Tissue

Tissue paper products, which include paper towels and toilet paper, play an important role in modern life. They contribute to improved hygiene, comfort and convenience in our society. Tissue paper products are highly engineered to provide strength, ultra-light weight, softness and absorbency, all at the same time.

Rolls of toilet paper were first introduced in the late 1800s and facial tissue made its debut in the 1920s. Today, tissue paper products are a popular, growing market. Demand for various tissue products continues to increase in the U.S. and abroad. Innovations in tissue and towel products have led to new product applications to meet the changing demographics of on-the-go millennials and today's families.

What is Tissue?

Tissue is a general term indicating a class of papers which are characteristically gauzy in texture and, in some cases, fairly transparent. They may be glazed, unglazed, or creped, and are used for a variety of purposes.

Tissue can be manufactured using trees that are turned into wood chips and then cooked to separate the fiber (cellulose) from the glue that holds the tree together. This fiber is then formed into a sheet and ultimately into tissue. Tissue can also be manufactured from recycled paper products, or a combination of fresh fiber and recycled fiber. Most mills in the U.S. that produce tissue use some recycled paper products to make new tissue paper products.

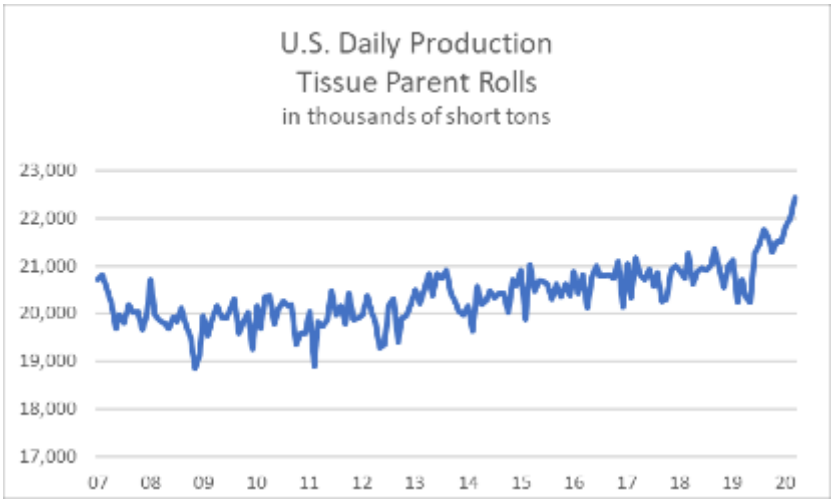
Examples of different types of tissue paper products include toilet, facial, napkin, towels, wipes, and special sanitary papers. Desirable characteristics in these types of tissue papers are softness, strength, comfort, thickness and freedom from lint.

Other examples of tissue papers are decorative and laminated tissue papers and crepe papers, often used in gift wrapping and to decorate. Desirable characteristics here are appearance, strength, and durability.

COVID-19 Response:

Since the onset of the COVID-19 pandemic, U.S. tissue producers have responded diligently to demand by increasing production, improving operational efficiency and working through supply chains to deliver more products to end-users. In 2020, U.S. tissue manufacturers reached record levels of production and shipped more tissue than ever before. The industry safely and reliably operates as it always has, 52 weeks out of the year, to meet customers' needs for essential products.

In February and March, AF&PA members safely and reliably delivered more than 22,000 short tons of parent roll tissue per day – an all-time high for the industry. In March alone, tissue mills produced nearly 700,000 short tons of parent roll tissue, more than any other month since 2007. This rate works out to more than 4 pounds of tissue for each U.S. resident.



Data Source: The American Forest & Paper Association

What Kinds of Products are Made from Tissue?

Tissue papers are divided into three major categories: At-Home (or Consumer), Away-from-Home (or Commercial & Industrial), and Specialty.

- **At-Home products:** Also known as Consumer Products, these are the tissue products you purchase in the grocery store, the convenience store and mass merchandisers for use in your home and include toilet paper and facial tissue, napkins and paper towels, wipes, and other special sanitary papers. For these products, softness and brightness are often high priorities. These products may also be decorated, multi-ply, scented, or contain emollients or lotions for added comfort and desirability.
- **Away-from-Home products:** Also known as Commercial & Industrial Tissue, these are the products that serve markets such as hospitals, restaurants, schools, businesses and other institutions. These tissue paper products are often produced in large sizes, with dispensers designed for high volume, public use.
- **Specialty tissue papers:** These types of tissue papers are often high-end, decorative papers that are glazed, unglazed, or creped, and include wrapping tissue for gifts and dry cleaning, as well as crepe paper for decorating.

Three of the most commonly used applications of tissue products are paper towels, toilet paper and facial tissue.

- **Paper Towels:** Paper toweling is folded or rolled sheets used for drying or cleaning where quick absorption is required. Paper towels are often embossed during the converting process for additional cleaning strength or absorption. Paper towels can be made from virgin pulp or recycled paper products or maybe a combination of the two.
- **Toilet Paper:** Based on the desire for better public hygiene, toilet tissue evolved along with the advent of indoor plumbing. Toilet tissue on a roll was introduced to North America in 1890 by Scott Paper Company. Designed to be sewer and septic safe, toilet tissue is an essential product of everyday life, providing sanitation, comfort, and convenience with each use.
- **Facial tissue:** The class of soft, absorbent papers in the sanitary tissue group. Originally used for removal of creams, oil, and so on, from the skin, it is now used in large volume for packaged facial tissue, toilet paper, paper napkins, professional towels, industrial wipes, and for hospital items. Desirable characteristics are softness, strength, and freedom from lint.

Download the Value of Tissue Infographic here.

How Does the Supply Chain Work?

From start to finish, the paper production process can take various routes – and those routes are dependent on individual company and customer logistics. Large, parent rolls are created on paper machines, and are then converted into individual rolls or folded into sheets using in-house converting operations or by third-party converters. Once converted, the various tissue products are wrapped, packed and shipped to a bulk distribution network, and then redistributed according to individual orders from retailers or other institutions like schools, restaurants or hotels.

How is Tissue Made?

Tissue paper products may seem simple, but manufacturing these specialty papers requires advanced science and technology. The first step in the tissue making process is to make pulp. Pulp can be made from either virgin fiber, which are wood chips, or from recycled paper products.

Wood chips (virgin fiber) are cooked using a chemical process in essentially a pressure cooker known as a digester. The wood fiber is separated into cellulose fibers, lignin (the wood glue that holds the tree together) and other substances such as sugars. Cellulose is an essential building block in the cell walls of trees and plants, helping to make them strong. The pulp is then washed to clean it and separate it from other substances such as lignin. After the pulp is washed, it is screened for further cleaning.

For mills using recycled materials, pulp is made by mixing the recycled materials with water in what resembles a large blender called a repulper. In the repulper, the pulp is separated to create individual fibers in a slurry. From there, the pulp is washed and screened for further cleaning.

Screening the pulp removes oversized and unwanted chunks or pieces from the slurry, leaving the best fibers for tissue products. The cleaning process further removes any unwanted particles and debris like any dirt or dust.

The pulp then goes through a series of rollers where the water is squeezed and evaporated out, helping to dry out the pulp. Though lignin is removed during the washing process, some lignin remains together with the fiber and at this stage it has a natural brown color. At this stage, the pulp is bleached, further separating the cellulose fibers from the lignin, increasing fiber strength while creating a bright white color.

After the pulp is bleached, it needs to be formed into a sheet by the paper machine. At the wet end of the paper machine, the pulp flows onto a moving endless belt with a screen to filter out water and form a web. Further down the line, in the press section, the pulp, which looks like a white sheet, goes through several presses to further remove excess water. At this point the web of material still must shed water, so it passes into a dryer. The dryer is a large cylinder and uses steam to dry the pulp. The wet web of pulp is pressed against the cylinder tightly to dry it through evaporation, providing a consistent thickness prior to the paper being processed into a giant roll.

At this stage, many tissue papers are further processed or converted for consumer use. For example, tissue may be further embossed or creped. Embossing rolls create a textured design pattern onto the tissue like the dots and swirls on your paper towels or toilet tissue. Creping enhances the overall thickness, making it softer, and adding

the stretch properties to the paper.

After the paper is creped, it is sent to a converting machine that turns the paper sheet into the tissue products you recognize. Converting machines can turn the paper into multiple plys, fold tissues and napkins, or otherwise transform large sheets or rolls into the final packaged configuration.

Why Use Tissue?

Tissue products are diverse, widespread and help to improve the quality of people's lives around the world every single day. By providing value, tissue products have helped to create modern life.

Tissue Products are Hygienic

Tissue products include those for sanitary use, such as bathroom and facial tissue, napkins, paper towels and wipes, and special sanitary papers used in sterile medical procedures. Disposable tissue products have helped reduce the spread of bacteria and communicable diseases.

Check out these studies that show the hygienic benefit of using paper towels:

- European Tissue Symposium
  - *Contamination of the Washroom Infographic*
  - *Microbiological Comparison of Hand Drying Methods: The Potential for Contamination of the Environment, User and Bystander – December 2014*
  - *Environmental contamination by bacteria in hospital washrooms according to hand-drying method: a multi-centre study*
  - *Multisite hospital study demonstrates hand drying method can affect risk of bacterial dissemination in real world settings*
- Mayo Clinic Proceedings
  - *The Hygienic Efficacy of Different Hand-Drying Methods: A Review of Evidence – 2012*
- Intermetra
  - *Study of Consumers' Attitudes to Different Hand drying Systems – June 2008*
- American Society for Microbiology
  - *Deposition of Bacteria and Bacterial Spores by Bathroom Hot-Air Hand Dryers - April 2018*
  - *Havard Medical School article, " The bacterial horror of hot-air hand dryers"*

You can also download our infographic on why paper towels are best for hand drying and our Tissue vs. Hand Dryers fact sheet

Tissue Products are Convenient

Strong, ultra-light and soft, tissue products are used in and away from home for cleaning and hygiene purposes. They are dependable and can be used on the go!

Tissue Products are Innovative

Advancements in manufacturing technology include more efficient tissue paper uses and improving the design of products and the way they are dispensed. These innovations allow the tissue manufacturers to keep up with growing consumer demand, improve existing products and develop new products.

Tissue Products are Sustainable

Tissue products are inherently sustainable. Whether they are made from sustainably harvested wood fiber trees or recycled paper, demand for tissue products ensures that the resources used to make them will be plentiful for generations to come. In addition, the U.S. paper and wood products industry voluntarily makes efforts to continuously improve upon its sustainability record.

- Tissue manufacturers drive demand for recycled fiber. In 2019, 90 percent of the U.S. mills that produced tissue paper used some recovered paper to make new tissue products. Twenty percent of the mills used only recovered paper.
- On average, about two-thirds of the energy used by pulp and paper mills comes from renewable sources such as byproducts like carbon-neutral biomass that would not otherwise be used in the tissue paper making process.
- Tissue manufacturers continue to further reduce greenhouse gas emissions from their facilities through efforts like reducing the use of fossil fuels and purchased energy (such as purchasing power from a local utility company), and reducing truck transportation.
- Tissue manufacturers work to combat illegal logging, requiring the loggers they purchase from to adhere to sustainable forest management practices and ensuring the wood they purchase is not from controversial sources.
- Tissue manufacturers continue to look for ways to improve their safety record in terms of reducing injuries and lost time from work. The goal for the industry is zero workplace injuries.
- In U.S. pulp and paper mills, water is used ten times, on average, before it is sent to a wastewater facility for treatment.

Tissue products are diverse, widespread and help to improve the quality of people's lives around the world every single day. Tissue products provide value in many ways and have helped to create modern life.