

Polytetrafluoroethylene (PTFE), better known by its trade name Teflon, was created accidentally by Dr. Roy J. Plunkett on April 6, 1938 as he was working with gases related to refrigerants. (1) Initially, PTFE appeared as a white, waxy, and seemingly useless mass that was difficult to process or mold. Due to its slippery nature and chemical inertness, it did not adhere well to surfaces, and its high melting point made traditional processing methods ineffective. (2) While the material is now well known for these traits, they were originally viewed as negatives due to the lack of processability.

The main issue was that the material did not adhere well to any surfaces. This downside was later deemed a positive as engineers began to chemically etch PTFE. (3) This process is required to make the surface of the PTFE chemically reactive so that it can bond to other materials easily. Once this discovery was made, the possibility of PTFE being used in everyday products became a reality, as the seemingly inert and useless material was suddenly useful.

Today, PTFE goes under the name Teflon, and is used in applications from surgery to cooking. Due to PTFE's low coefficient of friction, it can be used to transfer harsh chemicals and medical tools safely while maintaining purity. Also, it is so resilient that it can safely guide a catheter where devices need to slide freely without the threat of obstruction. Apart from these medical applications, it is also very well known for its use in creating non-stick surfaces on pots and pans. Other than that, PTFE has been used in the formation of pipe joints, bearings, and electrical insulators. (3)

(1) <https://www.teflon.com/en/news-events/history>

(2) <https://www.smithsonianmag.com/science-nature/the-long-strange-history-of-teflon-the-indestructible-product-nothing-seems-to-stick-to-180984920/>

(3) <https://www.brighton-science.com/blog/how-to-bond-ptfe-to-anything>