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Air Flow Monitoring Supports Colgate-Palmolive's Sustainability Initiatives

IIOT-enabled flow sensor helps consumer products company reduce the wasted energy from its pneumatic systems.

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Leaks happen. And even the best designed pneumatic systems will at some point in time suffer from leaks. A fitting may work its way loose, or the seals in pneumatic components may wear over time. The resulting leaks are wasteful and costly—both to your bottom line and to the environment. You can, however, effectively combat leaks by implementing a real-time compressed air monitoring system. Continuously monitoring compressed air usage will let you quickly identify and respond to those inevitable leaks.



Mounted in-line as a stand-alone device or as part of an air preparation system, the AF2 monitors compressed air usage in real time.

Equally important from an energy reduction standpoint, compressed air monitoring can provide insights that help you optimize the supply pressures to match the true demand requirements of your pneumatic processes. This approach stands in contrast to the commonplace, but potentially wasteful, practice of simply relying on nominal supply pressures recommended by pneumatic component manufacturers.

Colgate-Palmolive is a caring, innovative growth company that's reimagining a healthier future for all people, their pets, and our planet. As part of an ambitious plan to achieve net zero carbon in operations by 2040 (go to [pwgo.to/7287](https://www.pwgo.to/7287) to see the full plan), the company has

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embraced compressed air monitoring as an essential tool in its efforts to reduce wasted energy in its manufacturing plants. "With a brand that is in more homes than any other, Colgate has the responsibility to find innovative solutions to sustainability challenges such as wasted energy. One of the main drivers of energy consumption in many of our plants is compressed air," says Andres Bejarano, Colgate-Palmolive's Global Technical Director for Home Care Products. "We see compressed air monitoring as a valuable tool not just to reduce waste from leaks but also to optimize our pneumatic processes so they use compressed air more efficiently and, ultimately, contribute to our efforts to reduce our carbon footprint."

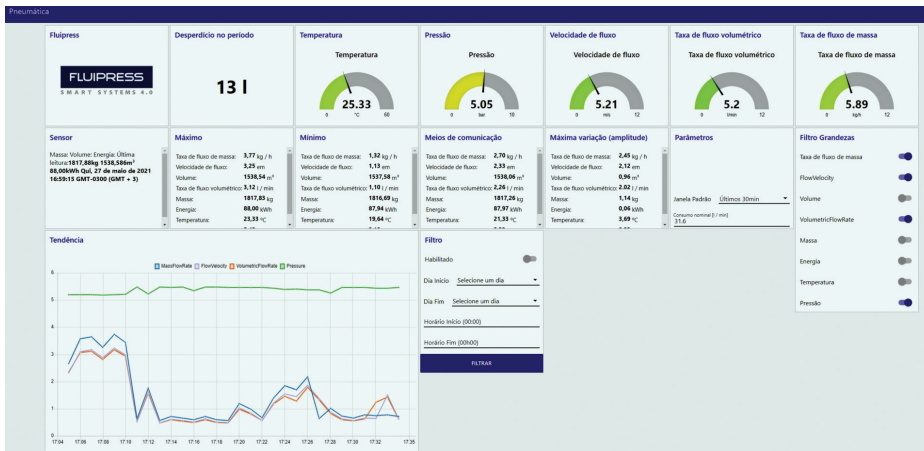
Over the past year, Colgate has implemented real-time compressed air monitoring on several of its production lines in South America. Bejarano reports that the company first piloted continuous compressed air monitoring on a single toothbrush tufting machine in Sao Paulo, Brazil. The success of that project led Colgate engineers to install a similar monitoring system on all tufting machines in Brazil and toothpaste packaging lines, also in Brazil and Mexico. "The toothpaste packaging lines now have compressed monitoring from filling to palletizing," he says, adding that the company has plans to expand compressed air monitoring to additional manufacturing and packaging operations across the globe.

Flow sensing gets smart

At the heart of Colgate's approach to compressed air monitoring is the Emerson Aventics AF2 Smart Flow Sensor. Mounted in-line as a stand-alone device or as part of an air preparation system, the AF2 flow sensor monitors compressed air usage in real time. Its calorimetric sensing cell accurately measures air flow, pressure, velocity, volume, and energy.

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The AF2 flow sensor's calorimetric sensing cell measures air flow, pressure, velocity, volume, and energy. The device also calculates and stores descriptive statistics on the usage data.

The device calculates and stores descriptive statistics on the usage data—including minimums, maximums, averages, and total energy consumption. The AF2 surfaces all this historical usage data via an integrated web server or over Ethernet IIOT communication protocols such as MQTT and OPC UA. AF2 also features IO-Link connectivity.

In Colgate's implementation, the AF2 communicates usage data to a SQL-based data historian via OPC UA. Colgate-Palmolive also makes use of the AF2's integrated web server and an analytics dashboard. According to Bejarano, the AF2's Ethernet connectivity options made the system easy to deploy with the web server, providing immediate insights at the machine level and the IIOT standards paving the way for plant-wide or even global analysis of compressed air usage.

Less waste, optimized usage

Armed with the compressed air usage insights provided by the AF2, Colgate has already made substantial progress in reducing air consumption—and the associated energy use. Bejarano reports that the first machines have seen roughly a 15% reduction in compressed air usage. He expects similar or even greater savings as the AF2 rolls out more widely.

The savings have come primarily through optimization of supply pressures, rather than simply finding leaks. As Bejarano explains, Colgate already had a successful leak reduction program in place—based on acoustic imaging. That system, however, didn't provide insight into how much compressed air a given machine really needs. "AF2 gave us a better understanding of how to match air supply and demand," Bejarano says. "The system let us see the peaks and valleys of our processes and not just rely on recommendations from our pneumatics suppliers."

Given the heavy reliance on pneumatics in large-scale consumer goods manufacturing, reducing the wasted energy associated with compressed air makes a substantial contribution to Colgate's sustainability mission to create a healthier, more sustainable future for all. But Bejarano describes flow monitoring as just part of a larger digital transformation strategy that includes other IIOT monitoring devices that together can support not just sustainability efforts but also overall equipment effectiveness (OEE). "Air flow monitoring is just the tip of the iceberg," he says. —*Pat Reynolds*

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Prioritizing Sustainability at Colgate-Palmolive

Reducing compressed air leakages and improving energy efficiency are part of Colgate-Palmolive's global sustainability and social impact strategy. Here are some of the other steps the company has recently taken to reimagine a healthier future for all people, their pets, and our planet:

- **Increasing recyclability.** Colgate introduced a first-of-its-kind recyclable toothpaste tube and is openly sharing the design with other manufacturers. The company is also actively educating stakeholders in the packaging and recycling sectors to adopt this new tube.
- **Decreasing waste and emissions.** Sixteen Colgate manufacturing facilities on four continents have achieved a Zero Waste certification from the U.S. Green Building Council—a number that includes more facilities in more regions than any other company. In addition, Colgate's manufacturing facility in Burlington, N.J., has achieved LEED Zero certifications for waste, carbon, energy, and water, a world first.

- **Saving water.** Since 2016, Colgate-Palmolive's "Save Water" program has conserved roughly 155 billion gallons of water. Less water also means less energy usage—and a reduction of about 8.3 million metric tons of greenhouse gas emissions. During Climate Week at the United Nations General Assembly, Colgate even hosted a panel discussion to further gain support for water conservation.

In addition to these steps, Colgate-Palmolive is listed as a leader within the United Nations Global Compact—the world's guiding leader on the UN's Sustainable Development Goals. The company was also added to the 2020 Dow Jones Sustainability World Indices, and was named a Household Industry Sector Leader. Most recently, Colgate received a 2021 U.S. EPA ENERGY STAR Partner of the Year Award for the 11th consecutive year and was honored as one of Fast Company's Most Innovative Companies of 2021.

To learn more about sustainability at Colgate-Palmolive, go to pwgo.to/7288.