Low Pressure Filter
Pi 2000

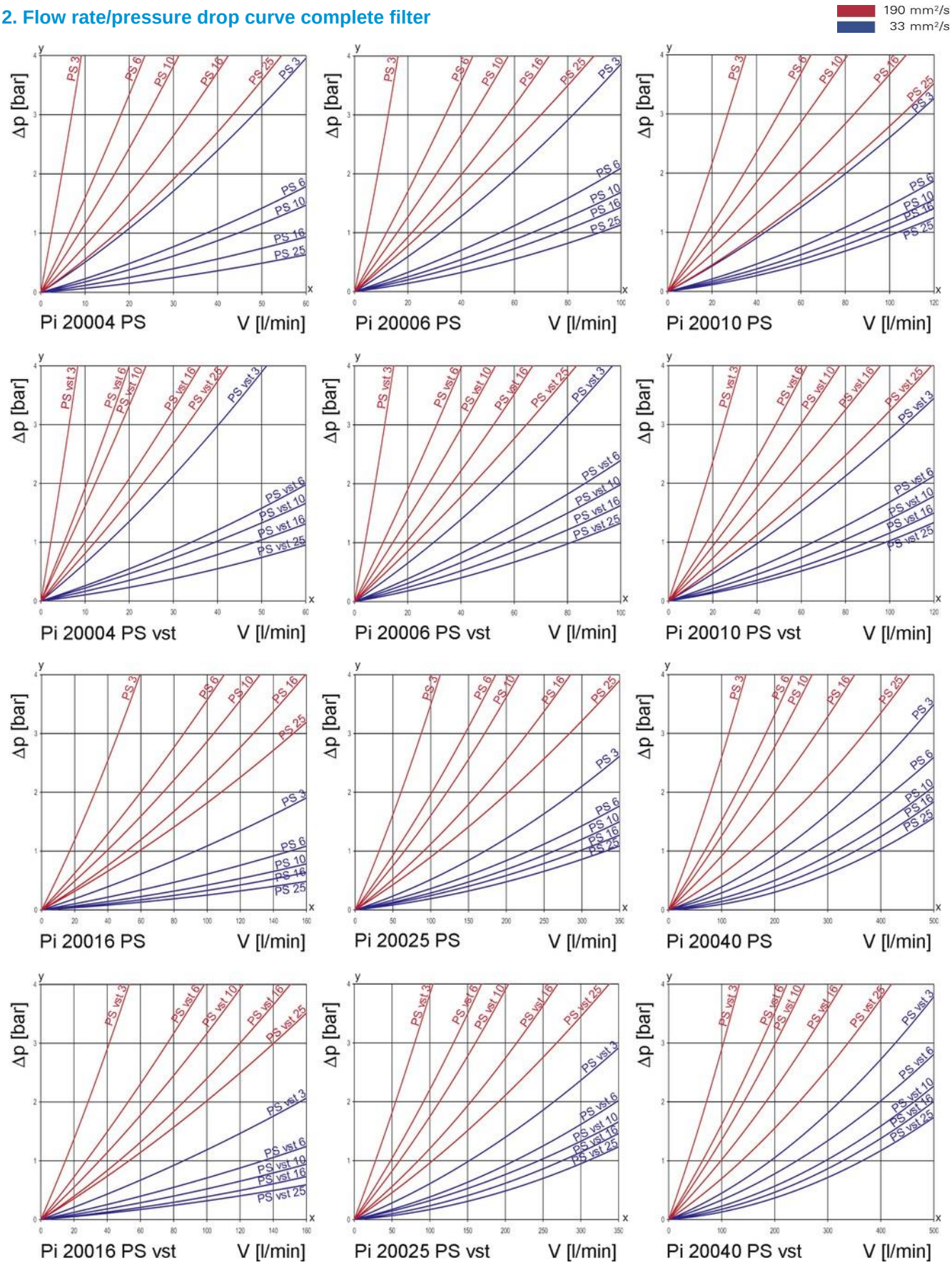
Nominal pressure 32/63 bar (460/900 psi), nominal size up to 400
according DIN 24550

1. Features

High performance filters for modern hydraulic systems

- Provided for pipe installation
- Modular system
- Compact design
- Minimal pressure drop through optimal flow design
- Visual/electrical/electronic maintenance indicator
- Threaded connections
- Quality filters, easy to service
- Equipped with higly efficient glass fibre PS filter elements
- Beta rated elements according to ISO 16889 multipass test
- Elements with high differential pressure stability and dirt holding capacity
- Other connections on request
- Worldwide distribution

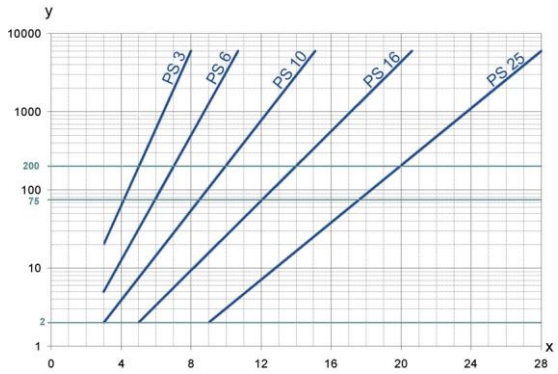
2. Flow rate/pressure drop curve complete filter



y = differential pressure Δp [bar]

x = flow rate V [l/min]

3. Separation grade characteristics



y = beta-value
x = particle size [µm]

determined by multipass tests (ISO 16889)
calibration according to ISO 11171 (NIST)

4. Filter performance data

tested according to ISO 16889 (multipass test)

PS elements with max. Δ p 20 bar

PS	3	$\beta_{5(C)}$	≥200
PS	6	$\beta_{7(C)}$	≥200
PS	10	$\beta_{10(C)}$	≥200
PS	16	$\beta_{15(C)}$	≥200
PS	25	$\beta_{20(C)}$	≥200

values guaranteed up to 10 bar differential pressure

PS vst elements with max. Δ p 210 bar

PS vst	3	$\beta_{5(C)}$	≥200
PS vst	6	$\beta_{7(C)}$	≥200
PS vst	10	$\beta_{10(C)}$	≥200
PS vst	16	$\beta_{15(C)}$	≥200
PS vst	25	$\beta_{20(C)}$	≥200

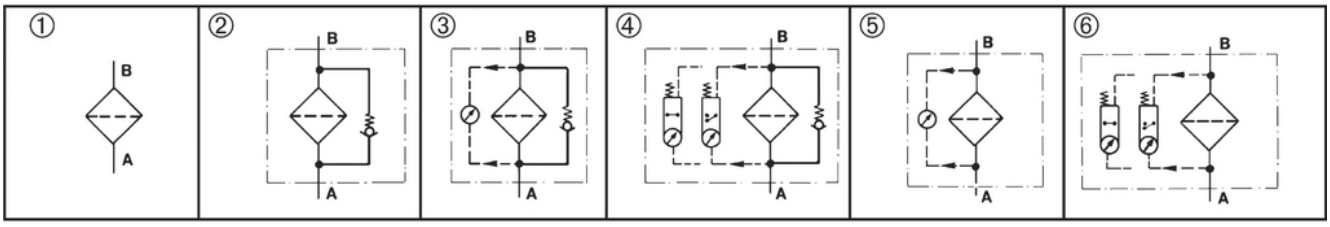
values guaranteed up to 20 bar differential pressure

5. Quality assurance

Filtration Group filters and filter elements are produced according to the following international standard:

Norm	Designation
DIN ISO 2941	Hydraulic fluid power filter elements; verification of collapse/burst resistance
DIN ISO 2942	Hydraulic fluid power filter elements; verification of fabrication integrity
DIN ISO 2943	Hydraulic fluid power filter elements; verification of material compatibility with fluids
DIN ISO 3723	Hydraulic fluid power filter elements; method for end load test
DIN ISO 3724	Hydraulic fluid power filter elements; verification of flow fatigue characteristics
ISO 3968	Hydraulic fluid power-filters-evaluation of pressure drop versus flow characteristics
ISO 10771.1	Fatigue pressure testing of metal containing envelopes in hydraulic fluid applications
ISO 16889	Hydraulic fluid power filters; multipass method for evaluation filtration performance of a filter element

6. Symbols



7. Order numbers

Example for ordering filters:

1. Housing design	2. Filter element
V = 100 l/min with visual/electrical maintenance indicator Type: Pi 20010-069 Order number: 78265035	PS vst 3 NBR Type: Pi 71010 DN PS vst 3 Order number: 78227480

7.1 Housing design

Nominal size NG [l/min]	Order number	Type	① no options	② with bypass	③ with bypass valve and visual indicator	④ with bypass valve and electrical indicator	⑤ with visual indicator	⑥ with electrical indicator
40	76116974	Pi 20004-060	■					
	76116982	Pi 20004-056		■				
	79328394	Pi 20004-057			■			
	79328402	Pi 20004-058				■		
	79328410	Pi 20004-068					■	
	79328428	Pi 20004-069						■
63	76116990	Pi 20006-060	■					
	76117006	Pi 20006-056		■				
	76117014	Pi 20006-057			■			
	76117022	Pi 20006-058				■		
	76117030	Pi 20006-068					■	
	76117048	Pi 20006-069						■
100	76117055	Pi 20010-060	■					
	76117063	Pi 20010-056		■				
	79328436	Pi 20010-057			■			
	77958705	Pi 20010-058				■		
	79328444	Pi 20010-068					■	
	78265035	Pi 20010-069						■
160	76117071	Pi 20016-060	■					
	76117089	Pi 20016-056		■				
	76117097	Pi 20016-057			■			
	79713520	Pi 20016-058				■		
	76114102	Pi 20016-068					■	
	76114110	Pi 20016-069						■
250	76114128	Pi 20025-060	■					
	76114136	Pi 20025-056		■				
	79328451	Pi 20025-057			■			
	77958879	Pi 20025-058				■		
	79328469	Pi 20025-068					■	
	79328477	Pi 20025-069						■
400	76114144	Pi 20040-060	■					
	76114151	Pi 20040-056		■				
	79714395	Pi 20040-057			■			
	76114169	Pi 20040-058				■		
	76114177	Pi 20040-068					■	
	76114185	Pi 20040-069						■

When filter with non bypass configuration is selected, the collapse pressure of the element must not be exceeded.

7.2 Filter elements*					
Nominal size NG [l/min]	**Order number**	**Type**	**Filter material**	**max. Δ p [bar]**	**Filter surface [cm²]**
40	78260929	Pi 21004 DN PS 3	PS 3	**20**	475
	77960859	Pi 22004 DN PS 6	PS 6		475
	77925571	Pi 23004 DN PS 10	PS 10		475
	78260937	Pi 24004 DN PS 16	PS 16		475
	78260945	Pi 25004 DN PS 25	PS 25		475
	78216079	Pi 71004 DN PS vst 3	PS vst 3	**210**	445
	77960156	Pi 72004 DN PS vst 6	PS vst 6		445
	77925654	Pi 73004 DN PS vst 10	PS vst 10		445
	78216087	Pi 74004 DN PS vst 16	PS vst 16		445
	78216095	Pi 75004 DN PS vst 25	PS vst 25		445
63	78260960	Pi 21006 DN PS 3	PS 3	**20**	835
	77960867	Pi 22006 DN PS 6	PS 6		835
	77925589	Pi 23006 DN PS 10	PS 10		835
	78260978	Pi 24006 DN PS 16	PS 16		835
	78260986	Pi 25006 DN PS 25	PS 25		835
	78216137	Pi 71006 DN PS vst 3	PS vst 3	**210**	780
	77960149	Pi 72006 DN PS vst 6	PS vst 6		780
	77925662	Pi 73006 DN PS vst 10	PS vst 10		780
	78216145	Pi 74006 DN PS vst 16	PS vst 16		780
	78216152	Pi 75006 DN PS vst 25	PS vst 25		780
100	78227472	Pi 21010 DN PS 3	PS 3	**20**	1375
	77960875	Pi 22010 DN PS 6	PS 6		1375
	77925597	Pi 23010 DN PS 10	PS 10		1375
	78261000	Pi 24010 DN PS 16	PS 16		1375
	78261018	Pi 25010 DN PS 25	PS 25		1375
	78227480	Pi 71010 DN PS vst 3	PS vst 3	**210**	1275
	77960131	Pi 72010 DN PS vst 6	PS vst 6		1275
	77925670	Pi 73010 DN PS vst 10	PS vst 10		1275
	78261281	Pi 74010 DN PS vst 16	PS vst 16		1275
	78216160	Pi 75010 DN PS vst 25	PS vst 25		1275

* a wider range of element types is available on request

7.2 Filter elements*					
Nominal size NG [l/min]	**Order number**	**Type**	**Filter material**	**max. Δ p [bar]**	**Filter surface [cm²]**
160	78261034	Pi 21016 DN PS 3	PS 3	**20**	2530
	77960826	Pi 22016 DN PS 6	PS 6		2530
	77925605	Pi 23016 DN PS 10	PS 10		2530
	78261042	Pi 24016 DN PS 16	PS 16		2530
	78261059	Pi 25016 DN PS 25	PS 25		2530
	77940638	Pi 71016 DN PS vst 3	PS vst 3	**210**	1885
	77960123	Pi 72016 DN PS vst 6	PS vst 6		1885
	77925688	Pi 73016 DN PS vst 10	PS vst 10		1885
	78269797	Pi 74016 DN PS vst 16	PS vst 16		1885
	78216178	Pi 75016 DN PS vst 25	PS vst 25		1885
250	78227514	Pi 21025 DN PS 3	PS 3	**20**	4020
	77960834	Pi 22025 DN PS 6	PS 6		4020
	77925613	Pi 23025 DN PS 10	PS 10		4020
	78261075	Pi 24025 DN PS 16	PS 16		4020
	78261083	Pi 25025 DN PS 25	PS 25		4020
	77940646	Pi 71025 DN PS vst 3	PS vst 3	**210**	3090
	77960115	Pi 72025 DN PS vst 6	PS vst 6		3090
	77925696	Pi 73025 DN PS vst 10	PS vst 10		3090
	78269813	Pi 74025 DN PS vst 16	PS vst 16		3090
	78216186	Pi 75025 DN PS vst 25	PS vst 25		3090
400	78227522	Pi 21 040 DN PS 3	PS 3	**20**	6770
	77960842	Pi 22 040 DN PS 6	PS 6		6770
	77925621	Pi 23 040 DN PS 10	PS 10		6770
	78261109	Pi 24 040 DN PS 16	PS 16		6770
	78261117	Pi 25 040 DN PS 25	PS 25		6770
	77940653	Pi 71 040 DN PS vst 3	PS vst 3	**210**	5240
	77960107	Pi 72 040 DN PS vst 6	PS vst 6		5240
	77930829	Pi 73 040 DN PS vst 10	PS vst 10		5240
	78269821	Pi 74 040 DN PS vst 16	PS vst 16		5240
	78260903	Pi 75 040 DN PS vst 25	PS vst 25		5240

* a wider range of element types is available on request

8. Technical specifications

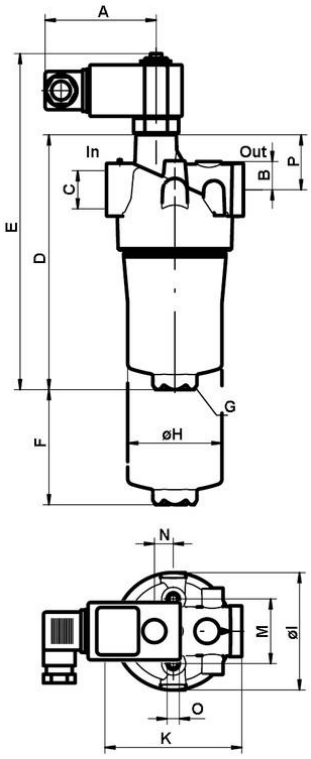
Design:	line mounting filter
Nominal pressure:	
Pi 20004-20010	10^7 load changes 63 bar (900 psi)
Pi 20016-20040	10^7 load changes 25 bar (360 psi) 2x 10^6 load changes 32 bar (460 psi)
Test pressure:	
Pi 20004-20010	95 bar (1370 psi)
Pi 20016-20040	48 bar (690 psi)
Temperature range:	- 30 °C to + 120 °C survival temperature - 40 °C (other temperature ranges on request)
Bypass setting:	Δ p 3.5 bar $\pm$ 10 %
Filter head material:	GDAL
Filter housing material:	AL/St.
Sealing material:	NBR/AL
Maintenance indicator setting:	Δ p 2.2 bar $\pm$ 10 %
Electrical data of maintenance indicator:	
Max. voltage:	250 V AC/200 V DC
Max. current:	1 A
Contact load:	70 W
Type of protection:	IP 65 in inserted and secured status
Contact:	normally open/closed
Cable sleave:	M20x1.5

The switching function can be changed by turning the electric upper part by 180° (normally closed contact or normally open contact). The state on delivery is a normally closed contact. By inductivity in the direct current circuit the use of suitable protection circuit should be considered. Further maintenance indicator details and designs are available in the maintenance indicator data sheet.

We draw attention to the fact that all values indicated are average values which do not always occur in specific cases of application. Our products are continually being further developed. Values, dimensions and weights can change as a result of this. Our specialized department will be pleased to offer you advice.

We recommend to contact us concerning applications of our filters in areas governed by the EU Directive 94/9 EC (ATEX 95). The standard version can be used for liquids based on mineral oil (corresponding to the fluids in Group 2 of Directive 97/23 EC Article 9). If you consider to use other fluids please contact us for additional support.

Subject to technical alteration without prior notice.



9. Dimensions

All dimensions except "C" in mm.

Type	A	B	C*	D	E	F	G SW	H	I	K	M	N	O	P	Weight [kg]
Pi 20004	78	19	G½	186	240	80	27	66	80	95	45	13	M8x10	37.5	0.9
Pi 20006	78	19	G¾	243	300	80	27	66	80	95	45	13	M8x10	37.5	1.0
Pi 20010	78	19	G¾	333	393	80	27	66	80	95	45	13	M8x10	37.5	1.1
Pi 20016	78	30	G1¼	268	326	110	32	109	128	150	60	24.5	M12x15	43.5	2.3
Pi 20025	78	30	G1¼	363	421	110	32	109	128	150	60	24.5	M12x15	43.5	2.5
Pi 20040	78	30	G1¼	509	566	110	24	109	128	150	60	24.5	M12x15	43.5	7.4

* NPT and SAE connections on request

10. Installation, operating and maintenance instructions

10.1 Filter installation

When installing the filter make sure that sufficient space is available to remove filter element and filter housing.
Preferably the filter should be installed with the filter housing pointing downwards.
The maintenance indicator must be visible.

10.2 Connecting the electrical maintenance indicator

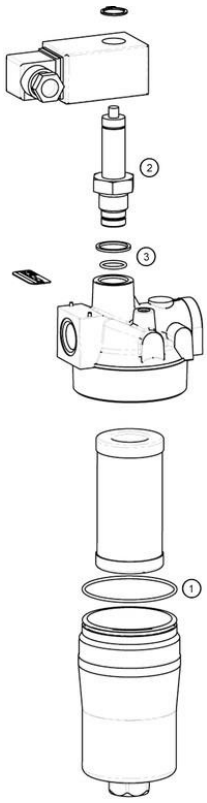
The electrical indicator is connected via a 2-pole appliance plug according to DIN EN 175301-803 with poles marked 1 and 2. The electrical section can be inverted to change from normally open position to normally closed position or vice versa. The state on delivery is a normally closed contact.

10.3 When should the filter element be replaced?

1. Filters equipped with visual and electrical maintenance indicator:
   During cold starts, the indicator may give a warning signal. Press the red button of the visual indicator once again only after operating temperature has been reached. If the red button immediately pops up again and/or the electrical signal has not switched off after reaching operating temperature, the filter element must be replaced after the end of the shift.
2. Filters without maintenance indicator:
   The filter element should be replaced after the trial run or flushing of the system. Afterwards follow instructions of the manufacturer.
3. Please always ensure that you have original Filtration Group spare elements in stock: Disposable elements cannot be cleaned.

10.4 Element replacement

1. Stop system and relieve filter from pressure.
2. Unscrew the filter housing by turning counter-clockwise. Clean the housing using a suitable cleaning solvent.
3. Remove element by pulling down carefully.
4. Check O-ring on the filter housing for damage. Replace, if necessary.
5. Make sure that the order number on the spare element corresponds to the order number of the filter name-plate.
   To ensure no contamination occurs during the exchange of the element first open the plastic bag and push the element over the spigot in the filter head. Now remove plastic bag.
6. Lightly lubricate the threads of the filter housing a little bit and screw into the filter head. Maximum tightening torque for NG 40 to 100 = 30 Nm, for NG 160 to 400 = 50 Nm.



11. Spare parts list

Order numbers for spare parts		
Position	**Type**	**Order number**
①	Seal kit for filter housing	
	Pi 20004 - Pi 20010	
	NBR	79328485
	FPM	79328493
	EPDM	79357609
	Pi 20016 - Pi 20040	
	NBR	79357617
	FPM	79357625
	EPDM	79357633
②	Maintenance indicator	
	Visual PiS 3098/2.2	77669971
	Electrical PiS 3097/2.2	77669948
	Electrical upper section only	77536550
③	Seal kit for maintenance indicator	
	NBR	77760309
	FPM	77760317
	EPDM	77760325

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