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TRENDS IN COMMERCIAL, INDUSTRIAL, AND INSTITUTIONAL CONTRACTING

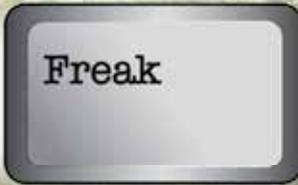
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the **NEWS**

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Air purity and energy consumption fall into place when you're in total control.

Imagine control of indoor air quality with such incredible efficiency it lowers operating costs. Either as a complete recirculation unit or one that mixes return and outside air, IFL delivers virtually pure, contaminant-free air with exceptional filtration and dehumidification at temperatures as low as 50°F — all with web-accessible, AdaptAire™ direct digital controls. The system can even incorporate HEPA filters.

Erratic temperatures and contaminants can be costly for indoor cultivation — given that mold, mildew and pests can destroy a million-dollar crop in a single day. Fortunately, our IFL provides so much control, it's downright freaky.

To learn more, visit: mestex.com/IFL



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HVAC Systems Impact Indoor Cannabis Cultivation

Medical mainstreaming means that marijuana now is big business



Marijuana has come a long way since the time it first gained widespread popularity as the psychotropic darling of the 1960s counterculture. Today, it has earned broad acceptance — and, in the process, considerable gravitas — as a medical therapy for the treatment of many diseases and conditions, including AIDS/HIV, Alzheimer's, arthritis, asthma, cancer, chronic pain, Crohn's disease, epilepsy, glaucoma, and multiple sclerosis.

This medical mainstreaming means that marijuana now is big business. This means higher — no pun intended — demand, which in turn requires greater growing productivity. To create such output, especially in an industry where the speed to market is inherently limited by Mother Nature's growth cycles, the need for the most sophisticated growing methods — not the least of which is state-of-the-art indoor cultivation — cannot be overstated.

At the same time, according to a recent study published this year by ArcView Marketing Research, a number of developments will have a significant impact on existing and would-be marijuana growers including how they manage indoor climate control. How well they respond to them will determine their level of success.

TREND NO. 1: THE RISING INFLUENCE OF REGULATIONS AND COMPLIANCE

It's a sign of the times that marijuana growers today fear regulators more than law enforcement officials. And considering the thicket of regulatory and compliance issues growers face, their fears are justified. For example, regulators, especially in states where marijuana is sold for recreational use, are keeping close tabs on the use of pesticides. In Colorado alone, 15 recalls of

PROTECTING THE CROP

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contaminated marijuana were ordered over a 16-week period, resulting in a loss of nearly \$180 million.

To avoid such losses in the future, many growers have instituted biosecurity measures to replace pesticides. Biosecurity started out as a means to reduce a number of risks, including transmission of infectious diseases in crops and livestock, quarantined pests, and living modified organisms. Given that cannabis plants can fall prey to mildew, spider mites, and other predators, biosecurity seemed a promising way to go.

Even better news for cannabis growers is the expertise of Mestex, a company with more than four decades of experience in cooling and air handling for mission-critical applications. Employing Computational Fluid Dynamics (CFD), an advanced technology, Mestex has designed systems that ensure humidity and temperature consistency in some of the most challenging environments.

Case in point: Using CFD to run particle trace analysis made it possible to discover how infectious disease particles travel through the air and helped determine the best way to pressurize a cleanroom where animal researchers sought to minimize the spread of disease. Such a system could prove invaluable to cannabis growing environments where airborne and human-borne contaminants are 24/7 threats.

TREND NO. 2: TO LEGALIZE OR NOT TO LEGALIZE? THAT IS THE QUESTION

We are rapidly approaching a watershed in the history of legalization where a majority of states will have some type of legalized marijuana by the end of this year. We don't have far to go. 25 states have already legalized marijuana for medical purposes. Alaska, Colorado, Oregon, Washington, and the District of Columbia have also legalized it for recreational use.

America isn't alone either. Canada's young, charismatic prime minister has expressed his support for medical marijuana and has backed full legalization by 2017. So much for Canada being like a loft apartment above a really great party, as comedian Robin Williams once said. Mexico, too, is getting into the act, as a response to the substantial legal markets that line its northern border along California, Arizona, and New Mexico.

Legalization has far reaching impacts. For example, in Denver commercial vacancies dropped to a record low 2 percent. Hundreds of office buildings, warehouses, and retail spaces were retrofitted to handle the unique requirements of cultivating, storing, processing, and retailing marijuana.

The message here for mechanical contractors and engineering consulting firms is clear: Don't wait. The ship is leaving. Opportunities to work with growers on new construction are quickly dwindling.

HVAC CONSUMPTION

Mestex's direct digital controls provides growers with invaluable data regarding the energy consumption and HVAC required to produce a crop.



TREND NO. 3: INTENSE COMPETITION AND THE GRAPPLING FOR MARKET SHARE

Balancing sale price and profit may seem an odd dilemma for what was once an outlawed product. Yet with so many existing cannabis growing ventures and the daily birth of new ones, each craving a bigger piece of the pie, this age-old challenge of commerce is center stage. Of course, for these legal growers, there's the added problem of competition from illicit trade.

It's Business 101 to lower price by producing more at a lower cost per item. This capability has multiplied as basement growers are replaced by sophisticated large-scale operations with climate-controlled systems aimed to optimize every square millimeter of growing space. As a trusted cooling and air-handling expert, Mestex has designed and built such systems for pharmaceutical warehouses, chicken farms, wine storage facilities, candy warehouses, and mushroom growing houses — all businesses in which just a few degrees of separation from the target optimal temperature can cause millions of dollars in losses.

TREND NO. 4: RELYING ON DATA AND INTEGRATED TECHNOLOGY TO MEET DEMAND

The cannabis market is growing in leaps and bounds. National sales of legal cannabis grew to \$5.7 billion in 2015, up from \$4.6 billion in 2014. Furthermore, demand is expected to remain high in 2016 — with projected growth to \$7.1 billion, a 26 percent increase over 2015.

This phenomenal growth has sparked a demand for reliable production automation. After all, it's unimaginable to think that a modern, large-scale growing facility could function with such unsustainable practices as hand watering hundreds of plants, or manually turning on/off hundreds of lights twice daily.

What's needed instead is a comprehensive integration of hardware and software with sensors and controls, a largely automated infrastructure that assures the right nourishment and environmental conditions for the right plant at the right time — without interruption. Mestex has a long and successful track record in the development and deployment of such infrastructures. For example, when a shrimp farm wanted to expand its dome (to about one million cubic feet in volume), Mestex developed a system that would detect too much wind shear or ice forming on the dome and then automatically adjust the air pressure inside the dome to resist the wind or to break up the ice formation.

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TREND NO. 5: AS THE INDUSTRY EVOLVES, ITS FOCUS WILL SWITCH FROM OPERATIONAL TO STRATEGIC PRIORITIES

Increased competition and rapid industry growth do more than impact product development and pricing. They necessitate careful attention to creating strategies that differentiate a business in a crowded field. In this environment, where strategic decisions must emerge from real data rather than hunches or anecdotes, quality business intelligence will become vital, as will the ability to analyze and leverage historical data.

Mestex's direct digital controls — for onsite/offsite management of lighting, temperature, and humidity — provide growers with invaluable data regarding the energy consumption and HVAC required to produce a crop. This means growers can now identify the environmental conditions that preceded both exceptional harvests and crop failures, giving them the intelligence to increase yield and reduce risk.

Case in point: A chicken farm wanted to cool its coops because optimum temperature could lead to more eggs laid and bigger, meatier chickens. Mestex environmental controls were the solution. And while the increased energy for cooling did add cost, the farm realized greater profits, thanks to larger yields.

TREND NO. 6: SAVING ENERGY WHILE DEMAND BOOMS

Marijuana is the most energy-intensive agricultural crop produced in America. In fact, the energy consumed in legal and illicit production could be as much as 1 percent of our nation's electrical output. That cost adds roughly 50 percent to the wholesale price alone.

The energy-consumption problems for growers don't end there. Many face operational snafus. For new construction, zoning issues are a thorn in the side. Many force growers into locations not rated with enough electricity to handle both lights and HVAC. As a result, some utilities are charging over a million dollars just to upgrade a substation and install new street wires to meet new kilowatt requirements. Add these start-up costs to the inevitable operational costs and the result is a migraine for growers you'd think only their products could remedy. Or not.

Mestex, in partnership with a provider of forced-air solutions that are fueled by natural gas, has developed a way to migrate the bulk of the energy required for heating and/or cooling a facility from the electric bill to the gas bill. This type of gas driven system retrofit is becoming increasingly popular and — depending upon a utility's peak/demand electrical costs — could cut a grower's energy costs substantially.

Is there then, in light of these six major trends, a place where the grass can always be greener? Apparently, Mestex thinks so. ■