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Plastic Tomorrow

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BUSINESS NEWS

ADVERTISEMENT INDEX

Resilient flooring manufacturers to join international conference in Georgia, heart of the flooring industry.

AMI, Bristol, 22nd July 2019 – Leading experts and key decision makers from across the US and beyond gather in Atlanta for the third Polymers in Flooring conference. This established industry forum, organized by specialist plastics industry consultancy AMI, takes place in Atlanta, September 17 - 18, 2019.

Demand for resilient flooring is still growing and shows no signs of slowing down. The industry is introducing new standards, facing regulatory changes and continuously looking to improve materials, design and sustain ability to appeal to consumers. In addition to unique networking opportunities, Polymers in Flooring, Atlanta 2019 provides experts analysis on the above, and many other topics. Speakers from the entire supply chain evaluate trends, challenges and opportunities facing this dynamic industry in the US. In addition to flooring manufacturers, materials and technology providers, universities and associations, this year's program features in-depth views from interior designers and architects.

Polymers in Flooring, Atlanta 2019 features a resilient flooring market overview, a dynamic panel discussion on shifting product demand and trends, views on the newest stabilizer systems, introductions to the newest regulatory and certification developments and in-depth talks on sustain ability in the flooring industry. It also includes sessions on the influence of design objectives on flooring selection and next generation technology solutions.

The high-level speaking faculty is comprised of representatives from **ZWICKER ADVISORY, HTMX INDUSTRIES, SHAW Inc., BAERLOCHER USA, UL ENVIRONMENT, TARKETT, BEAUFLOR USA, PERKINS + WELL, L. FISHMAN & SON, Inc., DOW PLASTICS ADDITIVE** and many more.

Polymers in Flooring, Atlanta 2019 takes place September 17 - 18 at The Westin Buckhead Atlanta, GA. Full program and booking details are available at: https://www.ami.international/Events/Resources/Programme/PolymersinFlooring2019.pdf

For details on sponsoring, exhibiting or registering for this event, please contact Olga Osipova at olga.osipova@ami.international or Tel: + 44 (0) 117 314 8111

About AMI:

We are the leading provider of information, market intelligence and conferences for the global plastics industry. Our business is underpinned by our talented staff and our unique databases. Our Consultants, Researchers, Writers and Event Organizer include many of the most respected experts in their fields. We can help you grow your business by identifying exciting market opportunities, new customers and innovative technologies from our intimate understanding of the global plastics processing industry, knowledge of how the markets have changed and where they are heading.

E - olga.osipova@ami.international
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Courtesy

Ascend to launch new Vydyne® XHT, LCPA and HTPA at K 2019

Ascend Performance Materials today announced plans to launch several new specialty polyamides at K 2019 to meet the growing needs of its customers. Among the new products are Vydyne® XHT, long-chain polyamides and high-temperature polyamides.

Vydyne XHT, a new portfolio of heat-stabilized polyamide 66 and copolymers, is capable of withstanding prolonged exposure to temperatures up to 230C. Using a combination of unique polymer chemistries and a multi-stage heat stabilization technology, XHT products push the boundaries of temperature resistance without sacrificing the process ability, durability and mechanical properties PA66 is known for.

"Consistent high heat performance is critical in under-the-hood applications to accommodate for various load, torque and speed conditions in engines," said Vikram Gopal, Ascend's senior vice president of technology. "We created Vydyne XHT to perform across a broad operating window for our customers, who are today limited to products with narrow operating windows and poor performance outside those windows."

The Vydyne XHT portfolio includes four glass-filled grades ideal for use in demanding automotive applications, such as charge air coolers, integrated air intake manifolds, exhaust gas recirculators and resonators. All XHT grades exhibit excellent flow and are regrindable, allowing excess material to be reprocessed, thus improving production efficiency.

Ascend will also introduce a new portfolio of PA610 and PA612 long-chain polyamides. With low moisture absorption, high chemical and UV resistance, Ascend's LCPA are engineered for a variety of applications, including monofilament, battery seals, cable ties, automotive cooling and fuel connectors, and sporting goods.

"Our customers are driving innovation and meeting increasing demands across the industries they serve," said Phil McDivitt, Ascend's president and CEO. "In turn, we are building off our vertical integration and strong position in PA66 to bring the greater reliability, functionality and flexibility to make that innovation possible."

The company is also expanding into high-temperature polyamide. Ascend's new HTPA grades offer higher strength, stiffness, chemical- and temperature-resistance for metal replacement and high-heat automotive applications.

Ascend sales and technical representatives will be at the company's stand 6A07 at K 2019 in Dusseldorf from Oct. 16-23.

For More Information.....

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rverschuuren@emg-marcom.com

SONGWON signs exclusive agreement for distribution of antioxidants for fuels and lubricant additives in ASEAN

Megachem, a leading worldwide distributor, will be responsible for supplying SONGWON antioxidants for fuels and lubricants in countries belonging to the Association of Southeast Asian Nations (ASEAN).

"As our global reach expands and our business in the Asia region increases, we want to ensure that our customers continue to benefit from reliable supply and local support. We have therefore appointed Megachem as our distribution partner in the ASEAN region," explained Gerard Mulqueen, Business Unit Leader Fuel and Lube Additives at SONGWON.

Sidney Chew, Chairman of Megachem, commented: "With headquarters in Singapore, and offices in the ASEAN region, our extensive global network and specialized knowledge of lubricant additives, Megachem is well placed to represent SONGWON in the ASEAN market. We look forward to providing SONGWON's customers with innovative, value-adding products and fully integrated services."

Megachem will supply SONGNOX® L101, L107, L115 and L135 phenolic antioxidants, SONGNOX® L670 & L570 aminic antioxidants, SONGNOX® L416 phosphite antioxidant, and SONGNOX® L224 and L226 thioester antioxidants to Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Papua New Guinea, the Philippines, Singapore, Thailand and Vietnam.

About Songwon Industrial Co., Ltd.

SONGWON, which was founded in 1965 and is headquartered in Ulsan, South Korea, is a leader in the development, production and supply of specialty chemicals. The second largest manufacturer of polymer stabilizers worldwide, SONGWON Industrial Group operates companies all over the world, offering the combined benefits of a global framework and readily accessible local organizations. Dedicated experts work closely together with customers to develop tailor-made solutions that meet individual requirements.

For further information, please go to: www.songwon.com.

About Megachem

Propelled by a vision to be a leading chemical player, Megachem has evolved through the decades to become a valued chemical solutions provider to its business partners; one that is able to meet its customers' needs through innovation and value creation. Today, we are an integrated solutions provider with the capability to provide customized blending services as well as distribution of chemicals. With an extensive global network and strategic locations in Asia, we are well-positioned to serve a diverse customer base across a spectrum of industries.

For further information, please go to: www.megachem.com.sg.

Courtesy

INNOVATION IN RECYCLING TECHNOLOGY

GMS EPE / XPS / EPS Recycling Plants

GMS Plastic Machinery Pvt. Ltd., has developed many models of Compact Fully Automatic Recycling Machine especially for EPS / XPS waste wherein one must feed the scrap material and collect the finished granules from the other end of the machine.

GMS is aware how to feed EPE / EPS / XPS waste to our extrusion equipment without degrading the waste. GMS offers special design Screw and barrels which permit homogeneous mixing, consistency of colours, etc. The GMS Online Olio Dynamic Screen Changer permits reduction of downtime of plant and can be changed with a flick of a button within seconds. This permits increase in output and reduction in wastage, downtime, power consumption and increase in output.

The Water Ring Hot Die Face Cutter Unit reduces wastage due to thread breakage which is more than 5% in strand pelletising equipment. It permits Compact Dry granules, Consistent size, Virgin alike round pellets shape. The finished granules can be easily compared to virgin alike material because it has the same feel and look like any natural granules.

Recycling as everyone knows is a great boon to the environment. Advanced Technology as compared to traditional recycling has many advantages:

- Requires lesser labour and operators,
- Fully Automatic Plants with clean room features,
- Granules can be directly bagged,
- No manual contact during processing,
- Reduced scrap generation during processing,
- Even round pellets,
- Lot of Waste during strand breakage,
- Lot of waste during Filter Change in terms and time, energy and production,
- Lot of gases remain trapped in the granules due to un-vented Extruders,
- Colour Variation due to degradation during Filter change.
- Reduced MFI as compared to advanced GMS Technologies, etc.

The lines are energy efficient because power consumption is very less as compared to any traditional Recycling Lines. There is also indirect Energy efficiency using GMS technology as reprocessed material provide higher output as against Granules produced from traditional machines. We have conducted a case study on cost effectiveness to a processor:

- A moulder using Injection Moulding Machine producing Buckets, can achieve 3 Cycles a minute or 180 cycles per hour.
- The same machine when using recycled granules made from our technological advanced equipment in Ratio of 20:80 (20 being recycled, 80 being Virgin) can achieve 220 cycles per hour.
- But when using recycled granules made from traditional recycling equipment with cylindrical shaped and uneven granules mixed with virgin material in the same Ratio of 20:80 can achieve only 150 Cycles per hour.
- This means a clear savings of 10 to 12% in energy consumption only. Over and above there is additional savings in terms of time and labour.

Another advantage of GMS advanced technology over traditional technology is when you recycle Light Weight waste. With Traditional Technology you first need to produce lumps, grind them, and then recycle them again to achieve final granules or use a mother baby (Double Stage recycling) machine which depletes the quality. GMS recycling Machines are Single stage machines which give higher output using a single extruder with lower power requirements and higher quality Granules.

EPE / EPS / XPS recycling were a huge problem especially with the very low (0.2 to 0.6) density waste. Thermoformed Article producers and Insulation Sheet producers were selling of their waste edge trims at very low prices and loosing on expensive polymer. On the other hand, with the surge in polymer prices, processors decided to adopt in house recycling because it would not only benefit them in saving cost of raw material but prevent them from selling of the scraps at extremely low rates.

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EXHIBITION DETAIL

COMPLAST	COLOMBO (SRILANKA)	9 -11 AUG. 2019
IPLEX - 2019	BANGALORE	23 - 25 AUG. 2019
K-2019	DUSSELDORF GERMANY	16 - 23 OCT. 2019
INTERPLAST - PACKPRINT	NAIROBI,KENYA	15 - 17 NOV. 2019
PLASTIVISION - 2020	MUMBAI(GOREGAON)	16 - 20 JAN. 2020
COMPLAST	JOHANNESBURG (S.AFRICA)	3 - 5 MARCH 2020
PLASTIVISION ARABIA - 2020	EXPO CENTRE-SHARAJ-UAE.	16 -19 MARCH 2020
PLAST ASIA - 2020	BIEC, BANGALORE	19 - 22 JUNE 2020
PLASTICS SHOW - 2020	GANDHINAGAR	20 - 22 SEPT. 2020
PLAST SHOW - 2020	AMEDABAD	17 - 20 DEC. 2020
PLAST INDIA - 2021	PRAGATI MAIDAN NEW DELHI	4 - 8 FEB. 2021
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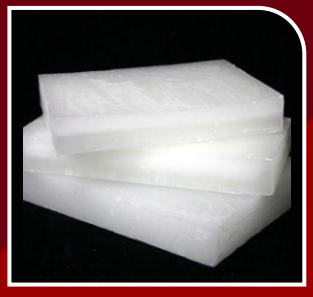

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"MATRUCHAYA"SCREEN CHANGERS FOR PLASTIC PROCESSING PLANTS

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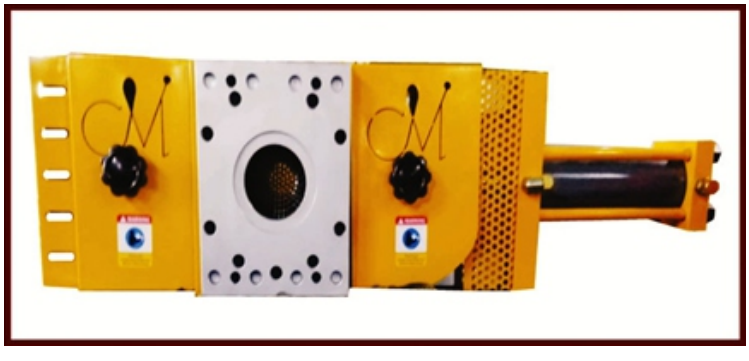
We, As well as all plastic machine manufacturer & Processors know about plastic processing plants & the ancillary equipment, which process the plastic material. All processes and all operation are very crucial, from material inlet to outlet. Storing, weighing, mixing, drying, cooling, extruding, filtering & others.

Typical ancillary used for higher output & quality plastic material and products. And this can be achieved thru selection of proper Screen changer for plastic processing plant. Screen Changer is most important & useful equipment. Screen changer is filtering device, by which, plastic melt impurities can be removed. There are several kind of Screen changers available in India & overseas. Widely popular Screen changers are Screw operated, Lever operated & Hydraulic operated.

Continuous & non-continuous designed Screen changers available with Round, Candle & Square breaker plates. Screen changers are selected, as per plastic material filtering requirement. Popular applications are as follows, Film plant, Sheet plant, Lamination plant, Pipe plant, Filament plant, Master batch plant, Filler plant, Compounding plant, Reprocess plastic granules plant etc.

Advantages of Screen changers, Maintaining plant output, Control wastage of plastic material, Saving labour, Saving electricity, Saving Heating loss, Saving wiremesh changing time, Easy to operate, Easy Wiremesh changing process.

SO GET READY AND GET FILTERED



Lean Manufacturing Example - How To Make Your Injection Molding Business 5% More Productive Immediately And Save Costs

Sanat Shah
Plastics Project & Recycling Consultant
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Here is a lean manufacturing example that will get injection molders at least 5% more productivity immediately without spending a Rupee.

The technique I use in this example is based upon 5% Rule.

5% Rule says that most injection moulding machines can give at least 5% more productivity because cycle times have not been optimized.

Have you ever noticed in a manufacturing company how a certain culture exists whereby a particular level of production becomes acceptable and few people are willing to question how much more productivity is possible with the existing machinery?

The machine operator might have become complacent because the management have also become complacent or the management don't have the technical background to understand how the process could be improved. Instead management are considering investing hundreds of thousands of dollars in new machinery with new technology.

Before investing in new equipment why not see how much more productivity your existing machinery has to offer?

Cycle Time Reduction

If cycle time is reduced by 5% then productivity will increase by 5%.

Take, for example, an injection molding machine producing a food container part.

If the annual requirement of this part is 400,000 then with 5% more productivity this machine will produce 420,000 parts which is 20,000 more parts per year. And if each product sells for ₹ 2 then this is an increase of ₹ 40, 000 in sales revenue per year per machine - a tidy return for very little investment of time.

What's more, if there are ten machines in your company with the same production requirements the extra sales revenue will be ₹ 400, 000 per year.

And how do I expect to achieve this 5 % extra productivity immediately without any investment of money?

Let me explain with a lean manufacturing example.

Lean Manufacturing Example

Consider the same injection moulding machine producing a food containers with a cycle time of 9.1 seconds. If the cycle time is reduced by 5% then the cycle becomes 8.6 seconds which means some part of the cycle needs to be reduced by 0.5 seconds. In the injection moulding process there are typically 6 phases that occur during each cycle.

The 6 phases:

1. Mould closing
2. Injection of plastic into the mould
3. Holding of plastic in the mould to allow proper formation of the container
4. Cooling of the container so that it is rigid enough to eject from the mould
5. Opening stroke of the mould
6. Ejection time; the container can be physically ejected off the mould

The following is a real life example performed on an injection molding machine in Melbourne, Australia running a 2 cavity mould.

The 9.1 second cycle time had the following breakdown:

Phase (seconds)
1. Closing 1.3
2. Injection 1.2
3. Hold 2.0
4. Cooling 2.1
5. Opening 1.5
6. Ejection 1.0

Total 9.1

In order to reduce the cycle time by 0.5 seconds, the first thing considered was the phase that would have the smallest effect on part quality. This was the ejection time.

In this example the ejection was started 0.2 seconds earlier while the mould was still in the opening stroke. There was no need to wait for the moving side to completely stop before starting the ejection stroke. Therefore, the ejection time was reduced to 0.8.

Additionally, the opening and closing times were reduced by 0.1 each saving another 0.2 seconds by reducing the opening stroke.

Another 0.1 was subtracted from the cooling time which achieved our target of 0.5 seconds. Although the part shrinkage was slightly more it was still within the quality limits and made no difference to the end user.

Here is a summary of the changes:

1. Closing 1.3 reduced to 1.2
2. Injection 1.2 unchanged
3. Hold 2.0 unchanged
4. Cooling 2.1 reduced to 2.0
5. Opening 1.5 reduced to 1.4
6. Ejection 1.0 reduced to 0.8

Total cycle changed from 9.1 to 8.6 seconds without effecting quality.

Additional Comments

From this case study one can see that there are 6 parameters that could be used to share the 0.5 second reduction in cycle time. This means there are several combinations that could be used to reduce the cycle time. For example, in the above example as it turns out the hold time could have been reduced by 0.2 seconds without any change in part quality.

It's a matter of looking at each mould and machine combination on a case by case basis. To see what works best. In some cases the mould and machine might already be operating at their limits so it is not possible to reduce cycle time.

Also, on some molding machines the plasticizing screw recovery time will have an effect on cycle time if the machine doesn't have a shut off nozzle.

Injection moulding companies have millions of Rupees invested in machinery and tooling so it is vital to get the most out of them. The right mindset is important to run efficiently as possible so as a factory owner, manager, leading hand or moulding technician you should be asking yourself how can I improve productivity by 5% today?

Exercise

I would like you to choose one moulding machine in your company that is producing a part with a stable cycle time and attempt to reduce that cycle time by 5% by using the above lean manufacturing example as a guide.

And once you have established a 5% cycle time reduction on a particular machine, try reducing the cycle time by another 5% until quality issues become your limiting factor. Use this approach on every machine in the company. Target one machine per week and just see how much more productivity can be achieved. You might be surprised how much difference it could make.

DESIGN FOR RECYCLED CONTENT

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Creating more sustainable packaging requires a multifaceted strategy to address an array of environmental considerations across the packaging life cycle. A key element of any sustainable packaging strategy is to ensure materials are effectively recovered at the end of their useful life to provide new inputs for industrial or biological cycles.

Recycling is the most prevalent recovery pathway for packaging, and in order to ensure that packaging is effectively recycled, the packaging community must engage on two critical fronts: designing packaging in such a way that it flows optimally through the recycling system, and supporting end markets for the recycled content created by that system.

In designing for recyclability, a package should be designed to flow smoothly through the entire recycling system. This means:

- It is accepted in the recycling collection receptacles available to end users.
- Waste haulers will collect and transport it.
- A material recovery facility (MRF) will sort it properly, if it is collected in a mix of materials.
- Reprocessors will turn it into valuable feed stocks used in the manufacture of new materials.
- End markets will purchase and use those new materials.

Designing recyclable packaging is critical to creating a supply of recycled materials.

However, for the recycling system to be robust and healthy, the practice of designing for recyclability must be accompanied by a practice of providing market demand for recycled content. Packaging producers play a key role in providing market demand by using recycled content in new packaging, "pulling" the recycling system in such a way that matches the "push" of designing for recyclability.

Packaging isn't the only end market for recycled content — recycled content can be used in the manufacture of new durable goods, nondurable goods, and materials for the built environment. While these open loop applications are critical, the demand created when new packaging is made with recycled content from old packaging is major component of the overall landscape of demand for recycled content and it directly applies the concept of circularity to packaging. This "take what you make" attitude helps transform the dialogue from recycling as an end in itself, to seeing recycling as a source of feedstock for new resources to be reused and given new lives.

Once packaging is collected, sorted, and reprocessed, circularity is only

complete upon the use of that recycled material in the manufacture of a new product or packaging product or packaging.

General guidance for using recycled plastics

Each type of recycled plastic carries its own set of characteristics and considerations, which are covered in detail in other sections. However, there are some common themes that are broadly applicable:

The common assumptions surrounding recycled plastics should be challenged. There are many common misperceptions related to recycled plastics, including safety and cleanliness, consumer acceptance and understanding, dramatic losses of performance and aesthetic qualities, and lack of return on investment on the price premium associated with many recycled plastics. While many assumptions may be grounded in a kernel of truth, the level of mistrust surrounding recycled plastics is undue and in many cases, outdated. When presented with these types of descriptions of recycled content, asking for data or examples can be useful to understand whether or not the concerns are valid.

Experimentation and incremental increases are important strategies for using recycled content. Instead of approaching suppliers with a request for a specific percentage of recycled content, brands should aim to incorporate as much as possible while balancing trade-offs around performance, aesthetics, and cost. After taking a first step to introduce a small percentage of recycled content, experimentation should be used to determine the optimal level. This stair-stepping approach is also preferential to suppliers as they navigate the learning curve, allowing them to get the processes under control and make needed adjustments.

Key initiatives for building demand for recycled plastics:

- The Association of Plastic Recyclers' (APR) Recycling Demand Champions program gathers industry commitments to increase use of recycled plastics, including use of recycled plastics in "Work In Process" (WIP) items such as crates, pallets, totes, drums and trash cans. These WIP items represent opportunities for use of lower grade recycled content that is more challenging to incorporate into consumer-facing packaging. . In the program's first year, it increased demand for recycled plastics by nearly 7 million pounds.

- Every year, 8 million metric tons of plastic ends up in our oceans, and that figure could increase by tenfold over the next 10 years if actions are not taken. The majority of this, referred to as "ocean bound" plastics, comes from mismanaged waste from within 30 miles of a waterway or coast. Plastic found in the ocean and plastic bound for the ocean (on beaches or near waterways) has become an environmental poster child for the need to improve recycling systems and end markets for plastics. Some suppliers and - brand owners have committed to sourcing ocean-bound plastic for reuse in their products and packaging as recycled content.

- Envision Plastics has committed to recycling 10 million pounds of ocean bound plastic over two years. To date, Envision Plastics has recycled five million pounds of HDPE, working with coastal organizations to collect packaging waste before it enters our waterways and shipping it to Envision Plastics' plants where it is processed using its patented Deodorized Resin™ technology to clean and remove odors. Envision Plastics has had numerous partners use its Ocean Bound Plastic in consumer products and packaging. Earlier this year, ViTA debuted a hair care line using the first bottle made from 100 percent Ocean Bound Plastic.

- High quality recycled plastics often come with a price premium compared to their virgin counterparts. Prices fluctuate greatly and some recycled plastics — particularly those with suboptimal technical and aesthetic characteristics — can be supplied at a cost advantage. It is also important to consider that the use of recycled plastics may introduce added processing costs, especially when there are stringent specifications for performance and aesthetics that must be met. Companies that excel in using recycled content consider any added costs as an investment to upgrade their packaging, finding justification within the robust business case for using recycled content.

- A lack of long term contracts in material procurement can lead to price volatility and inconsistencies for recycled plastics, which creates market uncertainty and discourages investment. Strategic partnerships that increase the length of contracts between MRFs, recycled plastic recyclers, converters, and brand owners can be used to negotiate stable, lower prices on recycled content. This strategy has been successfully used in other commodity markets where long-term contracts specify payment of a fixed margin above the cost of production and all parties involved benefit from predictable pricing. Long term contracts can also help create demand stability for recycled plastics that in turn helps encourage investment.

Processing of recycled plastics

Adding recycled plastic to existing manufacturing processes isn't always straightforward. Recycled resins don't always act like virgin resins. The melt flow rate, an important indicator of the behavior of plastic in converting processes, can differ between virgin and recycled batches of the same polymer type, which introduces unwanted complexity. Even high quality recycled plastics can display inconsistent flow behavior, which is generally attributed to contamination within the recycled feed stocks. Investment in new or upgraded processing technologies and adjustments to equipment is a necessary and worthwhile investment to meet growing demand for recycled content.

"As conversion technologies improve, like with blending or quality processes, we will be able to use more and more recycled content and still meet the demands of the end users." **– Plastics Converter**

"Manufacturing challenges with recycled content aren't insurmountable, so we have to overcome challenges. But there can be challenges with running higher recycled content on a manufacturing line. We have to prioritize the time that is spent to qualify materials. Since we run high volume, high speed lines, if the recycled content lends itself to a defect on that line, then we may have shut downs on the line — and that's a problem. So what we do is a lot of quality assurance and work up front to qualify and adjust our systems to accommodate that variability. That takes time and resources, so if making recycled content a reality is a priority for the business, there needs to be direction [from leadership] to the manufacturing team."
– Brand Owner

Performance of recycled plastics

Virgin plastic and recycled plastic rarely perform the exact same way. Contamination from other plastics in the recycled feedstock is the chief influencer, but colorants and additives in plastic packaging can also act as contaminants in recycled plastics. This can result in differences in a recycled plastic's performance, including characteristics that affect sealing or structural integrity. However, there are solutions available to help manage many of the performance differences between recycled and virgin plastics.

There are tools to assess the performance of recycled plastics. There are well-established technologies that evaluate the quality of recycled plastics using physical, chemical or other tests. One of the most effective methods to check the quality of a recycled plastic involves running a small batch of extrusion blown-film. In a film format, the material can be checked for stability, bubbles, gels, color, odor, strength and other quality measurements. Any poor-quality material can be discarded or blended with a better performing material, depending on the end use application.

Techniques exist to improve performance of recycled plastics, including resin compounding, blending of various grades of a resin and introduction of performance additives. Performance additives include but are not limited to: antioxidants, UV absorbers, anti-block agents, colorants, fillers, and impact modifiers. These additives can increase performance and reduce defects like gels, brittleness, and odors. Some of these technologies are well-known in polymer engineering yet have not been widely adopted when using recycled plastics.

Featured innovation: Water-based heat sealants

Water-based heat sealants may alleviate issues related to heat sealing recycled plastics, a common problem due to the different melting points of recycled resins. These products are beginning to enter the market and can be explored as a way to increase the use of recycled plastics while minimizing performance challenges.

Aesthetics of recycled plastics

Color consistency and color matching are common challenges in using recycled plastic, since brands tend to implement very stringent color requirements for packaging. Unlike virgin plastics, which initially do not contain pigments, recycled plastics are derived from mixtures of materials that may contain a wide range of pigmentation. Brands interested in using recycled plastics must manage their expectations and commit to finding ways to work with the color variations present in recycled resins.

White or lightly colored recycled plastics may take on an off-white color. Clear recycled plastics may take on a somewhat yellowed appearance due to the reheating process, or a cloudy appearance due to contamination in the recycled feedstock. Natural, white or lightly colored recycled plastics can be adjusted by adding colorants to match brand colors, however, their new color may appear less vibrant than virgin material colored with the same colorant. Mixed-color streams of recovered plastics can typically only be recycled into dark, opaque colors.

"Typically, recycled materials are darker, grayer, or have some tint to them and that tint is not always consistent from batch to batch." **– Plastics Recycler**

While these challenges are more pronounced with higher levels of recycled content, there are numerous examples of plastic packaging containing upwards of 30% recycled content with no or negligible aesthetic deficiencies. That percentage can be considered a general threshold above which aesthetic challenges should be expected to be more noticeable. While transparency may be critical for some applications, it is also important to note that the use of opaque plastic packaging allows for higher percentages of recycled content with fewer color challenges.

Progressive brands accept color variations that consumers can see, setting expectations with marketing departments and communicating variations through consumer messaging. This is easiest to implement in a new product line, a new brand, or a rebranding, in which alignment of expectations and strategy may be performed at the start.

If the entire organization is aligned around recycled content, then discussions on color and modifying specifications become easier.

"Other design strategies to navigate these variations include using recycled content in applications and products where color is not of such high importance, such as trash bags, inner layers of multi-layer rigid containers, or other areas the consumer does not see, like applications in which the material is hidden behind a label. Concerns about color matching across products and units are more relevant for packaging on retail shelves than for online retail, and so online products may be an easy area to initiate higher levels of recycled content. **Additives, such as specially formulated brighteners or clarifiers, can counteract the cloudy appearance typical of recycled resin.**

Food contact for recycled plastics

Despite common misperceptions and skepticism, many recycled plastics meet the required quality for food, beverage and pharmaceutical applications. Most plastic recyclers providing recycled plastic for food-grade packaging applications have successfully petitioned for a "letter of no objection" (LNO) from the FDA, which provides assurance that the recycled plastic is safe for food-grade applications. It is important to note that the FDA does not test the recycled resin, and it is therefore up to individual recyclers to ensure their feedstocks and processes will consistently produce food-grade resins. There are mechanisms comparable to the FDA LNO in other countries.

Some producers of recycled plastic for food-grade applications restrict their feedstocks to post-commercial or post-industrial plastics that were previously designated as food-grade. Any added colorant must be individually compliant with FDA requirements, so clear plastic is commonly used for recycled food-grade resins since it is easiest to add a colorant that is known to be compliant to a clear recycled plastic.

Another approach to including recycled plastic in food packaging is to limit the use of recycled plastic to the inner layer(s) of a multi-layered construction, with an innermost virgin layer acting as an effective functional barrier. However, it may be necessary to demonstrate that the barrier will protect foods or drugs from unwanted migration.

Unfortunately, skepticism and misperceptions around the safety of recycled plastics for food and drug applications are common. Changing minds internally about the safety of food contact recycled content may be a hurdle, but it is important to gather support from within the organization for recycled plastic. Sharing information with others about the FDA's process for issuing LNOs and the process used by suppliers to ensure food contact safety may be helpful.

Ref: The Sustainable Packaging Coalition

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