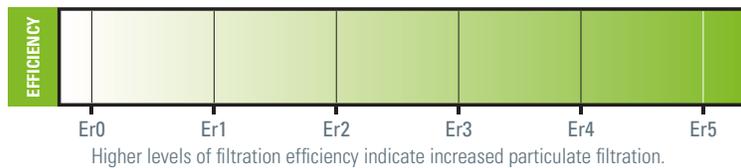


## INTRODUCING DONALDSON'S NEW USER-FRIENDLY FILTER RATING SYSTEM!

Operators of gas turbine systems now have a simpler, more effective way of selecting the optimal filtration solution for their facility. This straightforward approach is based on decades of experience serving gas turbine customers in all climates and conditions, and listening to their needs. Operators identify three main criteria they consider when evaluating a filtration solution: filter efficiency, watertightness, and pulse recovery rate. In response, Donaldson developed a 0-5 point rating scale for each attribute, and rates each of its filters on all three scales. This rating system is designed to help equipment operators optimize productivity and minimize operating costs, for their operating environment.

### EFFICIENCY



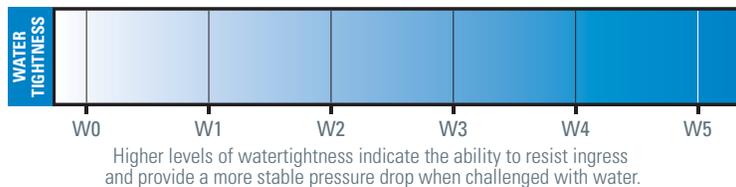
**DEFINITION:** The most widely recognized performance metric for efficiency is the proportion of inlet air particulates captured by the filter. Because higher-efficiency filters have associated costs, operators need to determine an efficiency rating that maximizes return on investment for their facility.

**TEST METHODOLOGY:** Existing industry test standards.

**EXPLANATION:** By using established standard test methodology, such as ASHRAE52.2, EN779, EN1822 and ISO 16890, Donaldson has worked to simplify how customers classify their filtration application. In this case, an Er5 rating is (H)EPA level filtration and Er0 represents coarse pre-filtration.

MERV Rating	ASHRAE52.2
G Rating	EN779
M Rating	
F Rating	
EPA	EN1822
HEPA	
ULPA	
ISO ePM1 XX%	ISO 16890

### WATERTIGHTNESS

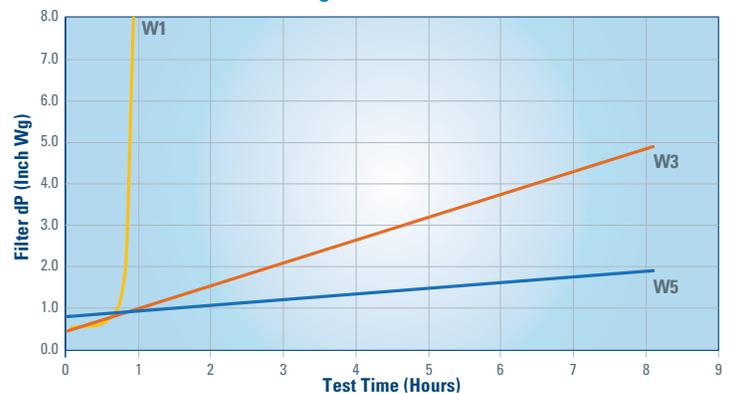


**DEFINITION:** In humid or ocean-front locations, resistance to moisture becomes a high priority. Salts and other dissolved solids carried by water can be highly corrosive and often more detrimental than airborne contaminants.

**TEST METHODOLOGY:** Donaldson developed a new methodology to determine how much water, if any, can pass through a filter. The test directs a 60-liter-per-hour water spray at the filter over an eight-hour period. The filter pressure drop and volume of water passing through the filter are recorded.

**EXPLANATION:** Donaldson rates its gas turbine filters on a scale of W0 to W5, with higher values indicating greater watertightness. A filter rated at W0 would not withstand moisture, while a W5 filter could pass the test with at least 99.5 percent water resistance and no more than a 1.5 inch water-gauge (WG) increase in pressure drop.

Watertightness Performance



## PULSE RECOVERY

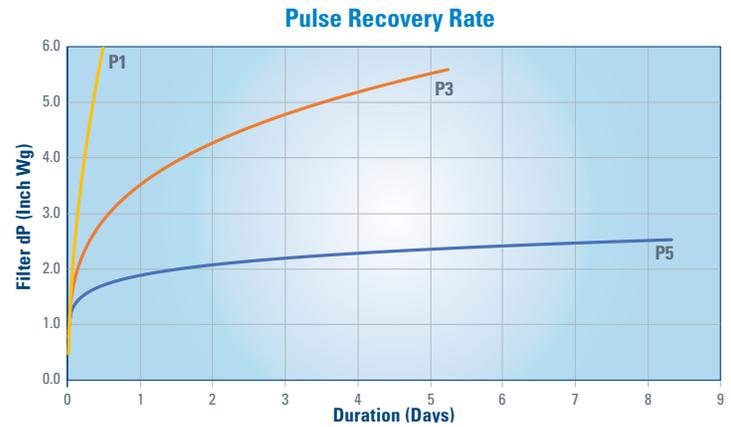


Higher levels of pulse recovery indicate stable pressure drop performance even when faced with challenging dust conditions.

**DEFINITION:** High pulse recovery is a top priority in desert or arctic environments, where there is either continual exposure to dust, snow, and ice buildup, or potentially sudden episodes of heavy loading.

**TEST METHODOLOGY:** Donaldson developed a process for measuring pulse recovery. Exposing filters to a long duration (more than seven days) dust flow of 0.016 g/cfm, (intended to simulate sand storm conditions) filter pressure drop and efficiency are measured to arrive at pulse recovery ratings.

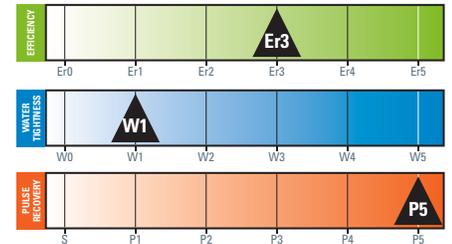
**EXPLANATION:** On Donaldson's scale, an S filter would be considered unable to be pulse-cleaned without damage, while the remainder of the P ratings indicate the level of pulse recovery. Note: If your filter housing does not have a pulse system, static filtration solutions are most appropriate.



## INTEGRATING THE THREE PILLARS: A CASE EXAMPLE

Donaldson's inlet air filter rating scale helps plants convert to the right filtration solution for their unique operating and environmental conditions. If a plant's environment or operating conditions change, Donaldson can help the plant choose the appropriate filtration based on efficiency (Er), watertightness (W) and pulse recovery (P) — the three attributes that differ most from one filter to another and, in combination, also drive operating costs.

Using a baseline profile of the current filter, the owner can select replacement filters with stronger ratings on the properties that matter most under the new conditions. An Er|W|P profile provides an apples-to-apples comparison and enables a better match. Donaldson uses standardized testing to determine the Er|W|P on a 0 to 5-point scale for both the current filter as well as the proposed solution.



### Environmental Issue

A plant in an agricultural region is coping with a dusty harvest season by using a pre-filter wrap on a depth-loading filter. The pre-filter and filter begin to quickly load and require frequent replacement. The owner discovers a rock quarry has reopened to the West, compounding a dust problem. Donaldson removes and tests the plant's current filter, discovering it has medium-high capture efficiency (Er3); moderate watertightness (W2); and weak pulsability (P1). The trouble becomes apparent: The existing filter's limited pulse recovery rate (P1) cannot keep pace with the high dust load. Using this comparative information, Donaldson recommends an Er3|W1|P5 replacement. No watertightness is required in the filter, but it has to deliver the highest possible pulse recovery rate (P5) to shed the heavy dust load. With this change, the plant runs continuously through high dust occurrences and projects a short return-on-investment.

 <b>URBAN/INDUSTRIAL</b> variety of contaminants, including moderate amounts of hydrocarbons	 <b>ARID/SEMI-ARID</b> with frequent seasonal ground fog	 <b>ARCTIC</b> very cold, dry air; snow and frost frequently build up on filters	 <b>DESERT ARID</b> frequently heavy wind, dust concentration	 <b>MARINE, COASTAL, TROPICAL</b> and semi-tropical (hot, humid, moisture-laden) environments
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# DONALDSON. MORE POWER TO YOU.

**Important Notice:** Many factors beyond the control of Donaldson can affect the use and performance of Donaldson products in a particular application, including the conditions under which the product is used. Since these factors are uniquely within the user's knowledge and control, it is essential the user evaluate the products to determine whether the product is fit for the particular purpose and suitable for the user's application. All products, product specifications, availability and data are subject to change without notice, and may vary by region or country.

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**GAS TURBINE SYSTEMS**