



# *THE STICKY STORY OF DUCK TAPE*

*by  
Bill Lee*

Noooo.... You have not caught me in yet another typo. 'Duck' is correct.

This sticky stuff was originally nicknamed 'duck tape' because, as legend has it, the material was waterproof (i.e., water ran off it like off a duck's back) - or - because one of its components was cotton duck fabric. Take your choice...

Besides, what is universally known today as 'duct tape' actually doesn't work very well on ducts in extreme temperatures. In addition building codes in some states actually prohibit its use to seal HVAC ducting. But as we all know, it has innumerable other applications that range from the practical to the ridiculous.

Duct tape is like the  
force...it has a light side,  
a dark side and holds the  
universe together!

Duck tape was the epitome of the phrase 'necessity is the mother of invention' during World War II. Well, sorta. There was a wartime need, and there was a mother involved. Best I begin at the beginning.

The sticky story of duck tape has its origin at the Green River Ordnance Plant, hastily erected at the beginning of World War II. That facility, located fifty miles west of Chicago, Illinois, employed 4,500 during the war, including a sizable percentage of women workers.



Housewives, clerks, and teenage girls and even their teachers; none of whom had any prior experience quickly learned to efficiently produce a wide range of explosives. These industrious women were nicknamed 'WOW's' [acronym for Women Ordnance Workers]. One of the items they manufactured in large quantities were rifle grenade [one of which is being demonstrated by a soldier in the photo on the left].

One of the WOW's was a Midwestern lady named Vesta Stoudt [right]. The mother of two Navy sons, her job was to inspect, box and seal the explosive cartridges used to fire rifle grenades. The boxes she packed were taped closed to protect the cartridges from moisture until ready for use. The thin paper tape used to seal the boxes included a small paper tab which supposedly could be used by a soldier in combat to quickly rip open one of the boxes.



But that posed two problems. The paper tape was not very strong, and prone to being compromised by weather and/or the rough and tumble of battle. The tab was even weaker and often tore loose, leaving a soldier in peril with only his fingernails...or a knife, if he had one...to frantically pry open a box.

Mrs. Stoudt had a better idea; use a stronger tape and associated tab, made of cloth. Simple. Practical. She experimented, probably at her home and came up with a sample of what she thought would work. Or so it seemed to her...

But when she mentioned her idea and showed her sample to her superiors at the ordnance plant, they told her to forget it. She was told: "*the government knows what it's doing. And besides, you can't do anything about the government*".

Frustrated, she did what any mom with two sons in the military during wartime might do. She boldly wrote a letter to none other than the President of the United States, Franklin D. Roosevelt.

Her original letter is now on display in the FDR library. The salutation she chose to use in her handwritten appeal was: *Dear Friend:*

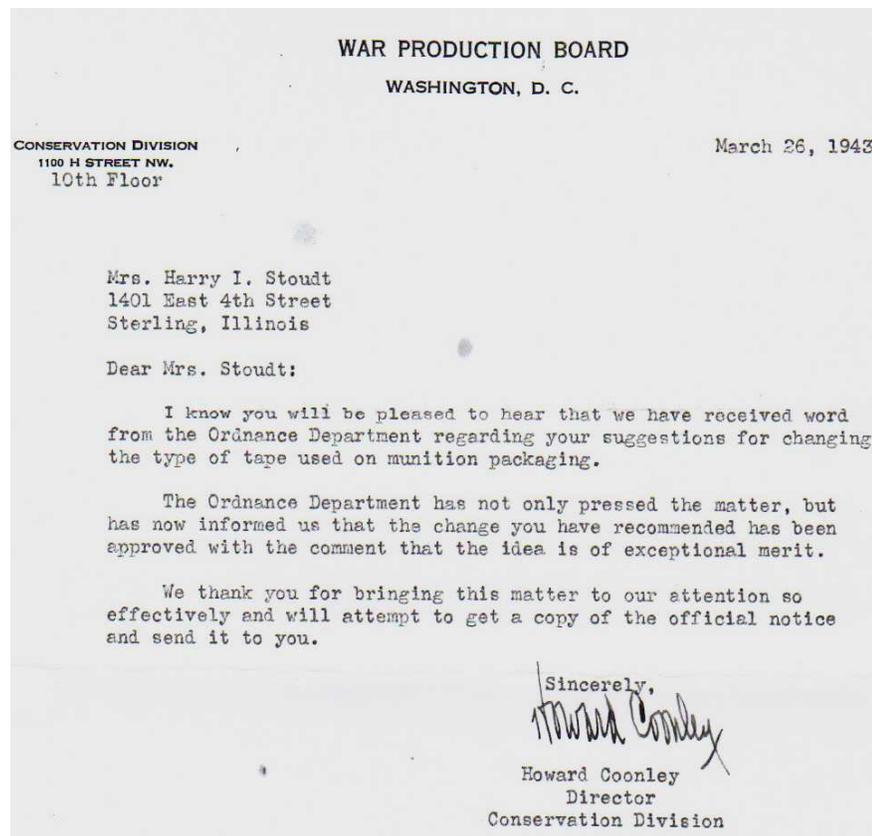
Two pages of script, outlined the problem and her idea of how to eliminate it. She included a sketch and ended the letter with an appeal and a challenge to President Roosevelt:

*"I have two sons out there some where, one in the Pacific Island the other one with the Atlantic Fleet. You have sons in the service also.*

*"We can't let them down by giving them a box of cartridges that takes a minute or more to open, the enemy taking their lives that could have been saved. Had the box been taped with a strong cloth tape that can be opened in a split second.*

*"I didn't know who to write to Mr. President, so have written you hoping for your boys, my boys, and every man that uses the rifle grenade, that packages of rifle cartridges may be taped with the correct tape."*

It worked. He wrote back to Mrs. Stoudt, thanking her profusely. Then quickly passed her idea on, where it stuck just as securely as the cloth tape she had suggested. It wasn't very long before she got another letter. On October 24, 1943, the Sunday edition of the Chicago Tribune announced that she had been presented a War Worker Award.





The task of creating a more suitable tape was assigned to the firm of Johnson & Johnson. They had experience making cloth-backed medical adhesive tape, so it was a simple matter to add a waterproof layer and a more aggressive adhesive, and produce it in an olive drab color to match the ammunition cans.

Ever since, duck (or duct) tape has been manufactured in a bewildering variety of colors...and even designer themes...in addition to the more familiar silvery fabric style that still dominates the market. And its uses have far exceeded Mrs. Stoudt's original purpose. They range from the practical, to the unlikely, to the downright absurd.

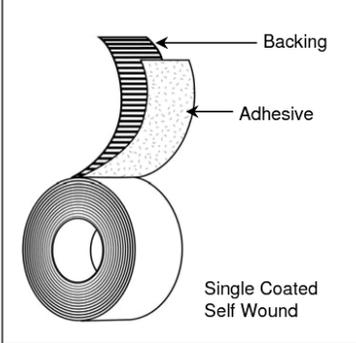


In addition to being called duck...and later on duct...tape, this simple, but highly versatile invention, has been given a number of other names. At Newport News Shipbuilding in the latter half of the 20th century, we called it 'Green Tape', even though it was closer to the olive drab color used during World War II than anything found in hardware stores.

It was once (and for all I know, still is) widely used onboard nuclear powered naval vessels berthed at Newport News for refueling and overhaul. Rolls of the sticky stuff, intended for use in sealing the seams of containment [nick-named 'clean'] tents to prevent loose radioactive contamination from escaping sometimes 'escaped' on their own. Any untended roll of tape onboard a ship often magically found its way into a sailor's locker.

I could resurrect a whole bunch of other examples of unauthorized, but well intended uses. Such as my own once-upon-a-time personal use of the stuff to patch torn or frayed clothing. But I digress...

As one might expect, once it became accepted by the government, it had to be given a set of specifications to control its manufacture. Here's a sample:

<p><b>POLYKEN® 231</b> Military Grade Duct Tape</p> <p><b>APPLICATIONS</b></p> <ul style="list-style-type: none"> <li>Quality waterproof packaging tape for military packaging and other demanding applications.</li> <li>General repair and sealing.</li> </ul> <p><b>FEATURES &amp; BENEFITS</b></p> <ul style="list-style-type: none"> <li>Waterproof.</li> <li>High adhesion - sticks to a variety of surfaces.</li> <li>Strong and durable.</li> <li>Meets Federal Specification ASTM D-5486 Type IV, Class 1 (supersedes PPP-T-60E, and PPP-T-60D).</li> <li>Meets Defense Standard 81-25.</li> </ul>	<p><b>CONSTRUCTION</b></p>  <p><b>TEST DATA</b></p> <table border="1"> <thead> <tr> <th>Test</th> <th>Typical Value</th> <th>Typical Value (Metric)</th> <th>Test Method</th> </tr> </thead> <tbody> <tr> <td>Total Thickness</td> <td>12 mils</td> <td>304.80 μ</td> <td>ASTM D 1000</td> </tr> <tr> <td>Adhesion to Steel</td> <td>80 oz./in.</td> <td>8.76 N/cm</td> <td>PSTC-1</td> </tr> <tr> <td>Adhesion to Backing</td> <td>30 oz./in.</td> <td>3.28 N/cm</td> <td>PSTC-1</td> </tr> <tr> <td>Tensile Strength</td> <td>50 lb./in.</td> <td>87.56 N/cm</td> <td>ASTM D 1000</td> </tr> <tr> <td>Unwind Force</td> <td>40 oz./in.</td> <td>4.38 N/cm</td> <td>ASTM D 1000</td> </tr> <tr> <td>Maximum Performance Temperature</td> <td>200 F</td> <td></td> <td></td> </tr> </tbody> </table>	Test	Typical Value	Typical Value (Metric)	Test Method	Total Thickness	12 mils	304.80 μ	ASTM D 1000	Adhesion to Steel	80 oz./in.	8.76 N/cm	PSTC-1	Adhesion to Backing	30 oz./in.	3.28 N/cm	PSTC-1	Tensile Strength	50 lb./in.	87.56 N/cm	ASTM D 1000	Unwind Force	40 oz./in.	4.38 N/cm	ASTM D 1000	Maximum Performance Temperature	200 F			<p><b>PRODUCT DESCRIPTION</b></p> <p>Single-Coated Construction</p> <p><b>Backing:</b></p> <ul style="list-style-type: none"> <li>Polyethylene Coated Cloth</li> </ul> <p><b>Adhesive:</b></p> <ul style="list-style-type: none"> <li>Rubber</li> </ul> <p><b>Colors:</b></p> <ul style="list-style-type: none"> <li>Black, Olive Drab, Silver</li> </ul>
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There is a current resurgence in the marketing of duct tape to revert to its original name. Which, of course includes cute logos like this one, which I suppose my use of here would be frowned upon by the holder of its copyright...should they ever find out. If so, and if discovered, my indiscretion can probably be 'taped over' with one of my favorite...and oft-practiced...sayings:

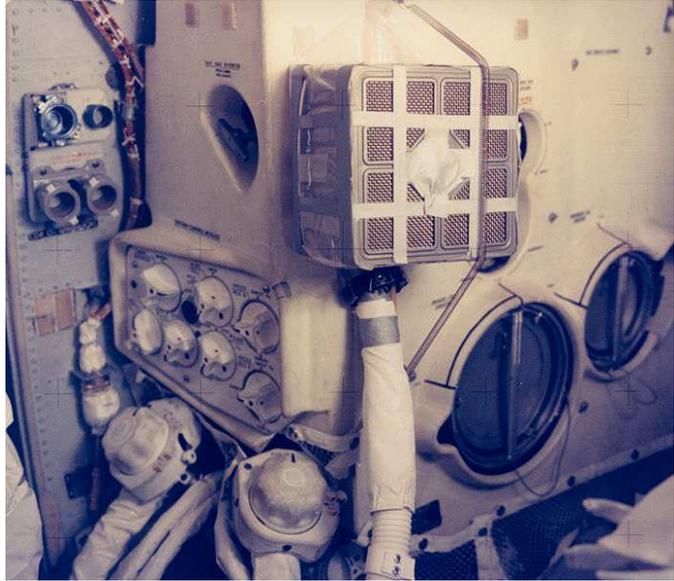


***Its easier to ask forgiveness than permission.***

Of course, the most familiar form of duct tape is the silvery-coated type. Which, in addition to innumerable uses all over the world, was ingeniously used when the Apollo 13 space craft suffered a severe casualty to most of its operating systems on the way to the moon, thereby placing its crew in extreme peril.

When one of Apollo 13's oxygen tanks exploded and damaged their vehicle, the situation looked bleak for the three astronauts onboard. A patchwork solution was necessary to provide them enough oxygen as they worked to return to earth.

They had no way of knowing if their remaining sources of oxygen had been contaminated by the accident. So, using plastic bags (originally intended for holding moon rocks), cardboard torn from the backs of manuals, various other bits and pieces, and duct tape; the trio of astronauts improvised a crude but effective filtering system. It worked.



No doubt Mrs. Stoudt would have been pleased to know that she helped someone's three sons come home safely.

