

Supor™ EKV

STERILIZING GRADE FILTERS

Supor™ EKV filters are validated sterilizing grade filters designed for the cost-effective filtration of a wide range of liquids such as buffer, cell culture media, and others.

Supor EKV filters have high flow rates and throughput due to an asymmetric prefilter layer, supported in some formats via a laid over pleat pack geometry. This ensures for sizing of compact formats for integration into single-use systems.

The patented Ultipleat filter technology, combined with the optimized, built-in asymmetric prefilter for higher flow rates and throughput, allows very compact sizing for easy integration in disposable systems.

Supor EKV filters are available in a wide range of scalable, encapsulated formats which allow fast and easy scale-up, to bring your product to the market faster.

From syringe filters to production scale, all products incorporate the same membrane and identical materials of construction.*

Every Supor EKV pleated filter is:

- Integrity tested during manufacture.
- Identified by lot and serial number for total traceability.
- Supplied with a certificate of test confirming each filter:
 - meets USP Biological Reactivity Test in vivo for class VI-121°C plastics.
 - meets cleanliness per *USP <788> Particulates in injectables*.
 - is non-fiber-releasing.
 - is non-pyrogenic per *USP Endotoxins (< 0.25 EU/mL)*.
 - meets total organic carbon and water conductivity per *USP Purified water*.

* Except Novasip™ capsules. See *Materials of construction* for each product for further details.



Fig 1. Supor EKV filters are available in a range of styles and sizes.

Mini Kleenpak syringe filters

Ordering information

50 filters per box

Materials of construction

Filter membrane	Hydrophilic PES
Housing, vent plug, and support material	Polypropylene
Sealing technology	Insert molding

Product code KM2EKVP S

Shipping format

Presterilized using gamma irradiation

Operating parameters

Maximum operating temperature and pressure	5.4 bar (80 psi) at 20°C 2.1 bar (30 psi) at 60°C
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In compatible fluids which do not soften, swell or adversely affect the filter or its materials of construction.

Typical hold-up volume < 2.5 mL

Sterilization

Pre-sterilized, subject to a minimum of 25 kGy of gamma-irradiation

Pre-sterilized Mini Kleenpak syringe filters must not be re-sterilized. Mini Kleenpak syringe filters must not be sterilized *in situ* by passing steam under pressure.

Nominal dimensions

Capsule length	21 mm (0.8 in.)
Capsule diameter	29 mm (1.2 in.)

Nominal effective filter area (EFA) 2.8 cm² (0.43 in.²)

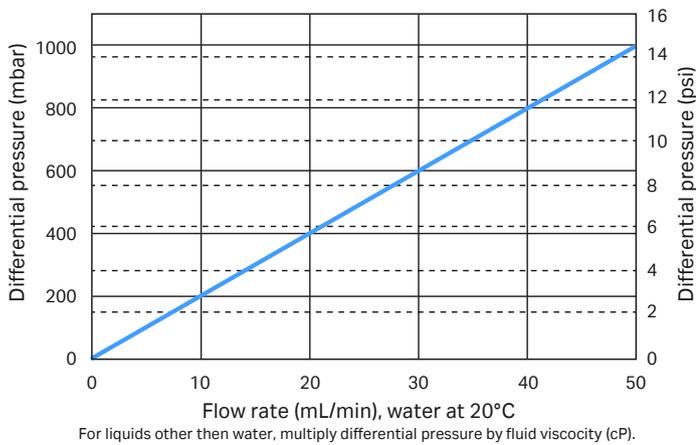


Fig 2. Typical liquid flow vs differential pressure.

Mini Kleenpak 20 capsules

Materials of construction

Filter membrane	Hydrophilic PES
Housing, vent plug, and support material	Polypropylene
Filling bell	Polycarbonate
Sealing technology	Thermal bonding without adhesives

Operating parameters

Maximum operating temperature and pressure	1.4 bar (20 psi) at 22°C
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In compatible fluids which do not soften, swell or adversely affect the filter or its materials of construction.

Typical hold-up volume	< 2.5 mL
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Sterilization

Autoclave	1 × 60 min at 125°C
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Mini Kleenpak 20 capsules must not be sterilized *in situ* by passing steam under pressure. Water wet Supor EKV capsules prior to steaming to retain full water wettability for integrity testing. Pre-sterilized Mini Kleenpak 20 capsules should not be re-irradiated.

Nominal dimensions

Capsule length	83 mm (3.3 in.)
Capsule diameter	67 mm (2.7 in.)

Nominal EFA	20 cm ² (3.1 in. ²)
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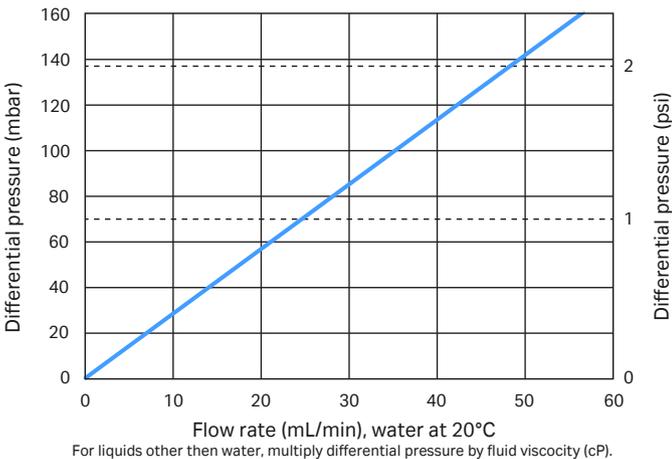


Fig 3. Typical liquid flow vs differential pressure.

Ordering information

Product code	KM5EKVP	2	
Connection	Code	Shipping format	
¼ to ½ in. (6 to 13 mm) stepped hose barb with inner bore to accept female slip luer interior and outer diameter to accept filling bell outlet	G ¹	Non-sterile Gamma irradiatable or autoclavable	
	S ²	Pre-sterilized using gamma irradiation (maximum 25 kGy)	

¹ 100 filters per box.

² 3 filters per box.

Mini Kleenpak capsules

Materials of construction

Filter membrane	Hydrophilic PES
Support and drainage	Polypropylene
Capsule shell	Polypropylene
Filling bell	Polycarbonate
Sealing technology	Thermal bonding without adhesives

Operating parameters

Maximum temperature	40°C
Maximum operating pressure	4.1 bar (60 psi) at 40°C
Maximum differential pressure	4.1 bar (60 psi) at 40°C

In compatible fluids which do not soften, swell or adversely affect the filter or its materials of construction.

Sterilization

Autoclave	3 × 60 min at 140°C
Gamma irradiation	Maximum of 50 kGy

Pre-sterilized Mini Kleenpak capsules must not be re-sterilized. Mini Kleenpak capsules must not be sterilized *in situ* by passing steam under pressure. Water wet Supor EKV capsules prior to steaming to retain full water wettability for integrity testing.

Typical extractables in water at 20°C	< 5.0 mg per capsule
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Nominal dimensions

Maximum diameter including valves	53 mm (2.1 in.)
Length code 2	105 mm (4.1 in.)
Length code 8	73 mm (2.9 in.)

Nominal EFA	200 cm ² (0.22 ft ²)
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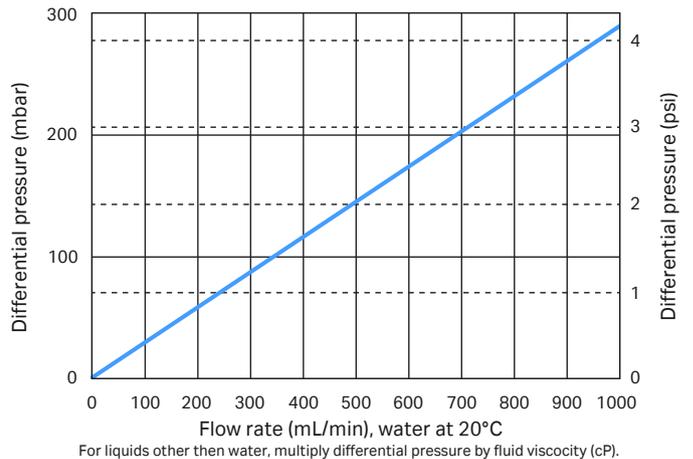


Fig 4. Typical liquid flow vs differential pressure.

Ordering information

3 filters per box.

Product code	KA02EKVP		
Code	Connection options	Code	Shipping format
2	¼ to ½ in. (6 to 13 mm) hose-barb	G	Non-sterile Gamma irradiatable or autoclavable
8	½ to ¾ in. (13 to 19 mm) sanitary flange	S ³	Pre-sterilized using gamma irradiation (maximum 25 kGy)

³ S grade with P2 connection is provided with filling bell on outlet. It is removable for in-line use.

Kleenpak capsules

Materials of construction

Filter membrane	Hydrophilic PES
Support and drainage	Polypropylene
End cap, core, and cage	Polypropylene
Capsule shell	Polypropylene
Sealing technology	Thermal bonding without adhesives

Operating parameters

Maximum temperature	40°C
Maximum operating pressure	5.2 bar (75 psi) at 20°C 4.0 bar (58 psi) at 40°C
Maximum differential pressure	4.0 bar (58 psi) at 40°C

In compatible fluids which do not soften, swell or adversely affect the filter or its materials of construction.

Sterilization

Autoclave	5 × 60 min at 125°C slow exhaust
Gamma irradiation	Maximum of 50 kGy

Pre-sterilized Kleenpak capsules must not be re-sterilized. Kleenpak capsules must not be sterilized *in situ* by passing steam. Water wet Supor EKV capsules prior to steaming to retain full water wettability for integrity testing.

Typical extractables in water at 20 °C

KA1 and KA2	< 5 mg per capsule
KA3	< 10 mg per capsule

Nominal dimensions	KA1	KA2	KA3
Diameter including valves	94 mm (3.7 in.)	94 mm (3.7 in.)	105 mm (4.1 in.)
Length - code 1	117 mm (4.6 in.)	157 mm (6.2 in.)	174 mm (6.8 in.)
Length - code 6	157 mm (6.2 in.)	197 mm (7.7 in.)	210 mm (8.3 in.)
Length - code 16	137 mm (5.4 in.)	177 mm (7.0 in.)	192 mm (7.6 in.)

Nominal EFA

KA1	375 cm ² (0.4 ft ²)
KA2	750 cm ² (0.8 ft ²)
KA3	1500 cm ² (1.6 ft ²)

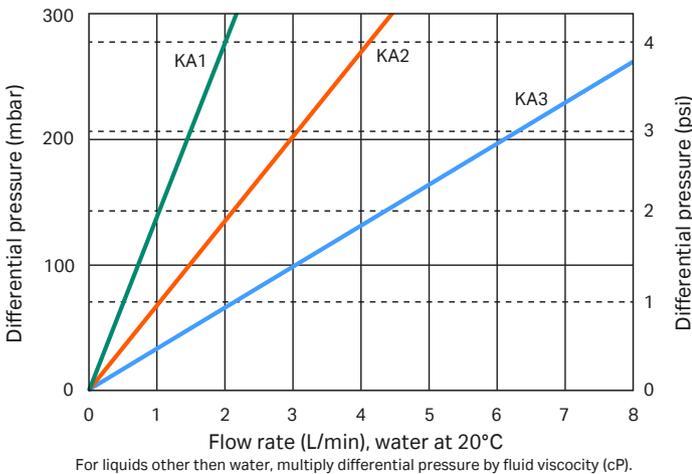


Fig 5. Typical liquid flow vs differential pressure.

Ordering information

Product code KA		EKVP			
Code	Filter area	Code	Connection options	Code	Shipping format
1	375 cm ²	1	1½ in. sanitary flange	G	Non-sterile Gamma irradiatable or autoclavable
2	750 cm ²	6	½ in. (13 mm) single hose barb		
3	1500 cm ²	16	1½ in. sanitary flange inlet and ½ in. (13 mm) single hose barb outlet	S	Pre-sterilized using gamma irradiation (maximum 25 kGy)

Novasip capsule

Materials of construction

Filter membrane	Hydrophilic PES
Support and drainage	Polypropylene
End cap, core, and cage	Polypropylene
Capsule bowl	Polyetherimide
Sealing technology	Thermal bonding without adhesives
Housing head	Polyetherimide with TiO ₂

Operating parameters

Maximum temperature	60°C
Maximum operating pressure	6.5 bar (94 psi) at 40°C 2.0 bar (29 psi) at 60°C
Maximum differential pressure	4.1 bar (60 psi) at 60°C

In compatible fluids which do not soften, swell or adversely affect the filter or its materials of construction.

Sterilization

Autoclave	5 × 60 min at 125°C slow exhaust
In-line	5 × 60 min at 125°C

Water wet Supor EKV capsules prior to steaming to retain full water wettability for integrity testing.

Typical extractables in water at 20°C < 10 mg per capsule

Nominal dimensions

Diameter including valves	123 mm (4.8 in.)
Overall length	157 mm (6.2 in.)

Nominal EFA 1500 cm² (1.6 ft²)

Ordering information

Product code **C3EKVP** 1

Inlet/outlet connections	Code	Vent/drain connections
1½ in. sanitary flange	Blank	Vent: quick connect and disconnect coupling (compatible with Stäubli fitting) Valve drain: Hose barb for ⅜ in. to ¼ in. (4 to 6 mm) i.d. tube, with valve
	A	Vent and drain: quick connect and disconnect coupling (Stäubli compatible) with valve
	B	Vent and drain: ½ in. (13 mm) sanitary flange, no valve sanitary clamp

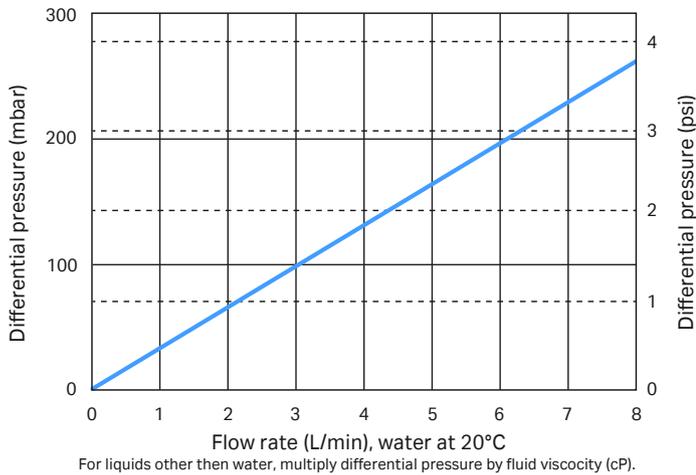


Fig 6. Typical liquid flow vs differential pressure.

Kleenpak Nova capsules

Materials of construction

Filter membrane	Hydrophilic PES
Support and drainage	Polypropylene
Core and end caps	Polypropylene
Cage ¹	Polypropylene
O-rings	Silicone elastomer
Sealing technology	Thermal bonding without adhesives
Housing bowl	Polypropylene
Housing head ¹	Polypropylene

¹ Formulated with TiO₂ whitener which does not contribute to organic extractables.

Operating parameters

Maximum temperature	40°C
Maximum operating pressure	3 bar (44 psi) at 40°C
Maximum differential pressure	3 bar (44 psi) at 40°C

In compatible fluids which do not soften, swell or adversely affect the filter or its materials of construction.

Sterilization

Autoclave	1 × 60 min at 135°C
Gamma irradiation	Maximum of 50 kGy

Pre-sterilized Kleenpak Nova capsules must not be re-sterilized. Kleenpak Nova capsules must not be sterilized *in situ* by passing steam under pressure. Water wet Supor EKV capsules prior to steaming to retain full water wettability for integrity testing.

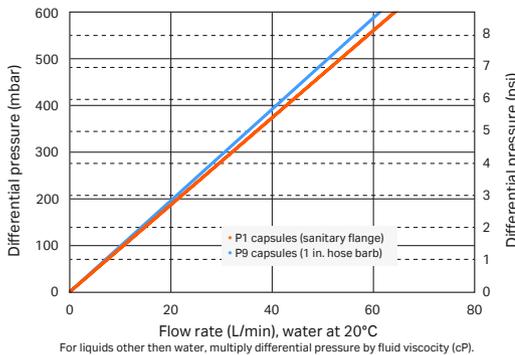


Fig 7. Kleenpak Nova (NP) typical liquid flow vs differential pressure.

Typical extractables in water at 20°C

< 25 mg after 4 hours extraction (per 254 mm module)

Tested on elements without pre-flushing.

Nominal dimensions

In-line 1	NP6	NP7	NP8
Maximum diameter including valves	154 mm (6.1 in.)	154 mm (6.1 in.)	154 mm (6.1 in.)
Length with hose barb inlet/outlet	397 mm (15.6 in.)	644 mm (25.4 in.)	895 mm (35.2 in.)
Length with sanitary inlet/outlet	335 mm (13.2 in.)	584 mm (23.0 in.)	834 mm (32.8 in.)

T-style capsules

	NT6	NT7	NT8
Maximum diameter including valves	240 mm (9.5 in.)	240 mm (9.5 in.)	240 mm (9.5 in.)
Length	349 mm (13.7 in.)	598 mm (23.5 in.)	848 mm (33.4 in.)

Nominal EFA

0.6 m² per 254 mm module (6.5 ft² per 10 in. module)

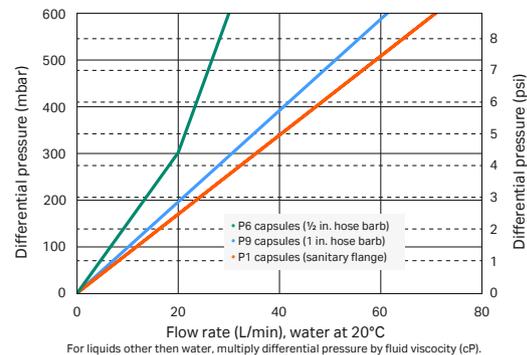


Fig 8. Kleenpak Nova (NT) typical liquid flow vs differential pressure.

Ordering information

Product code N EKVP

Code	Style	Code	Filter size
P	In-line	6	254 mm (10 in.)
T	T-style	7	508 mm (20 in.)
		8	762 mm (30 in.)

Code	Shipping format	Code	Vent/drain
G	Non-sterile Gamma irradiatable or autoclavable	Blank	Stäubli vent and stepped hose barb drain
S	Pre-sterilized using gamma irradiation (mimumum 25 kGy)	A	Stäubli vent and drain

Code Connection options

1	1 to 1½ in. (25 to 38 mm) sanitary flange inlet and outlet
9	1 in. (25 mm) single barb hose barb inlet and outlet
19	1 to 1½ in. (25 to 38 mm) sanitary flange inlet and 1 in. (25 mm) single barb hose barb outlet
6 ²	½ in. (13 mm) single barb hose barb inlet and outlet
16 ²	1 to 1½ in. (25 to 38 mm) sanitary flange inlet and ½ in. (13 mm) single barb hose barb outlet
1H ³	1 to 1½ in. (25 to 38 mm) sanitary flange inlet and outlet, with ½ in. (13 mm) sanitary port on inlet
1H9 ³	1 to 1½ in. (25 to 38 mm) sanitary flange inlet and 1 in. (25 mm) single barb hose barb outlet, with ½ in. (13 mm) sanitary port on inlet

² P-style only. ³ T-style only

Junior filter cartridges

Materials of construction

Filter membrane	Hydrophilic PES
Support and drainage	Polypropylene
End cap, core, and cage	Polypropylene
Sealing technology	Thermal bonding without adhesives
O-rings	Silicone elastomer

Operating parameters

Maximum differential pressure 5.2 bar (75 psi) at 40°C

In compatible fluids which do not soften, swell or adversely affect the filter or its materials of construction.

Sterilization

Autoclave 5 × 60 min at 125°C, slow exhaust

In situ steam 30 × 60 min at 125°C

Water wet Supor EKV capsules prior to steaming to retain full water wettability for integrity testing.

Typical extractables

in water at 20°C < 10 mg per filter

Nominal EFA 1500 cm² (1.6 ft²)

Ordering information

Product code

MCY4440EKVP

H4

O-ring material: Silicone elastomer
(other material available on request)

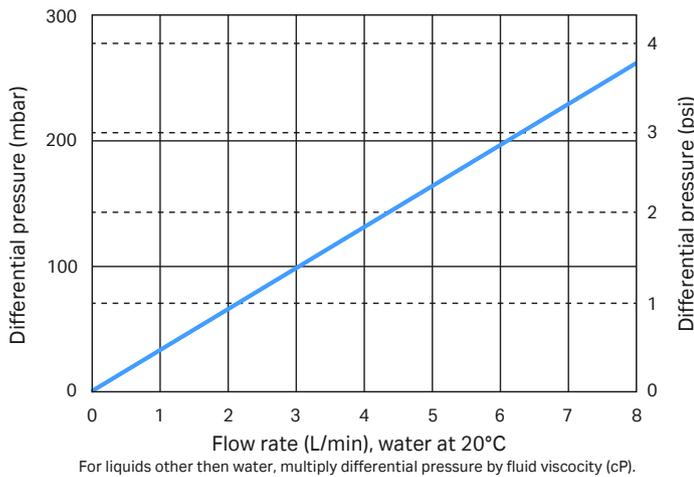


Fig 9. Typical liquid flow vs differential pressure.

Filter cartridges

Materials of construction

Filter membrane	Hydrophilic PES
Support/drainage	Polypropylene
Core/end caps	Polypropylene
Cage	Polypropylene with TiO ₂ (white colored)
O-rings	Silicone elastomer
Sealing technology	Thermal bonding without adhesives

Operating parameters

Maximum differential pressure (forward direction)	5.5 bar (80 psi) at 40°C 4.0 bar (58 psi) at 80°C
Maximum differential pressure (reverse direction)	2.0 bar (30 psi) at 40°C

In compatible fluids which do not soften, swell or adversely affect the filter or its materials of construction.

Sterilization

Autoclave	30 × 60 min at 125°C slow exhaust
<i>In situ</i> steam	30 × 60 min at 125°C 5 × 60 min at 142°C

Water wet Supor EKV capsules prior to steaming to retain full water wettability for integrity testing.

Typical extractables in water at 20°C

< 25 mg after 4 hours extraction (per 254 mm module)

Tested on elements without pre-flushing.

Integrity test values

Values for 254 mm (10 in.) filter at 20°C

Maximum allowable forward flow (air test gas)	Water wet 17 mL/min at 2760 mbar (40 psi)
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Nominal EFA

0.60 m² per 254 mm module (6.5 ft² per 10 in. module)

0.26 m² per 125 mm module (2.8 ft² per 5 in. module)

125 mm [5 in.] filters are standard pleated.

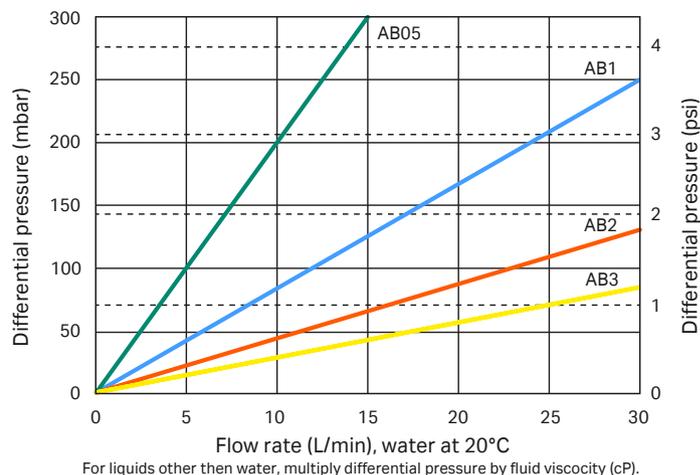


Fig 10. Typical liquid flow vs differential pressure.

Ordering information

Product code AB <input type="text"/>		EKV <input type="text"/>		P <input type="text"/> H4 <input type="text"/>	
Code	Nominal length	Code	Adapter style	O-ring material	
05	125 mm (5 in.)	7	Code 7 double O-ring bayonet lock and fin	Silicone elastomer (other materials available on request)	
1	254 mm (10 in.)				
2	508 mm (20 in.)	2	Code 2 double O-ring bayonet lock, no fin (code 05 only)		
3	762 mm (30 in.)				

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