Freezing Carton board with windows

When planning to freeze production please ensure that this advised to us at the time of material order. We can then make sure that we select a hard-sized material that is preferably also a “freeze” grade. The hard sizing is a way of treating the fibres in the board (not always every layer) to reduce the speed at which moisture is absorbed by the material. All carton board will absorb moisture if left in a damp environment; some materials resist the penetration for longer. Certain materials such as Kraft boards (brown fibre) have very good resistance to moisture and also retain greater strength if they become wet. So selection of appropriate carton board material is important.

With regard to the length of time material can remain frozen, then it is more likely to be an issue for the food product life rather than the packaging. We would suggest up to 6-month frozen capability for a carton board provided that it is handled correctly. The product must be frozen in such a way as to prevent moisture building up in the carton board and caution should be exercised when a window (either film or rigid) is present. Typical issues are where product is packed and moisture can condense on it either during the freezing process or the packaging gets wet during the packing process.

In the same way as selecting the correct material we also need to ensure that the correct glue and window material are used. Our typical adhesive is a pva water based glue used both on the carton and the window if applied. Both sufficient glue (two lines where possible) on windows and appropriate glue is required. Our “freezer” grade glues are suitable for storage at -18 degrees. The glue manufacturer will not guarantee the glue for performance under blast freeze conditions -40 or lower in fact they will only guarantee down to -20. However, many of our packs are blast frozen without any issue. The correct precaution to take is when handling blast frozen product, the glue becomes brittle at these very low temperatures so any undue pressure on the glue seam or window can cause the otherwise well stuck surfaces to separate without fibre tear. Our recommendation for appropriate window material would either by acetate or poly anti mist, the acetate is a breathable cellulose material and the poly anti mist is a treated polyester film designed to resist fogging.

If the packaging is not going to fail, the most critical area is the process for return from frozen to ambient. Gradual increase in temperature (it can take 2 or 3 days) and a large volume air flow are important. Essentially changes in temperature also tend to accompany changes in moisture, and it is the moisture in particular we want to prevent from being absorbed by the carton board, as if this happens then glue bonds can become weak and any build-up of droplets of moisture round the window areas can lead to glue bond failure. This type of issue would not be considered as faulty carton manufacture.

Packaging will withstand freezing and thawing if treated in line with these guidelines and in particular if attention is paid to preventing both pressure (stacking in piles of cartons one on-top of another) when freezing or thawing and preventing the build-up of high levels of moisture particularly when thawing products