PolarFit™

Cryogenic Liberation of Polymer and Metal Components

A Greener Process and Cleaner Components

Off-spec parts made from a polymer and a metal, such as electrical cables, vibration isolators, oil well seals, metal tracks with rubber pads and many other products contain materials that can be valuable if they are recovered and recycled. Current technologies, such as incineration, pyrolysis and chemical separation can be expensive to use and environmentally unfriendly. In addition, these techniques may not be able to recover the highest-value material from the part. Our PolarFit cryogenic liberation process offers you an environmentally sustainable alternative to recover clean components for reuse and recycling.

How It Works

Our PolarFit liberation process uses liquid nitrogen to cool component parts to extremely low temperatures. At these temperatures, the polymer portion contracts at a greater rate than the metal portion of the part due to the difference in their thermal expansion coefficients. For many parts, this differential contraction creates enough stress to break the bond between the polymer and the metal. This technology can be applied in your separation process to generate a stream of clean metal and a stream of metal-free polymers, making it easier to recover and recycle.

Feasibility

Due to the complex nature of these multicomponent parts, we at Air Products believe the most accurate and reliable way to evaluate the effectiveness of cryogenic material liberation is through laboratory testing rather than through calculations.

Air Products' applications engineers can help you evaluate the use of cryogenic liberation in your processes. At our trial facilities around the world, we can cool your multicomponent part by immersing it in liquid nitrogen or in a test chamber of cold nitrogen gas. Our engineers use these tests to establish process parameters for the separation of your part. Then they can use the parameters to develop estimated capital and operating costs for your processes.

The Air Products Advantage

When you choose Air Products to meet your material separation needs, you gain access to over 40 years of cryogenic experience. As a leader in cryogenic applications, we offer complete technical service from our experienced staff and fully equipped facilities, from feasibility and design through start-up and ongoing service. Whether you're recovering or grinding after separation, Air Products' skilled engineers can help you determine the feasibility and economics of using cryogenics in your process—from magnetic separation to conveying and grinding. We've helped customers design and specify customized processes to support their efforts for material recovery and reclamation. The process is different in every scenario, so call us to find out how Air Products can help you.

tell me more

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