

## NIOSH

(continued from front page)

In the end, the original seat design was modified to reduce the vibration frequency from 15Hz to just 4Hz (See Fig. 1.) using a combination of Extra-Soft SunMate and Pudgee. Some of the cushion's qualities which impressed the research team were its low modulus of elasticity, consistent damping and low temperature sensitivity. While NIOSH didn't endorse Dynamic Systems, Inc. by mentioning its products in the test, they did recognize SunMate and Pudgee as effective materials for occupational health and safety for use in the mining industry.

Good News!

### Price Increase Delayed

The price increase, which was scheduled for August 1, 1999, has been postponed to a later date. Before any price change takes effect, DSI will mail the new figures to customers 30 days in advance. Even with the impending increase, SunMate remains one of the most affordable, high-quality orthopedic cushions on the market.

The last issue of the newsletter stated that a small price increase on some sizes of SunMate, Pudgee and Laminar products would take effect in August. We apologize for the misinformation, and hope this provides more of a relief than an inconvenience to our customers.

FIPS Abroad

### Seating in South Africa

In September, Cathy Ramsey, DSI's FIPS specialist, will be travelling to South Africa to attend the annual S. A. Orthopedic Association Conference. At least 600 members of the profession will be attending the event including 250-300 orthopedic surgeons. Cathy will introduce Foam-In-Place Seating and describe the benefits of this system for the elderly and disabled. It is important that the surgeons, in particular, understand the benefits of this system because they are the ones who write patients' prescriptions and motivations for Medical Aid. This will hopefully facilitate ac-

ceptance of therapists' recommendations for the use of this system and help alleviate some of the medical expense for clients.

Cathy will visit the doctor who attended a workshop at DSI last November and related her plight and the medical challenges she and her peers are up against in their country. Cathy will attend conference events and dinners, including a traditional "braai" (similar to a barbecue). Before her return, she will spend a couple of days on safari recovering from jet lag and what is sure to be a very busy week.

#### The News

The Dynamic Systems newsletter is a free, quarterly publication. It gives a firsthand look at new products, makes important announcements and offers a personal look at the people behind the products.

If you or a friend would like to be on our mailing list, just give us a call.

dynamic  
systems news

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# dynamic systems

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## Developments In Seating NIOSH Study Shows the Effectiveness of SunMate

In May 1997, the National Institute for Occupational Safety and Health published an article in their newsletter about a study on ergonomic seating for mining vehicles. The study was sponsored by the U.S. Bureau of Mines which reported that as many as one-third of underground coal mining equipment operators suffer from whole-body vibration. Logging 25 million hours of work each year, mining equipment operators are susceptible to cumulative back, neck and abdominal disorders. Under the worst conditions, operators have sometimes had to resort to using blocks of wood or a bent steel plate welded to the machine frame for seating. The goal of this study was to find an effective seating design which would reduce the amount of vibration and absorb the majority of impact from which the operators suffer.

Last year, the results from the year-long study were presented at the Society for Mining, Metallurgy, and Exploration's annual conference. Samples of Pudgee and SunMate (of varied pressure qualities) were included in the tests. The samples were tested both separately and in various combinations under specific environmental conditions for use in shuttle cars. Under temperatures ranging from 40°F to 100°F displacement and force readings were taken to gauge the cushion's elasticity and damping properties.

Site tests were performed in a drift mine in eastern Kentucky, where operators have to work in a reclining position due to the narrowness of the coal seam. Researchers were able to gather data from the vehicle with a full load, and get important feedback from the operators. When comparing the new ergonomic seat to the original, one shuttle car operator stated, "It's easy to adjust...I liked the lower lumbar support. That's where most of your shock is at, in your lower back...It does support you more and [there is] less shock when you hit a hole...It's just much better all the way around."

#### Product Questions?

If you have an idea for using SunMate products, but are unsure of how to proceed; or if you have begun a project, and have reached a problem area, give the DSI technical staff a call. Our staff will help you determine the best material for your use.

#### Directory Assistance

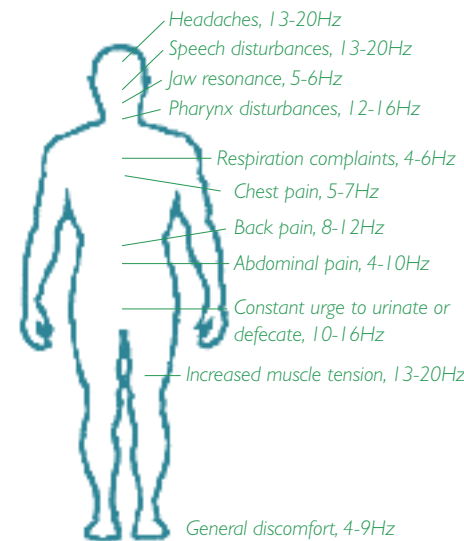
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**FIGURE 1** The illustration above shows worker complaints at various frequency levels. An ergonomic seat designed with SunMate and Pudgee reduced the level of vibration frequencies in a mining shuttle car from 15Hz to 4Hz.

(Continued on the back cover.)

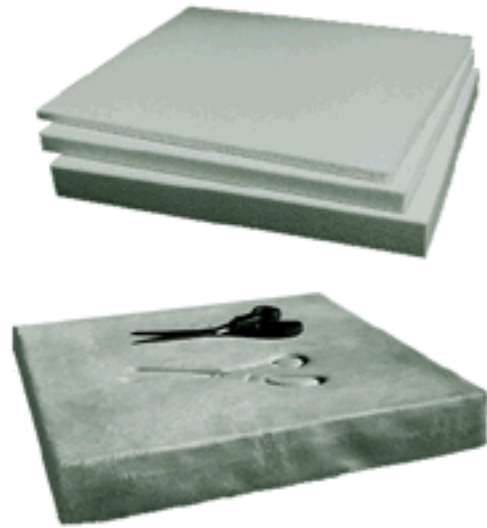
In the News

**Cushion Guide**

The August issue of *Rehab Report* contains a useful "Mini-Guide to Cushions". While it doesn't go into great detail, it does offer a good starting place for research. Without referring to specific brands, the guide objectively compares different materials used in orthopedic seating like foam, gel, air, and polystyrene beads.

This comparison can be very helpful for therapists and clients who have specific orthopedic requirements, who aren't sure which product best suits their needs. Sometimes a combination works when you want to get the benefits of two different types of cushion.

You can find more information on their web site at [www.rehabreport.com](http://www.rehabreport.com), or learn more about polyurethane foam cushion material at Dynamic Systems' site — [www.cheta.net/dsi/](http://www.cheta.net/dsi/) Along with images and detailed descriptions of our products, you will find several links to related sites. Happy surfing!



Up and Running

**Revised Web Site**

This July, the Dynamic Systems web site was redesigned. You can still find all the helpful information you need at the site, regarding SunMate, Pudgee, Laminar, and FIPS cushions, as well as information about special projects. There are links to help you with more specific concerns such as selecting a cushion cover, choosing a fire retardant or waterproof coating for your cushion, and selecting the correct pressure quality and thickness of your cushion.

It's easy to place an order or contact DSI directly from the site. Simply open the contact form, type in the relevant information and send

it via e-mail. You can also post your questions and concerns here, and someone from the company will get back to you right away.

The site has been tested on many different platforms, but seems to work best using Microsoft's Internet Explorer on a PC viewing at an 800 x 600 screen setting. Let us know if you have any difficulties accessing the site.

The web address is: [www.cheta.net/dsi/](http://www.cheta.net/dsi/)

While typing in keywords such as sunmate, pudgee, dynamic systems and foam in place seating should take you to the site, using the address is the quickest and surest way there.

Customer Service

**SunMate Terminology**

SunMate is a type of **polyurethane** foam cushion. Polyurethane is made up of chemical compounds that react to form an interlaced structure of molecules, or cells, the flexibility of which can be controlled to make very soft or very rigid foams. Other foam cushions may be made from latex or solid gel. SunMate is comprised of more than 50% plant derivatives which gives it a sense of freshness other cushions may lack.

The structure of a foam cushion may be described as **high-density** or **low-density**, **open-cell** or **closed-cell**. Density refers to the weight per cubic foot, SunMate weighs 5lb/ft<sup>3</sup>. A closed-cell cushion does not allow air passage, whereas an open-cell cushion does and is softer and more breathable. SunMate is a controlled, open-cell foam which is formulated in a variety of densities or **pressure qualities** ranging from extra-soft to hard.

The pressure quality of a cushion is directly related to its support pressure which might be expressed in PSI (lb/in<sup>2</sup>) and is an indication of the cushion's ability to support a given weight or pressure. Typically, a foam cushion with a support pressure of less than 1PSI is recommended for pressure relief. Firmer cushions offer postural support but little pressure relief. A combination of softer foam for comfort and a firmer foam for support is often an ideal solution.

A unique characteristic of SunMate and Pudgee is **memory**. A memory foam is one which when compressed, holds the shape of the impression for several seconds or even minutes after the pressure is removed. An orthopedic foam shouldn't spring back instantly, it should have **slow spring-back**.

SunMate and Pudgee are **contour cushions**.

This means the material forms around every surface feature of a body. It forms around wrinkles in clothing or a wallet in a back pocket instead of pushing them into the skin. This way SunMate and Pudgee alleviate the pressure points which cause discomfort.

A cushion which **bottoms out** or flattens to the surface beneath it no longer provides support or pressure relief and may result in pressure sores. This may happen if a cushion with a low support pressure quality is paired with a heavier weight than it is designed to support.

Pudgee is a gel foam which will bottom out when used alone. However, when used in combination with a SunMate base cushion, it becomes the ultimate in seating comfort and support (called **Laminar**). Pudgee also works well used on top of a cushioned surface, such as a car seat or office chair. Pudgee has unique properties because it is a gel cushion. This makes Pudgee a good solution for people with sensitive skin and prevents pressure sores from developing or worsening.

Although foam cushions are not inherently waterproof, SunMate may easily be waterproofed with a silicone coating that won't detract from the cushion's support capabilities. Colorful washable fabrics and waterproof fabrics are also available and make nice slipcovers for cushion protection and aesthetics. With proper care a SunMate cushion can last 3-5 years.



**An example of "memory"** These footprint impressions in a Pudgee cushion remain several seconds after the person who made them has left.

Customer Service

**Now Accepting Master Card, Visa and Amex**

Effective August 13, Dynamic Systems, Inc. and its computer division, PC Services, began accepting major credit cards for purchases. By providing an alternative method of payment, we hope to make our products more accessible for customers and facilitate the ordering and payment process.

