

Survey on the Properties of Packaging materials for Frozen Shrimp Export

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Folding duplex board carton is the most important primary package used in the export of block frozen shrimp products. These cartons are given a wax coating for protection of the contents from loss of moisture. The material used for the purpose is a solid bleached sulphate board. Frozen blocks weighing 2 kg are packed in such cartons lined with 100-125 gauge low density polyethylene (LDPE) or 60 gauge high molecular high density polyethylene (HMHDPE) film. Ten such waxed cartons are then packed in corrugated fibre board boxes, the survey of which was presented in part I in the November 1990 issue of *Fishing Chimes*, which serve as shipping container. Though used extensively by the frozen shrimp industry, ISI specifications have not been formulated for these duplex cartons.

ABSENCE OF ISI SPECS

Wax-coated duplex board of the grammage 300 to 400 gm/m² is used for the packaging of frozen shrimp for export. The wax coating varies from 40-50 gm/m². Dimensions of the carton also vary from packer to packer. There are no ISI specifications for these cartons. The 2 kg cartons are packed 10 to an outer corrugated fibreboard box. The carton is usually one piece, top opening tuck-on type. The common defects associated with the waxed duplex cartons are 1) Distortion of the inner carton when filled with water & 2) Inter-locked cartons tend to tear at the tags. As a result, the cartons often get distorted in the plate freezer, when height bearers and separating bars are not used.

DRAWBACKS

Distortion of the duplex cartons af-

ected their fit in the corrugated fiber board box which in turn get distorted and thereby stackability is affected. Another source of distortion is the prevalent use of the same size of the carton for both 2 kg and 5 kg. net weight packs with 13% more shrimps in the latter pack.

SAMPLING

Waxed duplex cartons used in frozen shrimp export were collected from 23 factories surveyed from all over India, viz. Tuticorin, Kollam, Kochi, Kozhikode, Veraval, Bombay, Paradeep and Kakinada. In the former survey it was observed that 100% of the factories were using duplex cartons and the primary packaging material, where as in this survey it was only 65.7%. Since rest of them have changed over to low density polyethylene bag as the primary package, which could enclose all the 10 nos of 2 kg slabs.

In the recent survey efforts have been made to compare the present status of the packaging system with the former survey to find out the improvements.

TESTS

Physico-chemical properties such as bursting strength, puncture resistance, water proofness, tearing strength, tensile strength, thickness, weight of carton and its wax content were conducted for the samples. The samples were conditioned before testing by the method of IS : 1060 (1966). Moisture content was determined by drying the sample in an air oven at 100°C. Degree of water proofness is expressed in terms of cobb 30/ value, thickness, tearing strength in both machine and cross directions, tensile strength and elonga-

tion were determined by the method in the appendix B of IS : 3962 (1967). Puncture resistance was determined according to IS : 4006 (1972).

Majority of samples had a moisture content varying from 6.7 to 8.8% against the previous survey showing moisture content between 8 to 10%. Moisture content of board is very important affecting physical strength, tensile strength, folding endurance and elasticity.

The waxed cartons should have a bursting strength as high as possible, so that they can withstand hazards of handling and storage. About 56% of the cartons examined had bursting strength above 6 kg/cm² compared to 50% in the previous survey.

PUNCTURE RESISTANCE IMPROVED

About 78% of the cartons had puncture resistance of 26 beach units compared to previous survey showing only 67.4%. Puncture resistance is very important, reflective of the paper board quality. Primary package usually will not have any problem of corner hit, however it is often encountered during handling and before packing into shipping containers.

GOOD IMPROVEMENT IN COBB VALUE

About 91.3% waxed cartons are having Cobb value below 46 in present survey compared to 80% in the previous survey. Cobb value should be as low as possible in the duplex cartons since water condensation may take place during packaging and transportation; which may lead to wet-



ling of the cartons. To prevent this, waxing is required. The wax content varied from 6-9% in the previous survey. In the present survey the wax content varied from 2-13.5%. There was a wide variation in the wax content.

TENSILE STRENGTH

As in the previous survey here also majority had tensile strength ranging from 6 to 9 kg force/1.5 cm width/18 cm length. In food packaging operations tensile strength of flexible packaging material is important as it determines resistance to rupture when subjected to pulling force. High tensile strength for the packaging material is required to hold heavy packed items.

TEARING STRENGTH IMPROVED IN CROSS DIRECTION

About 34.7% of the surveyed samples had a tearing strength in the range of 230-280 gm in the cross direction against 22% in the previous survey. About 33% of the surveyed sample had tearing strength 179-229 gm in the machine direction against 43.5% of the sample showing tear-

ing strength 179-229 gm in machine direction in the previous survey.

WEIGHT AND VOLUME OF CARTONS

Weight of the cartons depends on the grammage of the paper used. The weight ranged from 63 to 93 gm during the last survey. In the present survey it ranged from 63 to 71 grms. If the dimensions are maintained constant, the weight can be specified to manufacturers. In the last survey the volume of the cartons varied from 2170 to 3523 cm^3 against the present survey which varied from 2370 cm^3 to 3300 cm^3 .

CALIPER OR THICKNESS OF THE CARTONS

In the previous survey the thickness of cartons varied from 0.3375 to 0.6475 mm. In the present survey it varied from 0.3500 mm to 0.6025 mm. Thickness of cartons is very important since it determines all physical properties of the cartons.

CONCLUSION

There has been a significant change

in the current mode of packaging of 2 kg block of frozen shrimp products. While in the earlier survey all the shrimp processing factories had been using duplex cartons, in this survey 37.15% had changed over to packing the 2 kg blocks into a big poly bag which acted as a lining to the master cartons. The technologists of the factories argued that the importing countries reprocess the blocks into smaller consumer packs and also with the present convenient system of containerisation on board the ship for export, the handling hazards have been minimised, hence high standards of the quality of the duplex cartons are not required. It has been felt that with the present mode of packaging and transportation high standards of quality may not be insisted upon. However the quality of the corrugated fibre board boxes should have good physical strength to deliver the materials in good condition to the destination. All the more, it is desirable that certain minimum standards of quality are to be laid down for the waxed duplex carton also.

Note :

Part I of this Article was published in our November 1990 issue.

Continued from 33

ings. Payment of arrears of loan instalments will be possible only if SCICI grants a moratorium of atleast two years. The assumptions of successful shrimping along upper east coast is deceptive. Whatever small savings were their reached the pockets of commercial banks and private lenders.

Q: What do you think of the training aspect?

A: The charter scheme has failed in providing trained personnel in new types of fishing conducted from chartered vessels. CIFNET can impart the training in diversified fishing methods. In the same way, the Integrated Fisheries Project (IFP) can impart training in the manufacture of diversified products. There aspect are how-

ever linked to actual addition of larger fishing vessels suitable for diversified fishing.

Q: What have you to say about the utilisation of uneconomical varieties of fish for securing higher returns?

A: Value addition is one of the policy parameters of the government but their interest in this important aspect stops with this formulation. There are centers like Visakhapatnam where large quantities of presently uneconomical varieties of fish are caught. By providing some infrastructural facilities higher values can be imparted to these smaller fishes. Infact the World Bank, the Australians and the Norwegians are very much in-

terested in helping us in this respect. I am hoping that very soon there will be good progress in this direction.

Q: Do you like to say something about development of inland fisheries?

A: The progress, the problems and prospects in this sector are well known. Lot of progress has been achieved in several states in the setting up of chinese types of hatcheries for producing carp seed, adoption of composite fish culture, integrated farming etc. The subject has been very well taken into the hands of progressive fish farmers and I am sure there will be an immense progress in this line in the years to follow.

