

Dacron Tape — An Improved Harness Material

As is common knowledge among prosthetists, there are about six basic requirements for a fabric tape for use in harnessing upper-extremity prostheses. It must have a comparatively high tensile strength for a given weight of weave; it must exhibit good dimensional stability under load; it must be readily washable without significant shrinkage and later stretch on reapplication of load; it must be nonirritating to the skin and comparatively resistant to the deteriorative effects of perspiration; it must have good workability on the sewing machine and a minimum tendency to curl; and it must be of such color as to be appropriate for a piece of apparel to be worn in intimate contact with the body. Heretofore, the materials most nearly meeting all of these demands have been vinyon and, better still, boiled-off nylon.

In an attempt to discover an even more suitable harnessing material, the Army Prosthetics Research Laboratory carried out extensive studies of the stretching, shrinking, and

washing characteristics of a number of commercially available fabric tapes, including those of cotton, vinyon, nylon, dacron, and certain Fiberglas-vinyon combinations. (APRL Technical Reports 5302, 5318, 5423, and 5430.) Of these, boiled-off dacron and the Fiberglas-vinyon tapes were found to be the most dimensionally stable, both wet and dry. Although the Fiberglas-vinyon tapes showed properties equivalent to those of dacron, materials containing Fiberglas were ruled out because of the possibility of skin irritation from continued contact with glass fibers. The accompanying table summarizes the average results obtained on application of tensile loads four times up to 150 lbs. using a Baldwin-Southwark Universal Testing Machine.

It may be seen that the dacron tape stretched the least by a considerable margin. Even with loadings up to 150 lbs., far in excess of what is normally required for operation of an arm prosthesis, the dacron

Stretch in Percent of Original Length

| Load (lb.) | Dacron (dry) | Dacron (wet) | Nylon (dry) | Nylon (wet) | Cotton (dry) | Cotton (wet) | Vinyon (unracked) | Vinyon (racked) |
|------------|--------------|--------------|-------------|-------------|--------------|--------------|-------------------|-----------------|
| 50 | 0.4 | 0.5 | 2.5 | 4.8 | 4.5 | 7.5 | 5.5 | 2.3 |
| 100 | 0.9 | 1.2 | 4.0 | 7.7 | 6.2 | 10.1 | 9.7 | 3.7 |
| 150 | 1.3 | 1.7 | 6.3 | 10.1 | 7.4 | 11.7 | 15.0 | 6.9 |

tape stretched only 1.7% when wet. After removal of the load, recovery to the initial length was immediate. The shrinkage of boiled-off dacron tape after washing in warm water was found to be a minimum. An additional advantage disclosed was that holes to receive buckle tines may be made in dacron tape using a heated awl, and, just as in the case of vinyon, the ends of the tape may be burned to eliminate fraying.

Because of the favorable results obtained, APRL requested that the Prosthetic Devices Study at New York University conduct further laboratory studies as well as amputee tests on the actual usefulness of dacron tape for harnessing upper-extremity amputees. A number of above- and below-elbow amputees who had been wearing vinyon or nylon harnesses were fitted with harnesses of dacron. After some five months of wear, the opinions of the

amputees and of the fitters were solicited. Amputee reactions were highly favorable because of the color (which does not contrast with that of the shirt or undershirt), because of the ability of the tape to lie smoothly, because of the absence of stretching and relative absence of rolling of the tape under the axilla, and because of its excellent ability to withstand laundering. The prosthetists also favored dacron because of the low stretch characteristics, which eliminates the need for pre-stretching, and because of a lowered tendency toward fraying at buckle perforations.

The new material tested was furnished by the Bally Ribbon Mills, Bally, Pennsylvania. It is catalogued as "1-in. Dacron, Pattern 7928, S/O 6219, natural, boiled-off." The material is also available in the half-inch width.

Mayo Clinic Facility Now Private Enterprise

The brace facility at the famous Mayo Clinic in Rochester, Minn., has been transferred to private ownership and is now known as the Rochester Orthopedic Appliance Company. The new firm, which has been elected to membership in OALMA, is headed by Lucius Trautman as President. Joseph Gitlin is Vice President and Fritz Schroeder is Manager.

Special interest attaches to this transfer to private enterprise of an institutional brace shop. We are, therefore, quoting the following passage from the official release issued by the Clinic:

"Mayo Clinic orthopedic appliance services will be transferred to a private firm, Clinic officials have announced. The new organization which will be handling all services for orthopedic patients is known as Rochester Orthopedic Appliances, Inc., and will be owned and operated by Ray Trautman and Son of Minneapolis and La Crosse, Wisc.

The company will operate in a Clinic building on West Center St. between 2nd Ave. and 3rd Ave. The building commonly is known as the 'Old Whiting Press Building' and 'Dr. Kendall's Laboratory.' All services offered by the Clinic-operated orthopedic shops, plus some additional ones such as stocking a line of orthopedic shoes and supplying and fitting artificial limbs, will be offered by the new firm. Clinic spokesmen pointed out that while the company will have no connection with the Mayo Clinic, the Clinic orthopedic section will work closely with the firm on the problems of Clinic orthopedic patients during fitting and training in the use of artificial limbs and other appliances.

The Clinic has operated its own orthopedic shops for many years, but, officials said, they felt this work could and should ultimately be performed by a private firm.