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OFFICE OF THE CHAIRMAN

February 24, 1999

Robert Pitofsky, Chairman  
Chairman  
Federal Trade Commission  
Sixth Street and Pennsylvania Avenue, N.W.  
Room 440  
Washington, DC 20580

Dear Mr. Chairman:

I would like to comment for the record on the proposed Care Labeling Rule (16 CFR, Part 423) being reviewed and updated by the Federal Trade Commission (FTC).

The time has come for the FTC and other federal agencies to recognize more environmentally sound and energy efficient dry cleaning alternatives, including the Micare liquid carbon dioxide cleaning system our company developed and launched on February 5, 1999, at a Hangers dry cleaning establishment in Wilmington, North Carolina. Our liquid carbon dioxide dry cleaning machines will be introduced in other markets around the country with as many as 80 machines in operation by the end of this year.

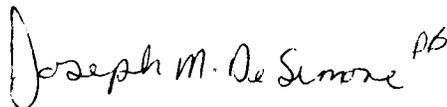
I would strongly recommend that the FTC require a garment care instruction for "Liquid Carbon Dioxide Process." Our company would work closely with the ASTM and the FTC to help develop a definition and test protocol for liquid carbon dioxide cleaning processes. Liquid carbon dioxide dry cleaning methods are no longer an experimental technology but a commercially-viable, environmentally-sound alternative to traditional dry cleaning methods

Enclosed for your review are an information kit and videotape detailing our liquid carbon dioxide cleaning process. We would encourage the FTC to adopt a garment care label for liquid carbon dioxide dry cleaning given its superior cleaning ability, lack of hazardous solvent use, energy efficiency and gentleness to fabrics. It is important that the FTC's Care Labeling Rule be updated to respond to new cleaning technologies like ours, which will soon revolutionize the dry cleaning industry in the United States.

Robert Pitofsky  
February 24, 1999  
Page Two

Thank you very much for your consideration of my input. If you need additional information, I may be reached at (919) 962-2166. Our company's web site is [www.micell.com](http://www.micell.com).

Sincerely,

A handwritten signature in cursive script that reads "Joseph M. De Simone" with a small "AS" written above the end of the name.

Joseph M. DeSimone, Ph.D.  
Chairman and Co-Founder  
Micell Technologies, Inc.

Enclosures (videotape, information kit)

# SOUTHEAST JOURNAL

## Chemist Hopes To Stir Up Dry Cleaners

By KAREN LUNDEGAARD  
Staff Reporter of THE WALL STREET JOURNAL

When chemist Joseph M. DeSimone was busy in the laboratory in the early 1990s trying to come up with an alternative method of manufacturing plastics, starting a company was the last thing on his mind.

But at a press conference Friday in Wilmington, N.C., Dr. DeSimone will announce the launch of Hangers, a franchised dry-cleaning operation that he and backers of his company, Micell Technologies Inc., hope will revolutionize the \$6.5 billion industry. The basis of Dr. DeSimone's claim: a dry-cleaning process that eliminates the use of toxic solvents and is gentler on clothes than other environmentally safe alternative cleaning processes.

On academia's well-traveled but often slow road to commercializing inventions, this scientist has taken a path less traveled—and one filled with higher costs and bigger risks. Instead of just licensing his technology to a company and counting royalties, he has built new dry-cleaning machines. And instead of simply selling the machines, he's trying to franchise full stores that initially would cost operators upwards of \$550,000, and require them to use the Hangers name in an industry known for its mom-and-pop operations.

A successful launch of his discovery "wasn't going to happen on its own. We felt we could do it much faster than anyone," says Dr. DeSimone, who at 34 years old holds a joint position in the chemistry department at University of North Carolina-Chapel Hill and North Carolina State University's chemical-engineering department.

But the deck seems stacked against him. Though chains have tried to consolidate the country's more than 30,000 dry cleaners before, few have succeeded beyond a particular region, says David Uchic, spokesman for the International Fabricare Institute in Silver Spring, Md. And business itself is flat, hurt by casual dress that now is common in many offices.

While the industry welcomes environmentally friendly machines, it doesn't need another franchise operation, says Sto Fox, president of the North Carolina Association of Launderers and Cleaners. And as the second generation to run Fox Cleaners in Greensboro, Mr. Fox says, "I'd

Please Turn to Page 54, Column 5

## N.C. Chemist Makes a Huge Bet On a New Dry-Cleaning Process

*Continued From Page S1*  
never be willing to take the [family] name off" the front of the store. "This is a people business. I have third- and fourth-generation customers."

Mr. Uchic adds that a price of \$150,000 for one of Dr. DeSimone's machines is a "high hurdle" for most cleaners, especially compared with other state-of-the-art dry-cleaning machines that cost between \$40,000 and \$50,000. And while these machines use perchloroethylene, or perc, the toxic solvent Dr. DeSimone's process eliminates, Mr. Uchic says new technology makes these machines safe.



Joe DeSimone

Dr. DeSimone disagrees. "Everything perc touches is hazardous waste," he says. "Everything but the clothes."

Initially, it was a slow process for Dr. DeSimone. It took him 18 months to gain the rights to a secondary invention made while he was trying to replace water with carbon dioxide in manufacturing paint. In order to make carbon dioxide work, he needed to create detergents that were soluble in it. He quickly realized the detergents had many applications in cleaning industries. But the first rights to commercialize the technology belonged to the chemical companies that had sponsored the research.

After a year and a half, he says, all eight companies agreed to allow his company to license the technology, and Micell was in business. But his plan to sell specialty chemicals quickly ran into another hurdle: no customers. Though Dr. DeSimone had talked to dry-cleaning-equip-

ment manufacturers, "they weren't moving at the rate they needed to move at."

After raising \$5 million in November 1996, the majority of it from Greensboro textile maker Unifi Inc., he raised \$15 million last year from Unifi and Soros Fund Management, a New York investment company. The push for franchising came largely from Ken Langone, a director brought to the company by Unifi. Mr. Langone is an original investor in Home Depot Inc. and is founder and head of Invemed Associates Inc., a New York investment bank.

Of the franchising approach, Ken Huggins, a senior vice president at Unifi and chief executive of Micell, says, "Dream a little. It is more capital intensive, it is riskier, but we think the payoff will be better."

Franchisees pay an initial \$25,000 fee and 5% royalty on sales. Initial stores cost \$400,000, not including equipment or the \$150,000 dry-cleaning machine.

So far, three franchisees have signed up, Dr. DeSimone says. One will develop New England, another St. Louis, and the third, the Williams family, launched the Wilmington store in late November and plans to open two more before summer. Ted Williams Jr., the third generation to run the business, which opened in 1941, says he's willing to give up the family name on stores because "this new technology is going to have more pull" than the Williams name. The machine is "light-years ahead of everything out there," he says. "I've bet my family business on it."

SOUTHEAST JOURNAL welcomes your comments—by mail, electronic mail, phone or fax. Letters should be addressed to Ken Gepfert, Editor, Southeast Journal, SunTrust Plaza, Suite 4200, 303 Peachtree St. N.E., Atlanta, Ga., 30308. The phone number is 404-865-0170; the fax number is 404-865-4379; the E-mail address is [ken.gepfert@news.wsj.com](mailto:ken.gepfert@news.wsj.com)

2/3/99

# N.C. firm shows the power of "green" research

Government should encourage more environmental R&D.

BY ANNA VONDRAK  
Staff Writer

WASHINGTON — Congress is notorious for its tendency to divert money for research and development to well-larded pork projects. The federal government is spending \$74 billion on R&D this year. But more than half of that goes to defense. A third of the rest goes to medical research, which consumes a rising share of federal research dollars.

In today's rapidly changing world, however, technological innovation by small firms will become increasingly important in ensuring economic success and en-

vironmental protection. Improved technologies can help industries move from dirty, energy-guzzling manufacturing processes to clean, energy-efficient ones.

An example of seemingly mundane but significant environmental innovation comes from Micell Technologies, a start-up firm based in North Carolina, in the heart of the famed Research Triangle.

Formed in 1995 by three scientists — Joseph DeSimone, Timothy Roestack and James McClain — Micell employs just 26 people. This small team is on the verge of solving one of this nation's most pervasive environmental problems.

Today, most dry cleaners rely on toxic solvents, such as perchloroethylene, or PERC, which can contaminate ground water and may cause cancer in humans after long-term exposure. While liquid carbon

dioxide has long been seen as an environmentally positive alternative, it has not fared well in the marketplace because it simply cannot clean garments to acceptable standards by itself.

Led by DeSimone, a soft-spoken chemistry professor who co-invented the process with his students, scientists at UNC-Chapel Hill developed new detergents that dissolve in liquid CO<sub>2</sub>.

Not only is the toxic substance PERC removed from the dry cleaning equation, but Micell's two new cleaning systems, Micare and Micore, separate and recover the CO<sub>2</sub> and detergents they use. Those waste products can then be recycled — an important factor in preventing run-off pollution from reaching sensitive waterways.

Just as important, Micell's innovation also will play a major role in

protecting the health of tens of thousands of employees in America's dry cleaning industry — and quite likely millions of their customers as well.

The firm's accomplishment caught the eye of R&D Magazine, which named it a winner of its annual R&D 100 Awards, long regarded as the "Oscars of invention."

Thus, a humble dry cleaner joins the fax machines, antilock brakes, and the ubiquitous ATM created by far larger corporations as a leader in cutting-edge technology.

Micell's experience shows that academic research and small company entrepreneurship may be the fastest — and greenest — path to the marketplace.

Congress should speed the discovery process by establishing new R&D tax credits and low-interest

loans to encourage small businesses and universities to expand research activities.

The House and Senate Appropriations Committees recently pledged to double funding for the National Institutes of Health over five years — for starters — increasing NIH funding by \$2 billion this year. Experts in the medical community believe the funding increase will pay huge public health dividends.

Similarly, significant increases in federal funding that supports research for new environmental technologies also will produce big

benefits for Americans — less pollution-driven disease, a greener planet and new industries that create jobs and enhance prosperity.

Continuing technological innovation is the key to America's economic and environmental health it enters the 21st century. Congress should move quickly to bolster R&D and tax incentives in this key area. The time to act is now, while the U.S. still enjoys global economic dominance.

Anna Vondrak is a journalist based in Washington, D.C., and frequently writes about environmental and public health issues.

Ⓞ Micell shows that academic research and small company entrepreneurship may be the fastest — and greenest — path to the marketplace. Ⓞ

# 'Green' technique ready for dry cleaning debut

By PAUL NOWELL  
Associated Press

It's probably unheard-of for the debut of a dry cleaning shop to make headlines.

The new Hangars store opening Friday in Wilmington is distinctive because it features environmentally friendly solvents to remove spaghetti sauce and other stains from garments.

If it is successful, the new technology could replace the more common dry cleaning process that uses toxic solvents like perchlorethylene, or PERC. And it could bring major change to an \$8 billion industry.

For years, the dry cleaning industry has sought a safer alternative to PERC, a toxic cleaning solvent that has been identified by the Environmental Protection Agency as a ground, air and water contaminant and probable human carcinogen.

Besides the pollution risks, the industry has been concerned about the potential dangers to dry cleaners' employees and customers.

"The wholesomeness of dry cleaning is not one of its best selling points," said Joseph DiSimone, a chemistry professor from UNC Chapel Hill who invented the new process with some of his students.

DiSimone is chairman of Micell Technologies, a tiny start-up firm based in Research Triangle Park with connections to UNC and N.C. State University.

According to its inventors, the new process eliminates most of the pollution created by dry cleaners.

"This is the biggest change to come to this industry in 50 years," DiSimone said as he drove from his office in Raleigh to Wilmington for Friday's opening.

"How big is this market? There are 100,000 dry cleaning machines in the world, and 90 percent of them use PERC. You can run the numbers."

Joel Deutsche, executive director of the Atlanta-based South Eastern Fabricare Association, which represents about 1,000 dry cleaning shops in Georgia, Alabama, South Carolina and Florida, has seen a demonstration of the new technology.

"It's the largest single investment in this industry in many years," he said Wednesday. "It's space-age technology for the industry. And it works."

His biggest objection to the Micell equipment is the price: Each machine costs about \$150,000.

Some industry veterans haven't even heard about the new technology. One is Bill Carstens, owner of Quality Cleaners & Laundry, which has six locations in Charlotte.

"At this point, I haven't seen anything on it," said Carstens, who has been in the dry cleaning business for 25 years. "I'm open to anything that would improve the industry and the end product."

As for PERC, he thinks there are

adequate protections.

"It's safe and it takes care of people's clothes," he said. "I'm not worried about it."

The Micell process uses liquid carbon dioxide, which for years has been singled out as a more environmentally sensitive method to dry clean garments. However, it has never caught on commercially because it could not do the job as well as the other solvents.

DiSimone and some of his former students created new detergent systems that dissolve in liquid carbon dioxide. Besides eliminating the toxic materials, the new process also separates and recovers the detergents and carbon dioxide.

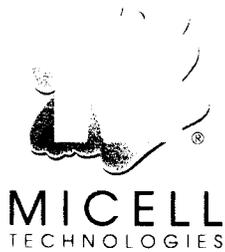
Instead of being flushed away, they are recycled.

The old process requires high temperatures to remove the solvents from the garments. And since PERC is classified as hazardous waste by the U.S. Environmental Protection Agency, it is expensive to dispose of the byproducts, including lint.

The new process doesn't require high temperatures, he said, which is gentler on the garments.

While DiSimone sees great potential in the new process, he also knows that dry cleaning is a cottage industry, with thousands of small players.

In the near future, Micell hopes to sell as many as 150 machines a year. Within five years, he said, Micell should grow into a \$250 million company.



# Micell® Leads The Way In Providing Commercial CO2 Solutions For A Sustainable Environment.

**A**s a sustainable environment grows as a global issue, Micell Technologies® grows as a major partner in sustaining the environment. With its CO2 technology, Micell will eliminate the need for toxic solvents without sacrificing precious water.

Recent advances in the company's CO2 technology will revolutionize the industrial and commercial cleaning processes, giving Micell a decided edge in garment care, metal cleaning and textile processing.

The Micare™ system represents an effective, environmentally safe replacement for conventional dry cleaning and many wet cleaning processes. This liquid CO2 garment cleaning process uses the specially designed 60-pound capacity MICO2 machine, which is similar to today's traditional front load mechanical action machines with gentle wash and extract cycles. A patented detergent system enhances the cleaning ability of the liquid CO2 - which normally cannot dissolve detergents effectively - allowing it to remove the dirt on the garments. After the cleaning cycle, the machine pulls the solution of liquid CO2 and detergents away from the clothes, and then recycles and purifies it.

The Micare system uses the same quality CO2 as used in carbonated beverages. NuCO2, the nation's largest distributor of bulk CO2 to the beverage and restaurant industries, will deliver CO2 to Micell's customers.

In time, the Micell process will replace dangers and inefficiencies associated with the old way of doing things. Perc, identified as a groundwater contaminant, and petroleum, with its dangerous flammability and performance limitations, will soon find their replacement in the Micare system.

Using similar technology, Micell is developing the Miclean™ system, a replacement for vapor degreasers and aqueous washers for metal cleaning applications.

Perhaps the greatest benefactor will be the public, who have been asking for a safe alternative to traditional cleaning solvents and for the preservation of safe drinking water.

The investment community, led by UNIFI Inc., and the Soros Group, has already demonstrated its confidence in Micell. They realize that businesses that adopt Micell's new technology will gain a competitive edge in their industries. They also recognize that a global market exists for this technology, positioning Micell for international growth.

Much of Micell's early success can be attributed to respected researcher and company chairman, Joseph M. DeSimone, Ph.D. who with his team of scientists helped invent the CO2 technology. The group's technical skills are matched by a strong, knowledgeable and dedicated management team and board of directors. Together they insure rapid growth for the company's leading-edge technologies.

Being well run and finding support within the investment community are certainly essential to Micell's growth, but nothing is more important than Micell's dedication to the environment. Micell is an environmentally friendly company. That's the big difference. A difference that will make Micell acceptable to the industries it serves as well as the global community.

**To find out more about Micell, call** .....

[www.micell.com](http://www.micell.com) • [dbarney@micell.com](mailto:dbarney@micell.com) .....

**1.877.MICELL1**



MICARE  
S Y S T E M

# Introducing an Environmentally Friendly Dry Cleaning Alternative

For years, perchloroethylene has been recognized as a danger to people and the environment. In fact, it has been identified as a groundwater contaminant and a probable human carcinogen. That's why finding an acceptable alternative to perc has been a goal of the dry cleaning industry.

With its Micare™ system, Micell Technologies® has done just that. Using Micell's patented CO2 technology, the Micare system can lower variable costs, decrease environmental concerns and eliminate perc and the risks related to it.

The Micare system represents an effective, environmentally safe replacement for conventional dry cleaning and many wet cleaning processes. This liquid CO2 garment cleaning process uses the specially designed 60-pound capacity MICO2 machine, which is similar to today's traditional front load mechanical action machines with gentle wash and extract cycles. A patented detergent system enhances the cleaning ability of the liquid CO2 - which normally cannot dissolve detergents effectively - allowing it to remove the dirt on the garments. After the cleaning cycle, the machine pulls the solution of liquid CO2 and detergents away from the clothes, and then recycles and purifies it.

The Micare system uses the same quality CO2 as used in carbonated beverages. NuCO2, the nation's largest distributor of bulk CO2 to the beverage and restaurant industries, will deliver CO2 to Micell's customers.

While other systems like wet-cleaning and petroleum have been tried, the Micare system is the best solution for dry cleaning. Especially when these Micare advantages are considered:

- Cleaning performance is comparable to or better than traditional dry-cleaning systems.

- Clothes are left free of odors associated with traditional dry cleaning.
- The 39 minute cycle system for a 60-pound load is faster than traditional cleaning processes. Therefore, total system and related efficiencies could reduce a typical dry cleaner's operating cost.
- Because a drying cycle is not required, the possibility for heat damage to clothes is eliminated. Overall, the process is very gentle on garments.
- CO2 is safe. It's the same gas used to carbonate sodas at restaurants.

In addition, time and money are saved by not having to deal with the environmental issues associated with perc and petroleum.

- Time isn't wasted completing paperwork to comply with the environmental regulations related to perc.
- Zoning headaches are eliminated. Stores can be placed in locations best for their long-term business growth.
- Money paid as taxes for perc disposal is saved.
- Getting insurance for the Micare equipment is easy. In fact, AON, a leading national insurance company, estimates the cost for such coverage to be a \$100 rider on a boiler policy.

Micare is happening. The technology is in place. Systems are presently being introduced with leading dry cleaners in three select markets. Orders are currently being taken for the Northeast, Mid-Atlantic and Mid-West markets.

*Interested operators should call Micell Technologies at*

[www.micell.com](http://www.micell.com) • [dbarney@micell.com](mailto:dbarney@micell.com)

**1.877.MICELL1**



**EMBARGOED UNTIL FEB. 5, 1999**

For more information, please contact:  
Tammy Stankey (314) 727-1070 or  
Denise Barney (919) 313-2102 ext. 143

### **National Launch of New "Green" Alternative in Dry Cleaning**

RALEIGH, N.C. (Feb. 5, 1999) -- Hangers™, a franchised dry-cleaning operation that offers an environmentally friendly alternative in dry cleaning, celebrates its national launch in Wilmington, N.C. on Feb. 5, 1999.

Hangers' franchises utilize a revolutionary new cleaning process that eliminates the use of toxic cleaning solvents in dry cleaning. The system is based on a carbon dioxide (CO<sub>2</sub>) process invented by Micell Technologies Inc. in Raleigh, N.C.

The system's most significant environmental benefit is the elimination of the toxic dry-cleaning solvent perchloroethylene (perc) – an environmental contaminant, which the Environmental Protection Agency (EPA) has found sufficient evidence for classifying as a probable human carcinogen.

Micell's CO<sub>2</sub> process has received many scientific accolades, including recognition as one of *R & D Magazine's* top 100 innovations of 1998.

Dr. Joseph DeSimone, professor of chemistry at the University of North Carolina-Chapel Hill and professor of chemical engineering at North Carolina State University, and his former graduate students Tim Romack, Ph.D., and Jim McClain, founded Micell in 1995.

After developing the CO<sub>2</sub> cleaning method, using patented detergents and a specially designed, 60-pound capacity MICO<sub>2</sub> machine, Micell has received backing from numerous respected investors including Unifi, Inc. and the Soros Group. Funding for DeSimone's early research, which led to the discovery of this technology, came from grants by the National Science Foundation and the EPA.

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767 GREAT ROAD  
NORTH SMITHFIELD, RI 02896

401.769.5501



“There are many advantages to using liquid CO<sub>2</sub>. Not only is it a non-toxic, naturally occurring substance, but it also can be recycled as can the detergent systems used in the cleaning process,” said Joseph M. DeSimone, Ph.D., founder and chairman of Micell.

The system is gentler on fabrics than current cleaning methods thereby extending the life of garments. Unlike perc or petroleum-based dry cleaning, no heated drying cycle is required, eliminating heat-related damage to fabrics.

In addition to offering the latest cleaning technology, Hangers provides cutting-edge customer service. With the “Hangers’ Express Service” program, Hangers creates a computerized profile of its customers allowing the franchise to meet the individual preferences for clothing handling and preferred pick-up location of each customer.

The first Hangers is located at 1516 Military CutOff Rd. in Wilmington, N.C. Micell Technologies, Inc. expects to have between 80 to 100 machines in operation by the end of 1999, with the New England area and St. Louis identified as the second and third markets for consumer rollout.

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EDITOR’S NOTE: Interviews are available with:

1. Joe DeSimone, Ph.D. - Co-founder and Chairman of Micell
2. Ken Huggins - Micell CEO
3. Bill Freeman – Micell President
4. Ted Williams - Owner of the first Hangers franchise

# *Congressional Record*

HON. DAVID E. PRICE

OF NORTH CAROLINA

IN THE HOUSE OF REPRESENTATIVES

*Friday, September 25, 1998*

Mr. PRICE of North Carolina. Mr. Speaker, I would like to recognize Micell Technologies, Inc., a high-tech company from my home state of North Carolina that deserves much praise, not only for landing a spot on R&D Magazine's list of 100 most significant Innovations of 1998, but also for discovering a new technology that will benefit people's lives and have a positive impact on the environment.

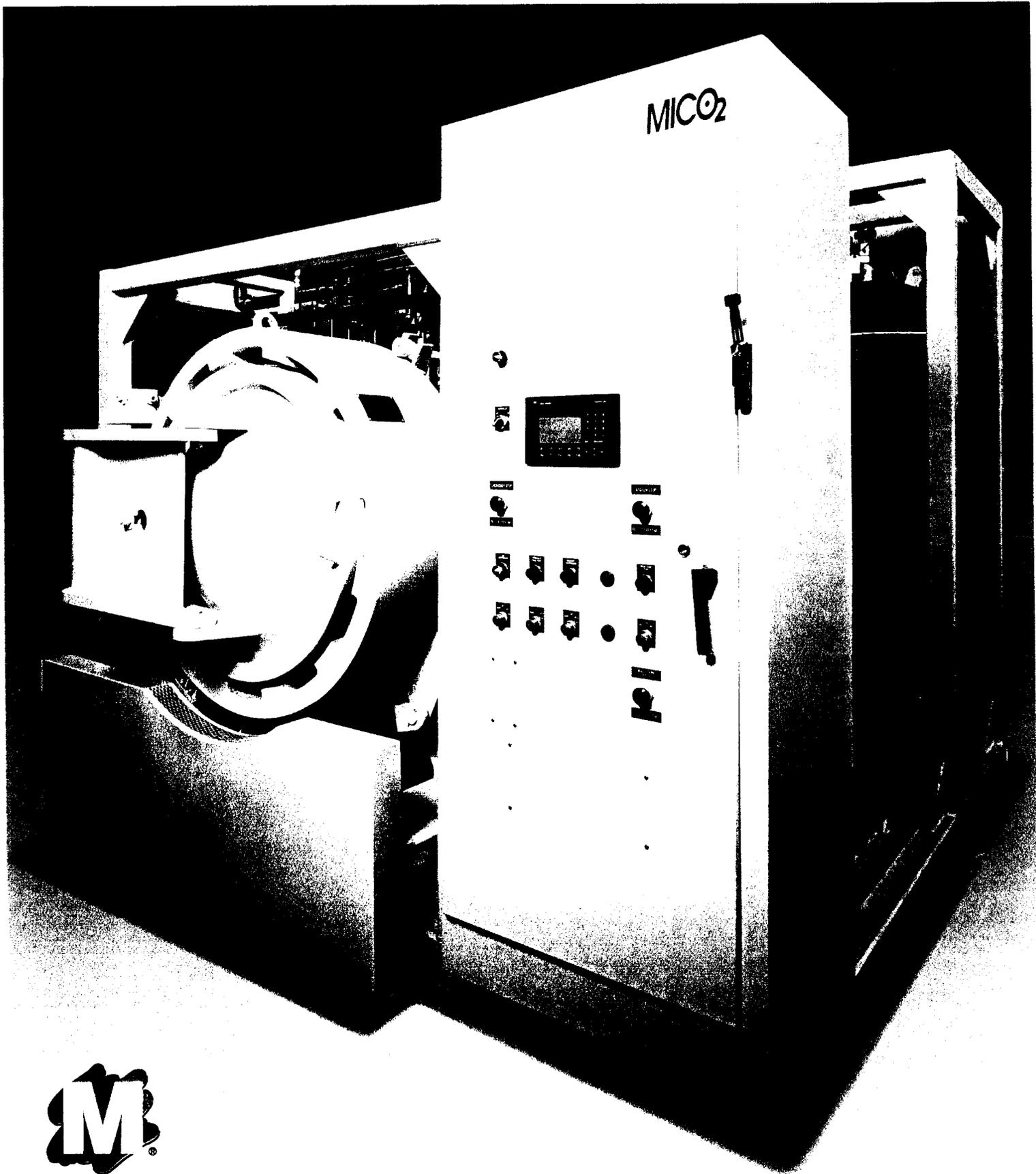
Located in Raleigh and founded only three years ago by Joseph DeSimone and fellow scientists Timothy Romack and James McClain, Micell is being honored in conjunction with Pacific Northwest National Laboratory (PNNL) for advancements in the use of carbon dioxide for professional garment care, metal degreasing, and textile processing.

R&D Magazine has highlighted Micell's newest inventions, the Micell and Miclean solvent cleaning systems, which provide an environmentally friendly alternative to traditional dry cleaning and metal cleaning methods. These systems use a liquid form of carbon dioxide to clean clothing and remove unwanted oils while allowing the carbon dioxide to be recycled time and time again.

This discovery is significant because it will offer an alternative to the use of perchloroethylene, the most commonly used dry-cleaning solvent, which has been known to contaminate groundwater and is also suspected to be carcinogenic. It will protect both consumers and employees in the dry cleaning industry and also help protect our environment.

To help Micell Technologies and others like them, we should be strengthening federal support for basic science and environmental technology development and creating incentives to encourage businesses to adopt environmentally sound, energy efficient, and water conserving processes.

The R&D 100 has been called "The Oscars of Invention." It has honored innovations like anti-lock brakes and the fax and automated teller machines, inventions that have changed the way we live. Therefore, it is with great pride that I publicly congratulate Micell Technologies for their innovative, environmentally friendly technological discoveries.



MICO<sub>2</sub>



MICELL  
TECHNOLOGIES



For more information contact:  
Denise Bentele Heintz (314) 727-1070  
Bill Freeman (919) 313-2102

FOR IMMEDIATE RELEASE

## **Micell Technologies Inc.**

### **Current Situation**

The demand for environmentally safe products has increased in recent years as a result of government regulations and greater consumer awareness of environmental issues. The cleaning industry, for example, which traditionally has used a great deal of water as well as potentially harmful solvents, now has an environmentally safe alternative.

For years, the dry-cleaning industry, in particular, has sought a safe alternative to perchloroethylene (perc), which is a groundwater contaminant and a probable human carcinogen. Petroleum, an alternative to perc, also has its drawbacks, including its potential to ignite as well as the zoning restrictions, taxation and inevitable regulation related to its use.

In response to growing environmental concerns in the dry cleaning and other cleaning industries, Micell Technologies Inc. developed a cleaning system based on carbon dioxide (CO<sub>2</sub>) technology. This alternative process has applications for professional garment care (dry cleaning), metal degreasing and textile processing, and it eliminates environmental concerns.

### **Scientific Basis**

Joseph M. DeSimone, Ph.D., helped invent the cleaning detergents, known as surfactants, which are necessary for effective CO<sub>2</sub> cleaning. For years, scientists worldwide tried to develop a detergent that would dissolve in CO<sub>2</sub>. DeSimone's team at Micell® achieved this goal.

DeSimone serves as a professor of chemistry at the University of North Carolina at Chapel Hill (UNC-CH) and professor of chemical engineering at North Carolina State University. His CO<sub>2</sub> research has won numerous accolades including the Presidential Green Chemistry Challenge Award and a 1998 R&D 100 Award for one of the most technologically significant new products of the year.

### **Company History**

DeSimone founded Micell in 1995 with fellow scientists Timothy Romack, Ph.D., and James McClain. In late 1996, DeSimone and his partners raised \$5 million in corporate and private start-up money. Micell licensed surfactant and coating technologies from UNC-CH and complementary technology from Battelle's Pacific Northwest National Laboratory. The University's Kenan-Flagler Business School then helped develop the company's original business strategy.

-more-

Today, Micell has 27 employees, six of whom are DeSimone's former students. Respected investment teams such as the Soros Group have demonstrated confidence in Micell by investing in the company.

### **The Micare™ System**

The Micare system represents an effective, environmentally safe replacement for conventional dry cleaning and many wet-cleaning processes. This liquid CO<sub>2</sub> garment cleaning process uses the specially designed 60 pound capacity MICO<sub>2</sub> machine, which is similar to today's traditional front load mechanical action machines with gentle wash and extract cycles. A patented detergent system enhances the cleaning ability of the liquid CO<sub>2</sub> - which normally cannot dissolve detergents effectively - allowing it to remove the dirt on the garments. After the cleaning cycle, the machine pulls the solution of liquid CO<sub>2</sub> and detergents away from the clothes, and then recycles and purifies it.

The Micare system uses the CO<sub>2</sub> from the same supply in carbonated beverages. NuCO<sub>2</sub>, the nation's largest distributor of bulk CO<sub>2</sub> to the beverage and restaurant industry, will deliver CO<sub>2</sub> to Micell's customers.

### **The Miclean™ System**

Like Micare, the Miclean system uses liquid CO<sub>2</sub>, but it features a different set of specially designed detergents. The system is designed to remove cutting oils, drawing oils, and other oily contaminants as well as any metal cleaning method known today, without many of the problems associated with those traditional processes.

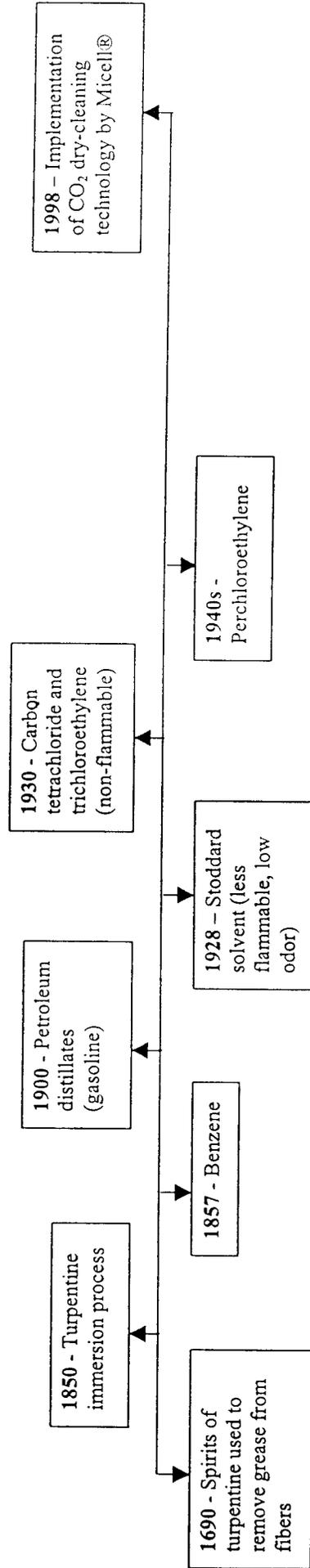
When the cleaning cycle is complete, a unique separation system recovers the CO<sub>2</sub> and detergents for reuse. The Miclean system is designed to replace vapor degreasers and aqueous metal cleaning machines.

### **Location**

Micell is headquartered near Research Triangle Park – one of America's research epicenters. Micell holds membership in the industrially sponsored Kenan Center for the Utilization of CO<sub>2</sub> in Manufacturing, a not-for-profit research organization located on the Centennial Campus. Micell also collaborates with North Carolina State's College of Engineering and College of Textiles, the largest most modern textiles college in the world.

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# History of Dry-Cleaning Solvents



## Micare™ Dry Cleaning Carbon Dioxide (CO<sub>2</sub>) Technology

Over the years, the dry-cleaning industry has tried to find a safe alternative to perchloroethylene (perc), which is a groundwater contaminant and a probable human carcinogen. In addition, the regulatory issues related to perc have become increasingly complicated and costly. Before Micare, CO<sub>2</sub> was seen as a possible alternative to perc, however, no detergent would dissolve in it easily. Then, the scientific and engineering research team for Micell® developed an integrated CO<sub>2</sub> garment cleaning system, which combines a state-of-the-art liquid CO<sub>2</sub> machine with a patented detergent package.

The Micare system represents an effective, environmentally safe replacement for conventional dry cleaning and many wet-cleaning processes. This liquid CO<sub>2</sub> garment cleaning process uses the specially designed 60 pound capacity MICO<sub>2</sub> machine, which is similar to today's traditional front load mechanical action machines with gentle wash and extract cycles. A patented detergent system enhances the cleaning ability of the liquid CO<sub>2</sub> - which normally cannot dissolve detergents effectively - allowing it to remove the dirt on the garments. After the cleaning cycle, the machine pulls the solution of liquid CO<sub>2</sub> and detergents away from the clothes, and then recycles and purifies it.

In addition to the environmental benefits, Micare's CO<sub>2</sub> technology holds many advantages over traditional dry cleaning. The system:

- Cleans effectively with no unpleasant odors.
- Treats garments gently.
- Eliminates the chance of heat-related damage or setting of stains.
- Reduces the safety risk for employees and customers.
- Offers lower variable costs and eliminates solvent disposal cost.
- Reduces operators' regulatory concerns.
- Reduces operators' concerns related to commercial zoning restrictions.
- Does not limit operators' insurance options.

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## **Carbon Dioxide Technology Platform for Micell®**

Imagine a cleaning system that offers:

- No toxic solvents
- Reduced energy requirements
- Simple processing
- High throughput
- No flammability risks
- No government regulations
- No solvent use taxes
- Quality results

**Joseph M. DeSimone, Ph.D.**  
**Founder and Chairman, Micell Technologies Inc.**

Joseph M. DeSimone Ph.D., co-founder and chairman of Micell Technologies Inc., is one of the country's leaders in the development of carbon dioxide applications. His firm commercializes these applications through environmentally friendly cleaning systems that are based on technology DeSimone helped invent.

Under DeSimone's leadership and that of two of his former students, Timothy Romack, Ph.D., and James McClain, Micell® has applied its technology for use in garment care, metal cleaning and textile processing. As described in the 1994 and 1996 issues of *Science*, DeSimone led a research team that created specialty detergent systems that would easily dissolve in CO<sub>2</sub>. The company's Micare™ system – an alternative to traditional dry cleaning – eliminates the need for the solvent perchlorethylene (perc) which has been identified as a groundwater contaminant and a probable human carcinogen.

In addition to his responsibilities at Micell, DeSimone currently serves as a professor of chemistry at the University of North Carolina-Chapel Hill (UNC-CH), professor of chemical engineering at North Carolina State University and as co-director of the Kenan Center for the Utilization of CO<sub>2</sub> in Manufacturing, a not-for-profit research organization sponsored by sixteen corporations from around the world. DeSimone has received numerous accolades for his work with CO<sub>2</sub> solutions including the Presidential Green Chemistry Challenge Award, the Governor's Award for Excellence, the National Science Foundation Young Investigator Award and the Presidential Faculty Fellow Award.

DeSimone has published 78 articles in leading scientific journals including *Science*, *Nature*, *Journal of American Chemical Society*, *Macromolecules* and *Journal of Polymer Science*. He is listed as inventor or co-inventor on 27 U.S. patents. Recently, DeSimone received the Alfred P. Sloan Research Fellowship. He also was named a finalist in for the 1995 Discover Award for Technological Innovation for his advancements with CO<sub>2</sub>. *Business Week* recognized him as the leading researcher in CO<sub>2</sub> technologies.

DeSimone began his career as a research technician at the Pennwalt Corporation in King of Prussia, Pa. DeSimone received his doctorate at Virginia Tech before accepting a faculty position at UNC-CH. Shortly thereafter, he also joined the faculty of North Carolina State University. In 1996, DeSimone earned the Mary Ann Smith Professorship, the oldest endowed chair at UNC-CH.

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## Awards and Honors

### **Micell Technologies Inc.:**

- *R&D 100 Award* (1998) – recognized as one of the 100 most technologically significant new products and processes of the year

### **Joseph M. DeSimone, Ph.D.:**

- *Alfred P. Sloan Research Fellowship* (1998)
- *Presidential Green Chemistry Challenge Award* (1997)
- *Governor's Award of Excellence* (1997)
- *Chancellor's Award for Excellence* (1997)
- *Charles H. Stone Award* (1995)
- *Presidential Faculty Fellow Award* (1993-1997)
- *National Science Foundation Young Investigator* (1992) – Division Materials Research
- *Philip and Ruth Hettleman Prize for Artistic and Scholarly Achievement* (1993)
- *Discover Award for Technological Innovation* (1995) - Finalist

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**William R. Freeman III**  
**President, Micell Technologies Inc.**

Bill Freeman serves as president of Micell Technologies Inc., a firm specializing in carbon dioxide (CO<sub>2</sub>) applications, including environmentally friendly cleaning systems. In this role, Freeman develops commercial strategies for the company's dry-cleaning franchise model, and manages marketing, advertising and sales administration for the firm as a whole.

Before joining Micell® in 1997, Freeman served as president and chief operating officer (COO) of TBWA Chiat/Day in St. Louis. At that firm, Freeman was responsible for office operations, key senior client contact, new business development, public relations and planning. While in this position, he helped oversee the firm's merger with Chiat/Day, developed an extensive new business network, transitioned the movie/studio unit of the company into mainline agency structure and provided solid profit performance.

Prior to the Chiat/Day merger, Freeman was president and COO of TBWA Wolfe Freeman-St. Louis and was president of TBWA Switzer Wolfe-St. Louis. As a senior executive at Leo Burnett in Chicago from 1984 to 1992, Freeman established a solid track record for launching well-known American brands overseas. While living in Hong Kong, he served as regional account director for the Pacific Rim countries. In addition, he established an affiliate office in Seoul, Korea, and helped Leo Burnett's Asian offices adopt U.S. business standards – expertise that will benefit Micell's international expansion efforts.

Throughout his career, Freeman has managed advertising for many of the world's leading brands and companies including Miller Lite, Heinz, Taco Bell, and Kentucky Fried Chicken. He is credited for leading one team responsible for creating the award-winning "Vince and Larry" crash dummies featured in a public service campaign promoting seat-belt use for Elizabeth Dole and the Department of Transportation. Freeman also earned many advertising awards throughout his career including the Addy for "best of show" and several Clios. He has made many contributions to the *CA Magazine* annual showcase issue as well.

Freeman graduated cum laude with a bachelor's degree in business/marketing from the University of Michigan. He served for two consecutive years as communications co-chairperson for the United Way and as a board member for the St. Louis Ad club. He remains active in the Young Presidents Organization and the AAAA St. Louis Board of Governors.

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**Kenneth L. Huggins**  
**Chief Executive Officer, Micell Technologies Inc.**

Kenneth L. Huggins serves as chief executive officer of Micell Technologies Inc. The firm specializes in carbon dioxide (CO<sub>2</sub>) applications including environmentally friendly cleaning systems. Such systems eliminate the environmental concerns surrounding current cleaning methods.

In addition to his responsibilities at Micell®, Huggins presently serves as the senior vice president and assistant to the president at Unifi, Inc. There he helped establish a yarn-dyeing business that is now recognized as one of the leading firms in the industry. Huggins also worked for two years at Allied Chemical in fibers research. He is a former president of Macfield Yarn Dyeing and served as one of the founders of Macfield Texturing. Huggins has gained CO<sub>2</sub> knowledge through yarn-dyeing research and is using that experience to promote the growth of Micell.

Huggins earned a bachelor's degree with honors in textile chemistry from North Carolina State University in 1964. He was recognized as the Distinguished Alumni for the College of Textiles at that university in 1997. Huggins studied business at the graduate level at the University of North Carolina in Greensboro, N.C. Additional training includes the American Management Association's president's course and the executive program for the Darden School at the University of Virginia.

Prior to beginning his professional career, Huggins was commissioned as a second lieutenant of the U.S. Army during the Vietnam era. He also was the honor graduate in officer's candidate school at Fort Lee, Va.

Huggins is currently a member of the dean's advisory committee for the College of Textiles at North Carolina State University, the Triad and Central North Carolina executive committee for Wolfpack Pride Campaign and the American Textile Manufacturers Institute. He is also the chairman of the IAB board for the consortium for CO<sub>2</sub> research in textile processing and a member of the board of directors for the American Yarn Spinners Association and Greensboro Triad Textile and Apparel Club.

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**MICELL**  
TECHNOLOGIES

**The technological leader in  
providing CO<sub>2</sub> solutions for  
a sustainable environment**



**MICELL**  
TECHNOLOGIES

**CARLENE BONNER**  
DIRECTOR OF BUSINESS DEVELOPMENT

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