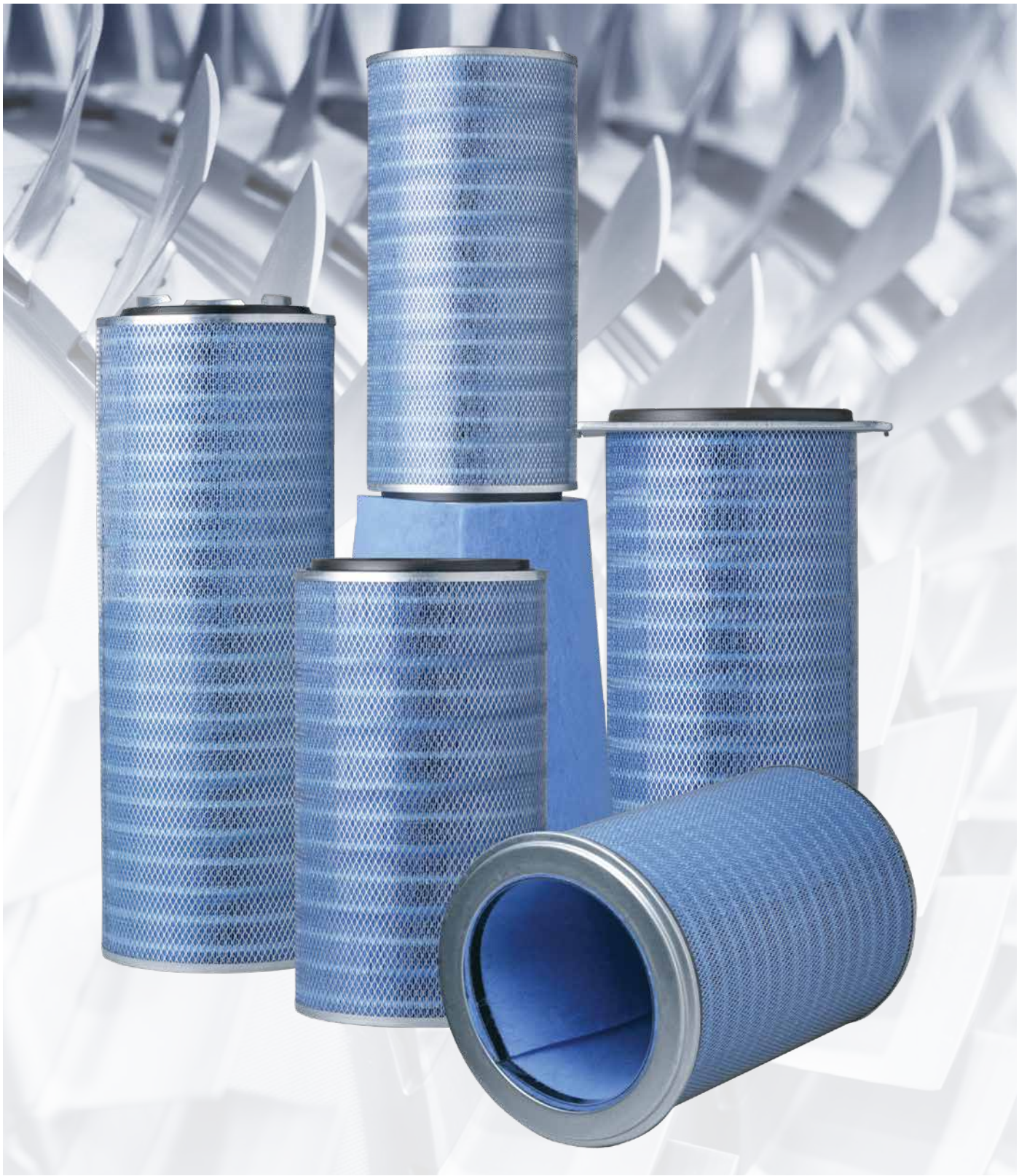
Donaldson
FILTRATION SOLUTIONS

CARTRIDGE SELECTION GUIDE

Gas Turbine Systems



DONALDSON'S USER-FRIENDLY FILTER RATING SYSTEM

With Donaldson's filter rating system, operators of gas turbine systems 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



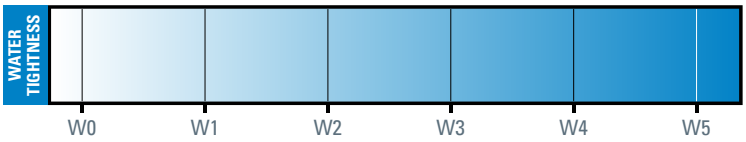
Higher levels of filtration efficiency indicate increased particulate filtration.

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.

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

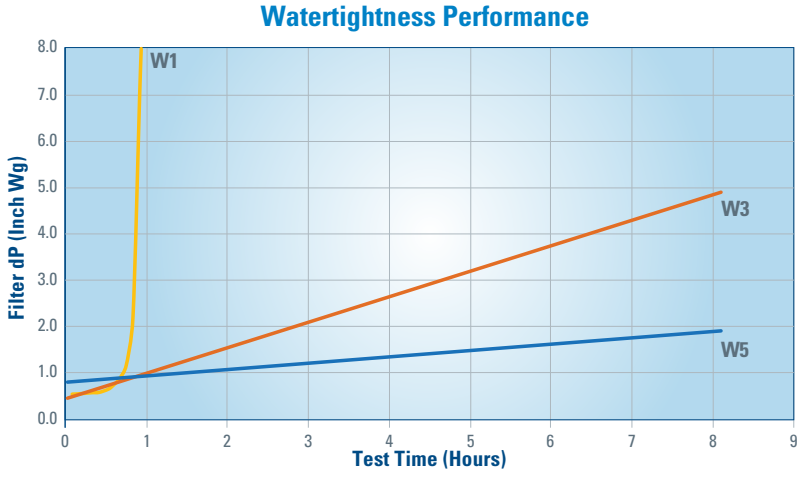
WATERTIGHTNESS



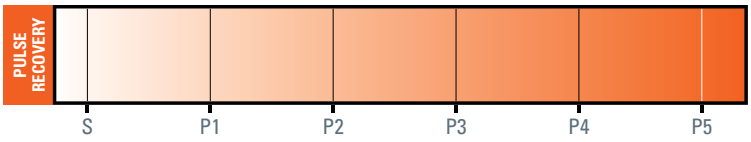
Higher levels of watertightness indicate the ability to resist ingress and provide a more stable pressure drop when challenged with water.

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.

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% water resistance and no more than a 1.5 inch water-gauge (WG) increase in pressure drop.



PULSE RECOVERY

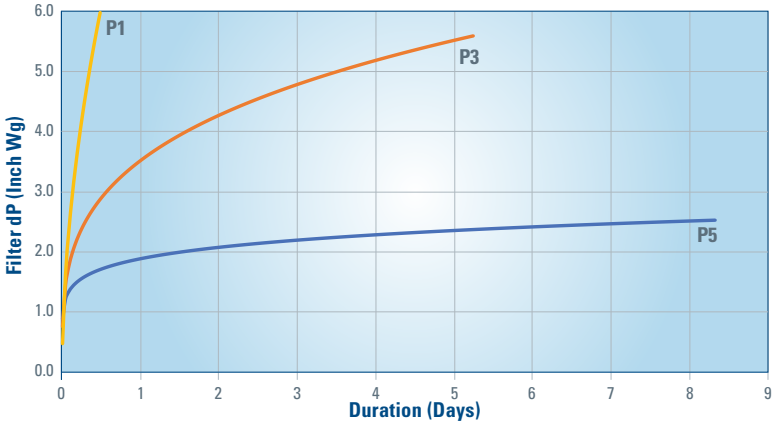


Higher levels of pulse recovery indicate stable pressure drop performance even when faced with challenging dust conditions.

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.

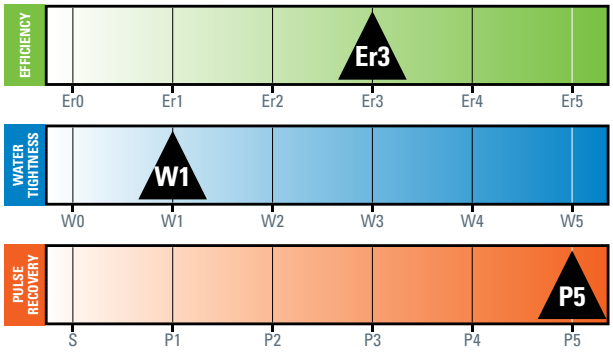
EXPLANATION: On Donaldson's scale, an S filter would be considered unable to be pulse-cleaned without damage, while the remainder of the P ratings indicate the level of pulse recovery. Note: If your filter housing does not have a pulse system, static filtration solutions are most appropriate.

Pulse Recovery Rate



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.



URBAN/INDUSTRIAL
variety of contaminants, including moderate amounts of hydrocarbons



ARID/SEMI-ARID
with frequent seasonal ground fog



ARCTIC
very cold, dry air; snow and frost frequently build up on filters

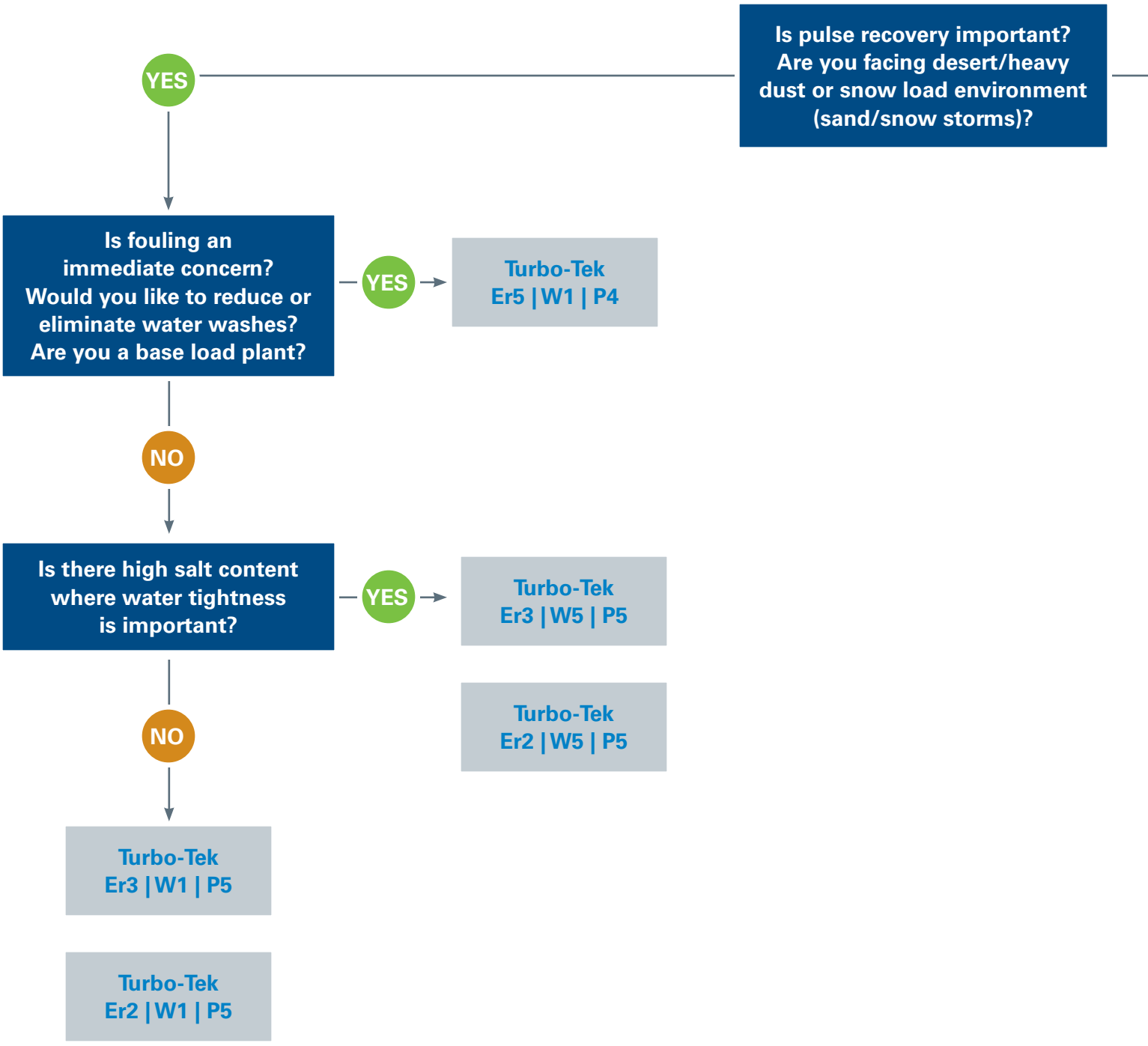


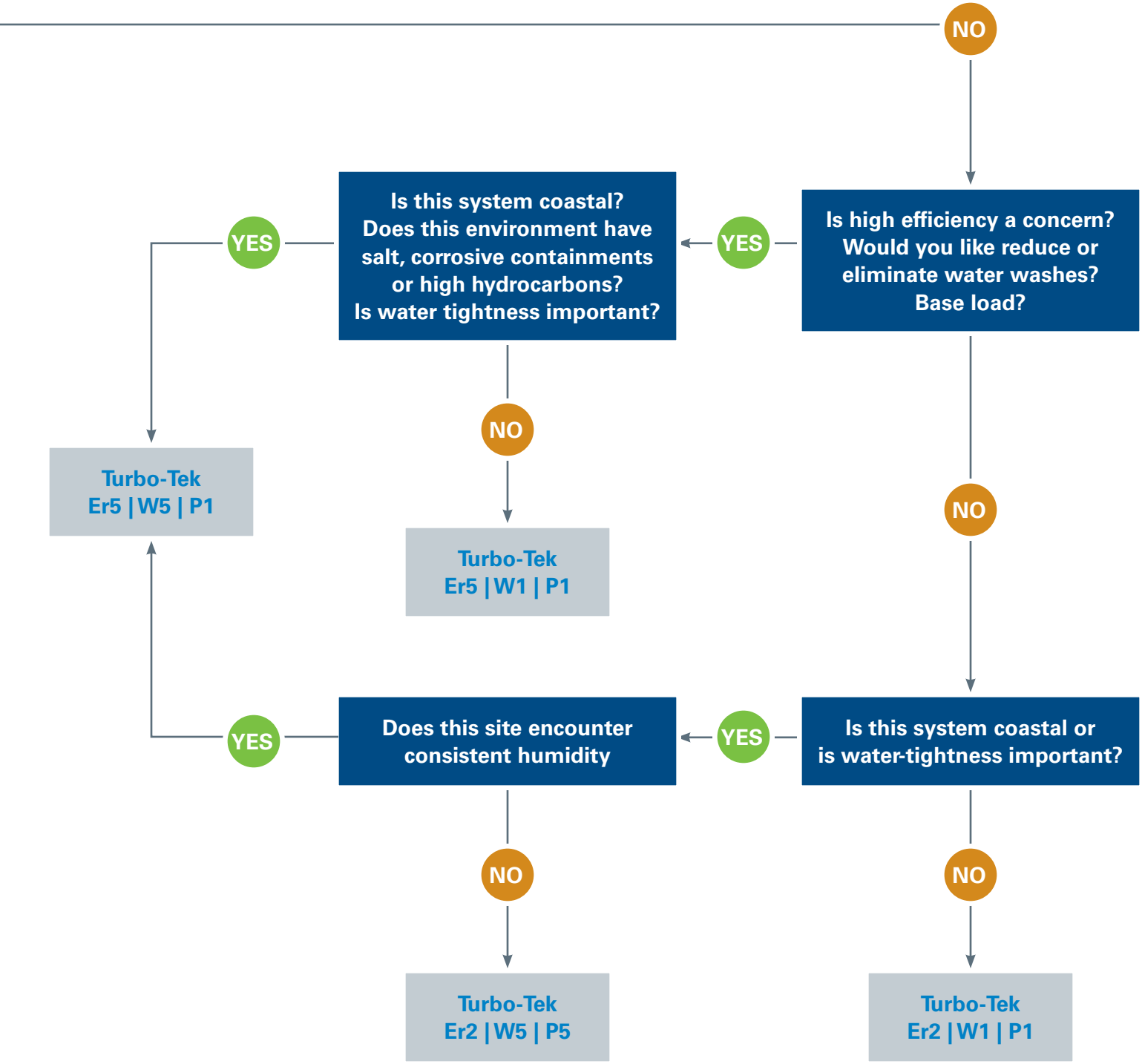
DESERT ARID
frequently heavy wind, dust concentration



MARINE, COASTAL, TROPICAL
and semi-tropical (hot, humid, moisture-laden) environments

MEDIA SELECTION FOR TURBO-TEK CARTRIDGE FILTERS





This document serves as a reference guide. Please work with your Donaldson representative to make the best selection for your application.

TURBO-TEK CARTRIDGE FILTER OPTIONS



Rating	Er1 | W5 | P1	Er2 | W1 | P1	Er2 | W5 | P5	Er3 | W5 | P5	Er2 | W1 | P5
Media Technology	Cellulose/Synthetic [Duratek]	Synthetic	Cellulose/Synthetic [DSW]	Cellulose/Synthetic [DSW XP]	Synthetic [SSW]
ASHRAE 52.2	MERV 11	MERV 12	MERV 13	MERV 15	MERV 13
Datasheet 779/1822	F7 (2002)	F8 (2002)	F9 (2002)	F9 (2012)	F9 (2002)
New/Clean dP @ 1630 cfm	0.72	0.57	0.84	0.84	0.71
Pulse Cleanability	Good	Good	Excellent	Excellent	Excellent
Environments 	Desert Arid	Desert Arid	Desert Arid	Desert Arid	Desert Arid
			Arid/ Semi-Arid	Arid/ Semi-Arid	Arid/ Semi-Arid
	Urban/ Industrial	Urban/ Industrial	Urban/ Industrial	Urban/ Industrial	Urban/ Industrial
	Arctic	Arctic	Arctic	Arctic	Arctic
		Marine, Coastal, Tropical			Marine, Coastal, Tropical
Application Recommendations	Designed for moderate moisture/humidity/ fog to dry environments.	Suggested for high moisture to dry environments.	Designed for moderate moisture/humidity/ fog to dry environments.	Designed for moderate moisture/humidity/ fog to dry environments.	Suggested for high moisture to dry environments.







Er3 | W1 | P5	Er3 | W1 | P5	Er5 | W1 | P4	Er5 | W1 | P1	Er5 | W5 | P1
Synthetic [SSW XP]	Synthetic [SSW XP2]	Blended (H)EPA [ECO Pulse]	Blended (H)EPA [ECO]	Synthetic (H)EPA [H20+]
MERV 15	MERV 15	MERV 16	MERV 16	MERV 16
F9 (2012)	F9 (2012)	E11	E11	E12
0.75	0.88	1.15	1.15	1.15
Excellent	Excellent	Great	Limited Pulse-ability	Limited Pulse-ability
Desert Arid	Desert Arid	Desert Arid	Desert Arid	
Arid/ Semi-Arid	Arid/ Semi-Arid	Arid/ Semi-Arid		Arid/ Semi-Arid
Urban/ Industrial	Urban/ Industrial	Urban/ Industrial	Urban/ Industrial	Urban/ Industrial
Arctic	Arctic	Arctic	Arctic	Arctic
Marine, Coastal, Tropical	Marine, Coastal, Tropical		Marine, Coastal, Tropical	Marine, Coastal, Tropical
Suggested for high moisture to dry environments.	Suggested for high moisture to dry environments.	Premium pulse cleanable filter media with (H)EPA filtration. Ideal for environments that require a strong pulse recovery.	Premium filter media with (H)EPA filtration. Ideal for temperate climates not requiring water tightness or pulse recovery.	Premium watertight filter technology with (H)EPA filtration. Ideal for coastal or harsh environments.



DONALDSON. MORE POWER TO YOU.

Comprehensive Technical Capabilities

- Extensive product and service portfolio
- Advanced filter media technology for optimal performance
- Engineering and design support
- Customization capabilities

Unrivaled Operations and Maintenance Support

- Filter testing and reporting
- Technical Field Advisor site inspections
- Dedicated service crews
- Comprehensive warranty
- Wide breadth of aftermarket filters, parts, and accessories

Extensive Global Reach

- 140 sales, manufacturing, and distribution locations globally
- Localized support for faster service and delivery
- Logistical and regulatory expertise

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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Donaldson FILTRATION SOLUTIONS

GAS TURBINE SYSTEMS