

## XpressKleen™ G2 filters XpressKleen™ G2 KC Assemblies (5 nm)

### Description

The XpressKleen G2 XP 5 nm filter represents a significant advance in the development of microporous PTFE membranes to meet the severe contamination control challenges that exist below the 14 nm manufacturing node. Pall Corporation's material science team of scientists and engineers has created a new filter morphology unlike current designs using newly developed proprietary PTFE membrane manufacturing technology.

The revolutionary design provides unparalleled control of critical size particles greater than 5 nm combined with a new standard of device cleanliness and purity that guarantees less than 500 ppt of total metal ion extractables per single length filter<sup>1</sup>. Proprietary advanced cleaning methods produce a filter with ultra-low levels of organics, NVR, and transient surface borne particles.

Every aspect of the XpressKleen XP 5 nm filter, from the PTFE resin to the final package, is designed, controlled, and manufactured to deliver unparalleled and elevated performance that is consistent, repeatable, and a new standard in sub 7 nm particle retention.

The unique combination of low differential pressure and measured retention at 5 nm makes the filter suitable for use from the point of supply (POS) to the point of process (POP), in bulk delivery, recirculating batch filtration, and in single wafer applications. The XpressKleen 5 nm filter is an integral part of a contamination control system that enables particle and purity defect levels needed for 10 nm and finer manufacturing.

The nondewetting XpressKleen G2 filter is qualified for use in aggressive high temperature cleaning chemistries like SPM, H<sub>3</sub>PO<sub>4</sub>; concentrated chemicals like NH<sub>4</sub>OH, HCl, H<sub>2</sub>SO<sub>4</sub>, H<sub>2</sub>O<sub>2</sub>; IPA and other solvents; high ppm DIO<sub>3</sub>, and aqueous chemistries such as SC1 and SC2.

- Low extractables < 500 ppt total of 19 elements < 0.1 ppb (Ni), < 0.2 ppb (Cu)
- > 20nm particle rinse up control in UPW
- TOC control
- 100% prewetted shipment with ultrapure water package
- High flow rates
- G2 KC assembly available with downstream venting
- Disposable filter unit with filter cartridge integrally sealed in housing
- Sealed assembly for safer handling and faster changeout
- 100% integrity tested

<sup>1</sup> Total metal concentrations of 19 elements for KC Assemblies: Al, Ba, B, K, Na, Fe, Li, Mg, Mn, Pb, Sn, Ti, Zn, Ni, Cu, Cr, Co, Ca, Ag. Consult factory for details.



KleenChange (KC)  
(downstream venting)



G2 Cartridge

### Specifications

#### Materials of Construction<sup>2</sup>

Parts	Material
Filter Medium	Surface-modified PTFE
Media Support	PTFE / PFA
Core, cage and end caps	PFA
Housing	PFA
O-ring options <sup>3</sup>	FEP-encapsulated fluoroelastomer

<sup>2</sup> All perfluoropolymer materials made without PFOA.

<sup>3</sup> Consult factory for other options.

# Removal Ratings and Operating Conditions

## Kleen-Change® (KC)

<b>Removal Ratings</b>	5 nm
<b>Media Code</b>	XP5
<b>Filter Area</b>	2.8 m <sup>2</sup>
<b>Flow</b>	Inline, L-flow, T-flow
<b>Metallic extractables<sup>4</sup></b>	< 500 ppt <sup>4</sup>
<b>TOC</b>	< 0.5 ppb <sup>5</sup>
<b>Particle rinse up control</b>	< 10 pc/ml > 20 nm <sup>5</sup>
<b>Resistivity</b>	18 megohm in < 30 min @ 10 Lpm flush
<b>Maximum Operating Temperature</b>	185 °C / 365 °F
<b>Maximum Operating Pressure</b>	0.49 MPaG ( 71 psig) @ 25°C (77°F) 0.39 MPaG (56.6 psig) @ 60°C (140°F) 0.34 MPaG (49.3 psig) @ 90°C (194°F) 0.20 MPaG (29.0 psig) @ 120°C (248°F) 0.15 MPaG (21.8 psig) @ 150°C (302°F) 0.12 MPaG (17.4 psig) @ 185°C (365°F)

## Cartridge

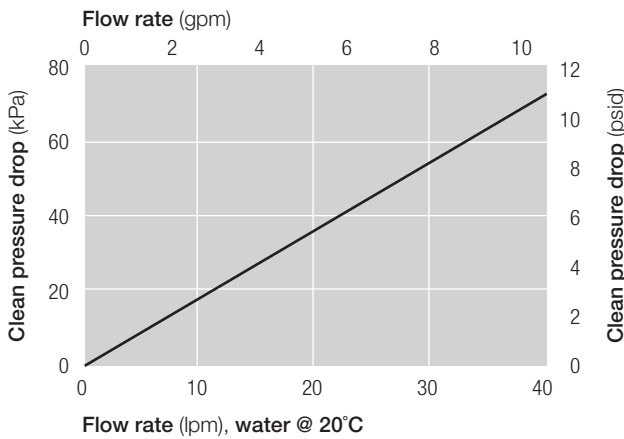
<b>Removal Ratings</b>	5 nm
<b>Media Code</b>	XP5
<b>Filter Area</b>	ABFG1 2.8 m <sup>2</sup>
<b>Metallic extractables<sup>4</sup></b>	< 1 ppb <sup>4</sup>
<b>TOC</b>	< 0.5 ppb <sup>5</sup>
<b>Particle rinse up control</b>	< 10 pc/ml > 20 nm <sup>5</sup>
<b>Resistivity</b>	18 megohm in < 30 min @ 10 Lpm flush
<b>Maximum Operating Temperature</b>	185 °C / 365 °F
<b>Maximum differential pressure</b>	0.59 MPaG (85.6 psig) @ 50°C (120°F)

<sup>4</sup> 19 elements, consult factory for test conditions

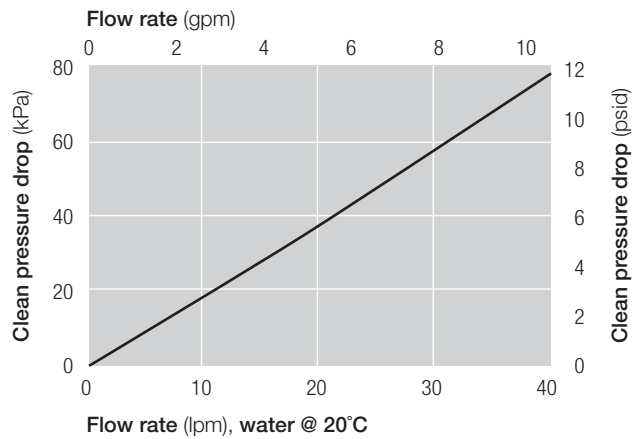
<sup>5</sup> After 40 min UPW flush @ 10 Lpm

## Pressure Drop vs. Liquid Flow Rate<sup>6</sup>

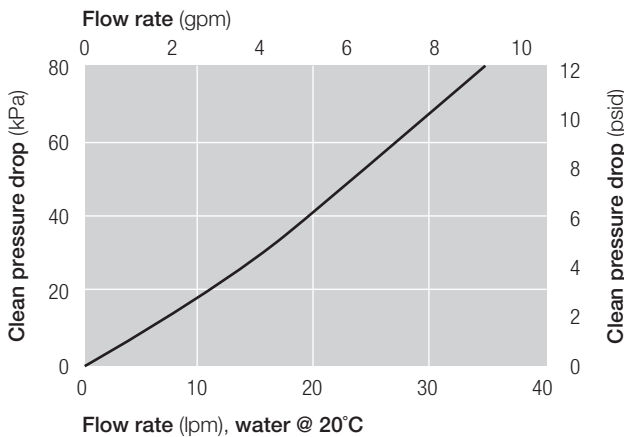
### G2 cartridge



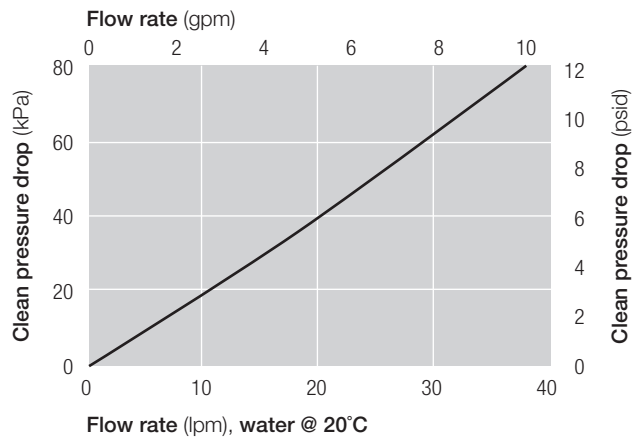
### 1" KC (In-line, T-flow)



### 3/4" KC (L-flow, T-flow)



### 3/4" KC (In-line)



<sup>6</sup> For liquids with viscosity differing from water, multiply the pressure drop by the viscosity in centipoise.

## XpressKleen G2 KC Assemblies

LDF 1 2 1XP 3 4 E 5

Table 1

Code	Downstream vent
G	N/A
V	Available

Table 2

Code	Flow
T	T-flow
N	In-line
L	L-flow

Table 3

Code	Removal rating
5	5 nm

Table 4

Code	Inlet/Outlet	Vent/Drain		Type
		Head end	Bowl end	
12	¾ in male	½ in male	½ in male	T-flow/L-flow
12	¾ in male	½ in male	½ in female	DV type
12	¾ in male	¾ in male	¾ in male	In-line
124	¾ in male	¼ in male	¼ in male	In-line
128	¾ in male	½ in male	½ in male	DV type
13	¾ in female	½ in female	½ in female	T-flow
16	1 in male	½ in male	½ in male	T-flow
16	1 in male	½ in male	½ in female	DV type
16	1 in male	¾ in male	¾ in male	In-line
164	1 in male	¼ in male	¼ in male	In-line
168	1 in male	½ in male	½ in male	DV type
17	1 in female	½ in female	½ in female	In-line

DV : Downstream Venting

Table 5<sup>7</sup>

Code	Connections
1	20 series Flowell <sup>8</sup>
2	Super Pillar type <sup>9</sup>
51	Flare style
6	FinalLock <sup>10</sup>
71	Super Pillar 300 P series
72	Super Pillar 300 P series L type
8	60 series Flowell
9	11CR series Flowell

<sup>7</sup> Disposable capsules are not available with every option. (Refer to codes for options.) Contact your local Pall representative for option availability.

<sup>8</sup> Flowell is a trademark of Flowell Corporation.

<sup>9</sup> Super Pillar is a trademark of Nippon Pillar Packing Co., Ltd.

<sup>10</sup> FinalLock is a trademark of Kurabo Industries Ltd.

## XpressKleen G2 Filter<sup>11</sup>

ABFG 1 XP 2 3E 3

Table 1

Code	Length (Nominal)	
	Inch	mm
1	10	225
2	20	468

Table 2

Code	Removal rating
5	5 nm

Table 3

Code	O-ring material
H1	FEP-encapsulated fluoroelastomer
H11	Kalrez <sup>12</sup>
H35	Perfrez <sup>13</sup>

<sup>11</sup> Cartridges are shipped prewet as standard.

<sup>12</sup> Kalrez is a trademark of DuPont Performance Elastomers.

<sup>13</sup> Perfrez is a trademark of Applied Seals North America, Inc.



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