

# Cold chain and Cryogenic Portfolio

## Why Ultra-low temperature labels?

The durability of labeling materials in cold temperatures is of utmost importance for biological and pharmaceutical products such as vaccines, biologic drugs, blood, stem cells, and whole tissues that are preserved by cooling to low sub-zero temperatures, as low as  $-196^{\circ}\text{C}$  (the boiling point of liquid nitrogen). At temperatures below  $-130^{\circ}\text{C}$ , biological activity ceases and therefore storage at these temperatures is necessary to preserve the product in a stable environment. It is imperative that not only these products, but the labels that identify them for potentially life-saving and life-creating medical applications, do not deteriorate. Avery Dennison materials for cryogenic applications were designed for applications ranging from room temperature to storage in liquid nitrogen and harsh deep-freeze environments. They can be applied to plastic and glass containers, tubes, and vials, as well as aluminum canisters and other challenging surfaces.

## Key Benefits

- Clear identification of biological drugs, bio-banking products and blood components
- Reduced risk of potentially catastrophic mixups due to label displacement during transportation
- Unobstructed view of products in transparent packaging (with clear film)
- Ultimate product protection throughout the supply chain, from manufacturer to retailer, medical facility and patient



### Key Features

- Good adhesion to substrates including polypropylene, glass, PVC and steel
- Compatibility with a variety of different printing methods such as UV flexo and thermal transfer
- Clear and white film facestocks available
- Excellent conformability for tight mandrel situations
- Ability to withstand multiple freeze-thaw cycles

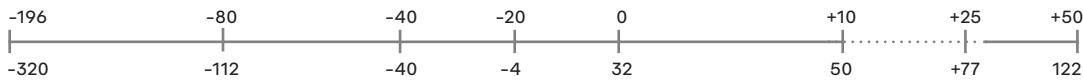
### Applications

- Pharmaceutical**
- Vaccines
  - Drugs
  - Injectables

### Bio-Banking

- Blood products
- Serum
- Reproductive tissue storage
- Stem cells
- Cell and tissue freezing
- Tissue culture
- DNA and RNA
- Cord blood and stem cells

### Low Temperature Pharma Segments



	Cryogenic	Freezing	Cold Chain	Ambient
<b>Application</b>	Biobanking; tissue collection containers	Clinical Trials, Dry ice	Blood and plasma, lab labels	Injectables: vaccines, biologics
<b>Adhesives</b>	C0196, C0320	C0196	AT1B, AT20N, FDA815S	S717P, S727
<b>Key Substrates</b>	Plastic vials and bottles	Plastic vials and bottles	PVC pouches	Glass and plastic syringes, vials,*

Spec#	Product Description	Service Temperature Range	Minimum Application Temperature	TT Printability
77392	2.3 Mil White Polypropylene TC/C0196/40#BG	-320F to +194F	-20F	Yes
79455	2.5 Mil White Polyester TC/C0320/55#BG	-320F to +212F	-320F	Yes
79700	2.3 Mil White Polypropylene TC/C0196/1.5M PET	-320F to +194F	-20F	Yes
79802	2.0 Mil Clear Polypropylene TC/C0196/40#BG	-320F to +194F	-20F	Yes

\*See Blood & IV Bag Labeling Solutions overview  
\*\* See Pharmaceutical and Healthcare Collection overview

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