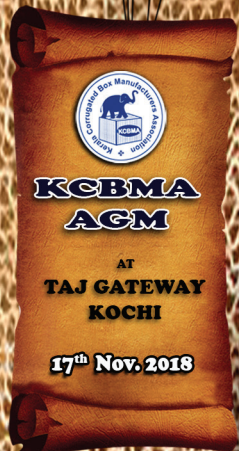


# MASTER



# CARTON

TRI-MONTHLY OF KERALA CORRUGATED BOX MANUFACTURERS' ASSOCIATION



*Best compliments of*



**Manufacturers of Quality Kraft Paper**



**GREENLAND PAPER MILLS LTD.**

**Registered Office**

XI/296, Alamcode, Attingal, Trivandrum Dist., Kerala.

Phone : 0470-2629845, 2624496. Fax : 27624489

e-mail : grenland@dataone.in



**Mill at**

Kummalloor, Adichanalloor, Kollam District



# MASTER CARTON

Official Tri-Monthly of KeCBMA

Vol. XIX | April-May-June 2019 | Issue 1

◆ KERALA CORRUGATED BOX MANUFACTURERS ASSOCIATION ◆

Chief Editor : Mr. R. Suresh

Publisher : Mr. N.X. George

|  |                                 |
|--|---------------------------------|
| President  | : Mr.Xavier Jose                |
| Hon. General Secretary                             | : Mr.P. J.Mathew                |
| Vice President (Central)                           | : Mr.P.K.Sayeed                 |
| Vice president (Malabar)                           | : Mr.K.Krishnan                 |
| Hon. Jt. Secretary(North)                          | : Mr.Sathyan                    |
| Hon. Jt. Secretary(N/W)                            | : Mr.Ramesh Kumar               |
| Hon. Jt. Secretary(Central)                        | : Mr.Padmalojanan               |
| Hon. Jt. Secretary(South)                          | : Mr.Praveen Peter              |
| Hon. Treasurer                                     | : Mr.Bijoy Syriac               |
| Co-ordinator                                       | : Mr.G.Rajeev                   |
| Chairman, Legal, Taxation & Constitution Committee | : Mr.Murali                     |
| Chairman –Machinery, Paper & Media                 | : Mr.Vijaya Kumar               |
| Chairman – Publications                            | : Mr.Isen.K.Oommen              |
| Technical Advisory                                 | : Mr.I.A Peter                  |
| Membership Development                             | : Mr.Ajaya Kumar<br>: Mr.Suresh |
| Chairman – Membership Development                  | : Mr.K.R.Raju                   |
| Chairman -Entertainment Committee                  | : Mr.P.A.M.Ashraf               |

|  |                         |
|--|-------------------------|
| Editorial Assistant  | : Lincy                 |
| Cover Design   | : Seven Arts, Ernakulam |
| Lay out, Color Separation, & Cover Printing, Inside printing | : STR & sons (EKM)      |

The views expressed in the columns of 'Master Carton' are not necessarily those of the KECBMA or the editor or the publisher and they accept no responsibility for them.

Building No.40/6185C7, Shop No.FF4  
Swapnil Enclave, High Court Jn. Marine Drive  
Kochi – 682 031. Mobile : 8921081726  
E-mail : info@keralacbma.org

## From the Editor's Desk

The Longstanding wish of KeCBMA of having own office space was fulfilled on 5th June 2018. The President of FCBM, Mr. Pradip Bosmaya inaugurated the function. Furnished office with 870 Sq.ft commercial space in Marine Drive, Ernakulam. Also planning to have a full-fledged lab with the assistance of FCBM

Corrugated Packaging is one of the most preferred packaging for small, medium and large size products which in turn has increased the demand across the nation. Growing e-commerce industry has become a major toll to create new trends in the Indian corrugated packaging market.

The emergence of retail – ready packages which are primarily corrugated is changing the perception of the manufacturers of goods, more so with the retail industry demanding well made, attractive and convenient package that are shelf-ready. The Changing life styles and shopping habits has made it necessary that products are made available to the customer under one roof, in attractive and convenient packs. The consumer demands and increasing competition among local and global bands has brought about new challenges on packaging designers and manufacturers

The new sustainability driven approach to adopt products which are leaving the least environmental footprint has given another push to paper-based packaging. Greener planet and the concept of eco-friendliness is now inspiring people and businesses alike to give a fresh look at the paper, which till recent times faced mordant criticism on account of being anti-forest, which is not true at all.

The Consumer companies are now increasingly replacing their hazardous packaging alternatives with paper based packaging. This trend is to give tremendous marketing edge to the paper-based packaging in times to come.

Let us hope and bring the nation's economy to a healthy level and bring cheer to all this year.

Regards

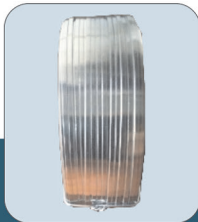
**R.Suresh**  
Chief Editor



**Since: 1979**



## India's Most Preferred Stitching Wire



W-31 / Part, M.ID.C. Area, Ahmednagar - 414 111 (Maharashtra)  
Tel.: (0241) 2778818 / 2779283 / 2328811.

Contact : **Omprakash- 98222-69672, Kashinath- 99224-04348**  
e-mail: [marshallwire@yahoo.com](mailto:marshallwire@yahoo.com) web: [www.marshallwire.com](http://www.marshallwire.com)

H.B.Wires / Anneled Wires in all sizes.

Galvanised Wires in all sizes.

Stitching Wires in

- Premium Quality (Electro G.I.)
- Heavy Coated G.I. (99% Rust Proof)
- Hot Deeped G.I. (100% Rust Proof)
- Available in all sizes & also in 5 Kg. , 15 Kg. , 25 Kg. . 50 Kg. coils.

*Fine Quallity Stitching Wire*

### OUR AUTHORISED CHANNEL PARTNER

**Shanto C.A.**  
094959 - 45773

**Saji T.V.**  
094470 - 45773

**M/S. Royal Packaging**

Near Railway Overbridge, Karayamparambu, **ANGAMALY** - 683 572 (Kerala)  
e-mail : [royalpack2002@gmail.com](mailto:royalpack2002@gmail.com)



## Greetings from the President-FCBMI

Dear Friends,

Season Greetings to each one of you. We have been blessed with more than bountiful rains this year in parts of the country and as you all know excess rainfall brings its own set of problems. I hope members from our industry have not been adversely affected in a major manner. We have all been witnessing a period of low demand from our customers but after a satisfactory monsoon I expect the overall demand to pick up and the industry to register a better growth in the coming months.

At FCBM we have had an activity packed year as we believe in carrying or rather building on the momentum set in the previous years. With immense contribution from our Seminar and Workshop Committee we have been able to carry on our flagship program the 2 day Comprehensive Packaging Course in Corrugated Packaging across our country. It gives me immense pleasure to announce that we have just concluded the 1st Workshop of Level 2 of this course very successfully in Bengaluru earlier this month. I am very hopeful that my brothers from Kerala will also benefit similarly once these courses are held in Kerala also.

Earlier this year I was very fortunate to lead a record number of over 1000 delegates from India including nearly 700 FCBM members to Sino Corrugated 2019 at Shanghai from 7th to 11 th April. The hosts REED EXPO were highly impressed by participation of FCBM and had discussions with FCBM Office Bearers on the sidelines of the event to take this partnership forward. The feedback from members attending the show was also very positive. It is also a matter of great pride for us that two of our FCBM members were honoured with Word Corrugated Awards 2019 launched concurrent to Sino Corrugated 2019. Velvin Paper Products headed by Mr. Vincent Mathias won the 2nd Prize under New factory Planning category and Mr. Amit Agarwal of B & B triple Wall won the 3rd Prize under New Generation Professional Manager Awards. Kudos to both of them for bringing accolades to FCBM.

Before concluding I wish to make special mention of our young brigade from Rajasthan RCBMA who having been pulling out all stops to make the forthcoming FCBM Conference at Jaipur, their maiden effort an unforgettable experience to every delegate. From knowledge packed technical sessions bound to keep the members engaged to well-planned events lined up throughout the day to keep the accompanying families involved to lavish cultural extravaganza in the evenings. This will be one memorable event which will be talked about for years to come. I would not like any of our member to miss this experience and would request you to register at the earliest. I hope to see large contingent from Kerala for this event.

With Greetings,

Arunachallam Kumaraswamy  
President, FCBM



# World Travel Made Easy



## AMERICA

- Bahamas cruise
- New York
- Orlando
- Chicago
- Niagara Falls
- Washington D C



## FUSION EUROPE

- Amsterdam
- Paris
- Zurich
- Innsbruck
- Venice
- Florence
- Rome



## MALAYSIA

- 03 Night at Kuala Lumpur
- En route Putrajaya, Batu cave Tour
- Genting Highlands Day Tour with cable cars
- City tour with Petronas Tower
- Aquaria KLCC, Sunway Lagoon Theme Park



## SRI LANKA

- 01 Night Kandy, 01 Night Nuwara Eliya
- 01 Night Colombo
- Private tour with Three star accommodation
- Temple of the Sacred Tooth Relic
- Colombo city tour



## DUBAI

- 03 Nights / 04 Days
- Desert Safari with BBQ dinner
- Dhow cruise dinner
- Half day Dubai City tour with Burj Khalifa entry
- Dubai Aquarium & Underwater Zoo



## THAILAND

- 02 Night Pattaya & 01 Night Bangkok
- Al cazar show
- Coral Island & Bangkok City tour
- Sriracha Tiger Zoo
- Safari world park



## SINGAPORE

- 02 Nights at Singapore
- Guided City tour & Night Safari
- Universal Studios



## AZERBAIJAN

- 04 Nights /05 Days in Baku
- Baku sight City tour
- Absheron tour

## Other Services

- Air Ticketing-International/Domestic
- Holiday Packages - Outbound/Domestic
- Hotel Booking
- Pilgrim Tours(Holyland)
- Visa Services
- Passport Service
- Travel Insurance
- Car Rental / Train Ticket Booking
- Bus Ticket Booking



Ph: 0484 2846999, 09383457179

1st Floor, Swapnil Enclave, High Court Junction, Kochi  
info@santamonicafly.com www.santamonicafly.com



**Santa monica®**  
Tours & Travels Pvt. Ltd.



## From the President's Desk

Dear Friends,

The office opened at our own place was one of the proud moments to remember. I take this opportunity to thank each and every one for the dedicated collaboration. Our association is becoming more strong with the immense support of our members. We have more dreams to be fulfilled, like library, packaging school etc. I have great pleasure to tell you that our project of lab is in progress.

Our AGM was conducted on 17th Saturday November 2018 at Taj Gate Way, Kochi. During the AGM flood relief fund was distributed to the affected members.

Severe flood affected Kerala due to unusually high rainfall during the monsoon season of 2018. It was the worst flood in Kerala nearly a century. As you know one sixth of the total population of Kerala had been directly affected by flood and related incidents.

Seventeen of our corrugators were badly affected by flood. Building machinery and raw materials were damaged seriously. Several members contributed to serve the affected ones. Rs 10 lakhs was distributed among the corrugators affected by natural calamity.

To meet the growing demand for international quality packaging, Corrugated packaging manufacturers in India are speedily moving on the path of modernization – adopting evolving technologies, installing high speed automatic machines, ensuring quality assurance and incorporating management systems and techniques for efficient operation of the plants.

The next generation of corrugated packaging manufacturers in India are ready and eager to embrace new technologies that can help them meet the demands of their customers for international quality boxes. The consumers are increasingly favouring companies who care about the environment

In the last year there have been wide-reaching developments in the industry. With new technology, and innovative products, as well as an increasing global focus on ethical packaging, the coming years are sure to be another one to watch. The market has changed unrecognizably in the last five years and in 2024, we will look back and hardly believe where we are today.

Let's work together with a sense of oneness for the betterment of our industry.

Thank you.

Xavier Jose  
President

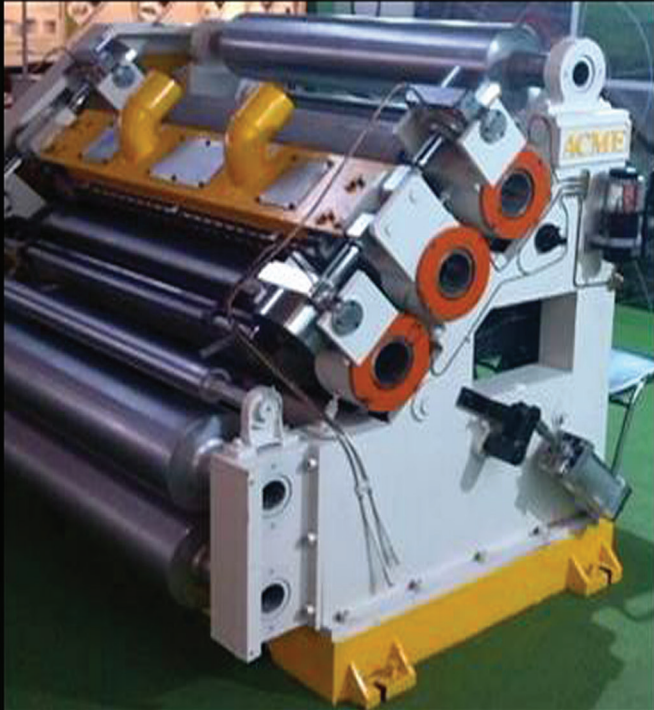




# HIGH SPEED CORRUGATOR

FINGERLESS

70 B OBL MODEL



- \* Fitted with 'flute Roller set (EN 19/ 24 Material)
- \* Pneumatic push button operated movement of top flute roller, pressure roll
- \* AIR Suction Unit (For Fingerless),
- \* Glue dam system with Automatic glue circulation system,
- \* Engraved Glue Applicator Roller,
- \* Control Panel & All control

- \* Fitted with flute Roller set (EN 19/ 24 Material)
- \* Roller set on Bearings
- \* Centralise Oil Lubrication Hand Pump

ACME MACHINERY CO. PVT. LTD.  
 OFFICE : B 3 ROYAL INDUSTRIAL ESTATE, NAIGAUM X ROAD,  
 WADALA, (W) MUMBAI 400 031 - INDIA  
 PHONE NO.: +91 22 24146345/6784  
 Local Contact No.: 09388601570 (Durga Madam)  
 Email : [info@acmemachinery.com](mailto:info@acmemachinery.com)  
 website : [www.acmemachinery.com](http://www.acmemachinery.com)



## Corrugated Box Making Machines Market – Global Industry Analysis, Size, Share, Growth, Trends and Forecast 2019 – 2024



WiseGuyRerports.com Presents “Global Corrugated Box Making Machines Market 2019 by Manufacturers, Regions, Type and Application, Forecast to 2024” New Document to its Studies Database.

Boxes are used for packaging consumer and industrial goods. Packaging is best suited for shipping and transporting various products that are fragile in nature. These boxes are very durable and have high safety standards compared with the other modes of packaging such as cardboard packaging. Boxes handle pressure and can be stacked for easy and economical transportation. These boxes are safe to use as they do not have any sharp edges. Box packaging are widely used in gift boxes, moon cake boxes, mobile phone box, shoes box, watches, jewellery box, cosmetic box, tea box, wine box, medicine box, etc. A corrugated box making machine is a machine can make box which will provide company with better selection of carton sizes. If they need to make a very small box for tiniest product as well as an extra-large box for a larger item, this machine can handle it.

Scope of the Report: The demand for corrugated boxes in the food and beverage

and electronic goods industries is expected to increase during the forecast period because these two industries are the top users of corrugated boxes. Since their invention, corrugated boxes have been mainly used to pack and transport food and beverage products. China and India dominated the corrugated box making machine market in APAC. The demand for corrugated boxes is also expected to increase from other Southeast Asian countries as these consumable products have not reached the maturity stage. With increasing urbanization and growth of the middle-class population, the demand for various products across different industries is expected to grow during the forecast period. The worldwide market for Corrugated Box Making Machines is expected to grow at a CAGR of roughly xx% over the next five years, will reach xx million US\$ in 2024, from xx million US\$ in 2019, according to a new GIR (Global Info Research) study. This report focuses on the Corrugated Box Making Machines in global market, especially in North America, Europe and Asia-Pacific, South America, Middle East and Africa. This report categorizes the market based on manufacturers, regions, type and application.

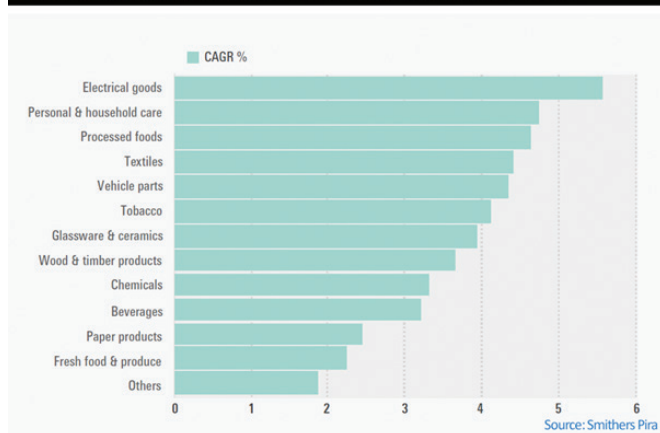
# FIVE KEY TRENDS THAT ARE CHANGING THE FUTURE OF THE CORRUGATED PACKAGING MARKET

The corrugated packaging market is growing quickly, helped by the explosion of e-commerce and developments in digital printing technologies.

The global corrugated packaging market is growing faster than expected, confounding some predictions that forecast a slowdown in corrugated consumption. A downturn in demand in China and the banning of contaminated recycled paper stocks has not fully materialised.

Smithers Pira's new report - The Future of Corrugated Packaging to 2023 – offers exclusive analysis on how this market is increasing, growing around 3.7% annually to reach \$300 billion in 2023. The report also reveals that the electrical goods end-use sector will see the highest levels of growth.

Figure E.3 CAGR % growth prospects for corrugated board, 2018–23, by end use



## E-commerce

E-commerce retail sales are continuing to rocket, with estimates of around 20% annual growth in e-commerce trade in Europe.

Global online sales are expected to be over

\$5.5 trillion in 2023. This will have a profound impact on packaging demand, especially in the corrugated industry as it represents 80% of demand in e-commerce.

The increasingly complex logistics chain for direct to consumer delivery – e-commerce packages are expected to be handled up to 20 times or more during standard distribution – means there is new demand for cost-effective secondary corrugated board packaging.

Demands from brand owners are now being felt by the converting industry as many brands now require the secondary pack to carry their image into the home, not just the retail outlet. This increases the need for converters to produce high-quality graphic designs on the shippers themselves.

## Fit-to-product

Born out of e-commerce has been the advent of fit-to-product (FtP) or box-on-demand systems, driven in particular by the needs of dedicated e-commerce sellers such as Amazon and Staples. This technology enables the production of customised secondary packaging based on the exact size of the product being packed, including irregular shapes. For the end-user this eliminates the need for large inventories of standard-sized boxes which often require copious amounts of filler material.

As FtP platforms become more popular, there will be more demand for boards sold as fanfold, as well as finishing equipment, such as printers, that can operate with them.



Major moves are being undertaken to capitalise on this growth market. West Rock for example acquired Plymouth Packaging. Based in Michigan it derives 70% of its sales from its BoD systems and corrugated fanfold, together with its equity interest in Panotec and exclusive right to distribute Panotec's equipment in the US and Canada.

### **Sustainability**

Corrugated board is proving popular in packaging as sustainability becomes a more important issue across the value chain – it is easy to recycle and the pulp and paper industry is already adept at converting these into new generations of containerboard. These qualities mean there has been a rise in popularity of corrugated protective formats over polymer based alternatives, such as expanded polystyrene (EPS) foams.

While light weighting of board has long been affecting the corrugated industry, right weighting, and rightsizing are playing an increasingly important role in this market, not only in response to consumer demand for efficient packaging, but also in response to the logistics chain's adoption of dimensional weight (DIM) pricing. In some instances substituting to a heavier board grade can have a beneficial impact overall as it allows for the elimination of additional protective elements,

The desire to minimise the volume of air being shipped within all delivery channels means that in some instances there have been significant cost increases. For example a 32-pack of toilet rolls costs an estimated 37% more to ship using charges based on dimensions, rather than simple weight.

Light weighting has been particularly successful in Western Europe, where box weights are now typically about 80% of US weights. The importance of light weighting will continue to be felt over the coming years as retailers look to save costs as well as appealing to end users.

### **Retail changes**

Retail-ready packaging has established itself as a major cost saver for retailers, especially in Western Europe. This on-going profit pressure is providing an impetus to use more retail ready formats as a labour-saving solution, as it is estimated that these secondary packaging formats can reduce shelf restocking and handling costs by up to 50%. It is also particularly popular with sales into convenience stores or discount retailers such as Aldi and Walmart. For brands it gives the added bonus of giving them greater control over the presentation of their goods within the retail space.

The expansion of e-commerce trade into the grocery sector is likely to have a slight impact on retail-ready packaging use as online sales do not require these pack types.

Corrugated cases will still be used to ship goods to an online retailers warehouse or 'fulfilment centre' but these do not need to be retail-ready formats. The emergence of subscription box and meal kit services – which offer direct-to-consumer delivery of specialist food using a weekly or monthly subscription – are providing some new opportunity for corrugated board suppliers with delivery-friendly formats containing goods within a die-cut interior.



## Digital printing advancements

As the digital print market matures, the corrugated sector, while still in its infancy, has developed a growing appetite for adoption of the process, and systems are now being developed to address the demands of the high-volume liner and post-print markets.

The flexibility of run-lengths, savings in set-up costs, the ability to personalise either relating to brands, regions, stores or individuals, and the level of quality now available through the latest technologies all combine to create a 'perfect storm' of growth opportunities for converters and printers.

Brand owners are recognising the opportunities to grow dwindling brand

loyalty through greater engagement with their customer base provided by these technological developments, and industry leaders see packaging as an important component in the creation of a memorable shopping experience that users will want to share via social media, which can drive marketing, encourage repeat business and attract new customers.

The Future of Corrugated Packaging to 2023 offers comprehensive market data for current and future demand for corrugated packaging, complemented with over 350 tables and figures delivering an unparalleled level of detail across all key segments. [Click here to download the brochure.](#)

### DECLARATION

The following particulars regarding the ownership of 'Master Carton' the English tri-monthly newspaper are published as called for by the Rule 8 of the Registration of Newspapers (Central) Rules 1956.

#### Form IV

- |   |   |
|---|---|
| 1. Place of Publication   | : Ernakulam   |
| 2. Periodicity of Publication   | : Tri-monthly   |
| 3. Printer's name, nationality and address  | : <b>N.X.George</b> , Indian,<br>Past President, Kerala Corrugated Box Mfrs. Association,<br>Swapnil Enclave, High Court Jn. Marine Drive, Kochi – 682 031. |
| 4. Publisher's name, nationality, and address   | : As above  |
| 5. Editor's name, nationality and address   | : <b>R. Suresh</b> , Indian,<br>S.T.Reddiar & Sons(Ekm), Veekshanam Road, Cochin.682035   |
| 6. Names and address of individuals who own the news paper/magazine and partners or share-holders holding total capital | : Kerala Corrugated Box Mfrs. Association,<br>Swapnil Enclave, High Court Jn. Marine Drive, Kochi – 682 031.  |

I hereby declare that the particulars given above are true to the best of my knowledge and belief.

31-3-2019

**N.X.George**  
Publisher



## THREE KEY EMERGING TRENDS PREDICTED TO IMPACT MARKET GROWTH FROM 2016-2020.

Growing demand from the e-commerce market landscape is anticipated to drive the demand for corrugated boxes until 2020. The growing e-commerce market has resulted in an increase in demand for corrugated boxes for shipment of the products. In 2015, though the overall economic growth rate slowed down in the region, the online retail sales growth outpaced some major markets such as the US and Europe because of the increase in online shopping. The ease of online shopping has led many consumers to switch from the traditional brick-and-mortar stores,” said Sharan Raj, one of Technavio’s lead industry analysts for packaging.

“The demand for packaging products primarily paperboard and corrugated boxes surges during peak holiday season in the US, between November and December, as Christmas is the biggest commercial holiday in the US. It is estimated that, the US total retail sales (excluding automobiles and gas) grew by 7.9% during the traditional Black Friday to Christmas Eve shopping season in 2015,” added Sharan.

Technavio’s market research study identifies the following three emerging trends expected to propel the growth of the corrugated box market in the US:

- Demand for innovative lightweight materials
- Need for premium packaging

- Growing preference for sustainable packaging solutions

### **Demand for innovative lightweight materials**

Vendors are providing high-performance, light-weight corrugated, and containerboard grades because of cost reduction, improving performance, and environmental concerns. For instance, in 2014, MWV Rigesa (now WestRock) launched the HyPerform line of Kraftliner and fluting papers that are more tamper-resistant and have a lower basis weight.

These products are eco-friendly, with a reduction of 10% in greenhouse gas emissions and up to 61% in water consumption.

MeadWestvaco Rigesa (WestRock) also acquired a new paper machine that uses the most advanced technology for the production of Kraftliner paper, to provide innovative products. Mondi, an international packaging company, invested in the recycled containerboard machine ECO7, which produces cost-effective and lightweight liners and flutings, with an annual production capacity of 470,000 tons. Earlier, Mondi introduced ProVantage, a high fiber containerboard made from recycled fiber, which is lightweight and provides high strength packaging. In 2015, Mondi showcased its kraft portfolio of high-quality containerboard grades suitable for various packaging end users such as the chemical and pharmaceutical.



## Need for premium packaging

The increasing demand for premium packaging, especially for premium consumer products such as cosmetics and other household items, is mainly attributed to the developed and mature US market. Premium packaging is a basic indication of the high quality of the product inside. Vendors use expensive ingredients, technologies, colors, and other raw materials to develop premium packs. Many consumers also buy these products as gifts, thereby driving the demand for premium packaging in the market.

Corrugated boxes are used as effective marketing strategies for various categories like retail boxes, and point of purchase display boxes. Unlike traditional corrugated boxes, the market has witnessed the trend of using printed designed small corrugated boxes at the point of sale in retail stores. Retail giants such as Walmart are using this form of packaging in the premium brand segment to improve marketing activities.

These boxes are placed at the point of sale

to attract consumers.

## Growing preference for sustainable packaging solutions

Consumer product manufacturers prefer eco-friendly packaging materials as they promote sustainability. Paper can be recycled up to seven times, which gives corrugated manufacturers an advantage over other packaging product manufacturers. Therefore, manufacturers are focusing on producing 100% recyclable corrugated boxes. For instance, in 2015, Mondi Containerboard launched eco-friendly ProVantage Kraftliner Aqua and ProVantage Fluting Aqua paper grades using high-quality containerboard paper grades. These are water-resistant and eco-friendly.

Corrugated boxes are considered an environmentally-friendly and sustainable form of packaging compared to other forms of packaging, such as plastics. These boxes are made of recycled material; almost 46% of the materials used in packaging are recycled. This helps corrugated boxes manufacturers to reduce the environmental cost, thus providing sustainability to the environment.















## ARE WE SELLING BOXES RAW MATERIAL COST?

One of the biggest issue corrugated box industry is facing today is getting right price from customers. Particularly when there is increases in Kraft paper price. The year 2017 was one such year when the price of Kraft paper went thru the roof.

### **Why is it that customers are hesitating to give price increase?**

Is that corrugated box industry is unable to convince the customer as to what is the actual cost.

Is it that the customers are unable to validate the actual cost of corrugated box against some reliable data.

To overcome these trust issues, there was a need to create a transparent pricing of corrugated boxes, WICMA approached Crisil to generate an Index for pricing of corrugated boxes. This index called "Cordex" was created by Crisil considering weightages of various inputs and taking average price of inputs from 5 to 6 reputed suppliers for each input. Index was published quarterly. Just when the industry was accepting this index as true measure of price of corrugated boxes it was withdrawn by WICMA. The reason for this withdrawal of index is best known to WICMA.

In recent times many customers as well as corrugated box manufacturers were raising the issue of restarting such an index. I started to think how we can create an index at minimum cost. My late father was a qualified statistician from Indian Institute of Statistics and oversaw statistics department of Reserve bank of India. I remembered him mentioning to me long ago that his department creates various Indices for GoI. Recollecting these information, I started

Ram Kumar Sunkara



searching for these indices and finally discovered that such an was being published by Office of the Economic Advisor ,GoI, Ministry of Commerce and Industry, department of Industrial policy and Promotion.

This index was called "wholesale Price Index" (WPI)

The base year for this index was 2011 – 2012. Every month this index is published. The index for Kraft paper started at 100 in year 2012 and went on increasing to reach 130.8 in year 2018. Similar indices were published for Starch products, MS wire, Coal, Inks, and HSD.

These being the major raw material input for corrugated boxes, I calculated the index for the corrugated boxes base on weightage of each of these raw material inputs. I have not considered the impact of manpower cost and finance cost as these are not included in the WPI. We may have to search for them elsewhere to get their impact on final cost corrugated boxes.

To carry out such calculations we need to establish the weightage of each of these inputs to the cost of corrugated boxes. For that I considered the total input cost per kg of output for two corrugating units. The total raw material input cost of unit A was Rs. 33.74 and that of unit B was Rs.30.65.

I have considered only those inputs whose WPI was available. I considered the average of these two units as starting point for weightage calculation.

This is shown in the table below:



| S. No | Item   | Unit A  | Percentage | Unit B  | Percentage | Average of Unit A & B |
|-------|--------|---------|------------|---------|------------|-----------------------|
| 1     | Paper  | ₹ 30.74 | 91.11%     | ₹ 27.22 | 88.81%     | 89.96%                |
| 2     | Starch | ₹ 1.08  | 3.20%      | ₹ 0.74  | 2.41%      | 2.81%                 |
| 3     | Wire   | ₹ 0.21  | 0.62%      | ₹ 0.15  | 0.49%      | 0.56%                 |
| 4     | Coal   | ₹ 0.64  | 1.90%      | ₹ 0.32  | 1.04%      | 1.47%                 |
| 5     | Power  | ₹ 0.23  | 0.68%      | ₹ 0.40  | 1.31%      | 0.99%                 |
| 6     | Ink    | ₹ 0.24  | 0.71%      | ₹ 0.18  | 0.59%      | 0.65%                 |
| 7     | HSD    | ₹ 0.60  | 1.78%      | ₹ 1.64  | 5.35%      | 3.56%                 |
|       | Total  | ₹ 33.74 | 100.00%    | ₹ 30.65 | 100.00%    | 100.00%               |

The average was taken as the weightage for the inputs and corrugated box index was calculated. This is shown in the table below.

| Month  | Kraft paper | Starch | Printing ink | MS Wire Rods | COAL  | Electricity | HSD   | Box index |
|--------|-------------|--------|--------------|--------------|-------|-------------|-------|-----------|
| Weight | 89.96%      | 2.81%  | 0.65%        | 0.56%        | 1.47% | 0.99%       | 3.56% | 100.00%   |
| Apr-12 | 100.9       | 98.6   | 101.9        | 106.8        | 100.9 | 97.4        | 111.9 | 101.23    |
| May-12 | 100.6       | 98.5   | 102.0        | 107.2        | 100.4 | 100.8       | 111.5 | 100.97    |
| Jun-12 | 101.9       | 98.5   | 104.4        | 107.3        | 101.2 | 102.5       | 109.6 | 102.12    |
| Jul-12 | 102.7       | 100.4  | 104.4        | 106.6        | 102.5 | 101.8       | 108.5 | 102.86    |
| Aug-12 | 102.4       | 108.6  | 101.6        | 105.4        | 102.5 | 98.5        | 111.0 | 102.85    |
| Sep-12 | 102.2       | 109.8  | 103.0        | 104.7        | 102.5 | 97.4        | 114.3 | 102.82    |
| Oct-12 | 101.7       | 108.3  | 101.5        | 104.8        | 102.5 | 101.4       | 108.4 | 102.15    |
| Nov-12 | 102.6       | 106.5  | 102.5        | 103.8        | 102.5 | 101.6       | 108.0 | 102.90    |
| Dec-12 | 101.1       | 109.1  | 103.1        | 103.5        | 102.5 | 101.3       | 108.1 | 101.62    |

During the period April 2012 to Dec.2012, we can see that

- Kraft paper index varied between 100.6 and 102.6
- Starch products index varied between 98.5 and 109.8
- Printing ink index varied between 101.5 and 104.4
- MS wire index varied between 103.5 and 107.3
- Coal index varied between 100.4 and 102.5
- Electricity index varied between 97.4 and 102.5
- HSD index varied between 108.1 and 111.7 (HSD index was considered as cost of box is inclusive of delivered cost)

Based on the above indices we calculated the corrugated box index, and this varies between 100.97 and 102.90

The WPI also publishes the index of corrugated boxes. Same is shown in the table below.

| Year   | Corrugated box calculated Index | Corrugated box WPI Index | Difference |
|--------|---------------------------------|--------------------------|------------|
| Apr-12 | 101.23                          | 107.7                    | 6.47       |
| May-12 | 100.97                          | 108.9                    | 7.93       |
| Jun-12 | 102.12                          | 105.9                    | 3.78       |
| Jul-12 | 102.86                          | 106.8                    | 3.94       |
| Aug-12 | 102.85                          | 107.9                    | 5.05       |
| Sep-12 | 102.82                          | 113.9                    | 11.08      |
| Oct-12 | 102.15                          | 115.2                    | 13.05      |
| Nov-12 | 102.90                          | 112.8                    | 9.90       |
| Dec-12 | 101.62                          | 112.0                    | 10.38      |

We see that the WPI for the corrugated boxes varied between 105.9 and 115.2 during the same period. It is important to note the difference between WPI for corrugated boxes and calculated index for corrugated boxes. It positive and varies between 3.78 and 13.05. It indicates the WPI for corrugated boxes is in line with indices for the input materials. The average difference between WPI and calculated index for boxes for the year 2012 was 7.95

Similar calculations have been done for the years 2013, 2014, 2015, 2016, 2017 and up to April 2018.

For the year Jan 2013 to Dec 2013

| Month  | Kraft paper | Starch | Printing ink | MS Wire Rods | COAL  | Electricity | HSD   | Box index |
|--------|-------------|--------|--------------|--------------|-------|-------------|-------|-----------|
| Weight | 89.96%      | 2.81%  | 0.65%        | 0.56%        | 1.47% | 0.99%       | 3.56% | 100.00%   |
| Jan-13 | 102.2       | 112.0  | 103.8        | 103.7        | 102.5 | 104.5       | 112.0 | 102.87    |
| Feb-13 | 102.6       | 111.5  | 103.8        | 104.6        | 102.5 | 100.6       | 117.6 | 103.38    |
| Mar-13 | 103.2       | 110.6  | 103.8        | 104.1        | 102.5 | 98.2        | 118.4 | 103.90    |
| Apr-13 | 104.9       | 110.3  | 103.9        | 103.0        | 102.5 | 101.1       | 114.6 | 105.31    |
| May-13 | 104.8       | 106.6  | 103.9        | 101.5        | 102.5 | 101.0       | 112.1 | 105.01    |
| Jun-13 | 104.5       | 108.0  | 106.3        | 101.5        | 104.5 | 101.5       | 117.1 | 105.01    |
| Jul-13 | 105.1       | 112.0  | 107.6        | 101.7        | 104.5 | 102.3       | 123.4 | 105.91    |
| Aug-13 | 108.1       | 113.5  | 107.2        | 101.3        | 104.5 | 103.1       | 126.3 | 108.75    |
| Sep-13 | 108.6       | 113.4  | 108.8        | 102.0        | 104.5 | 104.6       | 132.8 | 109.46    |
| Oct-13 | 109.0       | 114.1  | 111.6        | 102.3        | 104.5 | 103.3       | 130.1 | 109.75    |
| Nov-13 | 108.6       | 112.4  | 111.3        | 102.6        | 104.5 | 103.1       | 130.3 | 109.35    |
| Dec-13 | 109.2       | 112.3  | 113.6        | 102.2        | 105.6 | 105.6       | 132.5 | 110.02    |

| Year   | Corrugated box calculated Index | Corrugated box WPI Index | Difference |
|--------|---------------------------------|--------------------------|------------|
| Jan-13 | 102.87                          | 113.8                    | 10.93      |
| Feb-13 | 103.38                          | 113.2                    | 9.82       |
| Mar-13 | 103.90                          | 111.6                    | 7.70       |
| Apr-13 | 105.31                          | 113.7                    | 8.39       |
| May-13 | 105.01                          | 112.8                    | 7.79       |
| Jun-13 | 105.01                          | 112.9                    | 7.89       |
| Jul-13 | 105.91                          | 113.4                    | 7.49       |
| Aug-13 | 108.75                          | 113.4                    | 4.65       |
| Sep-13 | 109.46                          | 113.3                    | 3.84       |
| Oct-13 | 109.75                          | 116.3                    | 6.55       |
| Nov-13 | 109.35                          | 115.6                    | 6.25       |
| Dec-13 | 110.02                          | 114.8                    | 4.78       |



Difference between WPI for corrugated box and calculated index for corrugated box is positive. Indicating that WPI for corrugated boxes was in line with corresponding changes in input raw material cost. The average difference between WPI and calculated index for boxes for the year 2013 was 7.17.

For the year Jan 2014 to Dec 2014

| Month  | Kraft paper | Starch | Printing ink | MS Wire Rods | COAL  | Electricity | HSD   | Box index |
|--------|-------------|--------|--------------|--------------|-------|-------------|-------|-----------|
| Weight | 89.96%      | 2.81%  | 0.65%        | 0.56%        | 1.47% | 0.99%       | 3.56% | 100.00%   |
| Jan-14 | 108.3       | 111.9  | 110.6        | 103.5        | 106.7 | 105.8       | 131.8 | 109.18    |
| Feb-14 | 109.3       | 111.4  | 110.2        | 103.8        | 106.7 | 105.9       | 131.6 | 110.06    |
| Mar-14 | 109.5       | 111.7  | 108.5        | 104.7        | 106.7 | 106.4       | 133.1 | 110.30    |
| Apr-14 | 113.1       | 111.2  | 111.1        | 104.5        | 106.7 | 106.0       | 130.0 | 113.42    |
| May-14 | 114.4       | 110.8  | 112.8        | 105.1        | 106.7 | 102.7       | 131.2 | 114.61    |
| Jun-14 | 114.2       | 110.4  | 110.1        | 106.3        | 106.7 | 101.9       | 129.0 | 114.32    |
| Jul-14 | 112.0       | 111.1  | 112.1        | 107.5        | 106.7 | 102.7       | 131.6 | 112.48    |
| Aug-14 | 115.0       | 110.6  | 111.1        | 105.8        | 106.7 | 106.1       | 130.9 | 115.16    |
| Sep-14 | 112.6       | 111.4  | 111.6        | 105.3        | 106.7 | 104.9       | 129.6 | 112.96    |
| Oct-14 | 112.6       | 108.0  | 111.1        | 106.0        | 106.7 | 104.3       | 125.8 | 112.73    |
| Nov-14 | 111.1       | 106.6  | 110.3        | 104.1        | 106.7 | 106.5       | 112.7 | 110.88    |
| Dec-14 | 111.4       | 106.7  | 110.2        | 102.0        | 106.7 | 108.4       | 103.5 | 110.83    |

| Year   | Corrugated box calculated Index | Corrugated box WPI Index | Difference |
|--------|---------------------------------|--------------------------|------------|
| Jan-14 | 109.18                          | 112.5                    | 3.32       |
| Feb-14 | 110.06                          | 117.3                    | 7.24       |
| Mar-14 | 110.30                          | 113.5                    | 3.20       |
| Apr-14 | 113.42                          | 116.1                    | 2.68       |
| May-14 | 114.61                          | 116.6                    | 1.99       |
| Jun-14 | 114.32                          | 115.0                    | 0.68       |
| Jul-14 | 112.48                          | 116.1                    | 3.62       |
| Aug-14 | 115.16                          | 113.0                    | -2.16      |
| Sep-14 | 112.96                          | 114.4                    | 1.44       |
| Oct-14 | 112.73                          | 115.2                    | 2.47       |
| Nov-14 | 110.88                          | 116.8                    | 5.92       |
| Dec-14 | 110.83                          | 112.1                    | 1.27       |

Difference between WPI for corrugated box and calculated index for corrugated box is still positive. Indicating that WPI for corrugated boxes was in line with corresponding changes in input raw material cost. The average difference between WPI and calculated index for boxes for the year 2014 was 2.64

The gap between these two indices has reduced indicating that all costs were not covered.

For the year Jan 2015 to Dec 2015

Difference between WPI for corrugated box and calculated index for corrugated box is now

negative. Indicating that WPI for corrugated box was not in line with corresponding changes in input raw materials cost. The average difference between WPI and calculated index for boxes for the year 2015 was -2.53

The negative gap between these two indices is alarming, indicating that all costs were not covered, and boxes have been priced below cost.

For the year Jan 2016 to Dec 2016

Difference between WPI for corrugated box and calculated index for corrugated box

| Month  | Kraft paper | Starch | Printing ink | MS Wire Rods | COAL  | Electricity | HSD   | Box index |
|--------|-------------|--------|--------------|--------------|-------|-------------|-------|-----------|
| Weight | 89.96%      | 2.81%  | 0.65%        | 0.56%        | 1.47% | 0.99%       | 3.56% | 100.00%   |
| Jan-15 | 110.5       | 107.2  | 105.7        | 101.0        | 106.7 | 109.1       | 87.9  | 109.45    |
| Feb-15 | 110.8       | 105.7  | 106.5        | 99.5         | 106.7 | 107.8       | 79.1  | 109.35    |
| Mar-15 | 115.6       | 106.5  | 106.8        | 97.2         | 106.7 | 107.5       | 86.6  | 113.94    |
| Apr-15 | 112.5       | 107.8  | 107.1        | 97.7         | 106.7 | 108.0       | 83.3  | 111.08    |
| May-15 | 112.0       | 105.9  | 106.2        | 96.0         | 106.7 | 106.1       | 91.7  | 110.84    |
| Jun-15 | 113.3       | 106.0  | 105.0        | 93.7         | 106.7 | 105.9       | 92.7  | 112.03    |
| Jul-15 | 115.4       | 105.8  | 105.2        | 91.3         | 106.7 | 106.5       | 86.5  | 113.68    |
| Aug-15 | 115.7       | 108.9  | 104.9        | 89.5         | 106.4 | 105.4       | 73.1  | 113.54    |
| Sep-15 | 117.5       | 110.9  | 105.2        | 89.9         | 106.4 | 106.3       | 71.3  | 115.16    |
| Oct-15 | 117.4       | 112.0  | 105.3        | 89.4         | 106.4 | 103.1       | 73.8  | 115.16    |
| Nov-15 | 116.5       | 112.5  | 105.2        | 87.9         | 106.4 | 104.5       | 74.2  | 114.38    |
| Dec-15 | 116.4       | 115.0  | 106.1        | 86.7         | 106.4 | 104.9       | 72.3  | 114.30    |

| Year   | Corrugated box calculated Index | Corrugated box WPI Index | Difference |
|--------|---------------------------------|--------------------------|------------|
| Jan-15 | 109.45                          | 112.2                    | 2.75       |
| Feb-15 | 109.35                          | 109.6                    | 0.25       |
| Mar-15 | 113.94                          | 112.9                    | -1.04      |
| Apr-15 | 111.08                          | 105.6                    | -5.48      |
| May-15 | 110.84                          | 106.6                    | -4.24      |
| Jun-15 | 112.03                          | 107.5                    | -4.53      |
| Jul-15 | 113.68                          | 110.6                    | -3.08      |
| Aug-15 | 113.54                          | 109.3                    | -4.24      |
| Sep-15 | 115.16                          | 111.8                    | -3.36      |
| Oct-15 | 115.16                          | 112.6                    | -2.56      |
| Nov-15 | 114.38                          | 112.6                    | -1.78      |
| Dec-15 | 114.30                          | 111.3                    | -3.00      |

is now more negative. Indicating that WPI for corrugated boxes was not in line with corresponding changes in input raw materials cost. The average difference between WPI and calculated index for the year 2016 was -4.82

The negative gap between these two indices is alarming, indicating that all costs were not covered, and boxes have been priced below cost.

For the year Jan 2017 to Dec 2017



| Month  | Kraft paper | Starch | Printing ink | MS Wire Rods | COAL  | Electricity | HSD   | Box index |
|--------|-------------|--------|--------------|--------------|-------|-------------|-------|-----------|
| Weight | 89.96%      | 2.81%  | 0.65%        | 0.56%        | 1.47% | 0.99%       | 3.56% | 100.00%   |
| Jan-17 | 117.8       | 111.6  | 102.4        | 90.5         | 113.5 | 107.9       | 83.4  | 115.99    |
| Feb-17 | 119.5       | 112.9  | 102.3        | 91.6         | 115.9 | 107.4       | 85.0  | 117.65    |
| Mar-17 | 122.7       | 112.8  | 103.2        | 94.2         | 116.3 | 102.7       | 84.9  | 120.50    |
| Apr-17 | 125.6       | 113.8  | 102.7        | 96.2         | 117.5 | 103.3       | 81.5  | 123.05    |
| May-17 | 128.7       | 113.3  | 103.5        | 95.0         | 117.5 | 102.8       | 81.3  | 125.81    |
| Jun-17 | 128.2       | 113.5  | 103.9        | 95.4         | 117.5 | 102.0       | 80.0  | 125.31    |
| Jul-17 | 128.8       | 111.8  | 103.1        | 97.8         | 117.5 | 102.0       | 78.8  | 125.77    |
| Aug-17 | 128.5       | 111.7  | 103.3        | 98.6         | 117.5 | 100.6       | 80.9  | 125.56    |
| Sep-17 | 127.0       | 112.5  | 104.1        | 99.9         | 117.5 | 106.1       | 82.5  | 124.36    |
| Oct-17 | 127.6       | 112.2  | 104.5        | 99.0         | 118.3 | 106.1       | 84.5  | 124.97    |
| Nov-17 | 127.8       | 111.7  | 104.0        | 98.9         | 117.6 | 102.7       | 85.8  | 125.14    |
| Dec-17 | 129.7       | 112.0  | 104.1        | 100.4        | 117.0 | 102.4       | 87.1  | 126.90    |

| Year   | Corrugated box calculated Index | Corrugated box WPI Index | Difference |
|--------|---------------------------------|--------------------------|------------|
| Jan-17 | 115.99                          | 109.8                    | -6.19      |
| Feb-17 | 117.65                          | 107.8                    | -9.85      |
| Mar-17 | 120.50                          | 108.5                    | -12.00     |
| Apr-17 | 123.05                          | 109.1                    | -13.95     |
| May-17 | 125.81                          | 109.4                    | -16.41     |
| Jun-17 | 125.31                          | 109.1                    | -16.21     |
| Jul-17 | 125.77                          | 112.1                    | -13.67     |
| Aug-17 | 125.56                          | 109.9                    | -15.66     |
| Sep-17 | 124.36                          | 112.5                    | -11.86     |
| Oct-17 | 124.97                          | 113.5                    | -11.47     |
| Nov-17 | 125.14                          | 105.9                    | -19.24     |
| Dec-17 | 126.90                          | 104.7                    | -22.20     |

Difference between WPI for corrugated box and calculated index for corrugated box is now more and more negative. Indicating that WPI for corrugated boxes was not in line with corresponding changes in input raw material cost. The average difference between WPI and calculated index for boxes for the year 2017 was 14.06WPI

The negative gap between these two indices is alarming, indicating that all costs were not covered, and boxes have been priced below cost.

For the year Jan 2018 to April 2018

| Month  | Kraft paper | Starch | Printing ink | MS Wire Rods | COAL  | Electricity | HSD   | Box index |
|--------|-------------|--------|--------------|--------------|-------|-------------|-------|-----------|
| Weight | 89.96%      | 2.81%  | 0.65%        | 0.56%        | 1.47% | 0.99%       | 3.56% | 100.00%   |
| Jan-18 | 129.6       | 112.8  | 104.3        | 105.0        | 121.1 | 105.0       | 89.5  | 127.03    |
| Feb-18 | 130.8       | 112.8  | 104.3        | 108.6        | 122.6 | 105.4       | 91.3  | 128.22    |
| Mar-18 | 129.0       | 113.1  | 104.5        | 110.7        | 122.6 | 105.4       | 90.1  | 126.58    |
| Apr-18 | 126.5       | 111.7  | 104.6        | 111.0        | 123.0 | 105.4       | 92.1  | 124.37    |

| Year   | Corrugated box calculated Index | Corrugated box WPI Index | Difference |
|--------|---------------------------------|--------------------------|------------|
| Jan-18 | 127.03                          | 105.7                    | -21.33     |
| Feb-18 | 128.22                          | 108.2                    | -20.02     |
| Mar-18 | 126.58                          | 107.3                    | -19.28     |
| Apr-18 | 124.37                          | 107.6                    | -16.77     |

The average difference between WPI and calculated index for boxes for the year 2018 was -19.35

This is very alarming. We need to look into this.

| Average difference between WPI and calculated index for corrugated boxes |      |      |      |       |       |        |        |
|--|------|------|------|-------|-------|--------|--------|
| Year   | 2012 | 2013 | 2014 | 2015  | 2016  | 2017   | 2018   |
| Difference   | 7.95 | 7.17 | 2.64 | -2.53 | -4.82 | -14.06 | -19.35 |

### Conclusion:

1. We are selling boxes below cost
2. The price of corrugated box must follow the price of Kraft paper as it constitutes nearly 90% of input cost.
3. The index of Kraft paper has increased from 100 to 130 in the last 5 years so there seems to no issue in calculation of paper cost index by office of EA
4. We must use RTI to find out from office of the economic adviser as to which corrugated boxes prices are used to update index.
5. Make committee to go to office of EA and see how we can make corrugated box index to represent true price.
6. If we can achieve this, we get a free index for box which customers can not dispute as it WPI of India.
7. We must get a statistician to calculate the price index using WPI as well as other indices for wages, finance cost etc. and FCBM must publish every quarter in newspaper this index and if we succeed in getting office of EA to publish true index, then FCBM can publish that data quarterly in news paper.
8. Let us look at the past indices. That is prior to 2012.

| Average difference between WPI for Kraft paper and corrugated boxes |      |      |      |      |      |       |       |
|---|------|------|------|------|------|-------|-------|
| Year  | 2005 | 2006 | 2007 | 2008 | 2009 | 2010  | 2011  |
| Difference  | 4.12 | 2.00 | 2.40 | 5.48 | 1.71 | 11.43 | 21.73 |

9. In that past from 2005 to 2009 the WPI for Kraft paper and Boxes were following each other. However, from 2010 onwards difference became large and in 2012 WPI we re-calibrated with base index taken as 100 for 2012. Once again, we see that from 2017 onwards difference has become more as well as negative.
10. In my opinion, it is advisable to invest in getting this WPI corrected and updated so that same can be used by FCBM as an index for getting true price for boxes.



# FUNDAMENTALS OF STARCH ADHESIVES.

## Production and Quality Perspective

### OBJECTIVE

Ram Kumar Sunkara

To understand functional parameters Starch Adhesives and Testing these parameters with the help of Instruments from Production and Quality Control perspective.

### Why we need Adhesive

- 1 To stick various plies of Kraft paper
- 1 To get good strength to Board

### What is starch adhesive

When starch is heated in water, it will transform into a paste like structure. For stronger bonding chemicals are added.

Other adhesives other than starch

Yes. Like Sodium Silicate. Very few use.

### CLASSIFICATION OF STARCH ADHESIVES

#### Application

- Corrugation adhesives
- Pasting adhesives

#### Starch Base

- Tapioca starch
- Maize starch
- Physical form
- Liquid starch adhesives
- Power starch adhesives
- Preparation method
- Hot process starch adhesives
- Cold process starch adhesives

pH

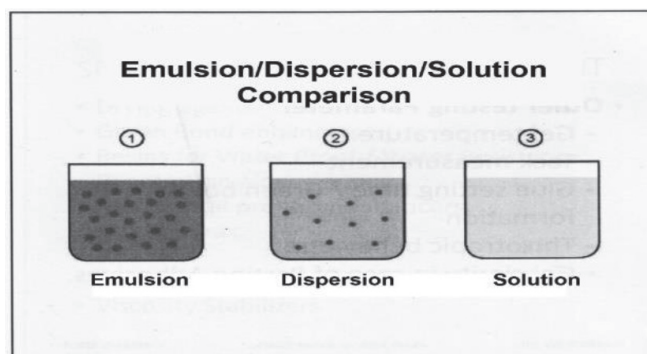
- pH>7 is alkaline
- pH=7 is neutral
- pH<7 is acidic

### Type of manufacturing

- Manual / Semi Auto Plant
- Auto plant
- Hybrid plant

### TESTING PARAMETERS – Solids

- Expressed in %
- Shows how starch or modified starch +chemicals are present in adhesives.
- Refractometer is used if adhesive is solution
- Oven method-If adhesive is suspension.
- This parameter signifies how much of water needed to be dried in the Board making process.



### TESTING PARAMETERS – Viscosity

- Resistance to flow
- Measured in seconds. Time taken to drain



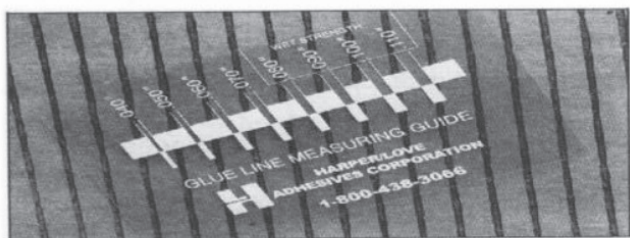
out

- Many cups are used. Fords cup, Love cup, Brookefield, RVA. Various cups
- Very important for stable operations and needs to be consistent.
- Normally manual plants operate at 25 – 35 sec for pasting and corrugation adhesives (B4 cup)
- Auto Plants operate at 40 to 120 sec (B4)

Other testing parameter

- Gel temperature
- Tack measurement
- Glue setting time/Green bond formation
- Thixotropic behavior
- Gel clarity in case of pasting adhesives

### Glue Line Width



|    | MRA  | WRA  | WPA  |
|----|------|------|------|
| SF | 2.00 | 2.30 | 2.80 |
| DB | 1.77 | 2.00 | 2.30 |

### SPECIAL ADDITIVES FOR ADHESIVES

- Drying agents
- Green Bond enhancers
- Resins for water proof/Water resistance
- Penetration aids

- Mechanical property enhancers.
- Liquid borax
- Biocides
- Antifoam agents
- Viscosity stabilizers

### NEW DEVELOPMENT IN ADHESIVES

- Very high solids (33% to 50%) adhesives for Flute laminators for instant drying.
- Powder resins for higher compression in manual operation

### Manual operation

- Borax substitutes
- Energy saving substitutes ( to the extent of 25%)
- Green adhesives /Environment friendly adhesives

Adhesives without Borax and caustic.

### Important points to remember

- Take exact amount of water. Do not leave it to discretion of any one.
- Do not need higher than 35 sec viscosity except above 250 GSM.
- Do not use same adhesive in corrugation and pasting.
- Single facer bonding is important for CS. Have right amount of heat. If possible have circulation.
- Check COBB religiously. It will save 30 – 50% adhesive cost & improve quality



## CORRUGATED BOXES MARKET TO GROW AT 3.9% IN 2019: FMI STUDY

*Corrugated Box Manufacturers Realign Business Model to Optimize Cost, Resource Conservancy and Sustainability*

VALLEY COTTAGE, N.Y. , Feb. 05, 2019 (GLOBE NEWSWIRE) -- Nearly 170 million tons of corrugated boxes were sold in 2018, equaling a market value worth US\$ 112 billion. A new study by FMI estimates that the corrugated boxes market will grow at a 3.9% y-o-y in 2019. Key market influencing factors include,

- Increased demand for bulk packaging solutions
- Higher recyclability of corrugated boxes
- Fluctuations in kraft paper cost and increasing gap in the supply-demand scenario

“While paper and pulp markets have witnessed a significant decline in the five years, increasing demand for paperboard packaging is said to balance the decline. However, manufacturers are likely to face challenges in the form of increasing popularity of plastic packaging as compared to that of fiber-based packaging solutions. Amid this, the corrugated boxes market is projected to generate revenues worth over US\$ 116 billion in 2019 with sales of 176 million tons,” says FMI.

Paperboard packaging companies are realigning their business focus by introducing a broader portfolio to efficiently address

customer value proposition. As forest-based paper and pulp industry is undergoing a dramatic transition, commercial interphase of companies offering corrugated boxes is likely to change in terms of creation of value over maintaining sales volume.

### **Demand for Recycled Corrugated Boxes Continues to Surge**

The FMI study finds that nearly 80% of the corrugated boxes sold in 2018 were made from recycled material. Demand for recycled corrugated boxes is estimated to grow annually at 4.4% in 2019, with the status-quo likely to continue throughout the forecast period.

Recyclability continues to be a focus area for both manufacturers and end-users. Sensing the changing preferences, manufacturers are adopting sustainable raw materials in the manufacture of corrugated boxes.

### **Single Wall Board Accounted for 7 in 10 Corrugated Box Sales in 2018**

Corrugated boxes find extensive application in storage, packaging, shipping or moving processes carried out across industries ranging from manufacturing to warehousing. According to FMI valuation, nearly 70% of the corrugated boxes sold globally were made from single wall board. Sales of single wall board are



likely to grow at 4.4% in 2019 as these boards are compatible with end-user requirements.

The study also opines that demand for double wall board corrugated boxes registered second highest consumption in 2018. While the demand trend of double wall board corrugated boxes will continue in the future, FMI finds that sales of triple wall board corrugated boxes is expected to rise on the back of focused demand from end-users that store ship large, high-value, delicate and heavy products.

**Preview Analysis Global Corrugated Boxes Market Corrugated Boxes Market Segmentation By Material Type (Historical Material Value, Current Material Value); By Grade Type (Liner, Testliner, Fluting Medium); By Product Type (Slotted box, Folder box, Telescope Box, Die Cut Box); By Board Type (Single Face Board, Single Wall Board, Double Wall Board, Triple Wall Board); By End Use (Food, Beverages, Electrical & Electronics, Textiles & Apparels, Tobacco, E-commerce, Building & Construction, Homecare, Automotive & Allied Industries, Healthcare):**

### **Corrugated Box Production Consumes More Liners over Fluting Medium**

Inner liner, outer liner and fluting medium comprise the design of the corrugated box. While each component carries different material options, volume sales of liners accounted for over 63% of all component sales in the corrugated boxes market.

The FMI study finds that sales of test liner is expected to grow at a higher rate over other liner types. Demand for unbleached test liner is expected to grow at 4.8% in 2019. Aligned

with the recyclability trend, recycled fluting medium will be highly sought after in the coming years.

**Slotted Corrugated Boxes Top Selling, Food Industry Leading End User**

Slotted boxes accounted for nearly 72% of all corrugated boxes sold in 2018.

Demand for slotted boxes is likely to rise in 2019 at a significant rate with the demand to remain highly consolidated in food and consumer goods industries.

The study foresees that among an extensive list of end users, the food industry is likely to account for over 60% of the total corrugated boxes application in 2019. The food industry, in particular, processed food industry manufacturers highly seek bulk packaging solutions, of which corrugated packaging is embraced owing to its cost effective and convenient nature.

**APEJ Spearheads Corrugated Boxes Consumption**

The FMI study estimates that a significant bulk of corrugated box consumption is registered from APEJ countries. China followed by India are leading consuming countries in APEJ. Easy availability of raw materials, a good price point and growing demand for packaging in the region can be attributed to the greater revenues of corrugated boxes market revenues in the region.

**Visit For More Information:**

**[https://www.futuremarketinsights.com/  
checkout/302](https://www.futuremarketinsights.com/checkout/302)**



## THE LATEST TRENDS IN THE CORRUGATED PACKAGING INDUSTRY



The corrugated packaging industry provides key services to both individuals and businesses around the world. This month, numerous researchers have produced reports providing insights and predictions on the future of this important industry.

A report by Ken Research Private Limited provided a comprehensive analysis of the United States paperboard packaging market, as well as a value chain analysis, an investment model, and prevalent trends.

“The market for paperboard packaging witnessed robust growth in terms of revenues and volume in the past few years,” PRNewswire noted in a summary of the report. “The paper packaging industry caters the needs of many sectors in the economy such as Food and Beverages, Automobile, Fast-moving Consumer Goods (FMCG), Pharmaceuticals, Durable Goods, Tobacco, and many more.”

A report by P&S Market Research described similar growth.

According to this report; “The global corrugated packaging market is increasing due to booming e-commerce, along with the increasing industrial production in the developing countries... Increasing urbanization and growing disposable income are further encouraging the growth

of non-durable consumer goods, which in turn is up surging the growth of the corrugated packaging market.”

The report by Ken Research also described developments and trends in the industry. For example, in the United States, more than 100 states and municipalities have banned the usage of plastic bags. As a result, consumers are left with an option to purchase paper bags.

The report adds, “Rising Industrial activity especially in the U.S. manufacturing and retail sector, which frequently requires the corrugated packaging in to protect and to transport goods has fueled the market over the past few years.”

For these reasons, the global corrugated packaging market is expected to grow at a compound annual growth rate of 4.6 percent during the forecasted period of 2015 to 2020



## Put the Seal of Quality on Your Packaging

## Trust Linux



### Comprehensive range of Testing Equipments for measuring :

Bursting Strength  
Box Compression  
Edge Crush  
Ring Crush  
GSM / Substance  
Puncture Resistance  
Water Absorption (Cobb)  
Moisture Content  
Tensile Strength  
Rub Proofness  
Tear Strength  
Stiffness Strength  
Caliper Thickness  
Drop Resistance  
Vibration Resistance



Testing is an integral part of Quality and Quality Assurance that of success.

In a competitive world, it is the Quality Assurance that sustains business and wins customers.

Participating as your partners in your endeavour is Linux – makers of Quality Testing Equipments.

Linux Testing Equipments, incorporating the latest innovative technologies, help you to assess the properties of raw materials as well as finished packages.

In a short span of twelve years, Linux has earned the trust and confidence of leading manufacturers and users of packaging, across India.

Your needs for package testing equipments will continue to drive our initiative and product innovations.

An attestation of our customer - centric approach.



### Bursting Strength Testers

Bursting Strength is a widely used measure of resistance to rupture in various packaging materials like Paper, Paperboard, Corrugated board, Nonwovens, Textiles, Geotextiles, Films, Tissues etc.

#### Models :

- Standard • Super • Double head • Eco Digi
- Micro digital • Micro print • Micro PC
- Available in two measuring ranges : 0-5 to 0-75 kg/cm<sup>2</sup>.



**GSM (Substance) Tester**  
Electronic model with 5 sample size measurement



**Equinox Moisture Meter**  
Hand held Digital Moisture Meter  
Imported from Germany  
for instant moisture results.

### Compression Tester



Winner of Pacmachine 2008 Award



Puncture Resistance Tester



Cobb Tester



Crush Tester  
Winner of Pacmachine 2006 Award



Tensile Tester



Tear Tester



Rub Tester



Sutherland Ink Rub Tester (Micro Digital)



Short Span Compression Tester (Sct Tester)



An ISO 9001:2008 Company

Instrumental in Your Success

## Linux Machines Incorporation

Plot No. 3, Ahad Industrial Complex, Near Bharat Gears Ltd.,

Bholenath Nagar, P. O. Dawla, Mumbai, Thane - 400612

Tel. No. : +91 88794 97458 / 68 / +91 88791 47556 / 54

Email: machines.linux@gmail.com | sales@linuxmachines.in | info@linuxmachines.in

[www.linuxmachines.in](http://www.linuxmachines.in)

# Serving the Corrugated Packaging Industry Since Five Decades



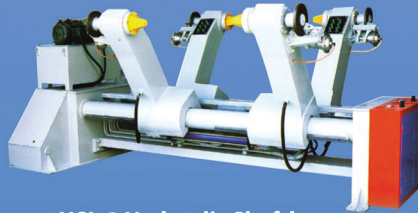
Pioneers and leaders with over 4 decades of experience, MICRO has brought about a technological revolution, setting a benchmark in corrugated packaging machinery in India.

MICRO endeavours to join the ranks of the world's leading names in corrugated packaging machinery by designing, developing and building machines that reflect engineering excellence and outstanding performance.

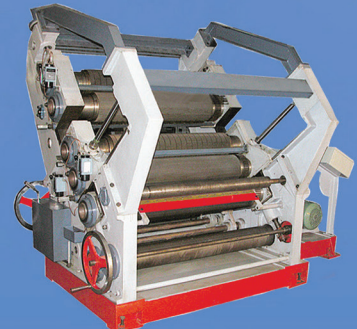
Towards this, MICRO will leverage their technological strength, expertise and experience to build a lasting relationship with their customers world-wide.



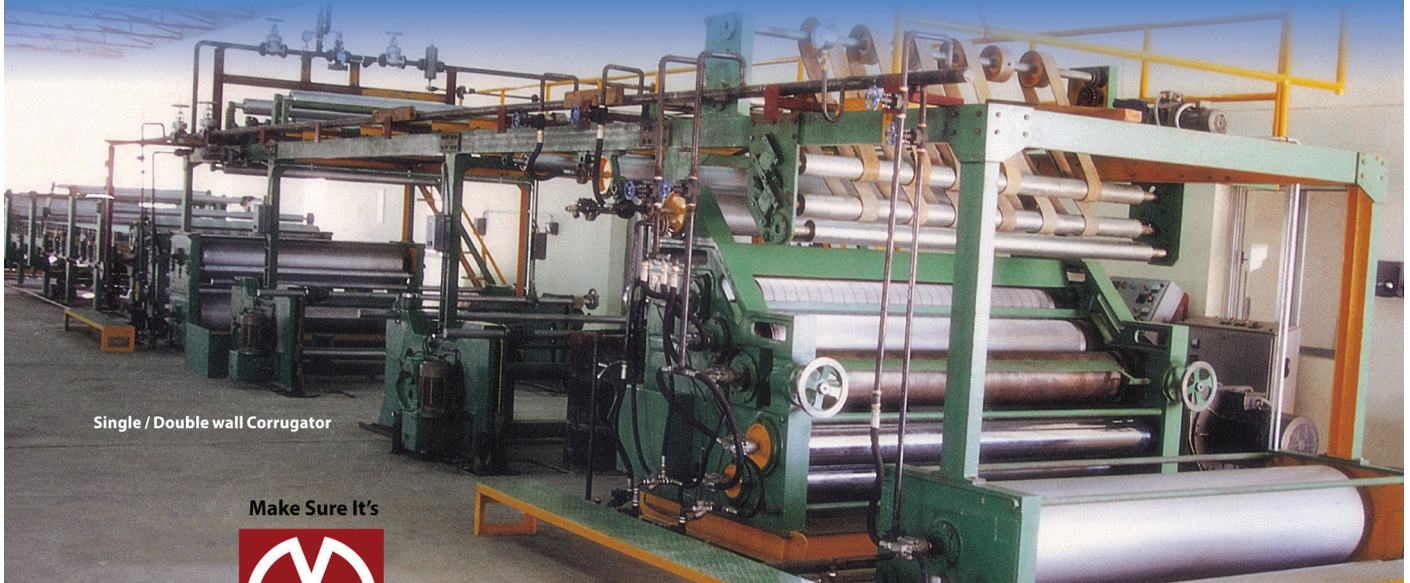
**H-350 Fingerless Single Facer**  
Speed : 150 M/ Min



**HSL-2 Hydraulic Shaftless  
Mill Roll Stand**



**HD-180 Dual Flute Single Facer**  
Speed : 70 M/ Min



Single / Double wall Corrugator

Make Sure It's



The Symbol of Quality  
in Corrugated Machinery

## **MICRO MECHANICAL WORKS**

1001 & 1002 Kanakia Atrium 2, Next to Courtyard Marriott, Chakala  
Andheri Kurla Road, Andheri East, Mumbai – 400 093

Tel: +91 22 2825 8136 / 2825 8137, Fax +91 22 2825 6147

Email : [micromec63@gmail.com](mailto:micromec63@gmail.com) | [www.micromechworks.com](http://www.micromechworks.com)



Since  
2010

## Mount Kailash Printpack Machines

XINGUANG AUTO CORRUGATED BOARD MAKING PLANTS  
JINGKE VACUUM TRANSFER PRINTER SLOTTER CUM INLINE GLUING & BUNDLING MACHINE  
JIASUN FULLY AUTO HIGH SPEED FLUTE LAMINATION  
JIASUN PLATEN DIE CUTTERS - FULLY AUTO & SEMI  
HUAYU FULLY AUTO GLUING MACHINE  
JEWEL WASTE MANAGEMENT SYSTEM  
ALL OTHER SEMI AUTO MACHINES

### Our Achievements

- ✓ 650 + Machines Sold and Still Growing
- ✓ 6 Fully Auto Plants
- ✓ 200+ Satisfied Customers all over India +
- ✓ 10 Dealers +

- Well Established Office in Chennai with Spares and Service Support
- Well Equipped Warehouse with stock of Essential Machines
- Expertised Engineering unit for spares

### Our Expertise

- ✓ Technical Guidlines
- ✓ Setting up Unit
- ✓ One Stop Shopping
- ✓ Spare Parts
- ✓ Service Engineers / Mechanical & Electrical
- ✓ Customer Care



#### MOUNT KAILASH PRINTPACK MACHINES

"SRI RAM" Apartment, Plot No. 21, Door No. 14, Third Cross  
Thirumalai Nagar, Perungudi, Chennai - 600 096, INDIA

Machines : [sales@nagjan.com](mailto:sales@nagjan.com) / 94455 66288  
Spares : [info@nagjan.com](mailto:info@nagjan.com) / 72992 07800  
Services : [info.mountkailash@yahoo.in](mailto:info.mountkailash@yahoo.in) / 95970 81196

[shop.nagjan.com](http://shop.nagjan.com)  [www.nagjan.com](http://www.nagjan.com)



[sales@indianadhesive.com](mailto:sales@indianadhesive.com)



since 1955

**VIJAYCHEMICAL INDUSTRIES**

Experience the best ..

## **MEET THE WORLD CORRUGATION STANDARDS**

**Introducing Premium Range of Improved  
Neutral pH Starch Adhesive for better output.**

- o. Enjoy Board Quality on manual / semi automatic plants which is at par with boards made on automatic plants.
- o. Enjoy Immediate drying (No sun drying required in any season).
- o. No drop in Bursting Strength even during winters or rainy season.
- o. Enjoy increment in C.S, E.C.T, F.C.T and other quality parameters.

**NO ADDITIONAL CHEMICAL OR MACHINE REQUIRED !**

**100 % FIBER TEAR GUARANTEED**



[www.viaychemicalind.com](http://www.viaychemicalind.com)

**Feel free to contact us on +91 9820085095 / 9819112161/9820840569**



G-178, 1st Floor, Panampilly Nagar,  
Cochin - 682036.

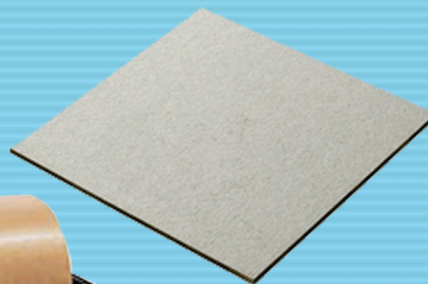
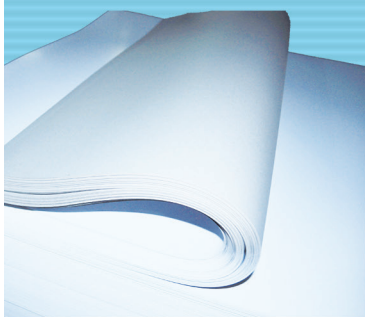
**Leading distributors in Kerala for the following products :**

Duplex Board | White Kraft Liner | Kraft Paper | Multi-Layer High RCT Kraft paper  
Absorbent Kraft | Fine Paper | Art Paper



**Distributors for :**

- |                              |                                   |
|------------------------------|-----------------------------------|
| 1) Deevya Shakti Paper Mills | 2) GVG Paper mills                |
| 3) Venkraft Paper Mills      | 4) Classic Papers                 |
| 5) Sivadharshini Papers      | 6) Gungan Paper Mills             |
| 7) Subam Papers              | 8) K.R Pulp and Papers Ltd        |
| 9) Sidharth Papers Ltd       | 10) ShriVaikunth Paper and Boards |
| 11) Gruppo Cordenons         |                                   |



*For Paper Order, Inquiry or Assistance*

Tel : +91-0484-2310265, +91-0484-2310275  
+91-0484-2310285

E-mail : [papereximcochin@gmail.com](mailto:papereximcochin@gmail.com)

(Est. 1983)

WE  
LOVE  
PAPER



## We deal with the following products....

### Commercial Printing & Notebook Industry

- Maplitho (Indian & Imported)
- Art Paper (Indian & Imported)
- Sticker Sheet (Avery Dennison & Imported)
- Art Board (200 to 350GSM)
- Colour Paper, Colour Maplitho
- Chart Paper (White & Colour)
- MG Poster (White and Colour)
- Printing Inx, Heat Transfer Paper, Thermal Paper.
- Premium Quality Maplitho Paper Available for Hi-End Jobs.
- 28, 30, 35, 40 GSM Fine Printing Paper.

### Copier & Digital Segment

- Reflection Copier – 65GSM – 100GSM,
- Hammermill Copier – 75, 80GSM
- HP Copier – 70, 75 & 80GSM
- ITC Digi Art for Digital Printing (A3 Express) – 220 to 300GSM

### Corrugation Industry

- Kraft Paper 12bf to 30bf,
- Hi-Brightness Recycled white top liner 180gsm – 250gsm.
- Hi-Strength Virgin White Top Liner
- 135GSM – 200GSM.
- Virgin Kraft Liner.

### Packaging Industry

- Virgin Board (ITC Cyber XL, ITC Saffire Graphix)
- SBS Board.
- Cup Stock (165 to 350GSM)
- Art Board (200 to 350GSM)
- US FDI Certified Food Grade Packaging Board
- Polycoated Board
- Oil and Grease resistant paper and board.
- Recycled Board – Grey Back, White Back, Grey Board, Fusion Pasted Board upto 4mm thickness.

Authorized Wholesale Dealers of

ITC paperboards and Speciality Paper Division

INTERNATIONAL PAPER

APRIL

AVERY  
DENNISON

Hansol

bilt

SAKATA INX...

**PANDIYAN MEENA PAPER COMPANY**

Post Office Link Road, (Near Vijaya Bank), Broadway, Cochin - 682031

**Phone : (0484) 2369575, 2363746, 2373677, 2374484, 2374486**

Email : [ekm@pmpc.in](mailto:ekm@pmpc.in), [chinna@pmpc.in](mailto:chinna@pmpc.in), [jaishankar@pmpc.in](mailto:jaishankar@pmpc.in)

Branches :- Calicut, Tirupur, Coimbatore, Sivakasi, Karur, Madurai & Trichy.

ONE STOP SHOP FOR ALL YOUR PRINTING AND PACKAGING NEEDS...



# ADITYA PAPERS

One place for all kinds of paper

## Distributors for

- Kraft Paper
- Duplex Boards
- Speciality Paper Boards
- News Prints
- Imported Test liner, Kraft Liner and Fluting medium

## Dealer for:

1. Gayatrishakti Paper & Boards Limited
2. Saraswati Udyog India Limited
3. Sri Hari Venkateswara Paper Mills Private Limited
4. Sripathi Paper and Boards Pvt Ltd
5. Vaithieswara Papers & Boards P Ltd

Reg. Office: 1st Floor, Door No. 60/4013 B  
Sree Sidhi Vinakyaka Apartments,  
Illom Road, Cochin -682016  
Ph: +919846051384, +919995803769  
Email: [lijo@adityapapers.com](mailto:lijo@adityapapers.com), [nidhi@adityapapers.com](mailto:nidhi@adityapapers.com)

Branch: Komal Apartments, Flat No. G1 18,  
Jagedeswa Street, T. Nagar, Chennai- 17  
Ph: +914445556057, +918754448669  
Email: [pappan@adityapapers.com](mailto:pappan@adityapapers.com)