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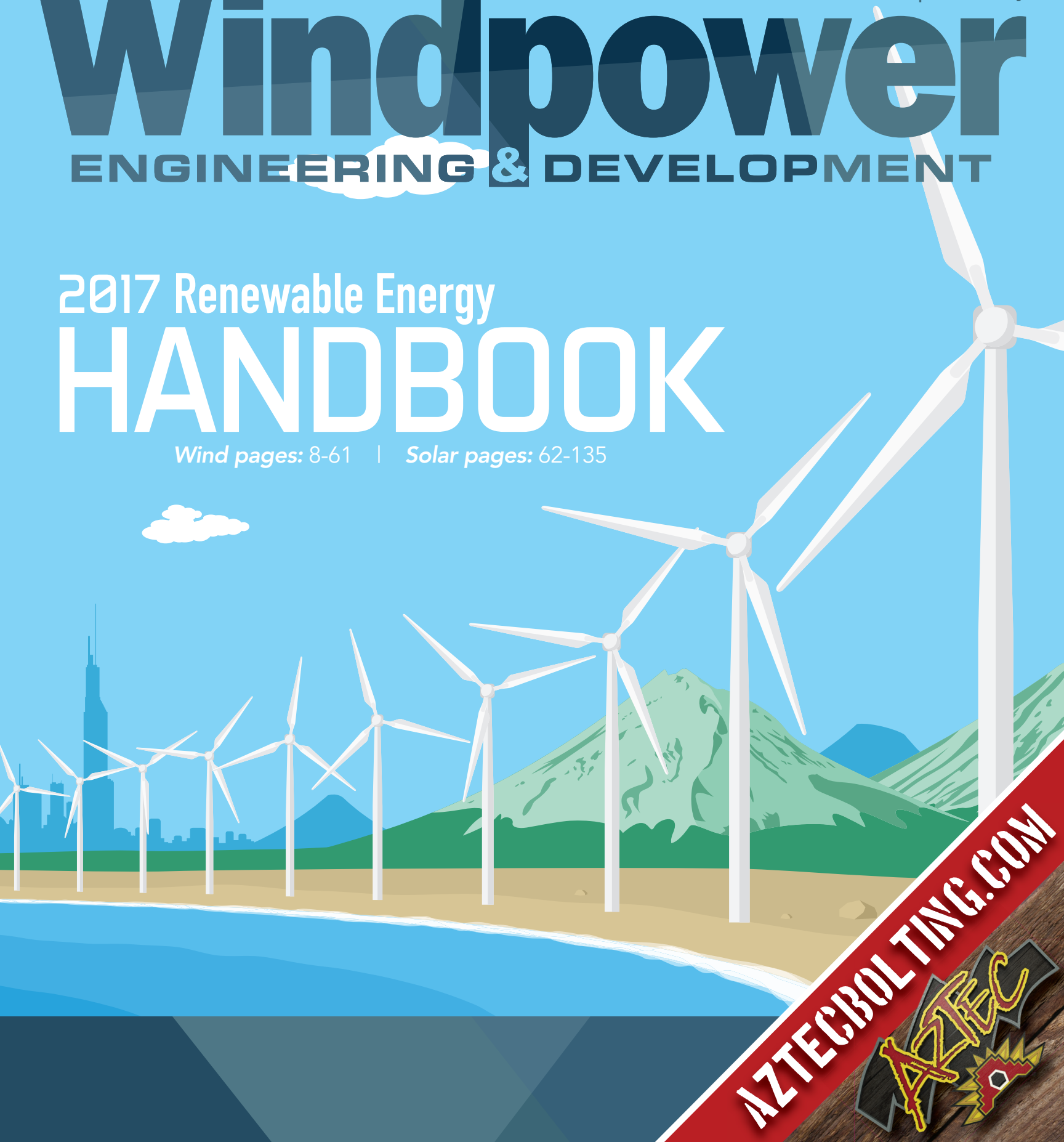

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WIND ARTICLES

FILTERS

What features should you consider when choosing filters for a wind turbine?

IN THE WIND INDUSTRY, simple logistics places importance on a well-planned operations and maintenance strategy. The geographic location, weather conditions, and height of most wind turbines make even the most basic gearbox or hydraulic repairs a daunting and costly task. For that reason, filtration is critical in wind turbines.

Gears and bearings ride on a film of oil only a few microns thick. This might seem insignificant, but quality gear oil and fine filtration are imperative to avoid unnecessary wear and equipment downtime. Filter elements are typically rated based on their ability to remove contaminants of specific targeted sizes from a fluid under set operating conditions. Enough contaminant particles, measuring only 1-µm in size and invisible to the human eye, can knock out a 20-ton gearbox.

"Full-flow and bypass filtration have benefits that can increase uptime, save costs, and extend maintenance intervals", says Michelle Arceneaux, Sr. Product Manager for Des-Case, a manufacturer of contamination control products for industrial lubricants. "Always make sure the filter you choose accommodates the needs of the system and filters the targeted particles of concern."

For example, water-removal filters and fine micron-rated filters are best used for hydraulic and gearbox fluids. On heavier gear oils, flow rate, pore size, and dirt-holding capacity are the key features to look for. "The most important selection criteria for kidney loop (offline) systems are filter pore size and flow rate. Also, make sure the flow rate is right for the sump size," advises Arceneaux.

She says that a kidney-loop filtration system should not take more than 10% of the total sump volume per minute. "Closer to 5% would be safer. And it's important to filter the entire volume at least 7 to 10 times in a 24-hour period for supplemental filtration and once per hour for primary filtration. And be sure to look for automatic emergency reliefs or bypass with these systems," she adds.

Fortunately, today there are more options than ever for intelligently and efficiently improving a turbine's reliability. However, Arceneaux points out that clean oil is only half the battle when it comes to maintaining good turbine health.

"Did you know that on average, it costs 10 times as much to remove contamination from a system than it does to exclude the contamination in the first place?" she asks. "And in the wind industry, this figure is probably even higher." To improve reliability and keep particles from entering a system in the first place, Arceneaux recommends a high-quality desiccant breather.

A desiccant breather replaces the standard dust cap or OEM breather cap on equipment, and provides better filtration and protection against even the smallest particulates that can destroy the effectiveness of turbine components. As air is drawn into equipment through the breather, the layered desiccant filter elements remove particulate. "As an added benefit, desiccant breathers are also very effective at removing existing headspace moisture," she says.

When selecting desiccant breathers, look for things such as a high flow rate (especially for hydraulics), check valves, and a large volume of filter media and silica gel to extend the breather life. "Things like over-sized check valves in some desiccant breathers already combine the benefits of high flow rate with longer breather life," says Arceneaux. "More media typically means a longer life."

In the wind industry, maintenance tasks are a challenge and, for this reason, it is important to choose components that last. "Compare dirt and water-holding capacities of different filter elements, as well as their efficiencies. On average, appropriately sized breathers and filter elements should last nine months or longer when in operation," Arceneaux says. "And a better filter choice means more reliability, greater longevity, and less worry for turbine operators." ▲

By Michelle Froese, WPE&D senior editor

The Des-Case EX-series breather combines offers a high flow rate and extended life from check valves. As wet, contaminated air is drawn through the unit, multiple 3-micron polyester filter elements remove solid particulate, and color-indicating silica gel extracts moisture. When air is expelled from the container, the top foam pad prevents oil mist from contacting silica gel or entering the atmosphere.