. It was developed as a universal container specially suited for carbonated drinks and there has been strong interest from brewers, distributors and the catering industry since then. About 80% of KeyKegs customers are brewers and distributors, others include wine and soft drinks. The KeyKeg works on a patented 'bag in a ball' principle. It is a lot more sophisticated than the plastic bag in a five barrel cellar tank which some more venerable readers will remember. Compressed air or CO₂ is used to dispense the beer through an existing dispense system together with a DSI or Micromatic coupler. Over carbonation of beer is avoided because no CO₂ makes contact with beer. The shelf life depends on the quality of beer in the container, but nine months is an average time, with up to four weeks on dispense once broached (Figure 8).

There are about 90 brewers worldwide using the KeyKegs and another 300 have the system on trial, mostly for export markets. The Technical University of Munich at Weihenstephan has compared the performance of the KeyKeg with a stainless steel keg, and has found no significant difference in taste tests and beer held in extreme conditions. Many breweries across Europe and the USA are using the KeyKeg including the Staatsbrauerei Weihenstephan, Hofbrauhaus (Munich) and Brewdog (UK).

As with the Ecokeg, the environmental impact of the KeyKeg has been analysed and has been found to be significantly lower than a stainless steel keg. The main reason being that far less energy is used in production and recycling and of course there is no recovery, return distribution or cleaning to be done. The raw material in these containers is all recyclable, but the challenge must be to ensure they are, and not left piled up somewhere. Psychologically, I think the manufacturers will have a tough job convincing people that a 'one trip' plastic container is better for the environment than a lifetime use returnable stainless steel keg.

Container repair

With sales of new containers falling, repair of existing stock has been a target market for the keg manufacturers. Container refurbishment and repair used to be carried out within breweries. My old company, Whitbread, did on-site repair at Magor, Samlesbury and other

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Figure 9 right: A rebranded keg showing Close Brewery Rentals ownership.

Figure 10 above: Type A (flat top) and Type S (well type) extractor tubes.

Photo: Micromatic Ltd

locations (having brought it 'in house' from previous repair companies). Again, companies viewed this type of operation as a 'non core' cost to the business, and so it was outsourced again, often in a much reduced way. Outsourcing the complete kegging logistics as with Trenstar was the culmination of this idea. The biggest suppliers now have their own service companies in the UK, with Portinox in 2008, joining Franke Keg Services, Kammac and Morrow Brothers in the repair business. Changes in brewery ownership and emergence of rental

companies such as Close Brewery Rentals has added rebranding to the normal list including descaling, repairing, pressure testing and spear refurbishment (Figure 9).

As brewers hold off buying new kegs, keeping up with inspection of aging stock should be integral to keeping beer returns low and quality at point of sale up. A recent development is the re-introduction of procedures to assist data capture for brewers in relation to line rejects and ullage returns. An example is the separation of ullage kegs from normal line rejects with statistics

given as to why a keg is returned from trade (if the return is not designated as a beer quality problem).

This provides useful customer data and the opportunity to reduce ullage returns considerably. I have a sense of *deja vu* here – I can remember in the early 1990s discussing keg returns and data, claiming that flat beer was due to leaking spear rubbers and nothing to do with the beer itself. I have a feeling that this will catch on again as people relearn the real cost of returned beer.

Another development is one of 'modular pricing' for repair costs. This means that the brewer would only be charged for work carried out and tasks completed rather than a one off repair cost applied to all containers. This would also provide valuable data to the brewer to understand and manage their containers to the required standards.



Figure 11 left: A rotary keg filling line – a popular choice for keg lines of over 500 kegs/hr.



Figure 12: A 5-lane B&R keg machine installed at the new Grolsch Brewery in 2003. The 550 kegs/hr line is very flexible and easy to work on when in production.

Photo: Briggs of Burton PLC



Extractor tubes

It would be wrong not to include extractor tubes (keg spears) in this review. Micromatic is the world's leading supply company and sells some three million extractor tubes globally a year. Extractor tubes are either well-type (S type) or what I call flat top (A type) (Figure 10). According to Micromatic, more well type extractors are sold, the decision on which type to use being made during discussions 20 years ago. I used to prefer the flat top connection because beer residues in the well neck were avoided; however, speaking with an engineer, he said he preferred the well type because there was less exposed rubber to perish. Nothing changes, even in the 21st century, brewers and engineers still have differing opinions! DSI is the other major extractor tube manufacturer. Safety spears have been on the market for 15 years, and there are a number of designs – threaded, circlip, welded neck and other innovative designs to prevent spears 'blowing out' or being removed for illicit purposes. Moving to a threaded extractor tube is becoming popular because it offers maximum keg flexibility.

Keg filling machines

As with keg suppliers, keg filling machine manufacturers are having a hard time at present, and the surge of new equipment reported on in Jeremy Browne's article has ended due to the economic situation. The technical aspects of filling machines, was also

well covered in Jeremy's article. In terms of trends, rotary keg lines are still considered a better option for lines rated at 500 kegs/hr and over, these being: lower capital cost, lower overall running costs, smaller footprint, but stunted growth in the beer market has reduced demand (Figure 11). KHS has about 65% of global market share on filling lines with over a thousand installations in 130 countries.

B&R focus on lane machines and find that they are more flexible in that lanes can be increased and reduced, and importantly, individual lanes can be worked on during production (Figure 12). Although new machines are not being ordered, there is more emphasis in making existing ones more efficient and upgrading control systems. Comac Group (Italy) are another machine manufacturer, and a number of other companies also build machines for small breweries.

Cask racking

With the larger brewing companies withdrawing from the cask market, no one is buying large filling machines, consequently the well known names of the past including

Chadburns, Porter Lancastrian, Esau and Hueber no longer manufacture cask lines. The only cask filling machine manufacturer in the UK is Microdat Ltd, which aims to supply the remaining cask brewers and the growing contingent of micro-brewers.

Microdat offers modern equipment for the whole cask filling operation, including cask washing (internal and external) de-shive/de-keystone, labeling and cask handling and control. A quick call to Black Sheep Brewery for an update on their line installed three years ago, indicated that laser location for the automatic deshive/dekeystone operation continues to be successful (my early experience with this resulted in more damaged casks and tools than removed keystones) Microdat's latest filling machines are based on the gentle efficiency of peristaltic pump technology which fills casks accurately with a no fobbing black fill. The larger machines are based on individual modules filling up 60 casks per hour, with five modules at Black Sheep achieving up to 300 casks per hour. Machines especially designed for microbrewers have a single or



double head capable of up to 60 and 120 casks per hour (Figure 13).

Figure 13: A recent Microdat two-head cask filling line at Otter Brewery using two peristaltic beer pumps.
Photo: Microdat Ltd

Last thoughts

Last thoughts in 2007 were about increased trends in Irish cider and blaming alcopops for our woes, maybe pear cider is the coming phenomenon. The market is in the doldrums, now we are at the bottom of an economic cycle; being miserable will not help us get out of it – and we must not forget the great strides beer has made in new markets outside Europe. So, as it should be, hope springs eternal. ■

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■ **The author**

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