Application report

Compressed air processing in crystal glass production

Industry:	Glass production
Customer/Location/Year:	Stölzle Lausitz, Weißwasser (Germany), 2013
Use of compressed air:	In production
Installed products:	DRYPOINT RA, BEKOMAT

Heavenly brilliance and hellish fire It is rare that one can see both inter-twined as closely as in glass drawing, the mechanical production of high-quality table glass. Stölzle Lausitz GmbH from Weißwasser in Saxony is recognized as one of the leading glassworks in Germany. Dry compressed air is the most important energy element in their manufacturing processes.

The flames hiss from the nozzles of the powerful-looking machinery in the spacious factory buildings at Stölzle with far more than 1100 degrees Centi-grade. One could almost imagine being faced with dragons made of steel – and one correspondingly keeps a respectful distance when visiting for the first time. But curiosity is always present and one wants to know what glitters and shimmers so auspiciously in the "phantom" within these monsters: purest, impressively brilliant crystal glass. Formed into elegant wine and sparkling wine glasses. Faultless beauty, born in fire.

Whilst standing there and considering this flaming genesis, the Stölzle company slogan of "born in fire" becomes a truly sensual experience. Utilizing the drawing process or the also associated welding technique enables Stölzle Lausitz to produce glasses which, due to their smooth, flowing transition from stem to goblet and outstanding glass distribution come very close to the characteristics

of mouth-blown glasses. They also have the additional advantage of being break and dishwasher resistant as well as a beneficial price-performance relation.

The glasses are perfectly coordinated for the character of various beverages. Wine, sparkling wine, spirits and cocktails. Recipients are mostly hotel owners, gastronomy, the beverages industry as well as demanding viticulturists. Stölzle Lausitz markets up to 35 million glasses in over 45 countries around the world annually.

Regular aspiration with compressed air

The art of glass manufacturing and refining has been maintained and developed in Lusatia for more than 500 years. The first certified reference about a glasswork dates back as far as 1433. Around 1930, Lusatia became the largest glass producing region in Europe and the "Glashüttenwerke Weißwasser AG" - the predecessor of today's Stölzle Lausitz GmbH - became the largest goblet producing company in Germany.

Most important in the produ-ction process is the aspiration of the fire-breathing dragon with dry compressed air. Compressed air is the most important means of production and the most important energy element. It´s used for controlling the systems and in uncountable compressed air cylinders as well as actuating valves.

What is hereby decisive is the induction of constant and reliable dry com-pressed air. If the moisture level is too high, then emulsions will result in the valves of the machines within a very short time – therefore slime build up and, consequently, standstill.

An Achilles heel of the compressed air processing at Stölzle: the refrigeration dryers. The dryers had to overcome a particular problem. The problem also had something to do with the unusually high temperatures.

Refrigeration dryer as an Achilles heel

One of the compressors which is utilized in the factory produces exceptionally hot compressed air due to its design. The refrigeration dryer downstream of this compressor could not always counteract the compressed air approaching it, which often reached temperatures up to 63 degrees. This often turned into a balancing act, especially during the hot Summer months. The outlet temperature downstream of the overworked refrigeration dryer was often higher than the subsequent compressed air logistics would have preferred.

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This was executed via an extensive pipework system from the compressor stations to the with-drawal positions in the production halls. Often also via longer routes in external areas and through the basement in the factory halls whereby the pipework system additionally branched off. The com-pressed air therefore had to pass through numerous temperature zones from the compressor to the destination and condensate forming routes. The risk that compressed air with too high humidity levels would arrive at the machinery increased accordingly.

Which refrigeration dryer would be able to resist the extremely high com-pressed air temperatures from the overheated compressors?

Good experience tipped the scales

The Saxony glassworks located a solution by contacting the German com-pressed air system provider BEKO TECHNOLOGIES GmbH. One had al-ready had rewarding, excellent experience with this technology at numerous other positions in the factory for many years. For example with ÖWAMAT oil-water separating systems, with CLEARPOINT compressed-air filters and BEKOMAT condensate separators.

The compressed air specialist from Neuss on the Rhine should also have an answer for the heated situation with refrigeration drying at Stölzle: com-pressed air refrigeration dryer DRYPOINT RA.

In the DRYPOINT RA eco refrigeration dryer, the compressed-air drying is executed by a counter-flow process via an optimised heat exchange through-out the entire process path, The air flows in a downward aligned movement without any unfavourable diversions. The generously dimensioned counter-flow heat exchanger unit, which comprises an air-air and an air-refrigerant agent heat exchanger cools the compressed air down to a temperature of around three degrees Centigrade, whereby the installation size of the heat ex-changers not only promote a particularly effective cooling, but rather also minimising flow resistance to an absolute minimum.

From the initial startup, the new drying system clearly demonstrated that it could easily cope with the high compressed air inlet temperatures. Even the hot Summer days shortly after installation caused no restrictions in the dryer performance. Performance was however not everything; the as-pects of effectiveness and economics were also de-cisive.

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A smart way to view the situation. In principle, it is not the investment costs for refrigeration dryers which determine the economic calculation, rather the operating costs. Considered over an operating period of five years, only about between 20 and 30 percent of the total costs can be attributed to the pure investment for purchasing and installation. 70 to 80 percent are however shared by the ongoing operating costs.

Operating costs reduced by 50 percent

Utilizing the DRYPOINT RA from BEKO TECHNOLOGIES enables these costs to be reduced by almost half. The return on investment calculation was decisive for Stölzle Lausitz as the new refrigeration dryer would be amortized within around just six months. Without doubt, a convincing argument for our business economists.

The DRYPOINT RA achieves this combination of effectiveness and efficiency with its particularly sophisticated design. Essential elements hereby include the vertical structure of the heat exchanger, which enables a condensate flow from top to bottom, a demister for safe separation and a large-volume sedative space which prevents entrainment of the condensate. Among other things, the device is particularly economical as it prevents of flow-unfavorable com-pressed-air deflections and unnecessary flow resistance. A consistently low pressure dew point, almost 99 percent droplet separation, hardly any com-pressed air losses, reduced maintenance requirements and low operating costs are further benefits.

Condensate discharge is also integrated in the DRYPOINT refrigeration dryer. It is equipped with a BEKOMAT condensate drain as standard. A controlling system executes not only the function controlling for the dryer but also the controlling and monitoring for the discharge – including display for any malfunction or fault indications.

Druckluft und Laserstrahlen

Glass drawing for Stölzle glasses is not just about firelight, but also concerns other light. Laser light to be precise. The bundled power of laser beams is utilized to cut the glass exactly to a tenth of a millimeter. In this area – as at many positions in the works – technology from BEKO TECHONOLOGIES also plays a role. In this specialize case as a membrane dryer as well as fine and super fine filters. They cool and clean the compressed air required for cooling the laser deflection mirror.

Before this highly efficient dryer-filter combination can be effective, one has to cool the mirror with inducted nitrogen. A very expensive cost-inducing procedure which swallowed up to 700 Euros a week. Implementing the new technology also enabled this cost-accounting position for compressed-air processing at Stölzle Lausitz to be eliminated.