For Private Circulations Only

The Corrugator

OFFICIAL MAGAZINE OF FEDERATION OF CORRUGATED BOX MANUFACTURERS OF INDIA

OCTOBER - DECEMBER 2023

CORRUMANTRA 2024:
EXTRAVAGANZA REDEFINED

Industry Stalwarts Insights

Hemat Bhai Bhayani
Prayesh Bhayani
Rinku Bhayani
Sagar Bhayani

2024
HAPPY NEW YEAR

CONTENTS

12

CORRUMANTRA 2024: Extravaganza Redefined

25 | Industry Stalwarts Insights

62 | How Amazon continues to improve its packaging

The key role of corrugated cardboard in delivering a stronger circular economy 32

Circular economy and cascading use of biomass 41

Take your custom box business online: a step-by-step guide on what all you need 54

An Overview of the Reducing Principle of Design of Corrugated Box Used in Goods Packaging 71

47

Adopting a Marketing Mindset in the Manufacturing Industry

82 | FCBM News

The Pursuit of Manufacturing Excellence: A Comprehensive Guide 83

The Power of Continuous Improvement 88

For Private Circulation Only

The Corrugator

OFFICIAL MAGAZINE OF FEDERATION OF CORRUGATED BOX MANUFACTURERS OF INDIA

OWNER

Federation of Corrugated Box Manufacturers of India

138, Mittal Estate No. 3, M. Vasanji Road, Andheri (East), Mumbai - 400 059.

E-mail: admin@fcbm.org

www.fcbm.org

Please address all correspondence to above address

Shlok Kedia
Editor

Pulkit Shah
Co-editor

Design & Production:

Akshar Tejas Enterprises

A/205, Rajhans apt, Louiswadi, Thane-400604, Maharashtra, India
9892799666 / 7977150597
atyourservice@akshartejasenterprises.com

Opinions and information shared by the authors of individual articles or an advertisement do not necessarily represent official view and endorsement by FCBM

Printed at: Sai Offset Printers

The Editor's Page

Pulkit Shah

Shlok Kedia

On Aug 23, 2023 crores of eyes were glued to the live streaming of Chandrayaan, Bharat indeed touched a new height of achievement on that historic day. We are always a step ahead when it comes to achievements, with G20 Bharat is taking the presidency of the first time reinforcing our ideology, our spirit of 'Vasudhaiva Kutumbakam' or 'World is One Family'. To add to that, now as our country is spreading its manufacturing wings, iPhones are also manufactured in Bharat. And irrespective of any commodity or manufacturing sector, packaging will always play a major role in almost every sector.

Be it any manufacturing industry like food industry, aerospace, automotive, or others, Innovation tops the client's requirement list over and above the product usual features. Innovation emerges from creativity, creating something new.

'Creativity is thinking up new things, Innovation is doing the new things'

And in this edition, we cover one such industry stalwart Haresh Mehta, MD - Jayna Packaging who is known for his innovations which arises from his creative approach which is truly out-of-the-box. In this edition, we also have touched upon ways to increases corrugated packaging sales, Innovation in packaging, entrepreneurial growth mindset, machine standards and more.

SinoCorrugated 2023 successfully completed on July 12-14, 2023 in Shanghai, China was attended by 100+ FCBM members to learn and update with latest technology and packaging trends in the Chinese, European markets.

WICMA Symposium 2023 this year carried the theme: Business Strategy for Growth. The symposium held on Sept 14-15, 2023 at Radisson Spa & Resorts, Lonavala got a great response from all 250+ delegates. Do not miss the details in our FCBM news column of this edition.

During Sept 24-26, 2023, FCBM delegation led by the R&D Chairman Ankit Agarwal, MD - Central India Packaging Pvt Ltd. embarked on a first of its kind, an Experiential Learning Mission (ELM) to Bangkok, Thailand.

We are glad to share that WICMA R&D Centre (WICMA Lab) is now an approved IMDG packaging testing centre in addition to the earlier milestone of NABL accreditation.

Conference team at GCBMA is all geared up to welcome all at our FCBM annual conference at Goa. Stay tuned for more details for CORRUMANTRA 2024 !

Happy Reading-Learning-Growing !

Farewell Message

Dear Friends,

As the President of FCBM India, I want to emphasize a crucial matter. Our nation is experiencing rapid economic growth, but we need to adapt to the changing global landscape.

Today, conversations worldwide are focusing on sustainability, recycling, and the health of our planet. It's time for us to take these discussions seriously and create a roadmap for our country's future.

In our industry, we must innovate, especially in packaging. It's unfortunate that our food packaging is still lacking in many areas. We need to explore new technologies and approaches to bridge this gap. I believe that involving professionals and educators is essential for our progress. Their expertise, combined with our industry knowledge, can lead to significant advancements.

It's worth noting that our country's per capita consumption of packaging paper is higher than in many developed nations. This presents both challenges and opportunities. We should focus on research, sustainability, and responsible consumption.

In conclusion, let's recognize the global changes and the need for sustainability. We must address the packaging issues in our nation proactively. Together, we can create a more sustainable and prosperous future.

Looking forward to meet all our members, affiliate industry stakeholders and friends at CORRUMANTRA 2024 at Goa.

Thank you for your dedication to FCBM India.

Jai Hind !

Vineet Jain
President
FCBM

President's Desk

Dear Respected Members,

I am deeply honoured and humbled by your trust and confidence in electing me as the President of Federation of corrugated box manufacturers of India (FCBM). It gives me immense pleasure with a sense of responsibility to assume this august office of the FCBM. Your faith in me means a lot, and I promise to do my utmost to live up to your expectations and with your support I will do my best to carry forward the 50 years of the golden legacy of FCBM laid down by our predecessors. I would also like to express my gratitude to the outgoing President Shri Vineet Jain and his team for their hard work and dedication in serving FCBM.

Let me congratulate and thank the FCBM fraternity for completing 50 glorious years because completing 50 years for any national organization having 13 regional associations and 2663 members itself shows its magnificence, immensity and strong bonding among the members.

I am really blessed that I have a very experienced and a dynamic team of office bearers, sub- committee chairman, active past presidents as our mentor and all the regional presidents to further strengthen and enhance the activities to bring the FCBM to remarkable heights.

Today FCBM Conference has become an industry event everyone looks forward to and we have recently witnessed the 51st conference of FCBM hosted by GCBMA from 7th to 9th January,2024 at Resort Rio Goa. Thanks to team GCBMA for hosting a remarkable event with great hospitality and brotherhood, far away from their hometown. This year's theme " CORRUMANTRA" and the tagline" Paryavaranrakshanam Parmo dharma" was relevant to the time, crafted keeping our dedication towards environment protection, on one hand by using concepts of use of sustainable forest management system and on other hand efforts taken for saving virgin fibres by Reduce, Reuse, Redesign and Recycle concepts of Kraft paper and corrugated boxes, the theme is more emphasize on use of recycle Kraft paper and corrugated boxes.

The Indian corrugated box industry falls mostly under the MSME sector, we have also been able to leverage new technologies and innovations to improve our products and services, and to stay ahead of the competition. However, we still face many challenges, such as unexpected rising input costs, supply chain disruptions, and regulatory compliance issues. Recently there have been severe spiralling price hikes imposed on Kraft papers. The supply of Kraft papers has become uncertain, disrupted and paper mills are increasing price without any prior intimation which created unnecessary burden and panic among the member corrugators. Our team is committed to working with all of you to overcome these challenges and to build a stronger and more resilient industry. We need your support and wholehearted active participation and I am confident that with your active cooperation, hard work and brotherhood we will overcome these hurdles.

Once again thank you all for your support and look forward to your active participation, guidance and day to day communication from each one of you during my tenure.

Wish you all a very Happy & healthy prosperous new year 2024.

Warm Regards,

DHARMENDRA PANDYA
PRESIDENT

CORRUMANTRA 2024:
Extravaganza Redefined

On 7-9 January 2024, the corrugation Industry bedazzled in Goa at the 51st Annual FCBM Conference hosted by Gujarat Corrugated Box Manufacturers Association (GCBMA). It was nothing more that a spectacle with an amazing confluence of Creativity, Hospitality and Professionalism at the India's favorite vacation destination - Goa. Here we share the extravaganza with all, with few snapshots capturing the amazing moments from the lens.

51st CONFERENCE OF FEDERATION OF
CORRUGATED BOX MANUFACTURERS OF INDIA
7th-9th January 2024 - Resort Rio, Goa
HOST
PCBMA
MPCBMA
RCBMA
SICBMA
ACCT

Kalupur Bank
The Kalupur Commercial Co-op. Bank Ltd.
FEDERATION OF
or BEARER
PCBMA
MPCBMA
RCBMA
SICBMA
ACCT

CORRUMANTRA 2024: Extravaganza Redefined

Introduction
Mr. Pragnesh Parikh -
I am a a Mechanical Engineer from M.S. University of Baroda. Vadodara. Gujarat
30 years of rich experience in the Safety & maintenance.
Worked with prestigious organization like
M/s. Siemens Limited,
M/s. Thermax Limited at Vadodara.
M/s. Torrent Pharmaceuticals.
M/s. Essar. M/s. Cheminova.
M/s. Alembic Limited. Vadodara.

51st CONFERENCE OF FCBM
Technical Session II
Environment Sustainability
YOUR OPTIMUM GOAL
Your Key Requirements:
- Maximum Corrugator Productivity
- Maximum Conversion Productivity
- Optimum Box Performance

corrumantra
HOST
G.C.B.M.A.
CORRUGATED BOX MANUFACTURE CHARITABLE ASSOCIATION

Corrugated European Industry Voice in Europe and World
corrumantra

51st ANNUAL GENERAL MEETING OF FCBM

CORRUMANTRA 2024: Extravaganza Redefined

The Grand 51st Annual Conference was inaugurated by then FCBM President Vineet Jain. The three-day agenda was precisely planned to fit in motivational speech, technical sessions and not to miss the evening pure entertainment shows.

The first day unfolded into canvassing a rather futuristic landscape of the corrugation industry. All the respected dignitaries warmly welcomed our Keynote speaker Swami Dharmabandhu Ji, an Indian Saint, and Motivational Guru for his wisdom on Social and Cultural responsibilities of our life.

Later, Shri Ram Kumar Sunkara, M/s. Avadhoot Paper Products presented a session on Future of Corrugation Market in India: Predictions and Trends. The ensuing panel discussion was wonderfully moderated by Shri Milan Kumar Dey, Director - Madan Packaging. In this panel discussion, three experts namely Shri Mayank Shah (Finance Consultant), Shri Manish Gupta, Director B&B Triplewall, Bangalore and Shri Vernon Mathai , Director, Velvin Paper Products, Goa were the invited the panelists.

The second day uncovered some insights from Sustainability and Industry trends of the corrugation industry. The presentations included Sustainability of Environment in Corrugation Industry by Shri Ganesh Kumar Vijaykumar AVP, Head Sales, Deutsch Quality System Pvt. Ltd, Industrial Health & Safety by Shri Pragnesh Parikh, Safety Consultant, International Trends in Corrugated Packaging by Dr. Fady Gemayel President FEFCO; moderated by Shri M. L. Agrawal, Vice Chairman-I, ICCA and Reimagine with Nature and Role of Corrugated Box Industry in Sustainability by Mr. S.K. Nayak, R&D Manager, Procter & Gamble (P&G).

The third day sessions were focused on production process and upcoming technologies. All the three sessions received very good response from all the participating delegates: Improvement in Production Process by Mark Miles, Erhardt Leimer GMBH, Advantages of Production Management System in Automatic 3/5/7/ply production by Randeep Sharma, Flotech Machineries Pvt. Ltd and Technology for Digital Printing by Mr. Satish Patel, Skyline Machineries.

The Gallantry of Award Winners

B. K. DOSHI AWARD 2023

Ashu Hot Temp Industries headed by Ashu Jhingan & Shivansh Jhingan

SPECIAL ACHIEVEMENT AWARD 2023

Awarded to
Shri Aditya Pal Sood,
Chairman - Paper Mills Co-ordinationCommittee

& Shri Ankkit Agarwal,
Chairman Research & Development Committee

HARLALKA AWARD 2023

Awarded to
Shri K. P. Singh

ESKAY AWARD 2023

for the Best Regional Association in 2023
Eastern India Corrugated Box Manufacturers' Association

CORRUSTAR AWARD 2023 WINNERS

Consumer Pack — Packers Products, New Delhi

Innovation

POP Display

Material / Fitments — Latha Industries, Chennai

Best Printing — A-One Containers Pvt. Ltd.

After witnessing this memorable spectacle, every FCBM member, every industry stakeholder is eagerly waiting for next the annual conference

આગામી કોન્ફરન્સમાં મળીશું

See you in the next conference

Industry Stalwarts Insights

In this edition, we go through the arduous-yet-rewarding journey of a family business based in Gujarat, whose first generation has made it through their tough times with a never-quit and Learning attitude. **Shridhar Group** and **HEM Packaging Pvt Ltd.** are driven by two brothers, Prayesh Bhayani and Rinku Bhayani, both Directors - HEM Packaging & Shridhar Group, along with the third Director from the second generation, Sagar Prayesh Bhayani.

Prayesh Bhayani

Director - HEM Packaging & Shridhar Group

Q: What are the three major challenges that you encountered in taking Hem Packaging to the pedestal it is now? How did you overcome them?

PB: Its all about mindset, wherever we are in our growth journey and which goal we plan to achieve. It's all about mindset of seeing challenges as learning. I was 21 and Rinku Bhayani, my brother was 18 years old when we moved from Jamnagar to Rajkot with a vision to start our own venture.

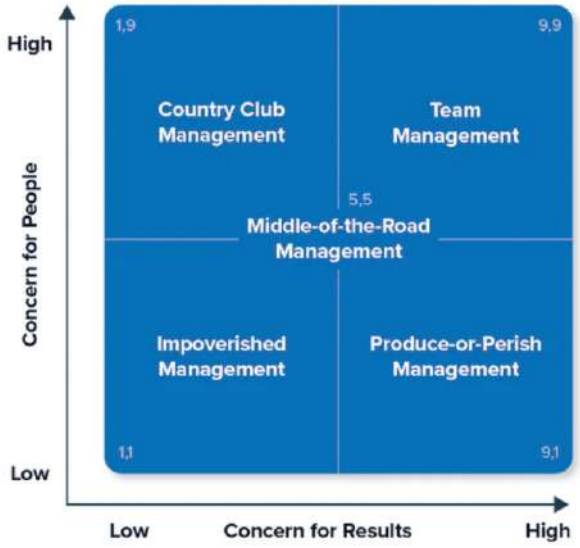
It was a hard decision as during that time our affluent friends were enjoying college life, and we took a path not usually taken right after our school. We left Jamnagar our native place, with one promise to ourselves that - we won't look back no matter what!

We kickstarted our journey with a meagre amount from our father toa new life in a new city only to discover the challenges that were waiting for us ahead.

Our main challenge was understanding the know-hows of the business without any technical or business skill, all that helped us was our failures! Each challenge, each obstacle helped us grow and learn almost every day. Both us were the salespersons, delivery boys, marketers, repairers, electricians, everything! We literally pulled off sleepless night at the plant itself for initial few years! Adjusting to this life coming straight out of school was nothing less than a nightmare, but it didn't stop us or even slow us down It was definitely not just difficult but an arduous journey, sometimes quitting seemed to be an option, but we choose otherwise. Today, at this stage we proudly share that the entire credit goes to our father Hemat Bhai Bhayani, his support and continuous inspiration made this this dream a reality.

Q: What are the business value systems of HEM Packaging & Shridhar Group that gives strength to your business? please elaborate.

PB: Honesty, Integrity and faith in our work are the three key values that we have ingrained not only in



ourselves but also in our staff. Honesty being the most important value, is the first thing we look out while recruiting. We are proud to share that few of our team members in Hem Packaging on their merit, climbed the stairs of hierarchy being absorbed from lowest step and now reached the top management. They've earned it with honesty, determination and an obsession to be better, to grow! We continuously emphasize on these values at HEM and Shridhar and have seen a significant growth since the last few years. Our main principle at HEM and Shridhar have always been to seek excellence, work with integrity and keep innovating. We firmly believe in keeping our words to deliver in time and our staff and customers should get safe working environment.

Q: Any TEAM grows when they live the philosophy "Together Everyone Achieves More". How did you manage the growing teams while being focussed on the organizational goals?

PB: The Blake Mouton Leadership Grid matrix weighs the importance of 'people' versus 'business' for a leader in a 4x4 matrix. This matrix helps us understand if the leader is more worried about his people or business goals, and to be a great leader, he/she should be concerned for both equally (experience taught me this, not school!). While pushing ourselves and our team towards a target, we not only consider their opinions and judgments but also empower them by giving them authority to take decisions. Our team is not just a team assigned on a project, it's a family working in our family business. Having worked with these wonderful people for years together, we understand their working style, and interdependence is inevitable. The sense of belongingness and also empowerment we get by working together is priceless. As our business started to grow, we looked out for internal recruitment first who usually manage the new recruits and train them on the tasks, culture and expectations. If we as promoters grow, we take with us our team because of whom we have grown, and that is always the best way forward.

Rinku Bhayani, Director - HEM Packaging & Shridhar Group

Q: With your rich combined experience of three decades for Hem Group, what were the key aspects to gain new customers and retain them?

RB: Our primary focus always been providing the best quality in the corrugation industry. Our work speaks for itself, it markets itself and Shirdhar Group now has independent production team, and we manage and just focus on expanding horizons for the group. Our marketing majorly has been organic, and eventually with minimal marketing efforts our potential clients know us before- hand due to our work. Our services are known among the top ones in the industry and we thrive to maintain rich customer relationships through this strategy. Gaining top-notch quality and service at a competitive rate, what more could the clients ask for? Give them what they want, and they are with you forever, forging long lasting cordial relationship !

Q: Where do you foresee the corrugated industry in the next 10 years keeping in mind the geopolitical issues, supply chain intricacies, raw material availability, and global competition?

RB: The Indian corrugation industry is growing at a high-speed owing to aspects like e-commerce industry boom, ban on single-use plastic and awareness in sustainability as paper is an eco-friendly product. These factors gave rise to use of paper packaging, corrugated board and boxes, however post covid certain factors have resulted in

a slowdown of the industry. Firstly, there had been extreme volatility in paper prices in tandem with the prices of scrap and OCC imported from foreign countries. This eventually fluctuated corrugated box price, in turn which is passed on to end user. And like a catch 22 situation, the end user is unable to increase their packing cost due to cut throat competition in the market. A corrugator can excel with long term commitments, provided raw material prices are stable or least fluctuating.

Global competition has also played a critical part in affecting corrugation industry as lot of foreign corrugator players are investing in India vying for the industry understanding its growth potential and increase its per capita consumption of paper. This has conversely impacted traditional Indian corrugators as due to the lack of advanced technology they wouldn't be able to compete with them. On the other hand, it's a good sign that implying huge scope to grow in future. To conclude, in the next decade the industry has a great growth potential, provided certain obstacles are taken care of. In the next decade, there is a possibility for corrugation industry to grow about 50% of its current value. However, it will take time and we will need to sustain in order to witness this era of extreme growth.

Q: What advice would you share with budding entrepreneurs in this field of corrugated packaging.

PB: If there needs to be only one quality that Entrepreneurs must have, its - being committed. Starting anything new is easy, but sustaining it through tough times with hard work without getting distracted midway, and still not give up is a humongous task. Second trait for an entrepreneur is ability of ask the right questions, to the right person at the right time. And it could to our mentor or own self. This questioning capability work wonders when it comes to learning new things and implementing those in the business. Specifically with respect to corrugation industry, I would suggest building entrepreneurs must be committed – deliver as promised to the customer. Shortcuts or tampering with raw materials/process to cut costs does not serve purpose in the long term. Thirdly, patience is the master key to everything, proven beyond point with the recent extremely volatile market owing to Covid, it even resulted in shutting down of various paper mills and packaging plants. In excel in the corrugation industry one must follow the right path, with ethics, and patience to grow gradually rather than raging to grow at an extreme pace and falling down eventually.

Sagar Prayesh Bhayani,
Director - HEM Packaging & Shridhar Group

Q: After getting absorbed into the family business, what were your initial challenges and how did you overcome them.

SB: Well, joining the family business and handling the operations was pretty challenging. People believe that the ones who join family business,

it's a cake walk for them, a ready platform and they just carry forward the legacy, however, it's not as easy as it seems.

One of the biggest challenges was to attain the benchmark already set by your elders in terms of technical, management and financing skills. In order to reach this level, I started from the scratch i.e. production, straight after completing my Post Graduation from the United Kingdom. I spent a whole year in Rajkot plant workshop to learn machine operations, understand and overcome production difficulties by being on the floor. This enabled to handle Ahmedabad plant as I was aware about each and every operation in a corrugation company.

Another main challenge is being versatile, an entrepreneur should have sound basic knowledge of each and every business aspect i.e. accounting, marketing, construction, operations, networking, financing, etc. This took time but gradually directly or indirectly I learnt these aspects in one or the other ways. Contradictory to schooling, where if someone scores less in subject however better in others, overall impact is compensated. Here, we need to be knowing it irrespective of the availability of staff member for every department. These challenges have been a path of success for me.

Q: What are the three key learnings from the previous generation that helps the new generation in taking the business ahead smoothly?

SB: Generally, in this context conflicts between generations are more known to the masses. Being brought up with learnings, from Family business perspective, I would love to share.

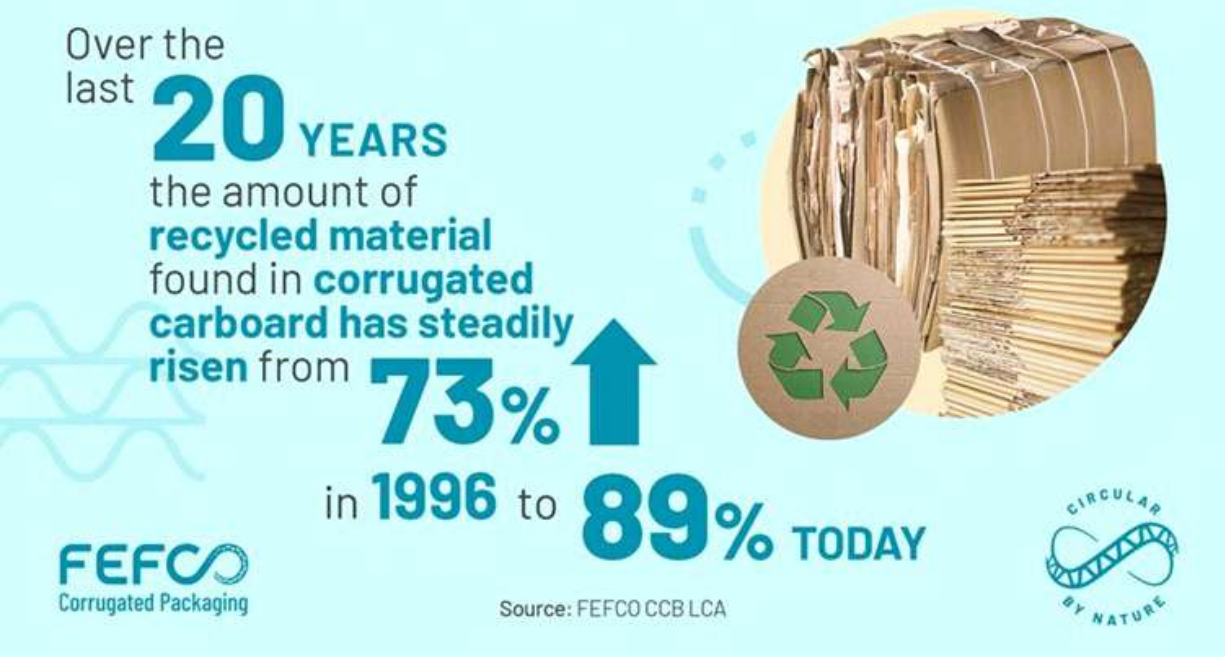
Flexibility and Authority is the first and most important learning which has helped me handle the business more efficiently till date. This is the key reason that we never had conflicts amongst us as my father and uncle never carried the rigidity to hold on to the business, when they decided to pass on the business to me, they gave the full charge of it. They have always trusted my decisions.

Second learning or a key quality is a lot is persistence and self-confidence as running a business includes numerous hurdles and obstacles. For example, when Ahmedabad plant was established, within three months the world pause with Covid-19, in which case we had just started our operations and not even completely set up and suddenly we had to shut down the plant for 60 days. This was not easy for us in terms of our personnel handling, customer retention and achieving the target as it was a completely new location for us. However, with confidence and the ability to keep going helped us in the long run to set up a new plant in such situation. Lastly, work ethics and honesty plays a significant role in running a business is what I've learnt, and as quoted by Mr. Zig Ziglar, an American motivational speaker that “Honest and Integrity are by far the most important assets of an entrepreneur”.

The key role of corrugated cardboard in delivering a stronger circular economy

The corrugated cardboard industry remains highly committed to achieving the objectives of the PPWR. We sit down with Saverio Mayer, CEO Europe Smurfit Kappa and VP of Fefco, to discuss the proposed changes - and why recycling and reuse must be seen as complementary.

Saverio Mayer, CEO Europe Smurfit Kappa and VP FEFCO



Why is the corrugated cardboard industry so important in Europe and what benefits does it bring?

Corrugated cardboard packaging matters because it plays an essential role in everyday life: it serves to protect the products we all buy and consume, be it when they are being transported, stored or sold.

In fact, 75% of all goods on their journey from producer to customer are transported and protected using corrugated cardboard. It protects and preserves even the most fragile goods, which helps the EU's environmental goals because damaged goods create pressure on the planet through wasted food, fuel and other resources. Trade, both within Europe and beyond, could barely survive without it.

As an industry, corrugated cardboard is a highly localised and productive business that Europe should be doing everything to support, not undermine. It has a massive European economic and social footprint, often in the most deprived areas.

This is not a sector dominated by one or two mega-corporations. It involves many smaller companies often embedded in local communities and creating large numbers of jobs and economic activity there. There are over 660 plants located across Europe employing 100,000 people directly and creating a further 270,000 jobs indirectly.

It is also arguably the greenest of all packaging materials, with a recycling rate of over 90% for cardboard and an average recycled content of 89% for corrugated cardboard. Our high-tech, high-

performance recycling system makes us a frontrunner in the EU's race to achieve circularity. We also use a high proportion of local raw material The main raw material for corrugated cardboard packaging is recycled paper. The remaining fibres in our packaging come from sustainably managed forests. According to data, 90.6% of forests owned or managed by the European pulp and paper industry are forest management certified.

How is the corrugated cardboard sector working to reduce its carbon footprint?

We already have a strong track record on circularity and are committed to helping reduce our carbon footprint even further. We have pledged to achieve carbon neutrality by 2050 at the latest. This ambition covers the sector's full carbon footprint and aims to work with the entire value chain, from cradle-to-grave, to achieve this goal.

Corrugated cardboard has some inherently circular properties: it is made from a renewable, bio-based feedstock, and is biodegradable. The corrugated cardboard industry wants to go even further and improve material efficiency and circularity, meeting customer requirements by using the minimum amount of materials while maximising protection of the product, and with the highest degree of recycled content. We work closely with our customers to optimise the value chain (this covers how packaged goods are transported, stored and handled), the design of packaging solutions and production processes.

Our sector also aims to improve its energy efficiency further and fully phase out fossil fuels from its energy mix. Various pathways are possible: the electrification of the heat supply (mainly via electric boilers), and the use of (gaseous) biofuels. Regarding the decarbonisation of the electricity supply, a corrugated cardboard plant can produce between 10% and 40% of its current electricity needs with onsite renewables, depending on its location.

Finally, the corrugated cardboard industry is working closely with suppliers to achieve their own circularity and decarbonisation goals - notably the paper sector.

What could policymakers learn from the work of the corrugated cardboard industry?

What the corrugated cardboard industry wants to see reflected in EU policy is a greater appreciation of the damage that efficient recycling avoids. Our industry is highly committed to reducing waste and our carbon footprint, as we have already explained, which is reflected in our high performance in terms of recyclability. Being aware of the need to reduce water use and transport in the life cycle of packaging is of utmost importance. Recycled cardboard boxes do not need anywhere near the same degree of washing, storage or extra transport, all of which increase fuel usage and emissions release. Our industry believes that recycling is an important aspect of circularity that should not be taken lightly.

Another aspect policymakers can learn from our industry is just how complicated the distribution business is, and that our constant efforts to improve logistics and rationalize delivery methods contribute to a more efficient and less wasteful use of resources.

Corrugated cardboard packaging plays an undeniable role in the transition towards a strong and circular European economy.

Can re-use and recycling co-exist in a sustainability seeking world?

They can and they must. Efficient recycling is undoubtedly the fastest route to circularity and carbon neutrality, but it should not be the only route. Other materials need other solutions, and this must be respected. PPWR must seek a balance between recycling and reuse that does not favour one and penalize the other. The irony of the proposal as it currently stands is that an excessive focus on reuse will lead to an upsurge in plastic – the very material consumers want to see reduced most of all – while devastating other packaging sectors like cardboard despite their powerful record on recycling.

Reuse and recycling are complementary, not mutually exclusive, and should be treated as such. Worryingly, this is not the way PPWR is heading. The reuse targets currently proposed risk compromising the objective of the EU's Circular Economy Action Plan, which states that the review should "ensure that packaging on the EU market is reusable or recyclable in an economically viable way by 2030".

What changes need to be made to the PPWR to ensure the best possible boundaries to achieve a circular economy?

First and foremost, PPWR must safeguard the peaceful coexistence and effective complementarity of recycling and reuse. Any reuse targets should be realistic, achievable, positive for the environment, good for society, and should not damage the competitiveness of European industry.

Waste prevention measures may be needed, but where they introduce market restrictions these should be assessed to ensure they do not worsen the environmental impact or increase food waste. Mandatory recycled content limits should be set only for plastic packaging, and prevention targets and excessive packaging limits should be realistic and promote competitiveness.

How can corrugated cardboard help the wider world in its bid to reduce plastics usage?

In PPWR the reusable packaging that will replace corrugated is plastics. The worst thing Europe could do is make rules that inadvertently favour plastic over other sectors like corrugated cardboard. Above all, the EU must not treat plastic crates as though they are a cleaner, safer and greener alternative to cardboard. They absolutely are not. Official Eurostat data are needed to make a proper evaluation and also consider market, society and industry realities.

The results from recent studies[2] - all backed up by credible, peer-reviewed research - speak for themselves: recyclable corrugated boxes emit 34.79 Kg of CO_2, while reusable plastic crates (even if used 24 times) emit 47.94 Kg of CO_2; corrugated cardboard boxes outperform reusable plastic crates in 10 out of 15 environmental impact categories, including CO_2 and water usage. Plastic crates must be reused at least 63 times to be sustainable; if corrugated cardboard is replaced for e-commerce, over 3,5 billion plastic boxes will be produced and placed on the EU market in the first year of implementation (2040).

The corrugated cardboard industry remains highly committed to achieving the objectives of the PPWR, and therefore hopes that the final PPWR text will consider the potential risks of increased plastic pollution, which would go against the very spirit of the Regulation and of the Green Deal.

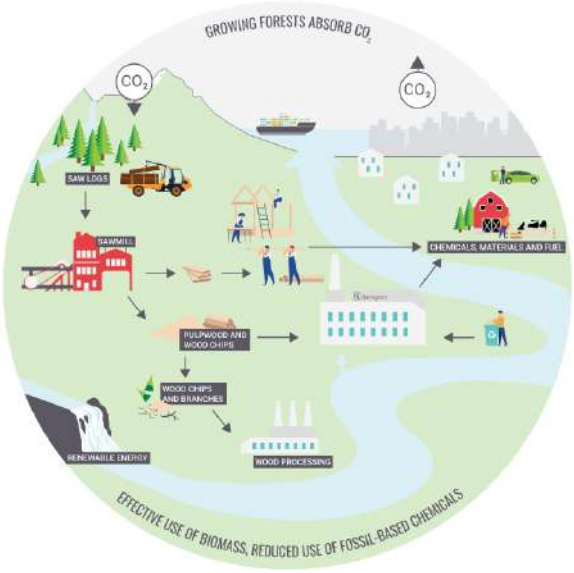
Source: The Parliament Magazine

Circular economy and cascading use of biomass

In a circular economy, the aim is to make the best possible use of society's resources for as long as possible, simply explained by the 3 R's: Reduce, Re-use and Recycle.

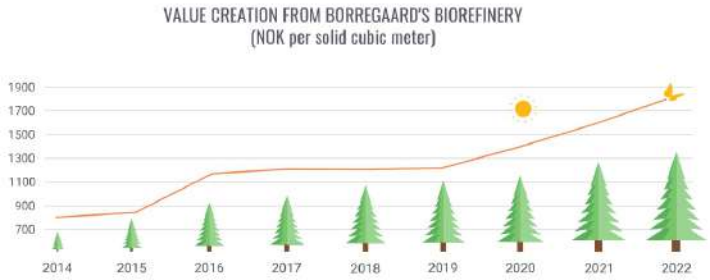
This can be done through the high utilisation of raw materials, reducing waste, emissions and the use of energy, as well as by reusing and recycling products.

One of the basic principles is eco-design; to design products in a way that ensures that materials can be recovered more efficiently and to view waste as a resource.



Transition to a circular economy

High raw materials utilisation, including efficient utilisation of sidestreams and cascading use are cornerstones of a circular economy. In this context, cascading means that the sidestream from one process is used as feedstock for the next. In this way, we gain more value-added by utilising the raw material for multiple products rather than producing just one product. The value-added and environmental contributions, including climate benefits, in this concept is higher than utilising the wood for energy purposes only.



Cascading use

Cascading use can both materialise within a cluster of companies and within an integrated production set-up.

In Norwegian forest-based industries, all parts of the tree are utilised for products. Wooden construction material is the main driver for harvesting trees in Norway. The most valuable part of the tree is used for this purpose. 25% of the wood entering the sawmills becomes residuals in the form of wood chips to our industry. The

remaining part of the tree and the residual wood chips from the sawmills are raw materials for Borregaard's sustainable, high value products.

Borregaard's biorefinery is an extraordinary cascading operation where wood, which consists of fibres, lignins, and sugars, is converted into cellulose and a variety of other valuable products. The sidestream from the cellulose production is first utilised in the production of bioethanol before the rest is converted into lignin-based biopolymers. Parts of the lignin are also used in the production of biovanillin, and parts of the cellulose are converted into cellulose fibrils. Some sidestreams from production are sold to other industries, which in turn use them as raw materials in their production. Knot pulp, which is removed from the cellulose and utilised for packaging materials and bark for soil conditioning, are examples of such utilisation. The sidestreams that cannot be utilised for products are converted into biogas or biomass used for energy in the production processes.

By using sidestreams to produce valuable biochemicals and biomaterials, we secure high resource efficiency of the renewable raw material sourced, which is key to the low-carbon circular bioeconomy.

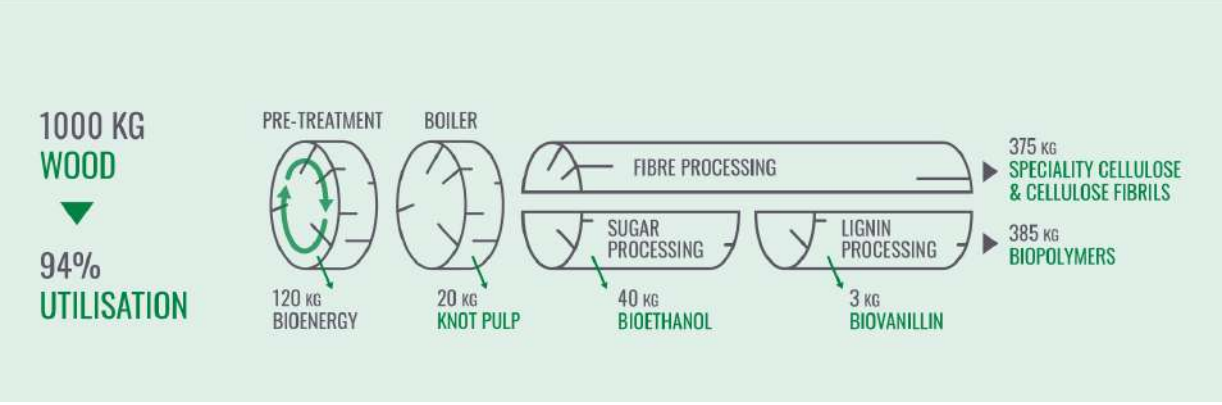
Borregaard's most important raw material, Norway spruce, is harvested from certified forests. We source wood from nearby forests by sustainable transportation, in which health and safety, emissions and costs are considered. In this way, Borregaard, together with external suppliers and customers, is part of a complex and well-established cascading system for bio-based products, intermediate products and sidestreams.

In other words, the Norwegian forestry sector and Borregaard's biorefinery are built on the principles of both cascading and circular use.

Borregaard contributes to strengthen circular value chains and promote circularity by offering sustainable solutions. Some of our products are used in sectors that have a high use of resources and where the potential for circularity is high, such as within electronics, batteries, vehicles, packaging, plastics, textiles, construction, food, water and nutrients. We promote circularity by offering sustainable solutions within these areas. Considering our products are based on a renewable, non-toxic raw material, they represent no negative impact when the end products are recycled.

High raw materials utilisation

The concept of utilising all parts of the harvested tree for valuable products such as building materials from sawmills and our bio-based chemicals, contributes to a high raw material utilisation. Borregaard's biorefinery concept demonstrates high raw material utilisation where 94% of the sourced wood is utilised, of which 82% is turned into commercial products and 12% is used for energy. As a result, high resource usage and circular economy is integrated into our business model.



Source: Borregaard

Adopting a Marketing Mindset in the Manufacturing Industry

Marketing executives have a tough job in the manufacturing industry. Convincing the CEO and CFO that marketing is a revenue generator and not just another expense is difficult. There are a few reasons for this, the first of which is, well, that's just "the way it has always been." And the reason it has always been done this way is because buying from manufacturing companies involves a long, information gathering process that then leads to a long decision-making process.

As the CEO or CFO, you should know that marketers understand that larger purchases require a longer buying cycle, and we know how to help buyers through that process to get them to the decision faster and more efficiently. It's hard to convince you and the rest of the executives of this when you think we're just prepping trade show booths and printing brochures all day.

So, how can you adopt a marketing mindset? Let's start with the way buyers have changed in the past twenty years.

The Need for Inbound Marketing

As manufacturing industry executives, you'll need to realize that marketing is more than brochures and catalogs. Smart marketers are working to educate potential buyers by answering common questions, providing solutions to common problems, introducing new ways to get the job done, and sharing success stories—all before someone actually asks for that information.

How can marketers anticipate the questions potential buyers will have? By analyzing buyer behaviors and anticipating their needs. With competent content marketing, you can provide the information your target audience is looking for at any tim e of the year and not just at the next trade show.

When the content already exists on your company's digital assets, such as your website and social media platforms, anyone searching for the services your company provides can find it. Maybe they won't be ready to make a purchase right away, but the marketing department can start them on the buyer's journey by educating and convincing them so that your sales department will have nice warm leads when the time is right.

Proving Your Expertise

By answering your potential buyers' questions before they even ask, executives can do so much more than provide marketing material. You also have a big chance to prove your expertise in your field.

To make sure you're answering the right questions, ask the marketing department to seek out your current loyal buyers. What challenges are they facing? What questions have they asked in the past? What was the catalyst that led to a purchase? Then, create content that answers these questions.

When sharing content, consider the life span of the questions you're answering. If the question is

one you receive often, create a blog where the answer can live forever on your website. If the answer is more timely in nature—perhaps focused on current events or short-term problems—create a video or social media post where you can take advantage of the viral nature of Instagram reels and TikTok videos to reach the widest possible audience in a short amount of time. Webinars and podcasts are also solid content pieces that give you a chance to really shine with your industry knowledge.

Earning Your Buyers' Trust

By becoming a thought leader in your space, you begin to earn your buyers' trust. Your company will become a resource for industry knowledge, which can drive them back to your website and other digital assets to get the answers they need at any time.

While your potential buyers may not be ready to make a purchase every time they seek your company out for answers, you can be sure they will keep your company top of mind at all times. This means that, when they do need to buy, your brand is the first one they will run to.

Even better, your prospects will likely recommend you to others who are seeking answers, which can grow your audience exponentially. And later, when they need to make another purchase, your company is the one they will seek. This is because establishing yourself as an expert leads to earning your buyers' trust, which then leads to unshakeable customer loyalty.

Creating Demand Among Your Audience

We've talked a lot about how to remain top of mind so that buyers will come to your company when they have a demand. Now, how can you create demand so that you can speed up the purchase process?

Creating demand among your audience requires a little bit of psychology, something marketing leaders are really good at. There are a few different tactics you can use, all tried and tested. The first is providing social proof. Did you know that you only need 25% of your audience on board to change the minds of the remaining audience members? By sharing the thoughts and testimonials of those buyers who have been satisfied with your company, you can begin to nudge the reluctant prospects toward a purchase.

The Noble Edge effect has been used by many companies with great success. A company that develops a reputation for supporting social causes that are important to their target audience can enjoy both higher profits and higher satisfaction ratings. Take Patagonia or TOMS Shoes as examples, and you'll understand the phenomenon. To adopt the Noble Edge effect, simply consider the causes that would appeal to your buyers and attach an action in favor of that cause to a purchase.

Finally, you can create demand by introducing a sense of urgency. You've likely seen this on informercials and on ecommerce websites. While you may not benefit from language such as “Only five left!” or “In two days, this style will be out of stock forever!” the psychology behind the phenomenon remains the same. Offer a limited-time discount. Call attention to limited times for production and how quickly those windows are closing. Anything that introduces a sense of urgency will spur those prospects that are still sitting on the fence to hop down to take action.

Provide Opportunities for the Sales Team

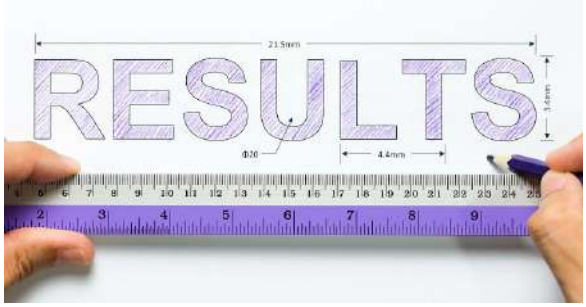
One major point that you'll need to understand is that marketing and sales are not the same. By expecting either to do the other's job, the company is set up for failure. Instead, marketing can help support the sales team by providing quality leads - prospects that have been well educated on the company and how you can solve their pain points - so that sales can easily close the deal.

Instead of thinking of the buyer's journey as a straight line, with marketing at the beginning and sales at the end, instead consider the journey as a loop. Once the prospects gain awareness of your brand, marketing must then use educational content and that demand psychology to convince and convert. Sales can then take over and turn those warm, convinced leads into customers. But you don't want the path to end there, do you? You want that buyer to come back again and again, and that's where marketing steps back in to continue nurturing and educating so that your company remains top of mind.

Your marketing team should work with the sales team to learn the sales targets so your marketing team can develop strategies to help them meet those goals. Identify areas that are primed for growth so your marketing department can develop new content to support that growth. Who in the sales pipeline needs a stronger nudge? Develop smart content that targets those buyers and the friction that's slowing their process.

When you see how crucial marketing is to the success of the sales team, you'll begin to see marketing more as a revenue generator than a cost center.

Measure Your Results for Refinement



Perhaps the biggest challenge the marketing leaders face as they work to transform your marketing mindset is a lack of patience. After all, building a marketing funnel with quality content that reaches buyers where they are in their journey takes time. That time is then multiplied by the size of the purchase the customer is planning to make.

When the marketing department is presenting results, look for the exciting metrics that have nothing to do with revenue - at least at first. For instance, if brand awareness has skyrocketed, realize what potential that has for a wider audience. If positive reviews and feedback have increased, learn from the feedback to continue improving your services. As the sales numbers begin to catch up with the awareness numbers, you'll have the proof you need to understand that marketing might take time, but it definitely works.

A strong marketing leader is crucial to success, and they need to be in the room with you and the rest of the executives when decisions are being made. If you're missing that key piece of leadership, consider seeking out a fractional CMO to get you on the right track while you identify potential candidates to keep the ball rolling on a permanent basis.

Source: Marketing Initiative Worx

Take your custom box business online: a step-by-step guide on what all you need

Gone are the days when businesses were forced to accumulate bulk quantities of packaging when they only needed a handful. With the rise of digital printing, companies can choose the size of their print order, however small, and thus save money and avoid wastage.

But that is not all! Today, businesses also have the option of personalizing the boxes they send to their customers. Major brands, such as Licious.in, Oreo and Crayola have forayed into custom box packaging at some point and enamored their customers!

No wonder, the custom packaging boxes market is projected to expand 1.6X the current market value during 2022-2032. There is considerable scope for variety in this growing industry – from pretty patterned cake boxes to durable display boxes for cosmetics.

Three reasons why custom packaging is so popular:

1. Growth of eCommerce

The Internet has made it possible for virtually anyone to set up a business anytime, anywhere, without investing in a physical store. Ecommerce allows products to be shipped worldwide and brings operating costs - and thus, final prices - down.

As more and more businesses move towards eCommerce and make use of web-to-print technology, product packaging becomes a functional necessity and a meaningful way to create an excellent first impression amongst consumers who are spoiled for choice.

2. Increased need for branding

In today's fiercely competitive market, having a

distinctive brand helps a business stand out – even more than having a high-quality product.

Product packaging plays an important role here, as consumers often come to recognize a brand from the colors and materials it uses in its boxes. And deploying a web-to-print solution can make it all happen!

Amazon Storyboxes, launched in India, was a packaging initiative to promote the various inspiring customer stories. Apart from the story in written words, each box had the caricature of that customer. Pretty personalized; we must add!

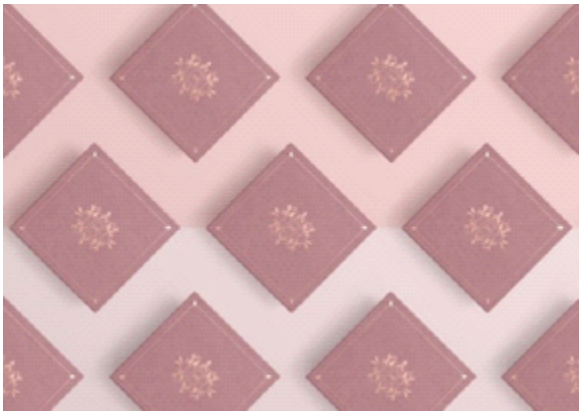
3. Better customer experience

Given that 80% of people experience brand awareness by sight, having a distinctive custom packaging plays a vital role in growing a brand. Many consumers associate attractive packaging with premium quality.

Durable boxes and bags can also be reused by them, helping keep the brand on their minds. Besides, with influencer marketing's growth where influencers create 'unboxing' videos to talk about brands, attractive packaging is likelier to get positive reviews.

Six products do buyers of custom packaging like to customize

1. Boxes



Brands like to be able to choose appropriately sized boxes for their products to fit into. They also want to include corner pieces or soft stuffing to protect fragile items without scratching them. Plus, if they can print specific designs on such boxes with web2print, it is even better!

2. Labels and stickers

Brands will typically attach a product label to every product they send out. They may also add stickers with their brand logo to the outside of the box to be instantly recognizable. These labels or stickers could just contain the brand's logo or a specific message they wish to promote. Thanks to a Web2Print Packaging Box Design Software, that is a possibility!

3. Tape

Not every brand wants to use the same white or beige masking tape to seal their boxes. Some may want to match their tape color to their box design or have their brand logo stamped along the length of the tape. Variety and personalization are two vital elements in the custom box printing and packaging industry.

4. Bags

For smaller products such as jewelry or cosmetics, brands often like to pack their boxes into attractive bags. These could be plain mesh or silk bags or

feature elaborate designs and are typically made with durable material so that customers can reuse them.

As mentioned earlier, influencers love creating "unboxing" videos. Thus, this could be the perfect opportunity for brands to showcase the depth of their creativity. They can upload their artwork or personalize any print-ready artwork on a web-to-print software solution.

5. Paper

If certain products such as chinaware or accessories need to be wrapped in paper before being packed into the box, brands may want to

add their logo or a distinctive design to the paper as well. This makes receiving and opening a package a visually appealing activity.

Source: Design'n'buy

How Amazon continues to improve its packaging

Across the globe, Amazon continue to find new and innovative ways to reduce their packaging and make it easier to recycle. Here's a look at how they do it and their progress so far.

Amazon spend a lot of time thinking about the best way to deliver products to their customers. When it comes to packaging, they start with protecting the product - ensuring your order will arrive without damage. From there, they find ways to use less packaging and prioritize recyclable materials.

Amazon use a science-based approach that includes continuous materials and technology innovation to find solutions that are good for both customers and the planet. This year, they've continued to improve our process by expanding on what works, and creating and testing innovations to solve for what doesn't.

Amazon is proud of the progress they made so far:

- Since 2015, they reduced per-shipment packaging weight by 41% on average, avoiding more than 2 million tons of packaging - the equivalent weight of more than 173 of Seattle's iconic Space Needle.
- In 2022, they decreased single-use plastic delivery packaging by 11.6% across their global operations.
- In 2022, they shipped 11% of our orders globally without any additional Amazon packaging.
- In Europe, they replaced our single-use plastic delivery packaging with 100% recyclable paper and cardboard packaging in their fulfilment network.

In India, Amazon eliminated single-use, thin-film plastic packaging originating from the country's fulfilment network. Let's take a closer look at how their scientists, engineers, and teams have achieved these numbers and milestones.

Reducing unnecessary packaging

Sometimes the best solution is to use what already exists. Amazon ships in Product Packaging program qualifies products that have been

thoroughly tested to ship in their original packaging, without any added Amazon packaging.

In 2022, we shipped 11% of their orders without any added Amazon packaging. Amazon use machine learning to identify products that allow for safe shipping without Amazon packaging. They also work directly with selling partners to redesign their packaging, creating innovative solutions that allow their products to ship safely without the need of added packaging from them.

Amazon is continuing to expand this program across the globe. Since 2021, the number of products shipped without additional Amazon packaging grew by more than 50% in Japan and more than tripled in Australia. In 2022, Amazon grew that number by more than 50% in Europe.

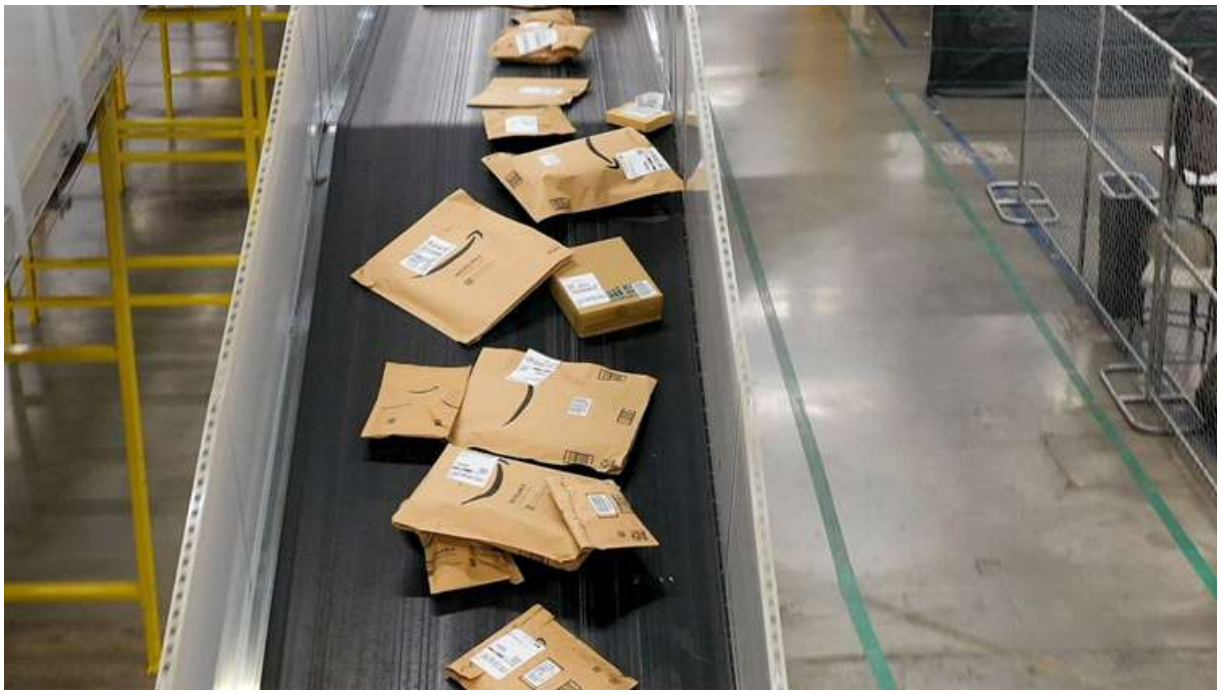
Expanding paper-based packaging

When additional Amazon packaging is required to ship a product, they create paper-based packaging solutions. This packaging can often be recycled at home, while single-use plastic needs to be taken to drop-off centers to be recycled.

In Europe, they have replaced the single-use plastic delivery bags and air pillows with 100% recyclable paper and cardboard packaging in our fulfillment network. They've also started using automated packaging technology, which cuts made-to-fit paper packaging for individual items, allowing us to avoid using more than 1 billion single-use plastic delivery bags across Europe. In India, they've eliminated single-use, thin-film plastic packaging originating from Amazon's fulfilment network in the country since 2020. Plus, they're a founding member of the Indian Plastics Pact, which unites businesses, governments, and nongovernmental organizations (NGOs) to shift from a linear to a circular plastics economy.

In the U.S., they announced their first automated U.S. fulfilment center to fully eliminate single-use plastic delivery packaging. Amazon engineers reimagined machinery that was previously using plastic, and rebuilt the machines to use a new type of more durable, weather-resistant paper with heat-sealing technology. They also invented new machines with improved made-to-fit technology. At the Ohio automated fulfillment center, they also transitioned from plastic air pillows to paper filler made from 100% recycled content. This was the first step in a multi-year effort to transition more U.S. fulfillment centers to paper.

They are also using similar machines that create



curbside-recyclable, made-to-fit packaging in Japan and Australia. These machines measure a product's dimensions and then create correct-sized packaging at the time of packing, allowing them to reduce waste by minimizing the amount of material they ship per package.

Correct-sized packaging

When an item needs additional Amazon packaging to ensure a damage-free delivery, they aim to use as little packaging as possible. They use machine learning algorithms to examine the qualities of a product and determine the protective packaging it needs. Over the past five years, these algorithms have helped reduced the use of corrugate boxes by over 35% in North America and Europe. For example, they often opt to use mailers and bags for delivery, which are up

to 90% lighter than a similar-sized box.

In addition to helping us identify what products can be sent in mailers or bags, machine learning helps them determine the correctly sized cardboard box. In North America, this has resulted in an annual reduction in cardboard waste of 7% to 10%, saving roughly 60,000 tons of cardboard annually.

Continued progress

Looking ahead, Amazon will continue to find ways to reduce packaging and increase the use of materials that can be easily recycled. Amazon is committed to the improvement of how orders are shipped, for the good of customers and the planet, and they will continue to share these progress updates with their customers.

Source: About Amazon

An Overview of the Reducing Principle of Design of Corrugated Box Used in Goods Packaging

Abstract

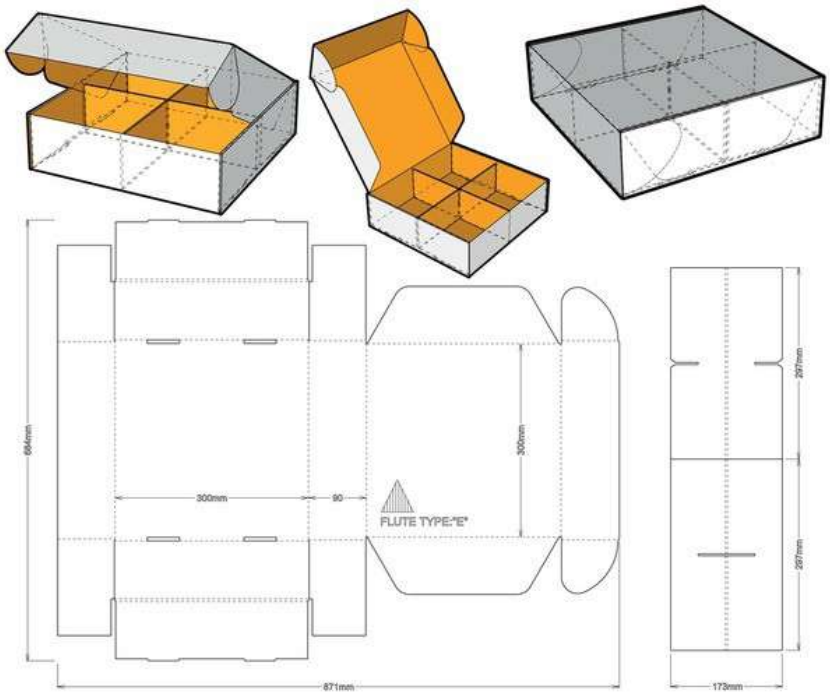
This study summarizes the reducing principle of design of corrugated box used in the goods packaging. Then it makes a term-by-term analysis on the selection of raw materials for paper boxes, the optimization of prism types, and the overall design of paper box, with special emphasis on the method to realize moderate packaging of goods.

1. Introduction

Corrugated box is a container most extensively applied in goods packaging and transporting. It is made from paper, and machine-shaped from corrugated box board with hollow structure.

Since 1903 when corrugated box was first accepted by legal freight classification organizations as the containers for freight transportation, the application history of corrugated box has been over more than 100 years. Because of its light weight, low cost, ease of assembly and disassembly, good sealing performance, certain cushioning and anti-vibration ability and easy recovery and waste treatment, corrugated box is widely applied in various fields.

China started to introduce and use corrugated box as the external packing box from early 1930s. At that time, 80% of the external packing boxes in use were wooden boxes, with cartons accounting for only about 20%. By the end of 1940 and the beginning of 1950s, the percentage of boxes in use increased to 80%. With the development of packaging materials and machine industries, 90% packing boxes in use nowadays are corrugated boxes. The Yangtze River Delta represented by Zhejiang, Jiangsu and Shanghai is the region which has witnessed the most rapid development of corrugated box industry in China over the past few years.



According to the statistics of Paper Committee of Shanghai Packaging Technology Association, the sales volume of corrugated box industry in Shanghai in 1990 was 1 billion RMB. By 2002, it had increased to 6 billion RMB, and to 13 billion RMB in 2007, with an average annual increase of about 30%. Apparently, China's production capacity of corrugated box is soaring dramatically.

However, with the constant rise of resource and manufacture costs, many corrugated box manufacturers at home and abroad are considering increasing the income while decreasing expenditure, especially the reduction of packaging expenditure. This is not only a response to domestic and international financial crises, but also an indication of the shift in priority from cutting down the cost of the product itself to the cost of the external packaging when taking

into account of products cost. It is indeed progressive.

The question is how to set the standards of over-packaging. According to the experiences of developed countries, the upper limit of volume ratio of the packaging space is controlled to be 20%; while that of the ratio of packaging fee is controlled to be 15%. The exceding part is the wasted part. The radical solution to the high packaging cost lies in the advocacy of moderate (rational) packaging.

Moderate packaging refers to this kind of packaging which is moderate and appropriate to the extent that it can completely carry the goods contained in it with proper appearance properties. And the packaging cost exceeding the upper limit is over-packaging.

The reducing principle discussed in this paper purports to reduce the over- packaging. For example, an over-packaging occurs when five boxes are used instead of three boxes which are necessary; or when the box with the volume of 1.5 cubic meters is used instead of that with the volume of 1 cubic meter, resulting in a waste of space; or when low-strength corrugated box board is sufficient to withstand the load, high-strength corrugated box board is chosen instead. All the above phenomena are widespread in many manufacturing and operational enterprises.

The concept of moderate packaging of goods has long been popular overseas. A bill was proposed in Connecticut, US, in 1990, compelling the implementation of "moderate packaging" in accordance with the reducing principle. Germany government proscribes over-packaging in relevant regulations, and requires the use of environmental- friendly materials. Moderate packaging is also strongly advocated in Japan, to save raw and auxiliary materials and to decrease packaging wastes.

In contrast, China lags far behind in the advocacy and implementation of moderate packaging. Besides the reason of consumption and design concepts, another more important reason is the low modernization level of commercial circulation. The large number of manual work links in logistics and the frequent presence of "barbaric" transportation, loading and unloading seriously affect the promotion and implementation of moderate packaging.

With the standardization and improvement of administrative mechanism of goods transportation and logistics, along with the sharp increase in raw material costs, large enterprises and manufacturers are forced to take a serious attitude towards moderate packaging.

Moderate packaging of commodities requires the reasonable, appropriate and precise packaging, which means that corrugated box should be designed in accordance with reducing principle. To be specific, the content of reducing principle in the design of corrugated box comprises optimal combination of raw materials, optimal selection of prism type, optimization of overall design of box, and the cost control of packaging.

2. Optimal combination of raw materials

2.1. The principle of "light weight"

Weight lightening of corrugated box can be realized through the selection and application of base paper, which is an important measure to achieve moderate packaging. This principle demands the selection of base paper characterized by low gram weight, high strength and weight lightening, which is mainly applied in the packaging of some large electrical household appliances and equipments. By considerably reducing the overall weight of the freight, it makes the handling and transportation more convenient. "Light-weight base paper" advocated currently has significantly lower gram weight of unit area of base paper than that of normal base paper, while its strength is comparable to that of normal base paper.

Therefore, this type of "light-weight base paper" will inevitably become the superior choice in the future.

In 1950s, due to the backward development of China's paper making, the gram weight of box averaged between 320g to 360g, and the base paper used for the manufacture of export boxes and domestic sale boxes was of poor quality.

There are several opinions concerning the selection of "light-weight" base paper. According to one opinion, the ration of base paper should be as low as possible; while according to another opinion, there should be explicit requirements on the selection of "light-weight base paper", and at least one of the following three requirements, namely, processed by special techniques, manufactured by independent equipments, with gram weight of less than 150g, should be satisfied.

There is a more widespread opinion: the ration of base paper should range between 100-180g/m2; indicators, such as ring pressure and breaking length should comply with certain standards. And, as to the aspects of base paper application in domestic, part of the electrical household appliances industry has adopted 3 layers of corrugated cardboard to replace 5 layer of corrugated cardboard previously used. For the outer and inner layer of corrugated cardboard, high-strength light-weight base paper is adopted, while for the middle layer, the high-strength corrugated cardboard. In this way, the consumption quantity of boxes was reduced tremendously, but with equal strength.

2.2. High-strength corrugated honeycomb composite board

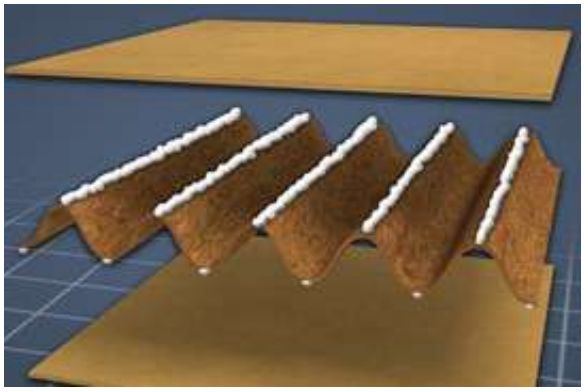
High-strength corrugated honeycomb composite board in divided into two types, namely, laminated board of corrugated cardboard and honeycomb board, and composite board of corrugated honeycomb board.

The laminated board of corrugated cardboard and honeycomb board is manufactured by arranging several pieces of continuous corrugated core papers cut into certain width in a parallel and vertical manner. Then waveform dislocation sticking is performed to form a structure similar to honeycomb (not a perfect hexagon), which is then glued to outer tissue and inner tissue. The corrugated core paper layer and flat paper layer are parallel to each other and glued together, with the prism perpendicular to the outer layer.

For the corrugated honeycomb composite board glued together of more than two layers, the arrangement orientations of adjacent corrugated cardboard layers can be deviated from each other with a certain included angle.

Since the corrugated core is "half-hardened", this type of high-strength corrugated cardboard has superior stiffness than honeycomb board, but its transverse stiffness is slightly lower than honeycomb. The board manufactured by this method is firm in overall structure, with high strength along various directions and balanced performance. Its load bearing capacity, pressure resistance, anti-rupture strength and cushioning performance have been significantly improved. Therefore, it proves to be an excellent substitute material for wood. The compressive strength as principle technical performance indictor of this high-strength corrugated composite box is as follows: when the pressure is 10560N, residual deformation 17.6mm. When this high strength corrugated composite box replaces wooden box, not only its appearance and printing has been improved, but more importantly, it satisfies the environmental protection requirement, at a remarkably reduced cost.

2.3. Intensified sandwich corrugated cardboard



Intensified sandwich corrugate paper is called "corrugated cardboards of corrugation".

Generally, two, three or five layers of corrugated cardboard are used as outer paper and inner paper (board), between which corrugated cardboard or corrugated paper-tube specially arranged is sandwiched to form wave-type sandwich layer. Reasonable structural design endows the intensified sandwich corrugated board with high strength. It is measured through testing that the total thickness of the board is 3.2cm (adjustable at will); corrugation density of sandwich layer is 38-40 prism/m; there are five layers of ordinary corrugated cardboard (C prism B prism) as outer layer(ration 780g/m2); three layers of ordinary corrugated cardboard(C Prism) as inner layers (ration 470g/m2); three layers of ordinary corrugated cardboard (B prisma) as sandwich layer(ration 680g/m2), with a total ration of 1900-2000g/m2.

"Corrugated cardboard of corrugation" is an application of the mechanical principle of multi-azimuth support. It is made of high strength corrugated cardboard, which is deformed and arranged by special technique to form optimal mechanical structure. It can be applied in the manufacture of the packing box of six facades, by forming strong tubular matrix. Its superiority is mainly manifested in its ability to prevent damages to the objects contained in the box, especially for the packaging of large-volume, heavier, fragile and pressure susceptibility items. Moreover, because of its compact structure, seamless, absence of nails, foldability and forming ability, the overall packaging cost can be reduced by about 30%, and its appearance and integrity are also improved. Therefore, this kind of structure is very applicable for the packaging and transportation of large electrical household appliances and electro-mechanical equipments.

2.4. Four-layer corrugated cardboard (also called double-arch composite corrugated cardboard)

Four-layer composite corrugated cardboard is also called double-core superimposed corrugated cardboard, double-arch corrugated cardboard or UPS resulting force corrugated cardboard. It is generally made by smearing the adhesive with special performance on two layers of corrugated base paper, so that adhesive can filter into the cardboard fibers. Thus, the softness of paper can be modified, and the two layers of corrugated base paper are combined together. The corrugation is rolled under heating conditions; then it is adhered to outer layer to form firm and stiff four layer corrugated cardboard. The structure of its corrugated core is the double arch "honeycomb" structure which is made by adhering double-layer core papers and then formed by corrugation roller. The two archs of four-layer corrugated cardboard adopts the shape of ordinary corrugation—U-shaped or V-shaped corrugation, which can be divided into 2A, 2B and 2C type.

The research, development and application of four-layer corrugated cardboard have been very widespread in Japan, Europe and America. Due to its late start in China, only a small number of corrugation cardboard manufactures have introduced the manufacture and processing technique of four- layer corrugated cardboard. However, its promotion and application have not been realized yet.

2.5. Network-structured corrugated cardboard

The inner layer of network-structured corrugated cardboard is made of corrugated paper. The adjacent corrugations are perpendicular to each other or at certain angle, and the lattice network is formed by adhering the prisms at the intersection points between corrugations. The layer number is determined according to specific need, and the network-structured corrugated cardboard and its products are obtained by covering it with cardboard.

In contrast, the corrugated cardboard and its products of conventional structure have good performance in bearing the load along the

direction of prisms. However, its load bearing capacity along other directions is relatively poor. By modifying the original structure of corrugated cardboard, the good load bearing capacity along the prism direction is fully utilized. Its impact resistance and flexibility, as well as its overall load bearing capacity, i.e. anti-puncture capacity, impact resistance, ring pressure resistance, and edge crush strength, can be improved by increasing its thickness.

Since corrugated paper is used to replace the original sandwich paper, the weight is reduced while its thickness is increased. Therefore, anti-puncture capacity, pressure resistance, ring pressure resistance, edge crush strength and flexibility are improved. If applied to the design of five-layer corrugated cardboard, this method can save 296g of paper per square meter of cardboard, with a 13% reduction in cost. Moreover, the cost and freight charges are lowered, and labor intensity of transport workers is also lessened.

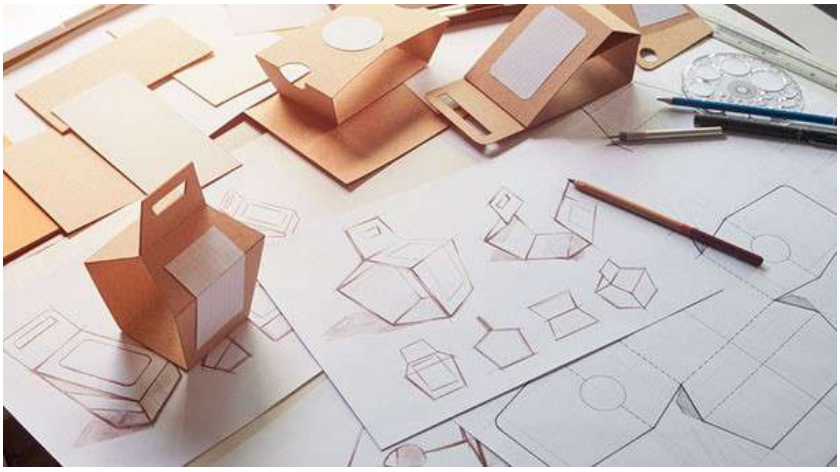
3. Prism type optimization

Prism type optimization refers to diversified design by designers based on their working experience and suitable engineering principles of the corrugation shape, with the purpose of strengthening its properties, such as pressure resistance and bursting strength. By this means, less consumption quantity of new corrugated cardboard will be needed to support the box, so that corrugation optimization is achieved on the same level. The tooth profile of corrugated box is divided into U type, V type and UV type. Its prism type can be divided into heavy type (D type, K type), ordinary type (A type, C type, B type, E type) and miniature type (F type, G type, N type, O type).

Over the recent years, achievements have been made in the research of corrugation structure. More and more attention has been drawn to optimal selection of corrugation structure in the reducing principle in the design of corrugated packaging. The constant increase in the consumption of minute corrugated packaging is due to its lower cost with a reduction of nearly 20% compared with solid corrugated cardboard; compared with large prisma type packaging, such as B prisma, the corrugated height of minute corrugated packaging is relatively lower, with more prisms per unit area. Moreover, its prism type is denser, with firmer structure. Therefore, its advantages in bearing strength and cushioning capacity with respect to parallel pressure are more significant under the conditions of using identical base paper under equal pressure. Therefore, more and more enterprises and manufacturers begin to choose minute corrugated box.

4. Optimization of overall design of corrugated box

Design optimization refers to the optimization made by designers according to the theory of meeting specific properties, so that different configuration complying with new standards will be obtained.



4.1. Forming process

The forming process of corrugated boxes has significant impact on the quality of corrugated box. Groove, slotting, printing, and gluing all need to be optimized in actual operation.

First, the strength of corrugated box is associated with the width and depth of press mark line of cardboard. Excessive width and depth of press mark will lead to the rupture of inner paper; while insufficient width and depth lead to the non-foldability of the corrugated box. Therefore, investigation has to be made into the groove process of corrugated cardboard, so as to determine the optimal operational parameters.

Second, the printing process is another factor affecting the load bearing strength of corrugated box. Research shows that with the increase of printing pressure, the contraction and deformation will occur to corrugated cardboard; its compressive strength declines until the crush of the corrugated box. It is thus necessary to adopt the smallest printing pressure possible while ensuring good printing appearance.

Third, the slotting and gluing process optimization also need exploration, since the compressive strength of corrugated box dramatically decreases with the deepening of the slotting; inadequate dosage of adhesive leads to the weak cohesion. As a result, adhesive failure is very likely to happen under pressure, leading to crushing and the decline of compressive strength. On the other hand, excessive dosage will bring about glue overflow, which affects the appearance of the products; or, it will result in cohesion between corrugated boxes, with a waste of production cost.

4.2. Optimization of size and proportion

To ensure moderate packaging, the arrangement number and arrangement orientation of the packaged commodities, as well as the internal and external size of the corrugated box can be optimized during the transportation. In actual practice, various kinds of cushioning pads are placed inside the corrugated box to prevent the packaged commodity from being damaged. By this means, the volume of commodity after packaging is usually larger than that of the commodity itself, sometimes by 5-10 times. In this case, prodigious waste is incurred with a several-fold increase in consumption quantity of corrugated cardboard.

Therefore, much can be done in reducing the size of corrugated box in accordance with the reducing principle of corrugated box.

4.3. Palletized corrugated packaging

The use of pallets in logistics has already reached maturity, including wooden pallets, plastic pallets, and metal pallets. The application of pallets makes the handling, loading and unloading, stacking and classification much more convenient. Over the recent years, the emergence of paper pallet has facilitated the seamless linkage of logistics packaging and retail packaging. The use of corrugated pallets, by protecting the bottom and facades of the commodity, makes the packaged commodities easier to be stacked. The remaining part is wrapped by plastic thin films or other packing methods. By this means, the consumption quantity of corrugated cardboard can be reduced by 60% or more. With its visibility and air permeability, pallets are extensively applied in the integrated packaging of carbonated soft drinks, mineral water, beer and other kinds of soft drinks.

5. Conclusion

To sum up, the reduction measures discussed above are not applied solely, but in combination by enterprises. In this way, the reduction design of corrugated boxes is implemented, which provides the first step to achieve moderate packaging. Due to its characteristics of being cost-saving and environmental friendly, the reduction principle in packaging design deserves more thorough research in future commodity packaging. Moreover, it will definitely make its own contribution to the effective utilization of natural resources.

Source: Deprintedbox

FCBM R&D Committee: Smart Test Series (Vol 3) - Linear Meterage

The FCBM R&D committee has published a video on Testing methods displaying the proper standards and procedure required for testing various properties of paper and box. This footage was released at CORRUMANTRA 2024, the annual FCBM conference.

This testing series was spearheaded by Ankkit Agarwal, Chairman-R&D Committee, FCBM and Director - Central India Packaging India Pvt Ltd. The testing series are part of an Experiential Learning Mission (ELM) run by R&D Committee, FCBM. Total 15 delegates PAN India participated covering five regional associations; ACCT, EICMA, KCBMA, SICBMA & WICMA had participated in test series and visited Bangkok, Thailand from September 24-26, 2023.

Scan this QR code to view the testing series footage released in the recent FCBM conference.

The Pursuit of Manufacturing Excellence: A Comprehensive Guide

In recent years, manufacturers have faced increased economic uncertainty forcing many businesses to shift their focus toward maximizing efficiency and productivity across their operations.

As a result, business leaders are increasingly investing their resources in initiatives that drive manufacturing excellence. This concept isn't merely an abstract ideal, but a crucial cornerstone in maintaining a competitive advantage and driving business success.

In this post, we'll provide a comprehensive overview of what manufacturing excellence looks like in a modern manufacturing environment and why it's more important now than ever for businesses to invest in their continuous improvement initiatives to improve the efficiency of their operations.

Defining Manufacturing Excellence

Manufacturing excellence is a fundamental concept in the industry that refers to the pinnacle of operational performance. It is the point where quality, cost, delivery, safety, and morale seamlessly converge, creating an environment of optimal productivity and continuous growth.

This state of excellence isn't achieved merely through investing in the most advanced machinery or technologies. It's a holistic strategy encompassing every facet of your operations, from process optimization and waste reduction to workforce empowerment and safety.

The relevance of manufacturing excellence in today's competitive landscape cannot be overstated. As manufacturers worldwide grapple with market volatility, achieving and maintaining this level of excellence offers a significant competitive edge. It drives productivity, enhances customer satisfaction, and ultimately, improves bottom-line results.

In essence, the pursuit of manufacturing excellence isn't a luxury or an abstract goal; it's an imperative strategy for survival and success in the dynamic and challenging world of manufacturing. It is a tangible initiative that, once achieved, can lead to sustainable growth and resilience in an uncertain economic climate.

5 Key Principles of Manufacturing Excellence

To truly understand the path to manufacturing excellence, it's essential to delve into the foundational principles that guide this journey. Here, we explore the five core principles that underscore manufacturing excellence.

1. **Continuous Improvement:** This principle revolves around the belief that there's always room for improvement, no matter how efficient or streamlined your operations might seem. Continuous improvement, often embodied by methodologies like Kaizen, encourages regular incremental changes that cumulatively result in substantial enhancements over time. It fosters a culture where everyone is committed to finding better, more efficient ways to do their work.

2. **Lean Manufacturing**: Originating from the Toyota Production System, lean manufacturing focuses on waste reduction within manufacturing systems while simultaneously increasing productivity. It involves identifying and eliminating non-value-adding activities, enabling you to deliver quality products at the least cost and time to the customer.

3. **Six Sigma**: Rooted in statistical analysis, Six Sigma is a data-driven approach to eliminate defects and reduce variability in processes. It aims to improve quality output by identifying and removing the causes of errors and minimizing variability in manufacturing and business processes.

4. **Total Quality Management (TQM)**: Total Quality Management (TQM) is a management framework

that enlists all members of an organization in a continual effort to improve quality and customer satisfaction. It fosters an environment where every individual feels responsible for maintaining high quality standards in their work.

5. **Operational Excellence**: Operational Excellence is about ensuring workflows are smooth and consistent, and business operations are well-coordinated. It involves optimizing performance to reduce downtime, improve throughput, and maintain a consistently high level of productivity and efficiency.

By integrating these principles into your manufacturing operations, you lay the groundwork for a culture of excellence that permeates every level of your organization. This approach not only leads to improvements in production efficiency and product quality but also helps foster a more engaged and motivated workforce. Together, these outcomes drive the achievement of manufacturing excellence.

The Human Factor in Manufacturing Excellence

There's a common saying that "people are a company's greatest asset," and this is particularly true in the pursuit of manufacturing excellence. Even with the most advanced technologies and robust systems in place, without the commitment, skills, and dedication of the human workforce, the goal of excellence remains a challenge. Let's delve deeper into the pivotal role humans play in this journey and how they can be both the solution and source of manufacturing challenges.

First, we must acknowledge the invaluable contribution of the human workforce. It's their skills, creativity, problem-solving abilities, and adaptability that keep the wheels of the manufacturing process turning. They bring an innate flexibility and problem-solving capacity that simply cannot be replicated by robots or AI.

Additionally, employee engagement and empowerment are key components of manufacturing excellence. When employees feel valued, appreciated, and involved in decision-making, they're likely to be more motivated and committed to their roles. This positive engagement leads to enhanced productivity, improved quality, and reduced turnover rates, all of which contribute significantly to achieving manufacturing excellence.

However, it's equally crucial to recognize the challenges associated with the human factor in manufacturing. Human error is often cited as a leading cause of quality issues and inefficiencies in production processes. Mistakes in data entry, misinterpretation of instructions, procedural errors, or simply unintentional oversights can result in defective products, rework, and waste, all of which hamper the quest for excellence.

Ultimately, the goal isn't to eliminate the human element, but to manage and mitigate these errors. Comprehensive training programs, clear communication, efficient work procedures, and a supportive work environment can all help reduce the risk of errors. Additionally, incorporating digital solutions like Tulip can help streamline complex procedures, offer real-time guidance to operators, and provide tools to catch and correct mistakes before they escalate into significant issues.

With the support of these tools, humans become a critical enabler in the journey to manufacturing excellence. By valuing and investing in our people, addressing human errors proactively, and balancing human skills with advanced technologies, we can maximize the benefits and minimize the challenges associated with shop floor workers. And in doing so, we move one step closer to achieving manufacturing excellence.

Empowering human workers with the right tools and technology

As we strive to achieve manufacturing excellence, a critical enabler in this quest is the strategic deployment of technology. Over the past decade, the rise of Industry 4.0 has revolutionized the manufacturing landscape. From automation and robotics to AI and IoT, these advancements are redefining what's possible in the realm of

manufacturing. However, technology alone doesn't guarantee excellence; the key lies in utilizing it to empower human workers to perform at their best.

Traditionally, Manufacturing Execution Systems (MES) have played a pivotal role in managing and controlling shop-floor operations. However, these systems, often monolithic and rigid in their design, may not fully cater to the dynamism and complexity of modern manufacturing environments. They can also be daunting for shop floor workers to interact with, hindering their productivity and effectiveness.

By contrast, Tulip's platform offers manufacturers an ability to build the tools they need to address their specific needs and challenges. Our platform is designed with the understanding that human workers are the backbone of the manufacturing process. Instead of simply dictating procedures from a top-down perspective, Tulip empowers shop floor workers to create apps tailored to their unique needs and workflows. This flexibility fosters a sense of ownership and agency, improving both morale and performance.

By bridging the gap between humans and machines, Tulip Interfaces has turned the spotlight back on the workforce. Its platform empowers employees by providing them with real-time data, interactive instructions, and immediate feedback, enabling them to perform their roles more efficiently and effectively. This not only reduces the scope for human error but also enhances engagement, as workers feel more involved and in control of their work processes.

The Roadmap to Manufacturing Excellence

With a clear understanding of what manufacturing excellence is, the key principles that guide it, and the crucial role of the human factor and technology, you are well-equipped to embark on this transformative journey. Here, we outline a roadmap to help you navigate your way towards manufacturing excellence.

1. **Commitment to Continuous Improvement**: Begin by fostering a culture of continuous improvement within your organization. Encourage every individual to seek out opportunities for improvement, no matter how small. Implement methodologies like Kaizen or Six Sigma to systematically identify inefficiencies and reduce waste.

2. **Employee Engagement and Empowerment**: Invest in your people. Provide comprehensive training programs to enhance their skills and reduce the risk of errors. Foster an environment that encourages engagement, innovation, and teamwork. Ensure your employees feel valued and involved in the decision-making process.

3. **Adopt Lean Principles**: Implement the principles of Lean manufacturing to streamline your operations, eliminate non-value-adding activities, and deliver quality products efficiently.

4. **Leverage Technology**: Utilize advanced technologies that complement your human workforce and enhance their productivity. Invest in flexible, user-friendly solutions that provide real-time data and interactive work instructions to your shop floor workers.

5. **Prioritize Quality**: Adopt a Total Quality Management approach to ensure high standards are maintained across all stages of your manufacturing process. Instill a mindset where every individual feels responsible for maintaining quality standards.

6. **Strive for Operational Excellence**: Ensure your operations are well-coordinated and workflows are consistent. Optimize processes to reduce downtime, improve throughput, and maintain a high level of operational performance.

7. **Measure and Monitor**: Establish key performance indicators (KPIs) that align with your manufacturing excellence goals. Regularly monitor these metrics to assess your progress and identify areas for further improvement.

Remember, achieving manufacturing excellence isn't a one-time event but a continuous journey. It requires persistent efforts, flexibility to adapt to changing market conditions, and a commitment to nurturing your workforce and harnessing the power of advanced technologies. With this roadmap as your guide, you can confidently embark on your journey towards manufacturing excellence.

Source: Tulip Interfaces Kft

The Power of Continuous Improvement

Floor markings guiding process flow. Shadow boards showing designated spots for each tool. An employee whose singular focus is ensuring efficient production runs.

At Acme Corrugated Box, these everyday measures all fall under Continuous Improvement. While most customers never see or hear about our Continuous Improvement department, it's one of our company's winning ingredients – and not commonly seen in our industry.

"Decreased downtime, shorter setup times, higher morale and retention – these are all fruits of Continuous Improvement here at Acme Corrugated Box," says Alex Cohen, Operational Excellence Manager. "They're passed to our customers in the form of box quality, cost, and on-time delivery. Honestly, I'm surprised more box manufacturers don't adopt it."

WHAT'S "CONTINUOUS IMPROVEMENT"?

Continuous Improvement is a rolling basis methodology that identifies problems impeding efficiency, then makes changes to fix them. Continuous improvement culture is widely attributed to Ford Motor Company, but as a formal business methodology, it began in Japan. In fact, the word Kaizen – the name of Continuous Improvement's lead strategy – literally translates to improvement: The Japanese character kai means "change;" the character zen means "good."

WHY CONTINUOUS IMPROVEMENT?

Companies with dedicated Continuous Improvement departments consistently outperform their counterparts in terms of longevity, customer satisfaction, and outcomes overall. This reality is what inspired Acme Corrugated Box to adopt the methodology more than ten years ago.

"Around 2010, we saw opportunity to tighten operations for a number of reasons, including the desire to keep cost down and drive quality up," Cohen explains.

The Continuous Improvement department at

Acme Corrugated Box was designed to address day-to-day problems faced by plant operators. As needed, events such as Kaizens – learning initiatives that typically last a week, – dig deep into the root causes of workplace hurdles and develop clear solutions.

"Continuous Improvement generates solutions that benefit our customers and our teams. It's a win-win," Cohen says.

WHAT IT TAKES

While Continuous Improvement's premise – ongoing change – sounds simple enough, Cohen notes that adoption of the methodology really does require a company-wide mindset shift.

"Change is sometimes seen as a dirty word in business," he says. "For Continuous Improvement to work, change needs to be seen as a good thing, which requires an initial shift in thinking for many employees."

Thanks to successful Continuous Improvement adoption over the last decade, today Acme Corrugated Box employees at every level routinely seek ways to reduce wasted time, material, and energy. "We use the acronym D.O.W.N.T.I.M.E to remind us of what might be impeding efficiency – that is, Defects, Overproduction, Waiting, Not utilizing talent, Transportation, Inventory excess, Motion, and/or Excess processing," Cohen explains.

In terms of company structure, Acme Corrugated Box's Continuous Improvement department works hand-in-hand with the Quality Assurance Department. Both fall under the umbrella of Operational Excellence.

"While Continuous Improvement is focused primarily on run efficiencies, Quality Assurance is focused on creating a good product and getting it to end users every time," Cohen says. "It's yet another winning combination. Together, these departments ensure the best possible product, and the best possible process for creating it."

Source: Acme Box Co. Inc.

KECBMA celebrates Onam with their family members

On 30th September 2023, a family meet was organized at Rama Varma Club, Kochi to celebrate the Festival of Onam with the family members.

KECBMA organizes labour laws workshop

On 18th November 2023, KECBMA organized a seminar on Labour Laws at Kerala Merchants Chamber of Commerce ,Ernakulam.

The esteemed speaker invited for this seminar was Shri. Varkiachan Pettah, DSS,MSW - Chief Faculty - Labour Laws of National Institute of Personnel Management (NIPM), Kerala. He is also a Principal Consultant Kerala State Productivity Council & Senior Faculty Kerala Institute of Labour and Employment (KILE).

All the 50+ members who attending the seminar gave positive feedback for the value-added expertise shared by the esteemed speaker.

KACBMA conducted its 33rd Annual General Meeting

On **December 10, 2023,** KACBMA conducted its 33rd Annual General Meeting at The Golden Resort & Spa Pvt. Ltd, Bangalore. The AGM was followed by a family get-Together followed by a sumptuous dinner. Following are new office bearers for the upcoming term elected by the association for the respective positions

Sri Amit Parasrampuria	President
Sri Sanjay Modi	Vice President
Sri Lakshminarayanan. R	Hon. General Secretary
Sri Deepak Agarwal	Hon. Treasurer
Sri Manoj Kumar Daga	Ex Officio

EICMA representative invited for West Bengal Food Processing Conclave

We are happy to bring it to your records that EICMA was invited for the

WEST BENGAL FOOD PROCESSING CONCLAVE

Towards Technology Upgradation and Awareness of Financial Schemes

21st December 2023, 10.30 AM, The Park Hotel, Kolkata

The above conclave was jointly organized by Ministry of Food Processing Industries and Indian Chamber of Commerce. Shri Milan Dey represented EICMA to be one of the speakers during the technical session amongst the many stalwarts of the industry both from the Government and public sector including IIP.

Shri Dey's presentation was well appreciated by the house. Attached are photos of the program