

## Qualitative filter papers

These cellulose filters are used in qualitative analytical techniques to determine and identify materials. Fluted qualitative filters are available, which give improved flow rate and increased loading capacity compared to equivalent flat filters.

### Grade 1 (11 µm\*)

The most widely used filter paper for routine applications with medium retention and flow rate. This grade covers a wide range of laboratory applications and is frequently used for clarifying liquids. Traditionally, the grade is used in qualitative analytical separations for precipitates such as lead sulfate, calcium oxalate (milk), and calcium carbonate.

- In agriculture, it is used for soil analysis and seed testing procedures.
- In the food industry, Grade 1 is used for numerous routine qualitative analytical separations.
- It is widely used in education for teaching simple qualitative analytical separations.
- It is used for air pollution monitoring, using circles or rods. Atmospheric dust is collected from airflow and the stain intensity measured photometrically.
- For gas detection, the paper is impregnated with a chromogenic reagent and color formation is quantified by optical reflectance.

Available fluted as Grade 1V.

### Grade 2 (8 µm\*)

Slightly more retentive and absorbent than Grade 1, with a corresponding increase in filtration time (i.e. slightly slower filtration speed). Used for the separation of fine particles such as bacteria and yeast, for example, to help soil nutrient in plant growth trials. Also used for monitoring specific contaminants in the atmosphere and in soil testing.

Available fluted as Grade 2V.

### Grade 3 (6 µm\*)

Doubles the thickness of Grade 1 with still finer particle retention and excellent loading capacity; more precipitate can be held without clogging.

- The extra thickness gives increased wet strength and makes this grade highly suitable for use in Büchner funnels.
- The high absorbency is particularly valuable when the paper is used as a sample carrier.

### Grade 4 (25 µm\*)

Extremely fast filtering with excellent retention of coarse particles and gelatinous precipitates such as ferric hydroxide and aluminum hydroxide.

- Very useful as a rapid filter for routine clean-up of biological fluids or organic extracts during analysis.
- Used when high flow rates in air pollution monitoring are required and the collection of fine particles is not critical.

Available fluted as Grade 4V.

- Particle retention rating at 80% efficiency



Grade 4 qualitative filter papers

### Grade 5 (2.5 µm\*)

The maximum degree of fine particle filtration in the qualitative range. Capable of retaining the fine precipitates encountered in chemical analysis. Slow flow rate.

- Excellent clarifying filter for cloudy suspensions and for water and soil analysis.
- Also available fluted as Grade 5V.

### Grade 6 (3 µm\*)

Twice as fast as Grade 5 with similar fine particle retention. Often specified for boiler water analysis applications.

### Grade 591 (7–12 µm\*)

A thick filter paper with very high loading capacity for fast filtration of medium to coarse precipitates. Offers high absorbency and increased wet strength.

Also available fluted as Grade 591 V.

### Grade 595 (4–7 µm\*)

Very popular, thin filter paper, medium-fast with medium to fine particle retention. Used for many routine analytical applications in different industries (e.g. particle separation from food extracts or filtration of solids from digested environmental samples for IC/PAAS analysis).

Also available fluted as Grade 595 V.

### Grade 597 Plus (4–7 µm)

A standard grade filter paper for a variety of routine applications in food and beverage industries.

- Well-suited for determination of fat content in food or removal of carbon dioxide and turbidity from beverages such as beer. Available in sheets and circles.

### Grade 597 (4–7 µm\*)

A medium fast filter paper with medium to fine particle retention.

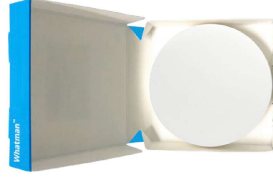
- Used for a wide variety of routine analytical applications in different industries like food testing (e.g. determination of fat content) or removal of carbon dioxide and turbidity from beverages (as in beer analysis).

Available fluted as Grade 597 V.

### Grade 597L (7 µm\*)

A qualitative filter paper with low fat content. Suitable for nitrate determination in foodstuffs to 535 LMBG\* (\* LMBG = German law for food and consumer products).

- Particle retention rating at 80% efficiency



Grade 597 Plus filter papers

**Technical specifications**  
Qualitative filter papers—standard grades

Grade	Description	Typical particle retention in liquid (µm) <sup>1</sup>	Filter retention (approx) in liquid (g)	Nominal air flow (l/100 ml/min)	Nominal thickness (µm)	Nominal basis weight (g/m <sup>2</sup> )	Typical water flow rate (ml/min)	Nominal ash content (mg)
1	Thin	11	13	80	87	57	0.06	
2	Thin	8	20	390	97	38	0.06	
3	Thick	6	26	390	185	28	0.06	
4	Thin	2.5	37	4	92	247	0.06	
5	Thin	2.5	1420	96	210	5	0.06	
6	Thin	3	32	80	100	22	0.15	
591	Medium fast, thick	7-12	45	5.9	350	181	—	
595	Medium fast, thin	4-7	60	150	68	—	—	
597	Medium fast	4-7	140	180	85	—	—	
597b	Medium fast, thick	4-7	170	100	82	—	—	
597c	Medium fast, thin	4-7	170	150	85	—	—	
598	Medium fast	6-10	80	200	140	—	—	
598b	Medium fast, thick	6-10	175	100	84	—	—	
602h	Slow, dense	2	3000	—	150	85	—	

<sup>1</sup> Particle retention rating at 85% efficiency.  
<sup>2</sup> Ash is determined by ignition of the cellulose filter at 500 °C in air.

**Ordering information**  
Qualitative filter circles—standard grades

Diameter (mm)	Catalog number						Quantity/pack
	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	
10	1001-6508	—	—	—	—	—	500
15	1001-0155	—	—	—	—	—	500
20	1001-0220	—	—	—	—	—	400
23	—	1003-323	—	—	—	—	100
25	1001-325	—	—	—	1005-325	—	100
25	1001-025	—	—	—	—	—	400
27	—	—	—	1004-027	—	—	400
30	1001-329	—	—	—	—	—	100
30	1001-030	—	—	—	—	—	400

**Grade 588 (8-10 µm<sup>1</sup>)**  
A thick filter paper with high loading capacity. Combines medium retention with medium-fast to fast filtration speed. Available fluted as Grade 588 ½.

**Grade 602 h (< 2 µm<sup>1</sup>)**  
A dense filter paper for collecting very small particles and removing fine precipitates.  
 • Used in sample preparation (e.g. in the beverage industry for residual sugar determination, acidic spectra, refractometric analysis, and HPLC).  
 Available fluted as Grade 602h ½.

**Grade 602 eh (2 µm<sup>1</sup>)**  
These cellulose filters are used in qualitative analytical techniques to determine and identify materials. A standard grade filter paper for very fine precipitates. Used for recovery of microfine crystalline components (< 1 µm) in alkaline tests in waste analysis (e.g. soils, filter dust, ash, one/slag waste).  
 Available fluted as Grade 602 eh ½.



Grade 602 eh filter papers

<sup>1</sup> Particle retention rating at 85% efficiency

**Ordering information**  
Qualitative filter circles—standard grades (continuation)

Diameter (mm)	Catalog number						Quantity/pack
	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	
32	1001-032	-	-	-	-	-	100
41	-	1004-041	-	-	-	-	100
42.5	1001-042	1002-042	-	1004-042	1005-042	1006-042	100
47	1001-047	1002-047	-	1004-047	1005-047	-	100
50	-	1004-050	-	-	-	-	100
55	1001-055	1002-055	1003-055	1004-055	1005-055	-	100
60	-	-	1003-060	1004-070	1005-060	-	100
70	1001-070	1002-070	1003-070	1004-070	1005-070	1006-070	100
76.2	1001-0035	-	-	-	-	-	500
82	1001-082	-	-	-	-	-	100
85	1001-085	-	-	-	-	-	100
80	1001-090	1002-090	1003-090	1004-090	1005-090	1006-090	100
90	1001-0048	1002-10048	-	-	-	-	5000
110	1001-110	1002-110	1003-110	1004-110	1005-110	1006-110	100
125	1001-125	1002-125	1003-125	1004-125	1005-125	1006-125	100
145	1001-045	-	-	-	-	-	100
150	-	1002-147	-	-	-	-	100
150	1001-150	1002-150	1003-150	1004-150	1005-150	1006-150	100
185	1001-185	1002-185	1003-185	1004-185	1005-185	1006-185	100
240	1001-240	1002-240	1003-240	1004-240	1005-240	1006-240	100
270	1001-270	1002-270	-	1004-270	-	-	100
320	1001-320	1002-320	1003-320	1004-320	1005-320	-	100
385	1001-385	1002-385	-	-	-	-	100
400	1001-400	-	-	1004-400	-	-	100
500	1001-500	1002-500	-	-	-	-	100

**Ordering information**  
Qualitative filter circles—standard grades

Diameter (mm)	Catalog number						Quantity/pack
	Grade 595	Grade 597 Plus	Grade 597	Grade 598	Grade 602 h	Grade 602 h	
12.7	-	989-410108	10311862	-	-	-	1000
45	-	989-410101	10311804	-	-	-	100
55	-	989-49552	10311807	-	-	-	100
70	-	989-410102	10311808	-	-	-	100
80	-	989-4329	10311809	10312209	-	-	100
110	10311810	989-4323	10311830	-	-	10312509	100
125	10311811	989-4323	10311830	-	-	10312511	100
150	10311812	989-4323	10311832	-	-	10312612	100
185	10311814	989-4323	10311834	-	-	10312614	100
240	-	989-410106	10311820	-	-	10312620	100
320	-	989-410107	10311822	-	-	10312622	100

**Ordering information**  
Qualitative filter sheets—standard grades

Dimension (mm)	Catalog number		Quantity/pack
	Grade 1	Grade 2	
26 × 31	1001-513	1001-513	1000
75 × 100	1001-514	1001-514	500
460 × 570	1001-517	1001-517	100
460 × 570	1001-518	1001-518	500
580 × 680	1001-531	1001-531	100
580 × 680	1001-532	1001-532	500
600 × 600	1001-529	1001-529	100
<b>Grade 2</b>			
460 × 570	1002-517	1002-517	100
580 × 680	1002-531	1002-531	100
600 × 600	1002-529	1002-529	100
<b>Grade 3</b>			
460 × 570	1003-517	1003-517	100

**Ordering information**  
Qualitative filter sheets—standard grades (continuation)

Dimensions (mm)	Catalog number	Quantity/pack
<b>Grade 4</b>		
450 × 570	10044317	100
550 × 550	10044330	100
6 × 6 in	10044432	100
<b>Grade 881</b>		
550 × 550	10311587	250
<b>Grade 885</b>		
550 × 550	10311687	500
<b>Grade 897</b>		
550 × 550	10311887	500
550 × 550	10311937	100
<b>Grade 897 Plus</b>		
550 × 550	988410110	100
550 × 550	988410109	500
<b>Grade 898</b>		
550 × 550	10312387	250

**Ordering information**  
Qualitative filter reels—standard grades

Dimensions	Catalog number			Quantity/pack
	Grade 4	Grade 897L	Grade 898	
10 mm × 50 m	—	—	Grade 602 eh 10312500	20
38 mm × 30 m*	10044648	—	—	1
40 mm × 100 m	—	10312070	—	10
500 mm × 100 m	—	—	10312000	1

\* Approximate dimension