Cutting-Edge Clean

A look inside how this Texas-based company is improving air quality, efficiency, and morale as it scales production

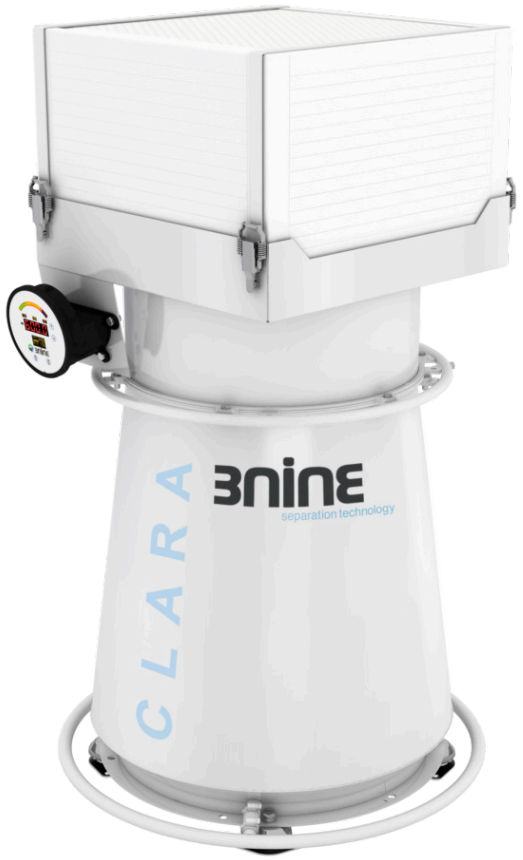
Aaron Fagan, Senior Editor

The importance of clean air in manufacturing is often underestimated, yet it's one of the critical elements that can impact both production efficiency and employee well-being. This is particularly true in facilities that rely heavily on CNC machining, where oil mist and coolant byproducts can create significant air quality challenges. Wolfram Manufacturing, based in Austin, has addressed this challenge head-on by integrating advanced mist collection systems into its operations.

For Wolfram, a rapidly growing high-precision manufacturing firm, maintaining a clean, efficient workspace is as important as producing quality parts. Specializing in industries like aerospace, defense, and oil & gas, the company operates in a high-stakes environment where machine uptime and employee productivity are paramount. However, managing the oil mist produced by their machines had long been a persistent issue. That is until they discovered a solution that changed the game: 3nine mist collectors.

Specifications

Suitable for cabin size: <353 CF
Air flow: 600 CFM
Operating conditions: <122°F
Power supply: 30/15 A, 230/460 V/3/60 Hz
Motor rating: 1.5 kW
Rated current: 5.6 A (230 V), 3.6 A (460 V)
Weight: 154 lbs
Height: 45”
Diameter: Ø 25.2”
Inlet pipe: Ø 6.3”
Sound level: <65 db (A)



The oil mist eliminator Clara by 3nine is suitable for just about any type of machine tool with a cabin size not exceeding 353 CF (10 m^3). The Clara effectively cleans the oil mist formed during parts processing and delivers clean air into the workshop, along with recycling almost all of your oil/coolant for reuse.

3nine is a Swedish company that develops solutions for the purification of processed air for the metalworking industry. The technology is based on centrifugal separation, using a disc stack which produces an extremely high degree of purification in a very compact format. Disk stack technology, also known as a disc stack centrifuge or separator, is a separation technology that uses centrifugal force to separate solids and liquids based on their density. The technology differs from traditional technologies such as rotating filters, electrostatic filters and mechanical filtration solutions by physically separating out the oil particles from the air instead of collecting them in filters. This allows for the immediate reuse of expensive cutting fluids and reduces maintenance.

A Breath of Fresh Air in CNC Machining

Stepping into Wolfram Manufacturing's facility today, you wouldn't know it was a place where heavy-duty CNC machining takes place. The air is clean, and the shop floor is free from the usual haze of mist that characterizes many machine shops. This hasn't always been the case, however.

"At our previous facility, you'd open the door to the shop, and you could immediately see and smell the coolant mist," says Kirby Martinez, optimization manager at Wolfram. "It wasn't just an inconvenience, it was a growing concern for us." This mist wasn't just a visual issue; it also posed a potential health hazard, not to mention the constant need for cleanup and maintenance that came with it. Employees often complained about the sticky residue that coated surfaces, leading to discomfort and reduced morale.

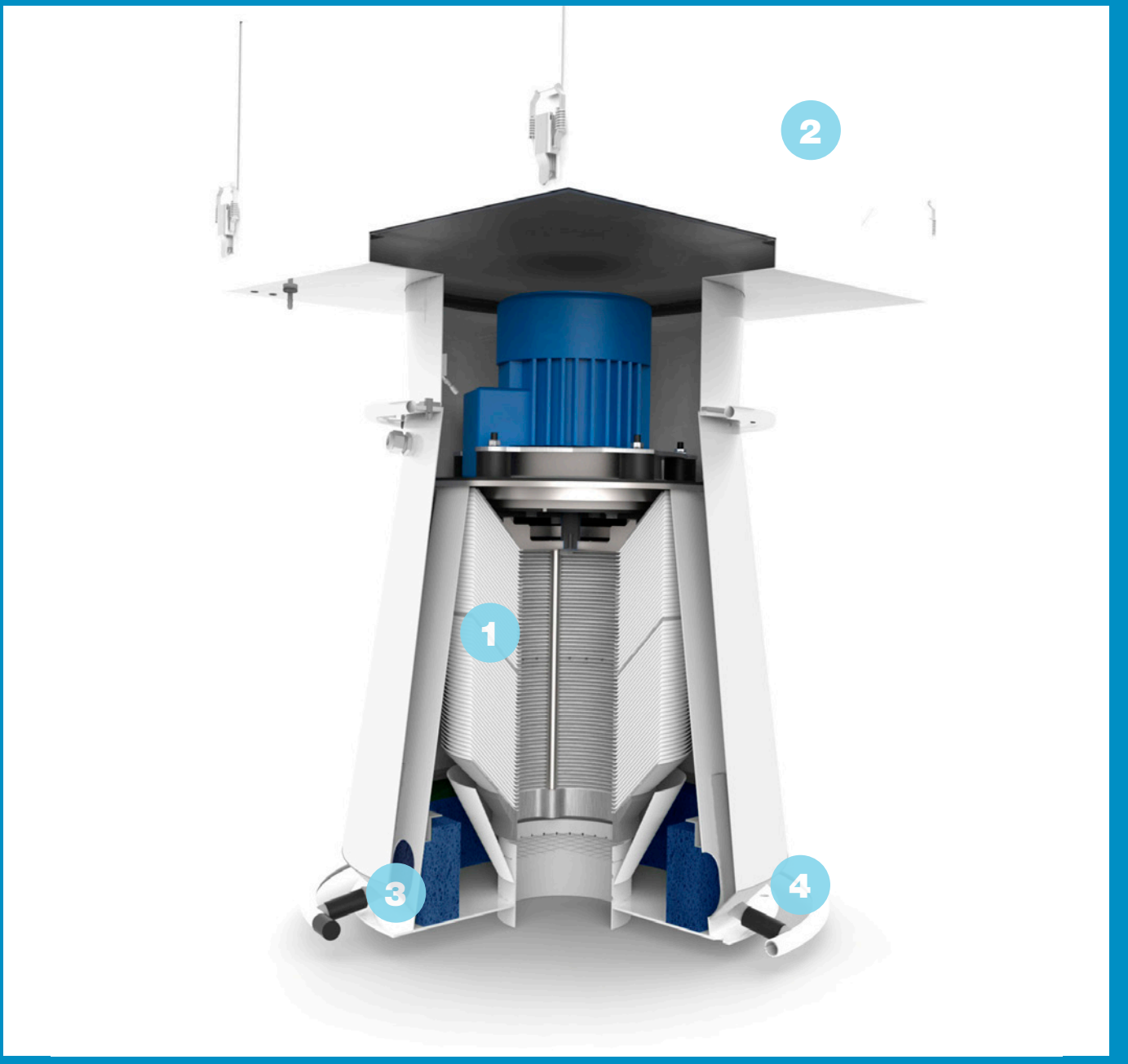
Wolfram initially attempted to address the issue with traditional ventilation systems. These systems helped to an extent, but they were far from a comprehensive solution. "Ventilation would reduce the problem, but it never really solved it," Martinez explains. "We needed something more targeted, something that could eliminate the mist at its source."

Enter 3nine. After extensive research, Wolfram decided to invest in 3nine's advanced mist collectors. These systems, which work by separating oil mist and coolant particles from the air, promised not only cleaner air but also increased efficiency. The technology operates by capturing mist at the point of origin—right at the CNC machines—and filtering it out before it spreads through the workspace. This was exactly the solution Wolfram needed.

Cutting Costs, Reducing Downtime, and Improving Efficiency

The benefits of the 3nine system were immediate. In fact, the first unit that Wolfram installed had such a profound effect that the company quickly expanded its use across the facility.

"We started with just one unit to test it out, but we quickly realized we needed more," says Chris Swaim, director of strategic initiatives at Wolfram. "The results were clear. Not only was the air cleaner, but we also started seeing reductions in downtime and maintenance costs."



Operating Principle

1. Permanent media—The oil mist enters the disc stack where 99.9% of the fluid particles are separated from the air down to 1µm.
2. H13 HEPA filter—The particles smaller than 1µm, will be collected by the final stage HEPA filter.
3. Fluid Recovery—The separated cutting fluid is returned to the machine tool for reuse.
4. Self-Cleaning—The disc stack is automatically and continuously cleaned with the CIP (Clean in Place) system using clean cutting fluid from the machine tool.

The design of the 3nine system offers significant advantages over traditional mist collection systems. Unlike bulky ventilation units that require extensive piping and large floor space, the 3nine collectors are mounted directly on top of the CNC machines. This space-saving design was crucial for Wolfram, particularly as they moved into their new facility.

"Our current space has a drop ceiling, which helps keep the temperature down, but it also limits how we can position large equipment," says Martinez. "The compact size of the 3nine units allowed us to make the most of our available space without compromising our cooling systems."

The space savings are just one part of the equation. The 3nine mist collectors also reduce the need for constant cleaning, allowing workers to spend more time on productive tasks rather than wiping down surfaces or changing filters on older systems.

Before installing 3nine, filter changes were frequent, time-consuming, and expensive. Now, filter changes are minimal, and the units themselves are incredibly efficient. "We've cut down our filter change costs by over $4,600 a month," Swaim notes. "That's significant, especially when you're talking about scaling operations."

Air Quality and Employee Morale: An Unexpected Benefit

One of the most unexpected benefits of the 3nine mist collectors has been the noticeable boost in employee morale. While air quality may not be the first thing that comes to mind when thinking about job satisfaction, it's something Wolfram's team has come to appreciate deeply.

"There's definitely a difference in the atmosphere on the shop floor," says Martinez. "You never fully get rid of the smell in a machine shop, but not seeing or breathing in that visible mist makes a big difference."

In fact, Wolfram's employees have reported feeling more comfortable and less fatigued since the installation of the new system. There's a psychological aspect to it as well: stepping onto a shop floor that's clean and clear of mist creates a sense of pride in the workspace. Employees are more focused and productive because they aren't dealing with the discomfort that used to come from the mist and the odor.

This morale boost has had a tangible effect on Wolfram's overall productivity. "Happy employees are productive employees," Swaim emphasizes. "When people feel good about where they work, they're more engaged and motivated. That translates into higher output and better quality."

Visitors to the facility have also noticed the difference. "When someone walks into a hazy shop, it leaves a negative impression," Martinez says. "But now, when visitors come through, they're impressed by how clean and clear everything looks. It's a point of pride for us."

Transforming Shop Conditions

One of the key challenges in gear manufacturing is maintaining a clean and safe working environment. Traditional air filtration systems often fall short, allowing oil mist and other contaminants to settle on machinery and surfaces, leading to increased cleaning time, machine wear, and potential health hazards for

employees. However, innovative solutions like the 3nine mist collectors are changing the game.

Nathan Byman, founder and president of Wolfram Manufacturing, offers a firsthand account of the transformative power of 3nine in his shop:

"3nine, at this point, is the end game of what we've found for air filtration. We have about 20 years working through different manufacturing environments, from old forging facilities that had machining on the shop floor where everything is charred and blackened. And you wipe the machines to see what colors they are through all kinds of manufacturing facilities that considered themselves clean and used a lot of different air filtration along the way and suffered all the consequences of just everything getting sticky and covered and harder to clean day to day.

"Fast forward, we're in a shop with bright epoxy floors and interior office tiling on the ceiling, and the only way it is possible to run a shop in that environment is with a system like the 3nines. So as far as I'm concerned, we have found the end game, and it's the only thing we'll be using going forward."

Byman's experience illustrates the profound impact that air filtration can have on not just air quality but the entire shop environment. His team has moved from working in dirty, oily spaces to clean, efficient conditions where the air is free from mist, allowing for better machine performance, a safer working environment, and less downtime spent cleaning.

The Numbers Behind the Success

Wolfram's investment in 3nine mist collectors has proven financially sound. By using their Production Management Software, OnTakt (*ontakt.com*), to track downtime costs from previous systems, the leadership team demonstrated the ROI of the new collectors even before purchase, confirming their value both in improved air quality and overall efficiency.

Here's a breakdown of the financial impact:

- **Cost per unit:** Each 3nine unit costs approximately $13,000, a figure that might seem high at first glance but quickly proves its value in terms of cost savings and improved efficiency.
- **Filter change savings:** Prior to installing 3nine units, Wolfram was spending upwards of $4,600 per month on filter changes for traditional mist collection systems. The 3nine units require far fewer filter changes, slashing these costs by about 90 percent.
- **Reduced cleaning:** With the mist largely eliminated, Wolfram's cleaning staff now spends about 25 percent less time maintaining the facility. This translates to significant labor savings—around $800 per month.
- **Downtime reductions:** Machine downtime due to mist-related issues has dropped dramatically. With each 3nine unit saving approximately two hours of machine downtime per month, Wolfram estimates they save thousands in lost productivity each year.

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filtration
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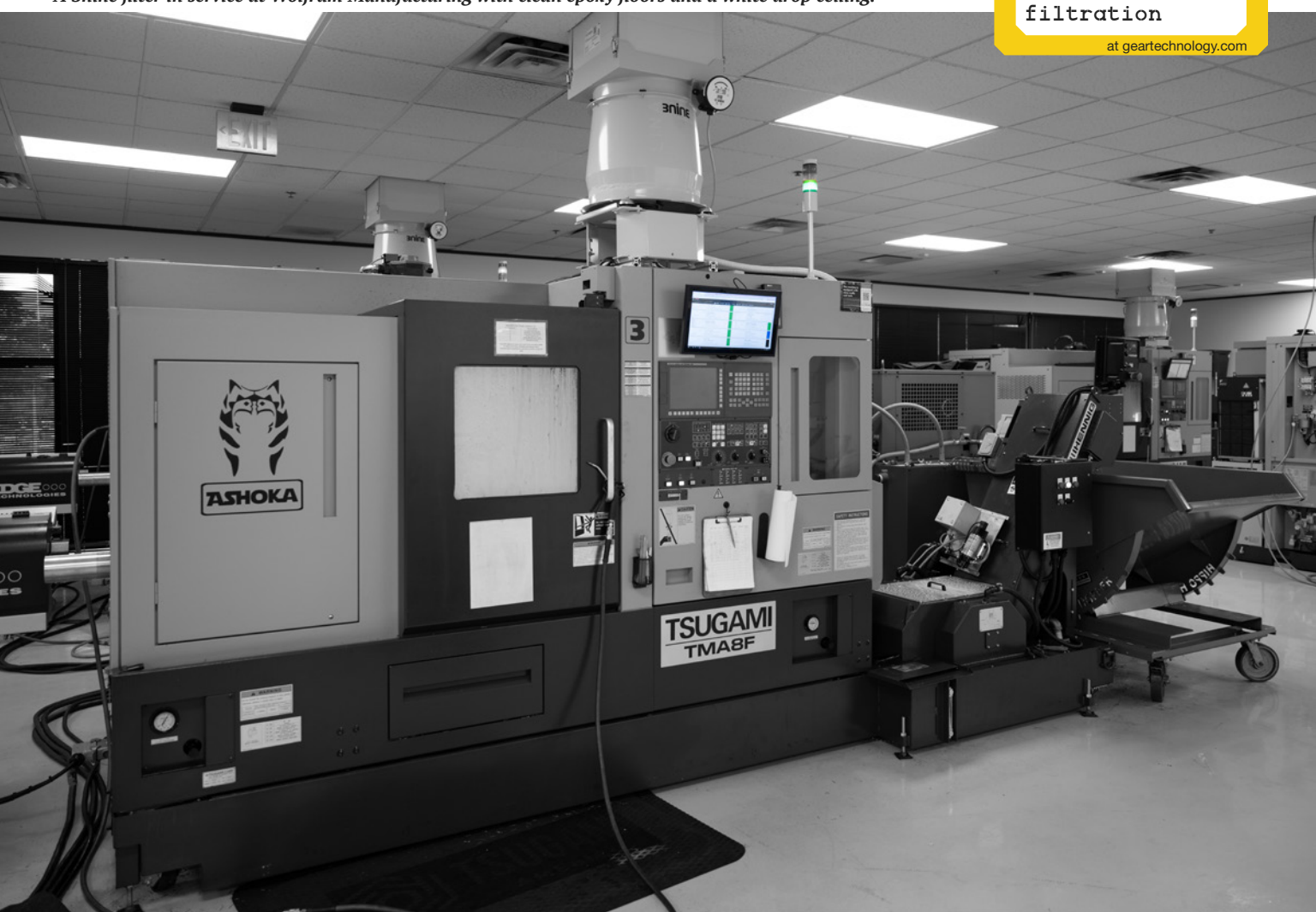
A 3nine filter in service at Wolfram Manufacturing with clean epoxy floors and a white drop ceiling.



The Numbers Behind the Mist

- **Cost of each unit:** $13,000
- **Monthly filter savings:** $4,600
- **Monthly cleaning savings:** $800
- **Total monthly savings:** $5,400
- **Payback period:** 19 months

In total, Wolfram estimates the 3nine units save them roughly $5,400 per month across the facility. This means that each unit pays for itself within about 19 months—an incredibly short payback period given the lasting impact on the facility.

"The return on investment was clear from the start," Swaim says. "We didn't just gain a solution for air quality; we gained a tool for efficiency and cost savings."

Scaling Up with Confidence

Wolfram Manufacturing is in growth mode. As the company continues to expand its operations to meet increasing demand, it plans to stay ahead of potential challenges—particularly air quality concerns—by continuing to invest in 3nine mist collectors.

"We're adding more machines all the time," says Martinez. "With every new machine, we're installing a 3nine unit right alongside it. It's a critical part of our strategy as we scale up."

This forward-thinking approach has positioned Wolfram not only as a leader in its industry but also as a model for modern manufacturing. By embracing technology that improves both operational efficiency and employee well-being, the company is setting a new standard for what a manufacturing facility can be.

A Blueprint for the Future of Manufacturing

Wolfram Manufacturing's success with 3nine mist collectors serves as a powerful example of how modern technology can solve age-old manufacturing problems. By prioritizing air quality, the company has not only improved the working environment for its employees but also boosted productivity, reduced costs, and optimized its operations for future growth.

As more manufacturers look to scale their operations while maintaining high standards of quality and efficiency, Wolfram's experience with 3nine offers a valuable blueprint. By adopting innovative solutions like advanced mist collection systems, companies can create cleaner, more efficient, and more productive workspaces—ultimately driving success in an increasingly competitive marketplace.

"In today's world, it's not enough to just produce good parts," says Swaim. "You have to create an environment where people want to work, where operations run smoothly, and where every investment counts. That's what we're doing with 3nine."

For more information about 3nine oil mist eliminators, contact *Shanti.Kachele@3nine.com*.

3nine.us