IBC and fire load

The choice of the correct IBC for transport and storage is oriented to a series of different requirements, in particular to their suitability and resistance - for example towards certain chemicals - or with regard to the dangerous goods regulatory approval. The choice is made predominantly according to the information provided by the manufacturer.

From a safety point of view – in particular with solvents or flammable liquids – the fire load of an IBC is also relevant, i.e. performance in case of fire (resistance time) and the possible hazards resulting from a release of the IBC contents – in particular the effect of the fire spreading to other areas. Another relevant factor in connection with flammable liquids is particularly the creation of static charge build-ups during the filling process. Here, reference is made to the VCH notification „IBC and flammable liquids“ which this notification supplements.

As a basic rule, IBCs made of metal are not as vulnerable to the effects of a fire as are plastic containers or IBCs made of combined materials. Plastic IBCs fail much faster during a fire and product leakage occurs quickly. Corresponding trials* showed that already 18 seconds after exposure to a source of ignition the plastic body of the IBC started to melt and immediately afterwards all the contents of the container were released (as a source of ignition even a cigarette lighter is adequate). The danger of fire quickly spreading to other areas is therefore many times more likely.

Effective pressure relief devices are of central importance for a safe stability of metal IBCs during a fire. Without such fittings the high thermal load or a fire will, as a rule, lead to the container bursting and the contents spilling out. Such a pressure relief device (e.g. safety valve) can guarantee a safe pressure relief of the IBC during a fire so that this can resist the fire for a longer period (30 minutes*). Further pressure relief during a fire occurs if the dome lid valve of the container melts before bursting pressure is reached.

Plastic IBCs should not be stored outdoors without additional suitable protection: Storing them at the edge of the business premises, i.e. in unprotected „throwing distance“, entails the danger of foreign influences from outside the company (e.g. fireworks, cigarettes). In order to counteract these and other influencing factors (effects of weather – intense sunlight, wind, rain) plastic IBCs with flammable liquids should be protected by a roof and stored away from possible ignition or heat sources. In the risk assessment of a storeroom, one must take account of the fact that a fire in a warehouse with plastic IBCs can result in the uncontrolled release and combustion of all the flammable liquids within a few minutes.

Furthermore, when choosing an IBC one must consider the following:

- The lower the flashpoint of a substance (and thus the smaller the difference to the ambient temperature), the greater is the danger which results from the formation of a potentially explosive atmosphere.

- A particularly effective method to reduce the danger of fire is the installation of an automatic fire extinguishing system which gives a clear safety gain even at high fire loads (plastic IBC warehouse).
In cases where no sufficient fire extinguishing system is installed, the combined storage of flammable liquids in plastic IBCs and metal drums (no pressure relief fittings) should be avoided. Otherwise, this means that two substantial risks are combined: the rapid spread of even just a small fire and subsequently the explosive bursting of drums under pressure with the risk of the fire spreading even further to other areas of the plant. If these items are indeed stored together then there should at least be separate leakage containment systems.

The use of a plastic or metal IBC should also be agreed with the customer taking the information in this notification into account.

The acquisition and maintenance costs of metal IBCs are higher in comparison with plastic IBCs. Metal IBCs do have a much longer working life however. Apart from that, the question of the economic efficiency of using one or another type of IBC can and should not be discussed in detail here and must be decided individually.

* The basis for this notification are in particular the results of two trials carried out by the Federal German Agency for Materials Research (BAM) in 1997 and 2010 concerning the fire behaviour of metal and plastic IBCs. Further information (partly in German) can be found under the links:
  - [http://www.bam.de/filme/bam_036/film_036_ibc.htm](http://www.bam.de/filme/bam_036/film_036_ibc.htm) (= BAM-Video No. 36 dated 1997 - „IBC im Feuer“) and

Furthermore, we recommend:

- a DVD „Solvents and IBC“, published by the European Solvents Industry Group (ESIG) and the British Solvent Industry Association (SIA) and which also deals with the fire behaviour of IBCs. *(DVD as online video under [http://www.sia-uk.org.uk/SIA-Solvents---IBCs.m4v](http://www.sia-uk.org.uk/SIA-Solvents---IBCs.m4v); in addition here the video under [http://www.youtube.com/watch?v=_pfbHGxyHNC](http://www.youtube.com/watch?v=_pfbHGxyHNC))*
- the Best Practice Guidelines „Flammability“ of the ESIG (Safety Guide for Users - Safe Working with Industrial Solvents; Vers. 3, June 2013)
- the SIA-guideline 51 „Selection of IBCs … “, as well as the SIA-guidelines No. 43 and No. 54, which deal in detail with the risk assessment of plastic IBCs for storing flammable liquids. Information on the dangers of electrostatic charging can be obtained from the SIA-guideline No. 47. *(SIA-guidelines under [http://www.sia-uk.org.uk/guidance-notes.htm](http://www.sia-uk.org.uk/guidance-notes.htm))*
- The VCH notification „IBC and flammable liquids“ can be downloaded in English from the VCH website under „Publikationen“.

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