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# Filter papers

**Cytiva's filter papers, including Pall and Whatman ranges, are crafted using the highest-grade raw materials and are subjected to rigorous quality control processes. This commitment makes our filters a trusted choice for laboratories and industries that demand consistent and dependable filtration performance.**

# 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 $\mu\text{m}^*$ )

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 used for clarifying liquids. Traditionally, the grade is used in qualitative analytical separations for precipitates such as lead sulfate, calcium oxalate (hot), and calcium carbonate.

- Agriculture: Used for soil analysis and seed testing procedures.
- Food industry: Grade 1 is used for routine techniques to separate solid foodstuffs from associated liquid, or extracting liquid. They're also used in education for simple qualitative analytical separations.
- Air pollution monitoring: Atmospheric dust is collected from airflow and the stain intensity measured photometrically.
- 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 $\mu\text{m}^*$ )

Slightly more retentive and absorbent than Grade 1, with a corresponding increase in filtration time (i.e., slightly slower filtration speed). The extra absorbency in Grade 2 filters can be used, to hold soil nutrient in plant growth trials and to monitor contaminants in the atmosphere.

Available fluted as Grade 2V.

## Grade 3 (6 $\mu\text{m}^*$ )

Double the thickness of Grade 1 with finer particle retention and excellent loading capacity. More precipitate can be held without clogging.

- Extra thickness gives increased wet strength and makes this grade suitable for use in Büchner funnels.
- High absorbency for using the paper as a sample carrier.

## Grade 4 (25 $\mu\text{m}^*$ )

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

- 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.



Grade 4 qualitative filter papers

\* Particle retention rating at 98% efficiency.

### **Grade 5 (2.5 µm\*)**

Our 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 high loading capacity for fast filtration of medium to coarse precipitates. Offers high absorbency and increased wet strength.

Also available fluted as Grade 591 ½.

### **Grade 595 (4–7 µm\*)**

A 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 ICP/AAS analysis).

Also available fluted as Grade 595 ½.

### **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 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 in beer analysis.

Available fluted as Grade 597 ½.

### **Grade 597L (7 µm\*)**

A qualitative filter paper with low fat content. Suitable for nitrate determination in foodstuffs to §35 LMBG\* (\* LMBG = German law for food and consumer products).

\* Particle retention rating at 98% efficiency.



Grade 597 Plus filter papers

### **Grade 598 (8–10 µm\*)**

Thick filter paper with high loading capacity. Combines medium retention with medium-fast to fast filtration speed.

Available fluted as Grade 598 ½.

### **Grade 602 h (< 2 µm\*)**

Dense filter paper for collecting 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 602 h ½.

### **Grade 602 eh (2 µm\*)**

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 ultrapure crystalline components (< 1 µm) in alkaline tests in waste analysis (e.g., soils, filter dust, ash, ore and slag waste).

Available fluted as Grade 602 eh ½.



Grade 602 eh filter papers

\* Particle retention rating at 98% efficiency.

## Technical specifications

### Qualitative filter papers: Standard grades

Grade	Description	Typical particle retention in liquid (µm) <sup>1</sup>	Filtration speed (approx) herzberg (s)	Nominal air flow (s/100 mL/in <sup>2</sup> )	Nominal thickness (µm)	Nominal basis weight (g/m <sup>2</sup> )	Typical water flow rate (mL/min) <sup>2</sup>	Nominal ash content (%) <sup>3</sup>
1	-	11	-	13	180	87	57	0.06
2	-	8	-	20	190	97	38	0.06
3	Thick	6	-	26	390	185	28	0.06
4	-	25	37	4	210	92	247	0.06
5	-	2.5	1420	96	200	100	5	0.06
6	-	3	-	32	180	100	22	0.15
591	Medium fast, thick	7-12	45	5.9	350	161	-	-
595	Medium fast, thin	4-7	80	-	150	68	-	-
597	Medium fast	4-7	140	-	180	85	-	-
597L	Medium fast, low fat	7	170	-	180	82	-	-
597 Plus	Medium fast	4-7	300	-	190	85	-	-
598	Medium fast, thick	8-10	50	-	320	140	-	-
602 h	Slow, dense	< 2	375	-	160	84	-	-
602 eh	Very slow, very dense	2	3000	-	150	85	-	-

<sup>1</sup> Particle retention rating at 98% efficiency

<sup>2</sup> For 9 cm diameter

<sup>3</sup> Ash is determined by ignition of the cellulose filter at 900°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	1001-020	-	-	-	-	-	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

## 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	-	-	-	-	1005-060	-	100
70	1001-070	1002-070	1003-070	1004-070	1005-070	1006-070	100
76.2	1001-10035						500
82	1001-082	-	-	-	-	-	100
85	1001-085	-	-	-	-	-	100
90	1001-090	1002-090	1003-090	1004-090	1005-090	1006-090	100
90	1001-10048	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	
12.7	-	989410108	10311862	-	-	1000
45	-	989410101	10311804	-	-	100
55	-	98949552	10311807	-	-	100
70	-	989410102	10311808	-	-	100
90	-	98949329	10311809	10312209	10312609	100
110	10311610	989410103	10311810	-	-	100
125	10311611	989410104	10311811	-	10312611	100
150	10311612	98949613	10311812	-	10312612	100
185	10316114	989410105	10311814	-	10312614	100
240	-	989410106	10311820	-	10312620	100
320	-	989410107	10311822	-	-	100

## Ordering information

Qualitative filter sheets: Standard grades

Dimensions (mm)	Catalog number	Quantity/pack
<b>Grade 1</b>		
26 × 31	1001-813	1000
75 × 100	1001-824	500
460 × 570	1001-917	100
460 × 570	1001-918	500
580 × 680	1001-931	100
580 × 680	1001-932	500
600 × 600	1001-929	100
<b>Grade 2</b>		
460 × 570	1002-917	100
580 × 680	1002-931	100
600 × 600	1002-929	100
<b>Grade 3</b>		
460 × 570	1003-917	100

## Ordering information

### Qualitative filter sheets: Standard grades (continuation)

Dimensions (mm)	Catalog number	Quantity/pack
<b>Grade 4</b>		
460 × 570	1004-917	100
580 × 580	1004-930	100
6 × 6 in	1004-492	100
<b>Grade 591</b>		
580 × 580	10311387	250
<b>Grade 595</b>		
580 × 580	10311687	500
<b>Grade 597</b>		
580 × 580	10311887	500
580 × 580	10311897	100
<b>Grade 597 Plus</b>		
580 × 580	989410110	100
580 × 580	989410109	500
<b>Grade 598</b>		
580 × 580	10312287	250

## Ordering information

### Qualitative filter reels: Standard grades

Dimensions	Catalog number				Quantity/pack
	Grade 4	Grade 597L	Grade 598	Grade 602 eh	
10 mm × 50 m	–	–	–	10312500	20
38 mm × 30 m*	1004-648	–	–	–	1
40 mm × 100 m	–	10312070	–	–	10
500 mm × 100 m	–	–	10312000	–	1

\* Approximate dimensions