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The ABC of IBCs

Development and application fields of today's stainless steel IBC

IBCs (intermediate bulk containers) grew out of the supposedly simple idea of bundling barrels or drums together. Users subsequently realised just how diverse the possible applications for these containers were. Consequently, IBCs underwent further development and specialisation. Today, they are used in many industrial sectors for a great variety of different tasks. Some still find uses even after their long service lives - a success story that can generate enormous potential for the future.

The general benefits of today's IBCs over the smaller containers used in the past are obvious: their cubic shape enables much better utilization of the filling space. Depending on construction and design, they can hold volumes of between 500 and 3,000 litres. They are easy to clean, leaving no residues, which is why they are widely used in the food industry. At the same time, this cleaning makes them reusable. The service life of a metal IBC is almost unlimited, often reaching 20 or more years. And finally, those models fixed into a stable steel frame have permanent approval for transporting hazardous goods - provided that regular inspections are carried out every two and a half years by technical standards authorities like TÜV and Dekra or inspection bodies operating in accordance with BAM* GGR 002.

(*BAM is a senior federal scientific and technical institute with responsibility to the Federal Ministry for Economic Affairs and Energy)

Historical development

The first IBC was created in the 1960s. Up to then, most industries had used 200-litre containers for transporting liquid and solid goods in groups of four on Euro pallets. Logistics and technical staff at the then paints manufacturer Herberts came up with the idea of developing a cubic container adapted to the pallet. In cooperation with the Mannesmann company, this idea was then put into practice. The 1,000 litre container was initially made of steel or stainless steel and installed inside a protective frame. Its slightly inclined bottom section meant it could be emptied by gravity and a large manhole allowed access for cleaning and filling. And IBCs are an environmentally friendly form of packaging, as the original 4 one-way containers have been replaced by one reusable container.

The benefits of these new containers were quickly recognised, not just by other sectors of industry but also the VDI (Verein Deutscher Ingenieure - Association of German Engineers). Accordingly, in the early 1970s, it issued a guideline to adapt IBC dimensions to Euro and chemical pallets. Ultimately, application and popularity of the new IBCs reached an initial peak with its approval for hazardous goods transport. This was regulated nationally by the GGVS/GGVE (Germany's hazardous goods directive) and internationally by the ADR/RID. Up to then, they had only been responsible for cylindrical pressure containers, but not cubic ones. This led the transport ministry to issue a number of exemptions for IBCs after detailed examination. Government ratification and permanent incorporation into the GGVS/GGVE were not long in coming.

European neighbour states also began to orientate themselves towards Germany's showcase packaging and began to draft and adopt their own national legislation. As international trade - and consequently hazardous goods transport too - was steadily growing at this time, IBCs were sometimes adorned with up to 10 different approval labels. This situation was then quickly addressed by the responsible European authorities, culminating in an international framework of legislation based on Germany's TRKTC-regulations (Technical guidelines for cubical tank containers). With the additional inclusion of pressureless cylindrical containers, the IBC received its international designation as an intermediate bulk container from this point.

Fields of application

Today, IBCs stand for market and customer-oriented container solutions, as they can be adapted to a great variety of customer specifications and requirements by professional manufacturers. That's one reason why IBCs are used in a number of industries for the transport and storage of liquids and semi-solids, such as the chemical and petrochemical industries, the cosmetics, pharmaceuticals and food sectors, waste disposal, the recycling of paints, varnishes and adhesives, as well as in plant engineering and the building industry. For hazardous goods, in particular, IBCs are among the most frequently used packaging today.

These applications fields and requirements, however, have still not been exhausted. On the contrary: to make their benefits available for even more sectors and scenarios, IBCs are constantly being developed further. Increasing use in the chemical industry, for instance, led to fire resistance becoming an important issue. Modern stainless steel containers are significantly more fire resistance than plastic containers and can withstand fire for 30 minutes without a sprinkler system - as verified by the BAM (Federal Institute for Materials Research and Testing).

The differences in detail

In keeping with the wide range of applications and industries in which IBCs are used, different containers also have the appropriate different properties. On the one hand, these are prerequisites for gaining approval for use in a particular industry. On the other hand, they are the new developments and modifications that improve or facilitate the way IBCs are used. Electrically heated IBCs, for instance, are used for the storage and transport of temperature-sensitive media. Chocolate, waxes and adhesives, amongst other substances, can be transported or stored in such containers at temperatures of up to 120 °C.

Other IBCs are specially developed or designed for the treatment of air or various gases in order to clean soil using activated carbon. In contrast to costly earthworks, these mobile filter units can treat the soil on site by means of soil vapour extraction. These IBCs are supplied as combined transport and adsorption units, fitted with all the necessary pipes and standard quick coupling connectors. Filled with selected adsorbents, they achieve much more cost-efficient cleaning results. The filter unit is replaced when the adsorbent is saturated or the required cleaning objective has been reached. To do this, the unit is removed in its entirety and replaced by a new one, if required. This completely eliminates the need to replace the spent activated carbon on site, which in turn minimises transport costs.

Models like the Cube, on the other hand, focus neither on the industry nor on the application scenario, but on economic aspects. The advantage of this stainless steel container lies particularly in its frameless, lightweight design, which, in combination with its weigh-saving construction, makes this IBC ideal for almost all requirements of the chemicals, paints, food, pharmaceuticals and oil industries. It is ADR certified and approved in accordance with UN 31 A/Y for the transportation of hazardous goods up to 2.0 kg/litre.

Conclusion

IBCs are genuine all-rounders that can be used for any transport and storage task in almost any industry. Containers specially made of stainless steel not only have a long service life. Special manufacturing methods, such as deep-drawn lower sections with a minimum of dead space, also guarantee they can be emptied of any residues completely. This enables IBCs to keep pace with the current trend towards greater sustainability. At the same time, they are being constantly improved and developed to expand their range of applications or make them even more effective in their current fields. And these current developments are also taking future requirements for IBCs into account. With a view to Industry 4.0 and automation, work is currently underway on intelligent containers that can communicate information to users, such as filling level, cleaning or position.

Info box: “About the company”

SCHÄFER Container Systems is one of the world's leading manufacturers and suppliers of container systems for beverages (KEGs), as well as IBCs (Intermediate Bulk Container) and special containers in stainless steel for liquids, solids and granulate. In its portfolio, the company, founded in 1978, has IBCs for liquid or paste-like substances, for bulk materials or temperature-sensitive media ranging from proven and officially tested standard systems, like tank, round and silo containers, right up to tailor-made special solutions. SCHÄFER has its head office in Neunkirchen in the Siegerland region of Germany, and a second production plant in Ledeč nad Sázavou in the Czech Republic.

SCHÄFER Container Systems is part of the owner-led SCHÄFER WERKE group of companies, which operates globally with diversified business areas.