



**HY-PRO**

**FILTRATION**

**WIND TURBINE  
FILTER ELEMENT  
SOLUTIONS**

[www.hyprofiltration.com](http://www.hyprofiltration.com)





## G52-850 kW G87-2.0 MW

Hy-Pro DFE Rated Filter Element  
Gamesa Wind Turbine Upgrade Kits

High Efficiency Filter Elements &  
Breathers Yield Cleaner Fluid and  
Lower ISO Codes

Cleaner Fluid Extends Gearbox,  
Hydraulic Component & Fluid Life

### Media

G8 media pleat pack features our latest generation of graded density glass media that delivers required cleanliness while optimizing dirt capacity.

### DFE Rated (Dynamic Filter Efficiency)

DFE rated elements perform true to rating even under demanding variable flow and vibration conditions. Today's industrial and mobile hydraulic circuits require elements that deliver specified cleanliness under all circumstances. Wire mesh supports the media to ensure against cyclical flow fatigue, temperature, and chemical resistance failures possible in filters with synthetic support mesh.

### Fluid Compatibility

Petroleum based fluids, water glycols, polyol esters, phosphate esters, HWBF. Contact Hy-Pro for seal selection assistance.



Normally wind turbines are fitted with breathers that prevent only particulate ingress. Consider upgrading to a Hy-Dry desiccant breather to protect your system from ingress of water & particulate contamination.

### Tested to ISO Quality Standards (ISO-9001)

ISO 2941	Collapse and Burst Resistance
ISO 2942	Fabrication and Integrity Test
ISO 2943	Material Compatibility with Fluids
ISO 3724	Flow Fatigue Characteristics
ISO 3968	Pressure Drop vs. Flow Rate
ISO 16889	Multi-Pass Performance Testing

### Water Removal Media Available

Media code "A" specifies G8 Dualglass media co-pleated with water removal scrim to produce a filter that can remove water while maintaining  $\beta_{x_{[C]}} > 1000$  efficiency down to  $1\mu / 2.5\mu_{[C]}$ . Ideal for off-line filtration systems.



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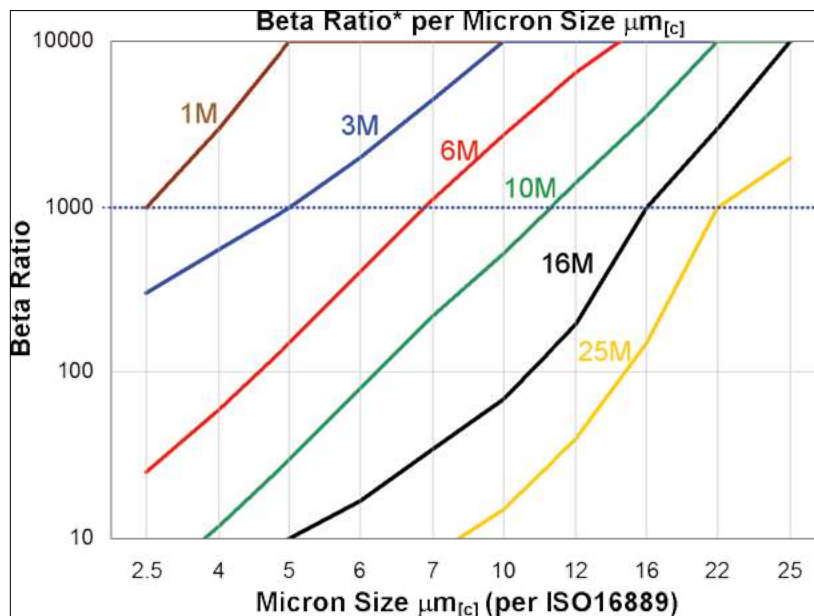
**FILTER ELEMENT UPGRADE KIT PART NUMBER BREAKDOWN**

<b>Gamesa G52 Hy-Pro Element Upgrades</b>			
Qty	Hy-Pro Number	Original Number	Description
1	HP250L7-3M		G52 Hydraulic Oil Filter Element Hy-Pro $\beta_{5_{[c]}} > 1000$ DFE Rated
1	HP707L12-10MB	HC35	G52 Lube Oil Spin-on Filter Element Hy-Pro $\beta_{12_{[c]}} > 1000$ DFE Rated
1	HPQ240467-10MB	852519SML	G52 Gearbox Breather Filter Element Hy-Pro $\beta_{12_{[c]}} > 1000$

<b>Gamesa G87 Hy-Pro Element Upgrades</b>			
Qty	Hy-Pro Number	Original Number	Description
1	HP800L10-3M	Pi2130SMX3 or Pi2130PS3	G87 Hydraulic Oil Filter Element Hy-Pro $\beta_{5_{[c]}} > 1000$ DFE Rated
1	HP800L10-10M	Pi3130SMX10 or Pi3130PS10	G87 Hydraulic Oil Filter Element Hy-Pro $\beta_{12_{[c]}} > 1000$ DFE Rated
2	HP707L12-10MB	HC35 or GP018876	G87 Lube Oil Spin-on Filter Element Hy-Pro $\beta_{12_{[c]}} > 1000$ DFE Rated
1	HP0007L2-3MB*	00310948 or 0007L003P	G87 Gearbox Breather Filter Element Hy-Pro $\beta_{5_{[c]}} > 1000$
1	HPQ240467-10MB*	852519SML	G87 Gearbox Breather Filter Element Hy-Pro $\beta_{12_{[c]}} > 1000$
1	HP1525L10-VAB	BG 15/25	G87 Off-line Gearbox Filter Element, Hy-Pro $\beta_{5_{[c]}} > 1000$ DFE Rated Plus Water Removal (Adsorption)

\*G87 Wind Turbines will generally utilize breather element 852519 SML or either part number 00310948 or 007L003P.

**FILTER ELEMENT MEDIA PERFORMANCE**





# GE 1.5MW XLE GE 1.5MW SLE

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GE 1.5MW XLE & SLE Hy-Pro Element Upgrades			
Qty	Hy-Pro Number	Original Number	Description
1	*HPQ3DNL4-12MB (Brake element option 1)	02055898, 0030D010BN3HC or 0030D01BN4HC	Parking Brake Hydraulic Oil Filter Element Hy-Pro $\beta_{12_{[c]}} > 1000$ DFE Rated
1	*HPQ290231-10LB (Brake element option 2)	CFMM20G10W1.0/12	Parking Brake Hydraulic Oil Filter Element Integrated into Manifold Plug Style Endcap Hy-Pro $\beta_{12_{[c]}} > 1000$ DFE Rated
1	HPQ260292L18-10HB	1300R010BN3HC-B4-KE50, 1300R010BN4HC-B4-KE50 or 02087458	Gearbox Lube Oil Filter Element Hy-Pro $\beta_{12_{[c]}} > 1000$ DFE Rated
1	**HPB-302 (Hy-Dry Dessiccant)	02080977 Disposable Desiccant Cartridge for BDR- 400-BSP	Gearbox Desiccant Breather Cartridge Water Absorbing, 2 micron absolute efficiency

\*Hydraulic brake oil filter element may be either of the first two elements listed depending braking system vintage. Please confirm the brake system element part number and contact us if it is neither of the elements listed above

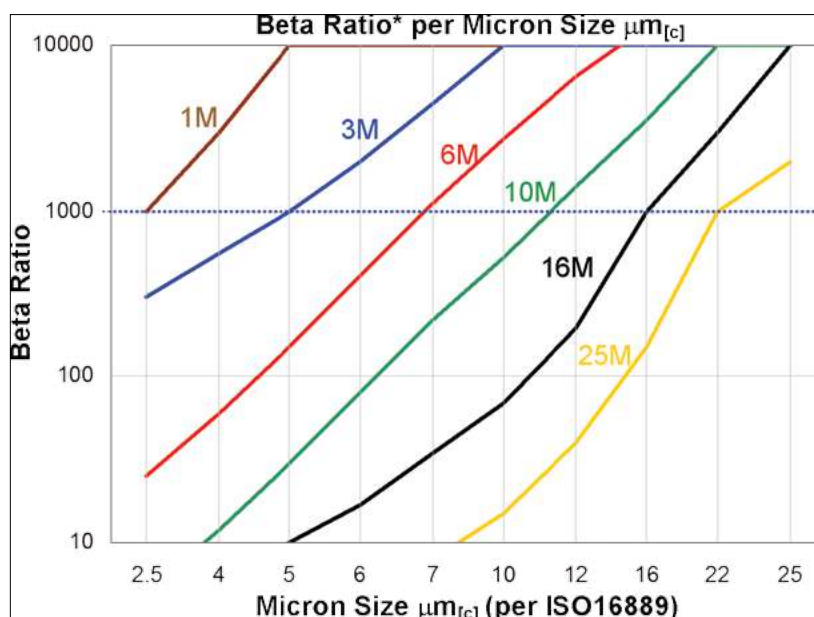
\*\*Hy-Pro disposable desiccant breather cartridge HPB-302 fits existing gearbox breather base



\*\*To extend desiccant breather element life consider upgrading to the Hy-Pro BC series desiccant breathers with integral check valves that minimize desiccant consumption from unnecessary air exchange driven by daily ambient temperature changes.



**FILTER ELEMENT MEDIA PERFORMANCE**





## V82-1.65MW V80-2.0MW V47-0.66MW

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Vestas Wind Turbine Upgrade Kits

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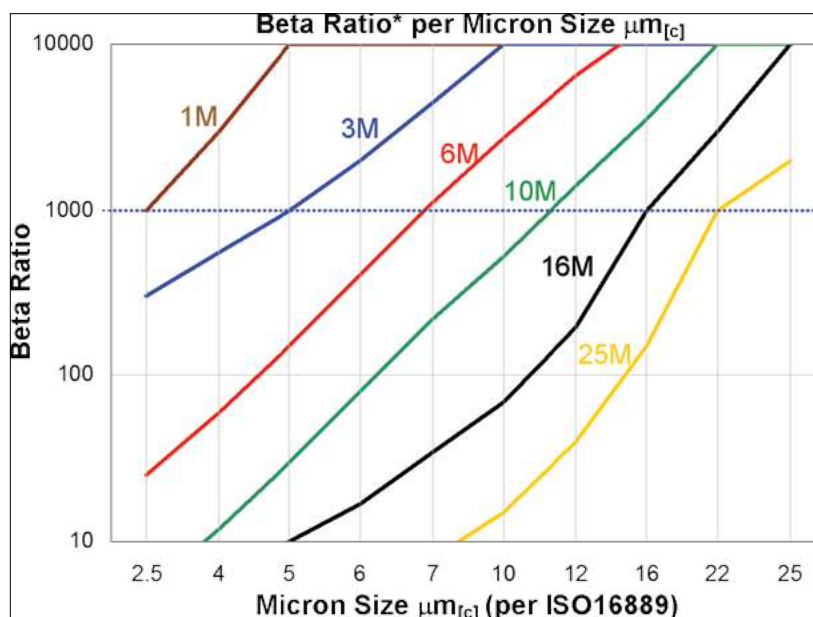
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## FILTER ELEMENT UPGRADE KIT PART NUMBER BREAKDOWN

Vestas V82 & V80 Hy-Pro Element Upgrades			
Qty	Hy-Pro Number	Original Number	Description
1	HP800L10-3M	Pi2130SMX3 or Pi2130PS3	V82 Hydraulic Oil Filter Element Hy-Pro $\beta_{5_{[c]}} > 1000$ DFE Rated
1	HP800L10-10M	Pi3130SMX10 or Pi3130PS10	V82 Hydraulic Oil Filter Element Hy-Pro $\beta_{12_{[c]}} > 1000$ DFE Rated
1	HP930L16-25MB	Pi15100RN or Pi25100RN	V82 Gearbox Filter Element, Hy-Pro $\beta_{22_{[c]}} > 1000$ DFE Rated
1	HPQ240467-10MB	852519SML	V82 Gearbox Breather Filter Element Hy-Pro $\beta_{12_{[c]}} > 1000$

Vestas V47 Hy-Pro Element Upgrades			
Qty	Hy-Pro Number	Original Number	Description
1	HP250L7-3M	Pi2108SMX3	V47 Hydraulic Oil Filter Element Hy-Pro $\beta_{12_{[c]}} > 1000$ DFE Rated
1	HP707L12-10MB	HC35	V47 Gearbox Filter Element, Hy-Pro $\beta_{22_{[c]}} > 1000$ DFE Rated
1	HP1525L10-1AB	BG 15/25	V47 Off-line Gearbox Filter Element, Hy-Pro $\beta_{2.5_{[c]}} > 1000$ DFE Rated Plus Water Removal (Adsorption)
1	HPQ240467-10MB	852519SML	V47 Gearbox Breather Filter Element Hy-Pro $\beta_{12_{[c]}} > 1000$

## FILTER ELEMENT MEDIA PERFORMANCE



**Understanding ISO Codes** - The ISO cleanliness code (per ISO4406-1999) is used to quantify particulate contamination levels per milliliter of fluid at 3 sizes  $4\mu_{(c)}$ ,  $6\mu_{(c)}$  and  $14\mu_{(c)}$ . The ISO code is expressed in 3 numbers (example: 19/17/14). Each number represents a contaminant level code for the correlating particle size. The code includes all particles of the specified size and larger. It is important to note that each time a code increases the quantity range of particles is doubling and inversely as a code decreases by one the contaminant level is cut in half.

ISO 4406:1999 Code Chart		
Range Code	Particles per Milliliter	
	More Than	Up To/Including
24	80000	160000
23	40000	80000
22	20000	40000
21	10000	20000
20	5000	10000
19	2500	5000
18	1300	2500
17	640	1300
16	320	640
15	160	320
14	80	160
13	40	80
12	20	40
11	10	20
10	5	10
9	2.5	5
8	1.3	2.5
7	0.64	1.3
6	0.32	0.64

Particle Size	Particles per Milliliter	ISO 4406 Code Range	ISO Code
$4\mu_{(c)}$	151773	80000~160000	24
$4.6\mu_{(c)}$	87210		
$6\mu_{(c)}$	38363	20000~40000	22
$10\mu_{(c)}$	8229		
$14\mu_{(c)}$	3339	2500~5000	19
$21\mu_{(c)}$	1048		
$38\mu_{(c)}$	112		
$68\mu_{(c)}$	2		

Particle Size	Particles per Milliliter	ISO 4406 Code Range	ISO Code
$4\mu_{(c)}$	69	40~80	13
$4.6\mu_{(c)}$	35		
$6\mu_{(c)}$	7	5~10	10
$10\mu_{(c)}$	5		
$14\mu_{(c)}$	0.4	0.32~0.64	6
$21\mu_{(c)}$	0.1		
$38\mu_{(c)}$	0.0		
$68\mu_{(c)}$	0.0		

## Succeed with a Total Systems Cleanliness Approach

Developing a Total System Cleanliness approach to control contamination and care for fluids from arrival to disposal will ultimately result in more reliable plant operation and save money. Several steps to achieve Total Systems Cleanliness include: evaluate and survey all hydraulic and lubrication systems, establish an oil analysis program and schedule, insist on specific fluid cleanliness levels for all new fluids, establish a baseline and target fluid cleanliness for each system, filter all new fluids upon arrival and during transfer, seal all reservoirs and bulk tanks, install high quality particulate and desiccant breathers, enhance air and liquid filtration on existing systems wherever suitable, use portable or permanent off-line filtration to enhance existing filtration, improve bulk oil storage and handling during transfer, remove water and make a commitment to fluid cleanliness.



The visible cost of proper contamination control and total systems cleanliness is less than 3% of the total cost of contamination when not kept under control. Keep your head above the surface and avoid the resource draining costs associated with fluid contamination issues including:

- Downtime and lost production
- Component repair/replacement
- Reduced useful fluid life
- Wasted materials and supplies (\$)
- Root cause analysis meetings
- Maintenance labor costs
- Unreliable machine performance
- Wasted time and energy (\$)