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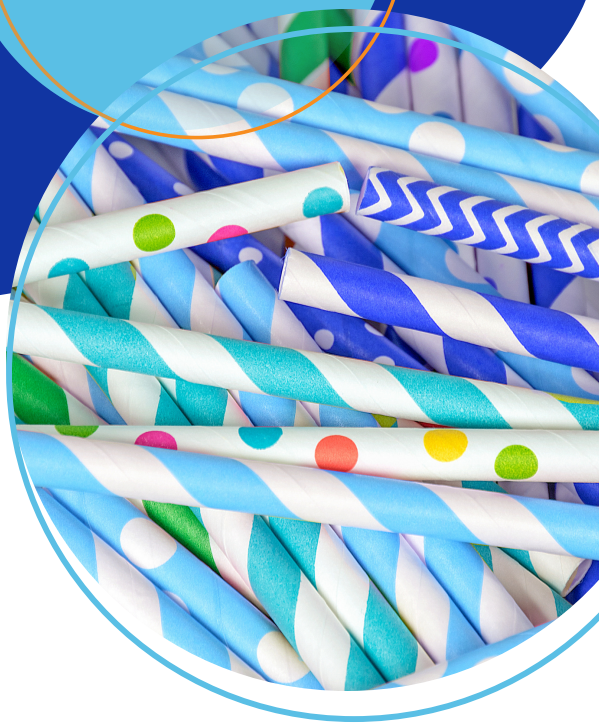

Demystifying Paper Straw Sustainability

Trends and Environmental Guidelines for Paper Straw Manufacturers

A video of a sea turtle with a plastic straw stuck in its nose, which has more than 80 million views, has become an iconic symbol of environmental harm and mobilized a global outcry for change. This mobilization, and the growing environmental problems with plastics, has caused an extraordinary resurgence in paper straws. The movement for more environmentally responsible straws and fewer single-use plastics has fueled many complexities for both companies and consumers to navigate. In addition to carefully monitoring the fast-growing straw market trends, today's paper straw manufacturers are facing a fast-changing industry teeming with raw material options, challenging environmental and food safety guidelines, myriad standards and testing organizations, and confusing certifications. After wading through the complexities, straw manufacturers have to make choices that affect how they market their paper straws.

TRENDS AFFECTING PAPER STRAW GROWTH

Four key trends are driving the growth of the paper straw market.

TRENDS DRIVING GROWTH

- Growing concern for the effect of single-use plastics on the environment, especially marine wildlife, has led to consumer demand for plastic straw alternatives. In addition to the aforementioned turtle video, the media is showing consumers photos of the Great Pacific Garbage Patch[i], the largest of five accumulation sites for plastics in the ocean. Statistics are often being calculated and cited about the toll that plastic is taking on our oceans, landfills and bodies.
- Governments are banning single-use plastics. The UK banned single-use plastic straws in 2020, and in the U.S., Vermont, Maine and several U.S. cities already have existing bans. As of January 1, 2021, China banned single-use plastic straws. In the European Union (EU), 27 countries will ban single-use plastic straws in June 2021. Canada also will ban single-use plastic straws in 2021.
- As regulators legislate to force the reduction of single-use plastics, plastic straws are being replaced. While plastic substitutes for the straw have grown to include such materials as stainless steel, glass, dried grass or plant stems, bamboo, pasta, PHA, PLA, other new "biodegradable" plastics, the return to paper is a natural solution.
- Corporations are joining the movement to protect wildlife and our environment by voluntarily moving away from plastic straws. From airlines and cruise lines to hotels and theme parks, companies are replacing plastic straws with paper straws.
- With the rapid growth in the paper straw market, some manufacturers are greenwashing, or making unsubstantiated environmental claims, due to competition and inexperience. There are many new, small manufacturers entering the paper straw market who might not yet understand environmental claims laws.

There also are plastic straw makers who have quickly converted production to paper. As competition intensifies, manufacturers are racing to claim their straws as “the most environmentally friendly.”

While the EU’s Environmental Claims Guidance expressly discourages use of general claims, such as “environmentally friendly”[ii], legal action takes time. In addition, there are only a few universally recognized standards with test methodologies that measure environmental paper straw labeling claims. Just two ASTM tests cover compostability claims by paper straw manufacturers, ASTM D6400 and ASTMD6868.[iii] in the U.S. and EN13432 in Europe and U.K.

RESISTANCE TO PAPER STRAWS

Counter to these trends driving paper straw growth, some food service outlets are reluctant to switch to paper straws due to the perception that consumers dislike paper straws. In a 1,200-person H.B. Fuller-funded customized study across Spain, France, Italy, Germany, U.K., Canada and the U.S., 65% of consumers supported a single-use plastic straw ban. Despite this, restaurants and bars express concerns that their patrons will be disappointed in the performance of paper straws. The paper straw has a bad reputation with consumers for getting soggy. The reason for this is that food safety standards and paper straw quality standards differ by region, resulting in a wide window of variability when it comes to paper straw quality. Since quality paper straws can cost an average of five times the cost of plastic straws[iv], some food service buyers are purchasing lower quality straws that perpetuate the negative image. High quality straws have advantages, such as resistance to breaking down and adherence to food safety requirements. Consumer concerns underscore the need for paper straw manufacturing to have testing available that demonstrates the straw's ability to withstand the beverages that their customers serve.

Additionally, as McDonalds in the UK learned very publicly, not all paper straws are easily recyclable. The thickness of the paper can affect whether current recycling programs will accept the straws. For McDonalds in the UK, the thickness needed for the paper straws to withstand all of their beverages was too thick for recycling[v].

SUSTAINABILITY OF PAPER STRAWS: RECYCLING, BIODEGRADABILITY AND COMPOSTING

The paper straw industry is sustainable through the recycling and composting of its components, once straws enter the waste stream.

SUSTAINABILITY DEFINITIONS

Recycling

In general terms, recycling can be defined as materials that can be recovered from a waste stream for reuse or conversion into new materials or objects. A paper straw can be recycled if it complies with the requirements of local recyclers. There are many factors that affect a paper straw’s recyclability, including thickness of paper, paper coatings, inks, adhesives, and the beverage remnants remained inside the straw post-consumer use. The coatings, inks, and adhesives used in the straw must be less than 5% of the total dried maximum weight of the straw for the straw to be considered a mono-material. The benefit of a mono-material recycling stream is that it mitigates the risk of recycling contamination.

Biodegradability

Biodegradability is the ability of materials to break down physically and chemically in the presence of moisture, oxygen and microbes. There is no time frame within the definition. The term biodegradable, though positive, is very vague. Leaving the time-frame undefined allows for too much interpretation. Almost every substance will break down eventually. Thus, most environmental claim certification organizations do not recommend use of the term biodegradable as a descriptor for paper straws. There also are no universally recognized test methods for biodegradability of paper straws. In California, it is illegal to market a product as biodegradable, for example.

Marine Degradability

Marine degradable is a term that has come to the forefront of waste management, as so much of our global waste stream ends up in oceans and lakes. If a material is marine degradable, it can biodegrade completely under marine environmental conditions, which includes aerobic marine waters or anaerobic marine sediments, within a specified timeframe and without leaving toxic substances or residue. Marine degradability involves a complex set of conditions.

There are many variables affecting testing for marine biodegradability, such as water type (salt or fresh), amount of water movement, temperature, location of tested water or sediment and even the lab doing the testing. Currently, there are universal test methods that cover the marine degradation of plastics, but there are no universally recognized standards for marine degradation of paper straws.

Composting

Compostable means the product will disintegrate in a reasonable amount of time, leave no toxic residue and safely become an additive to soil. Though "reasonable amount of time" is unspecified, guidelines suggest the time-frame should be the same as other materials in the compost. Generally, 84 days is a reasonable time for fragmentation and ASTM D6400 testing uses 180 days for complete mineralization. The compostability of a straw is determined by the paper, coatings, inks and adhesives used in manufacturing.

LEGAL GUIDELINES AND CLAIM VERIFICATION FOR PAPER STRAW MANUFACTURERS

Guidelines for Making Valid Composting Claims

In 2000, Europe introduced Guidelines for Making and Assessing Environmental Claims. To supplement earlier guidelines and existing EU Member State Guidance, the European Multi-Stakeholder Dialogue on Environmental Claims (MDEC) developed the 2016 Environmental Claims Guidance, which outlines principles largely shaped by the United States Federal Trade Commission's Green Guides.

To offer more specifics on compostability, the Green Guides state in section 260.7[vi] that for compostable claims:

- It is deceptive to misrepresent, directly or by implication, that a product or package is compostable.
- A marketer claiming that an item is compostable should have competent and reliable scientific evidence that all the materials in the item will break down into, or otherwise become part of, usable compost (e.g., soil-conditioning material, mulch) in a safe and timely manner (i.e., in approximately the same time as the materials with which it is composted) in an appropriate composting facility, or in a home compost pile or device.
- A marketer should clearly and prominently qualify compostable claims to the extent necessary to avoid deception if:
    - the item cannot be composted safely or in a timely manner in a home compost pile or device;
    - or the claim misleads reasonable consumers about the environmental benefit provided when the item is disposed of in a landfill.
- To avoid deception about the limited availability of municipal or institutional composting facilities, a marketer should clearly and prominently qualify compostable claims if those facilities are not available to a substantial majority of consumers or communities where the item is sold.

VERIFICATION OF COMPOSTING CLAIMS

ASTM has developed standard specifications, ASTM D6400 and ASTM D6868, that apply to industrial compostability of paper straws. For compostability claims, the Green Guides state a producer must scientifically show that all the materials in the item will break down into usable compost in a safe and timely manner (i.e., in approximately the same time as the materials with which it is composted), in an appropriate composting facility. ASTM determined the definitions for this Green Guide statement* as follows:

1. Break down: 90% of the article must not remain.** (Must turn into carbon dioxide, water, inorganic compounds and biomass.)
2. Into usable compost: Since the broken-down materials within the compost become mixed into the soil, the ASTM specifications define parameters for toxicity and regulated metals of the composted product.
3. In a safe and timely manner: D6400 for industrial composting defines 84 days as reasonable for fragmentation of the product, and 180 days for complete mineralization in a properly managed composting facility.
4. In an appropriate composting facility: Industrial composting must be a usual form of disposal in the community where this product will be used and added to the waste stream.

*The European standard for compostable packaging is EN 13432[vii]. Requirements are similar in that the packaging is required to break down within 12 weeks with industrial composting and leave no more than 10% of the original material in pieces bigger than two millimeters, while doing no harm to the soil with heavy metals or other worsening the soil structure.

**The remains after 90% of the article is measured to have degraded sufficiently, will include components that are not compostable. These elements may include adhesives, coatings and inks. The specification further states that adhesive, inks and coatings cannot exceed more than 5% of the straw's total dried maximum weight. It is important to note that the 90% specification is a reflection of the accuracy of the test and does not imply that 10% of an article can be non-biodegradable.

ASTM D6868 is a similar specification for multilayer materials: end items that incorporate coatings or additives designed to be industrially composted. This specification requires that each layer of the multilayer material also pass the biodegradation requirements of ASTM D6400 to be verified as compostable.

The good news is that for a standard 200 millimeter beverage straw, on average the adhesive comprises less than 5% of the total maximum dried weight of the straw***. Therefore, in many cases, the article of the straw may be deemed compostable even if the adhesive component itself isn't compostable.

THIRD PARTY CERTIFICATION OF COMPOSTING CLAIMS

Multiple independent organizations exist to verify that EN 13432 or ASTM testing and other country-specific environmental standards testing has been properly completed on the product and the product has passed the test requirements. There are organizations that certify the product and also provide marketing elements with the certification. These organizations offer websites that list the product and logos to add to product packaging or advertising. Additionally, many independent laboratories do EN13432 and ASTM testing and can serve as an independent source verifying the product's compliance with test requirements.

CERTIFICATION ORGANIZATIONS FOR COMPOSTING CLAIMS

TÜV Rheinland
Organic Waste Systems (OWS)
ISEGA
Intertek
Eurofins
CSI S.P.A
Institut Kirchhoff Berlin
FABES
SQTS
Composting Manufacturing Alliance
Cedar Grove Composting Inc.
Biodegradable Products Institute (BPI)

SUSTAINABILITY RESOURCES FOR PAPER STRAW MANUFACTURERS

- 360ºFoodService, formerly known as Pack2Go Europe, is the trade association for foodservice packaging. It is both a membership group and also started a not-for-profit international association headquartered in Brussels, Belgium. Pack2Go Europe has launched a logo program that requires manufacturers to meet a number of quality requirements including environmental practices for better recycling. Members include leading paper straw manufacturers, paper suppliers and adhesive suppliers who are dedicated to establishing and sharing paper straw industry best practices. The organization is working to establish quality standards for paper straws. H.B. Fuller is on the committee to help establish industry standards.
- Food Drink Europe is an international association created for the food and drink industry. Its mission is "to facilitate the development of an environment where all European food and drink companies can meet the needs of consumers and society while competing effectively for sustainable growth."[viii] The association enlists hundreds of experts who use data and science to promote members interests in food safety and science, nutrition and health, consumer trust and choice, competitiveness and environment sustainability within the regulatory framework.
- BioCycle is recognized worldwide as the authority on organics recycling. With BioCycle CONNECT e-newsletter, BioCycle.net online magazine and BioCycle Conferences, BioCycle is dedicated to the advancement of composting and compost utilization, organics recycling, anaerobic digestion and renewable energy.
- Foodservice Packaging Institute (FPI) Trade Association (primarily single-use packages) supports the foodservice packaging industry commitment "to reducing the impact of its products on the environment and is dedicated to making sure these items are recycled or composted instead of littered."[ix]
- The US Composting Council (USCC) has as a mission "to advance compost manufacturing, compost utilization, and organics recycling to benefit our members, society, and the environment."[x] The Council focuses mostly on large-scale compost manufacturing and training programs for compost facility operators, certification programs of compost quality, and lobbying at the state and federal level.
- The Compost Council of Canada is a "national non-profit, member-driven organization dedicated to advocating and advancing organics residuals recycling and compost use. The Council serves as the central resource and network for the compost and organics recycling industry in Canada and, through its members, contributes to the environmental sustainability of the communities in which they operate."[xi] The Council has certification programs for facility operations staff to increase their level of knowledge. Council operator certification programs are also available to provincial governments to use for regulatory approvals and compliance programs.
- The Composting Collaborative has a mission "to accelerate composting access and infrastructure to improve soil health and divert compostables from landfill."[xii] The Composting Collaborative unites composters, consumer-facing businesses, and policymakers to share best practices and resources, as well as generate innovative solutions for shared challenges. The Collaborative is a project run by three organizations: GreenBlue, BioCycle Magazine, and the U.S. Composting Council.

Manufacturer Checklist for Marketing Paper Straws

- Stay abreast of plastic straw bans and timing.
- Test straws for performance in your target customers' most popular beverages.
- Avoid greenwashing by verifying any environmental claims and understanding guidelines for making claims.
- Leverage knowledge of machinery, paper, ink, and adhesive suppliers for production tips and marketing content.
- Utilize industry resources to understand certifications and legislation affecting paper straws.

ADHESIVES FOR PAPER STRAW MANUFACTURING

H.B. Fuller is a global leader is manufacturing paper straw adhesives. H.B. Fuller Swift®tak 5730 is a world-leading paper straw adhesive. It is plasticizer-free, food safe, and has more than three-hour liquid resistance to create durable straws that consumers enjoy. It is suitable for corewinding and slot nozzle paper straw construction. Swift®tak 5730 maintains straw integrity in use and is clean machining to reduce downtime and overall cost to create a paper straw. Our entire Swift®tak paper straw adhesives portfolio is durable, clean machining, liquid resistant and may allow straws to be recycled and/or composted.

At H.B. Fuller, our scientists work beside paper suppliers and paper straw equipment manufacturers to ensure the proper adhesive selection for specific applications and equipment. We are your partner in starting your paper straw business, expanding your business from plastic to paper straws, or upgrading your adhesive technology to a high liquid-resistant adhesive to improve straw integrity. Our headquarters features state-of-the-art laboratories that are designed to test H.B. Fuller adhesives with your paper samples prior to running our adhesive on your paper straw lines — providing you with confidence in product performance before interruption of regular production to trial a new adhesive or paper. Our technical support team can assist you on-site as needed to ensure your lines are running as efficiently as possible. Additionally, we can refer you to paper suppliers and equipment manufacturers. We are active in the paper straw industry and helping to solve its current challenges.

Contact us today to discover how we can help optimize your paper straw production.

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