

The background of the image is a blue-tinted photograph of laboratory glassware, including Erlenmeyer flasks and beakers, some containing liquids. In the foreground, a portion of a periodic table is visible, showing elements like Carbon (C), Nitrogen (N), and Silicon (Si).

Sometimes It's Smarter
to Make Your Own...

(Nitrogen, that is.)

The specialty of pain management integrates challenges unique to the medical arts, including the use of medications with the potential to cross react with other medications or even cause dependency if abused. Careful management of these medications is crucial to successful patient outcomes.

Castle Medical, LLC of Smyrna, Georgia, is a leading provider of drug management and monitoring to physicians specializing in pain management. The company pushes the leading edge of toxicology laboratory science by conducting a complete spectrum of medication monitoring services that provide physicians with valuable feedback regarding the effectiveness and adherence of current pain management practices.

In the company's state of the art toxicology laboratories, Castle Medical technicians use specialized equipment and procedures to test for the presence and concentration of dozens of drugs in the most frequently abused classes of pharmaceuticals:

- Opiates/Opioids
- Amphetamines
- Benzodiazepines
- Barbiturates
- Z Drugs
- Alcohol
- Illicit Drugs





“Medication management and drug confirmation testing at Castle Medical is based on spectral chromatography analysis,” according to Jim Gray, Facilities Manager at Castle Medical. “We operate a quantitative drug confirmation laboratory facility that goes far beyond the basic drug screening provided by traditional laboratories. With an oral, blood or urine specimen, we can determine what drugs are in someone’s system, at what levels, and if any of the drugs are counteracting each other. We can also tell if drugs are being taken in other than the amount prescribed, which could indicate over-medication or even an illicit use for drugs that aren’t accounted for. Being able to quantify this information for each patient is extremely important for pain physicians.”

A critical component of Castle Medical’s advanced laboratory testing methods is nitrogen gas, which is used in three phases of process:

- **To break down specimens and isolate different chromatographs on different drugs**
- **To sanitize the system between specimens**
- **To flush waste from the system**

“Each of our machines has a flow rate of 40 liters per minute, and we have 17 machines that run pretty much 24/7,” Gray explains. “We use a lot of nitrogen, which we make on site.”

Why doesn’t Castle Medical just buy nitrogen from a bulk supplier? “For starters, we would need a holding tank the size of a railroad car,” says Gray.



“When we costed it out, we found that compared to buying bulk nitrogen, we were in the black in 18 months by making our own, plus we have the ability to make only what we need.”

Castle Medical’s nitrogen generation system includes an air compressor, a mist eliminator, three specialized filters, a nitrogen generator and two holding tanks—all Atlas Copco products. The compressor and filtration systems supply a reliable stream of extremely clean and dry compressed air to the nitrogen generator, which separates out everything that isn’t nitrogen.

The Atlas Copco Mark V Elektronikon controller enables Gray to set the pressure at which the compressor

loads and unloads, so the system automatically increases or decreases nitrogen generation as needed. The compressor builds to 150 psi to create finished nitrogen pressure of 100 psi. The leftover gas, which is about 21% of the original air volume and predominantly oxygen, is safely vented outdoors to prevent an oxygen-rich environment inside the facility.

“Our purchase decision was driven partially by price, of course, but when I was doing research on nitrogen systems, most of the quotes I was getting from other vendors were using the Atlas Copco compressor anyway,” says Gray. “Only the nitrogen generators were different, and when I compared the various nitrogen generators, I found Atlas Copco’s

Castle Medical is passionate about the assuagement of drug misappropriation and abuse, and continually investigates new ideas related to pain medication monitoring and pain management testing to help provide the safest and most efficacious medication management possible.



to be as good or better than the others. For me, the bottom line was a good price and buying direct from the manufacturer. That meant the whole system—compressor, generator, filtration, and tanks—came straight from Atlas Copco.”

Gray emphasizes that he had worked with compressors before in construction and knew the basics, but he never had put together anything as big as this toxicology lab. “I had a lot of questions,” he recalls. “Will the compressor provide this flow rate, can it pass this test, and many more. What I learned is I could rely on Jason. (That’s Jason Hobbs, Sales Manager at Atlas Copco Compressors LLC.) Either he knew the answers or where to find them. It’s important to me for a sales guy to be able to say, ‘I don’t know the answer to that, but I’ll find out and get back to you.’ Jason came through for me.”

“We did spend a lot of time discussing Castle Medical’s needs and answering Jim’s questions,” Hobbs says. “When they were finally ready to make the purchase they wanted the system right away. The 150 psi setup they

needed is something we don’t stock, simply because 125 psi is much more common. The difference between the two systems is essentially gearing, so instead of building a new compressor to order we took a 125 psi machine and reconfigured it at our Houston Engineering Center to produce air at 150 psi. This resulted in the right machine at Castle Medical with far less lead time. I’m proud of the way Atlas Copco took care of this for our customer.”

“The system was installed in September 2013 and it’s been running great,” Gray reports. “There was one small issue early on and I got on the phone with a tech who talked me through a bypass. They got a new part here in a couple days and we had no productivity loss. Actually I’m kind of glad we had a small issue so I could see how fast a problem gets resolved. Props to Atlas Copco’s techs and customer service people because they were right on it. The whole system has really come together for Castle Medical. I’m pleased and I’m looking forward to doing business with Atlas Copco again.”

CASTLE MEDICAL’S NITROGEN GENERATION SYSTEM:

*GA22+ – 150 Full Feature
compressor*

LV400 – 200 tanks (2)

MLME – 40 mist eliminator

PD70+ coalescing filter

QDT60 carbon filter

NGP47 nitrogen generator

DDp35+ particulate filter

*All engineered, manufactured,
sold and backed by Atlas Copco*

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