



# Facts About the Use of Bleaching Agents in Tissue and Paper Towel Manufacturing

Have you ever wondered what makes the bathroom tissue and paper towel products you use every day bright and white?

Many consumers want to know how products are made, and what ingredients and materials are used in the manufacturing process and/or are present in finished products.

Paper made with wood-based pulp is brown in its natural state (think paper grocery bags). The desired brightness and whiteness of many finished paper products is achieved through a bleaching stage in the paper manufacturing process.

Online articles and social media posts are not the best or most current sources of accurate or science-based information about the use of chlorine in the bleaching stage and residual chlorine in bleached tissue products. Some articles suggesting a link to toxic exposure through tissue contact with the skin may have raised concern among some consumers.

The following explains the facts about bleached tissue and paper towel products and why consumers can feel confident their favorite tissue products and brands were manufactured with great care by U.S. producers to protect both the environment and human health.

## Modern Bleaching Process

Trees are largely composed of cellulose, sugars, and lignin (the “glue” that holds the tree together). In tissue manufacturing, the objectives of the bleaching phase are to separate wood fiber from the lignin, resulting in a strong and sustainable product; soften the fiber for comfortable skin contact; and brighten the fiber for the clean, white appearance consumers prefer. In the past, elemental chlorine was used to bleach wood fiber in order to achieve the desired strength and brightness properties. However, this technology has not been used in a few decades and has been replaced by alternative technologies. Modern bleaching processes are most often ECF or elemental chlorine free bleaching. ECF substitutes the compound chlorine dioxide for elemental chlorine gas as the bleaching agent. While chlorine dioxide and chlorine may sound similar they are very different chemicals having different bleaching chemistry.

## Bleaching Process Definitions

**Elemental Chlorine Free (ECF):** The U.S. pulp and paper industry currently uses chlorine dioxide bleaching – also known as Elemental Chlorine Free or ECF. ECF is a pollution prevention technology recognized and accepted globally by such organizations as the United Nations Environment Programme, the European Commission, the International Joint Commission and the International Court of Justice. It is an alternative bleaching agent that eliminates the formation of persistent, bioaccumulative toxic substances. Because of its environmental and economic benefits, the ECF bleaching process is by far the technological choice for sustainable pulp and paper manufacturing globally; a shift that now represents more than 95 percent of worldwide pulp production. Domestically, ECF bleaching is recognized by the U.S. Environmental Protection Agency (EPA) as being the “Best Available Technology” to bleach paper products.

**Process Chlorine Free (PCF):** This process uses fiber that meets EPA guidelines for recycled or post-consumer content that has not been re-bleached with chlorine-based compounds. Only the recycled percentage of the end product is considered PCF.

**Totally Chlorine Free (TCF):** This technique indicates no chlorine or chlorine compounds were used as bleaching agents in the wood pulp bleaching process. It is used by only about 3 percent of worldwide pulp production. New tissue mills continue to incorporate ECF bleaching, as TCF has not proven to provide environmental advantages compared with ECF technology. For example, TCF mills in Germany and the Nordic countries, where TCF had a higher market share, have either been abandoned or reduced TCF production in favor of ECF production. Finally, compared to ECF, the TCF bleaching process requires more energy and more wood fiber to produce pulp that can meet the same strength and brightness requirements of the final tissue or towel product.

## Conclusion

- Tissue and paper towel manufacturers meet consumer demand for bright, white products using modern technologies that protect the environment and promote personal hygiene.
- Concerns about toxins when it comes to chlorine bleaching in paper product manufacturing are outdated fears relating to bleaching processes that have long been eliminated by U.S. paper manufacturers.
- Modern bleaching technologies make it a safe and sustainable choice to meet the challenges of today’s environmentally concerned world.
- Tissue and paper towel manufacturers are committed to making safe, reliable, and environmentally sustainable products that consumers can use with confidence.

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### About AF&PA

The American Forest & Paper Association (AF&PA) serves to advance a sustainable U.S. pulp, paper, packaging, tissue and wood products manufacturing industry through fact-based public policy and marketplace advocacy. Our member companies make products essential for everyday life from renewable and recyclable resources and are committed to continuous improvement through the industry’s sustainability initiative – *Better Practices, Better Planet 2020*.