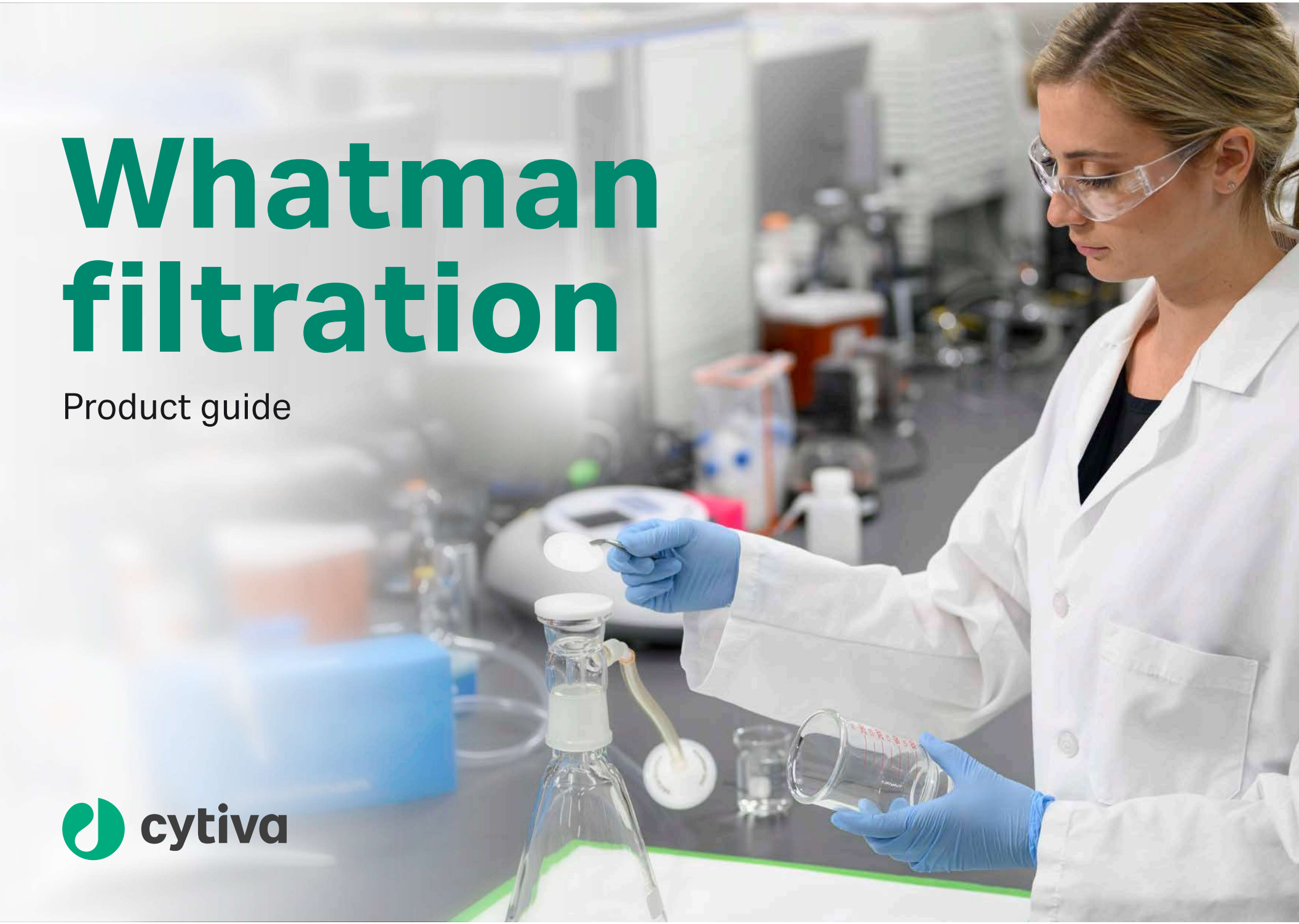
Whatman filtration

Product guide



cytiva

01

Filter papers

Whatman filter papers are associated with quality, reliability, and customer service. We maintain high standards for reproducibility and uniformity by using only the highest quality raw materials and strict quality control measures.

Cellulose filters

Whatman cellulose filters are manufactured from high-quality cotton linters which have been treated to achieve a minimum alpha cellulose content of 98%. These cellulose filter papers are used for general filtration and exhibit particle retention levels down to 2.5 µm. We offer a wide choice of retention/flow rate combinations to suit numerous laboratory applications.

The different groups of cellulose filters offer increasing degrees of purity, hardness, and chemical resistance.

Grade 5 qualitative filter papers

Cellulose filters, trace element composition

Typical values (µg/g paper)

Grade	1	42	542
Aluminum	3.6	2.5	3.4
Antimony	< 0.5	< 0.5	< 0.5
Arsenic	< 0.5	< 0.5	< 0.5
Barium	< 0.5	< 0.5	< 0.5
Boron	< 1.0	< 1.0	< 1.0
Calcium	27.5	8.3	14.7
Chromium	1.0	1.5	1.1
Copper	0.9	2.0	8.2
Iron	13.7	12.0	16.3
Lead	< 0.5	< 0.5	< 0.5
Magnesium	21.0	4.0	3.3
Manganese	< 0.5	< 0.5	< 0.5
Mercury	< 0.5	< 0.5	< 0.5
Potassium	6.2	2.3	3.7
Silicon	8.8	6.2	< 6.0
Sodium	32.3	16.8	17.0
Zinc	58.3	64.5	87.8

Typical values for additional grades can be found in Appendix A.

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 (hot), 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 techniques to separate solid foodstuffs from associated liquid, or extracting liquid and is widely used in education for teaching simple qualitative analytical separations.
- In air pollution monitoring, using circles or rolls, 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). In addition to general filtration in the 8 µm particle size range, the extra absorbency is utilized, for example, to hold 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*)

Double 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.

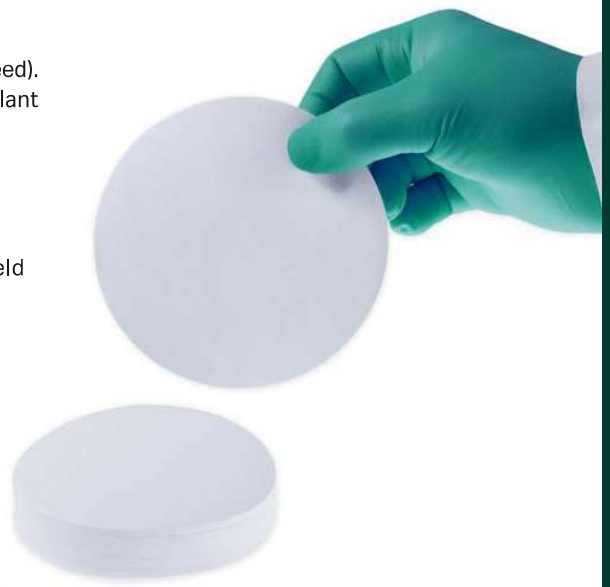
Grade 4 (25 µm*)

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 98% 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 ½.

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 ICP/AAS analysis).

Also available fluted as Grade 595 ½.

Grade 597 Optima (4–7 µm)

A standard Whatman 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 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).

Grade 597 Optima filter papers

* *Particle retention rating at 98% efficiency.*

Grade 598 (8–10 µm*)

A 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*)

A dense filter paper for collecting very small particles and removing fine precipitates.

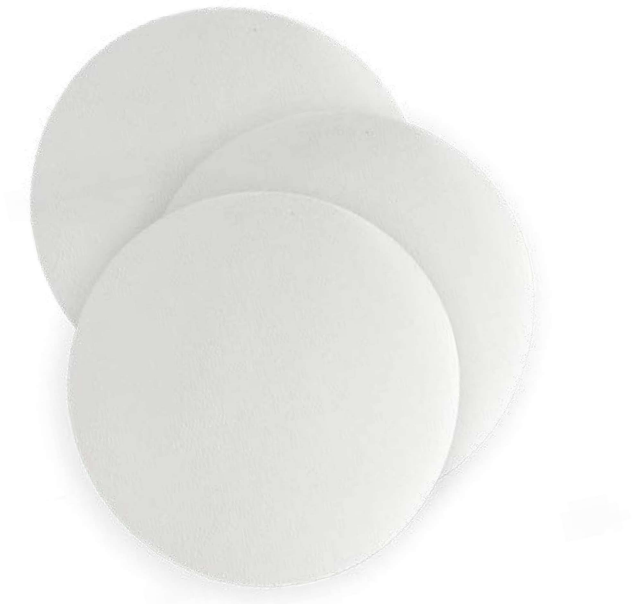
- Used in sample preparation (e.g. in the beverage industry for residual sugar determination, acidic spectra, refractometric analysis, and HPLC.

Available fluted as Grade 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/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)[1]	Filtration speed (approx) herzberg (s)	Nominal air flow (s/100 mL/in²)	Nominal thickness (µm)	Nominal basis weight (g/m²)	Typical water flow rate (mL/min)[2]	Nominal ash content (%)[3]
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 Optima	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	–	–

[1] *Particle retention rating at 98% efficiency*
[2] *For 9 cm diameter*
[3] *Ash is determined by ignition of the cellulose filter at 900˚C in air*

Ordering information

Qualitative filter circles—standard grades

	Catalog number						
Diameter (mm)	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Quantity/pack
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)

	Catalog number						
Diameter (mm)	**Grade 1**	**Grade 2**	**Grade 3**	**Grade 4**	**Grade 5**	**Grade 6**	**Quantity/pack**
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

	Catalog number					
Diameter (mm)	**Grade 595**	**Grade 597 Optima**	**Grade 597**	**Grade 598**	**Grade 602 h**	**Quantity/pack**
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**
Grade 1		
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
Grade 2		
460 × 570	1002-917	100
580 × 680	1002-931	100
600 × 600	1002-929	100
Grade 3		
460 × 570	1003-917	100

Ordering information

Qualitative filter sheets—standard grades (continuation)

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

Ordering information

Qualitative filter reels—standard grades

	Catalog number				
Dimensions	**Grade 4**	**Grade 597L**	**Grade 598**	**Grade 602 eh**	**Quantity/pack**
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*

Quantitative filter papers—ashless grades

Whatman quantitative filters are designed for gravimetric analysis and the preparation of samples for instrument analysis. They are available in three formats designed for specific requirements.

- **Ashless:** 0.007% ash nominal for Grades 40 to 44 and a typical nominal ash content of 0.01% for the 589 Grades. These filters are very pure and suitable for a wide range of critical analytical filtration procedures.
- **Hardened low ash:** 0.015% ash nominal—treated with a strong acid to remove trace metals and produce high wet strength and chemical resistance. These filters are particularly suitable for Büchner filtration where the tough, smooth surface of the filter makes it easy to recover precipitates.
- **Hardened ashless:** 0.005% ash nominal, acid hardened to give high wet strength and chemical resistance with extremely low ash content. The tough surface makes these filters suitable for a wide range of critical filtration procedures.

Quantitative filter papers, ashless

Grade 40: 8 µm*

The classic general purpose ashless filter paper with medium speed and retention. Typical applications include gravimetric analysis for numerous components in cements, clays, iron, and steel products; as a primary filter for separating solid matter from aqueous extracts in general soil analysis; quantitative determination of sediments in milk, and as a pure analytical grade clean-up filter for solutions prior to AA spectrometry. Also used as a high-purity filter in the collection of trace elements and radionuclides from the atmosphere.

Grade 41 (20 µm*)

The fastest ashless filter paper, recommended for analytical procedures involving coarse particles or gelatinous precipitates (e.g. iron or aluminum hydroxides). Also used in quantitative air pollution analysis as a paper tape for impregnation when determining gaseous compounds at high flow rates.

Grade 42 (2.5 µm*)

Used for critical gravimetric analysis with the finest particle retention of all Whatman cellulose filter papers. Typical analytical precipitates include barium sulfate, metastannic acid, and finely precipitated calcium carbonate.

Grade 43 (16 µm*)

Intermediate in retention between Grades 40 and 41, and twice as fast as Grade 40. Typical applications include foodstuffs analysis, soil analysis, particle collection in air pollution monitoring for subsequent analysis by XRF techniques, and inorganic analysis in the construction, mining, and steel industries.

Grade 44 (3 µm*)

Thin version of Grade 42 retaining very fine particles but with lower ash weight per sample and almost twice the flow rate of Grade 42.

* *Particle retention rating at 98% efficiency.*

Grade 589/1 (12-25 µm*)

Black Ribbon Filter: ashless filter paper with very high flow rate. Used for many quantitative standard methods, especially for gravimetric applications (e.g. determination of the ash content in foodstuffs or for the Blaine test in the cement industry).

Also available fluted as Grade 589/1 ½.

Grade 589/2 (4-12 µm*)

White Ribbon Filter: ashless standard filter paper for medium fine precipitates offering medium filtration speed. Applied in a variety of routine methods in quantitative analysis, (e.g. determination of the sand content in foodstuffs, determination of the grade of flour or analysis of aqueous suspensions in the paper industry).

Also available fluted as Grade 589/2 ½.

Grade 589/3 (2 µm*)

Blue Ribbon Filter: ashless standard filter paper for very fine precipitates. Slow filter paper with highest efficiency for collecting very small particles. Also used for many analytical routine methods in different industries (e.g. determination of the amount of insoluble contaminants in animal and vegetable fats and oils).

* *Particle retention rating at 98% efficiency*

Whatman ashless quantitative filter paper circles

Technical specifications

Quantitative filter papers—ashless grades

Grade	Typical particle retention in liquid (µm)[1]	Filtration speed (approx) herzberg (s)	Nominal ash content (%)[3]	Nominal thickness (µm)	Nominal basis weight (g/m²)	Typical water flow rate (mL/min)[2]	Nominal air flow rate (s/100 mL/in²)
40	8	–	0.007	210	95	25	21
41	20	–	0.007	215	85	254	4
42	2.5	–	0.007	200	100	5	96
43	16	–	0.007	220	95	62	11
44	3	–	0.007	176	80	11	56
589/1	12–25	25	0.01	190	80	–	–
589/2	4–12	70	0.01	180	85	–	–
589/3	2	375	0.01	160	84	–	–

1 *Particle retention rating at 98% efficiency*
2 *For 9 cm diameter*
3 *Ash is determined by ignition of the cellulose filter at 900°C in air*

Ordering information

Quantitative filter papers—ashless grades

	Catalog number								
Diameter (mm)	**Grade 40**	**Grade 41**	**Grade 42**	**Grade 43**	**Grade 44**	**Grade 589/1**	**Grade 589/2**	**Grade 589/3**	**Quantity/pack**
Filter circles									
12.7	1440-012	–	–	–	–	–	–	–	400
12.7	–	–	–	–	–	–	10300102	10300263	1000
25	1441-6309	1441- 6309	–	–	–	–	–	–	10000
30	1440-329	–	–	–	–	–	–	–	100
32	1440-032	–	–	–	–	–	–	–	100
40.5	–	–	–	–	–	–	10300103	–	100
42.5	1440-042	1441-042	1442-042	–	–	–	–	–	100
47	1440-047	1441-047	1442-047	–	–	–	–	–	100
50	–	1441-050	–	–	–	–	10300106	–	100
55	1440-055	1441-055	1442-055	–	–	–	10300107	–	100
60	–	1441-060	–	–	–	–	–	–	100
70	1440-070	1441-070	1442-070	–	1444-070	–	10300108	–	100
79	–	–	1442-10055	–	–	–	–	–	100
90	1440-090	1441-090	1442-090	1443-090	1444-090	10300009	10300109	–	100
110	1440-110	1441-110	1442-110	1443-110	1444-110	10300010	10300110	10300210	100
125	1440-125	1441-125	1442-125	1443-125	1444-125	10300011	10300111	10300211	100
142	–	–	–	–	–	–	–	10300213	100
150	1440-150	1441-150	1442-150	1443-150	1444-150	10300012	10300112	10300212	100
185	1440-185	1441-185	1442-185	1443-185	1444-185	10300014	10300114	10300214	100
240	1440-240	1441-240	1442-240	–	1444-240	–	10300120	–	100
320	1440-320	1441-320	1442-320	–	–	–	–		100
450	1440-6168	–	–	–	–	–	–	–	100
500	–	–	–	–	–	–	–	–	100
700	–	–	–	–	–	–	–	–	100
Filter sheets									
25.4 × 90	–	–	1442-6551	–	–	–	–	–	100
203 × 254	–	1441-866	–	–	–	–	–	–	100
460 × 570	1440-917	1441-917	1442-917	–	–	–	–	–	100
Flag shape	–	–	1442-971	–	–	–	–	–	100

Quantitative filter papers—hardened low ash grades

The maximum ash content of these grades is intermediate between ashless and qualitative grades. They are particularly suitable for Büchner filtrations where it is desirable to recover the precipitate from the filter surface after filtration. Other characteristics include high wet strength and chemical resistance, which are similar to the acid hardened ashless filter papers.

Grade 50 (2.7 µm*)

Retention of very fine crystalline precipitates. The thinnest of all Whatman filter papers with a slow flow rate, these filters have a hardened and highly glazed surface, which also keeps the paper free from loose surface fibers. Highly suitable for qualitative or quantitative filtrations requiring vacuum assistance on Büchner or 3-piece filter funnels. Very strong when wet and will withstand wet handling and precipitate removal by scraping. In the electronics industry, the virtual absence of fiber shedding is utilized in carriers for integrated circuits.

This grade is also available in Smear Tab format for wipe testing (e.g. testing of surfaces for radionuclide contamination).

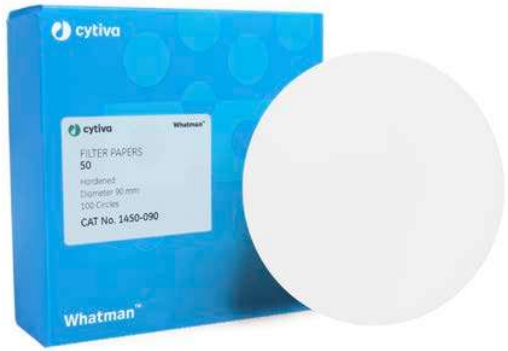
Grade 52 (7 µm*)

The general purpose hardened filter paper with medium retention and flow rate. Very hard surface.

Grade 54 (22 µm*)

Very fast filtration and high wet strength makes this grade very suitable for vacuum assisted fast filtration of difficult coarse or gelatinous precipitates.

* *Particle retention rating at 98% efficiency.*



Hardened low ash quantitative filter papers

Technical specifications

Quantitative filter papers—ashless grades

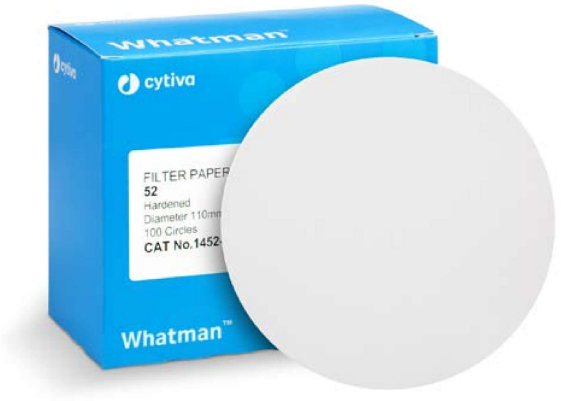
Grade	Typical particle retention in liquid (µm)[1]	Nominal ash content (%)[3]	Nominal thickness (µm)	Nominal basis weight (g/m²)	Typical water flow rate (mL/min)[2]	Nominal air flow rate (s/100 mL/in²)	Nominal air flow rate (s/100 mL/in²)
50	2.7	0.015	115	96	10	144	21
52	7	0.015	175	96	66	15	–
54	22	0.015	185	90	453	3	–

[1] *Particle retention rating at 98% efficiency*
[2] *For 9 cm diameter*
[3] *Ash is determined by ignition of the cellulose filter at 900°C in air*

Ordering information

Quantitative filter papers—hardened low ash grades

	Catalog number			
Dimensions (mm)	**Grade 50**	**Grade 52**	**Grade 54**	**Quantity/pack**
Filter circles				
42.5	1450-042	–	–	100
55	1450-055	–	1454-055	100
63.5	1450-063	–	–	100
70	1450-070	–	1454-070	100
90	1450-090	1452-090	1454-090	100
110	1450-110	1452-110	1454-110	100
125	1450-125	1452-125	1454-125	100
150	1450-150	1452-150	1454-150	100
185	1450-185	–	1454-185	100
240	1450-240	1452-240	1454-240	100
320	1450-320	–	1454-320	100
500	1450-500	–	1454-500	100
Smear Tab	1450-993	–	–	100
Filter sheets				
150 × 230	1450-916	–	–	100
460 × 570	1450-917	–	1454-917	100

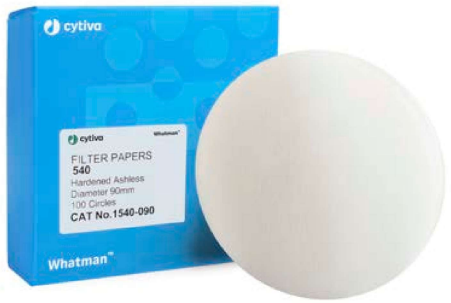


Hardened low ash quantitative filter papers

Quantitative filter papers—hardened ashless grades

Hardened ashless filter papers are suited for a variety of precipitate sizes. Along with general filtration Grade 540, the range includes Grade 542 for retention of fine precipitates and Grade 541 for fast filtration. All three grades are designed for use in gravimetric analysis.

These filter papers exhibit high wet strength and chemical resistance and are acid hardened, which reduces ash to an extremely low level. Their tough surfaces make them suitable for a wide range of critical analytical filtration operations. Each grade offers a convenient combination of filtration speed and particle retention.



Hardened ashless quantitative filter papers, Grade 540

Grade 540 (8 µm*)

A general purpose hardened ashless filter paper with medium retention and flow rate. Extremely pure and strong with a hard surface. High chemical resistance to strong acid and alkali. Frequently used in the gravimetric analysis of metals in acid/alkali solutions and in collecting hydroxides after precipitation by strong alkalis.

Grade 541 (22 µm*)

The general purpose hardened filter paper with medium retention and flow rate. Very hard surface.

Grade 542 (2.7 µm*)

High retention of fine particles under demanding conditions. Slow flow rate. Very hard and strong with excellent chemical resistance. Often used in gravimetric metal determinations.

* *Particle retention rating at 98% efficiency.*

Technical specifications

Quantitative filter papers—hardened ashless grades

Grade	Typical particle retention in liquid (µm)[1]	Nominal ash content (%)[3]	Nominal thickness (µm)	Nominal basis weight (g/m²)	Typical water flow rate (mL/min)[2]	Nominal air flow rate (s/100 mL/in²)
540	8	0.005	160	85	97	13
541	22	0.005	155	78	359	3
542	2.7	0.005	150	96	13	64

[1] *Particle retention rating at 98% efficiency*
[2] *For 9 cm diameter*
[3] *Ash is determined by ignition of the cellulose filter at 900°C in air*

Ordering information

Quantitative filter papers—hardened ashless grades

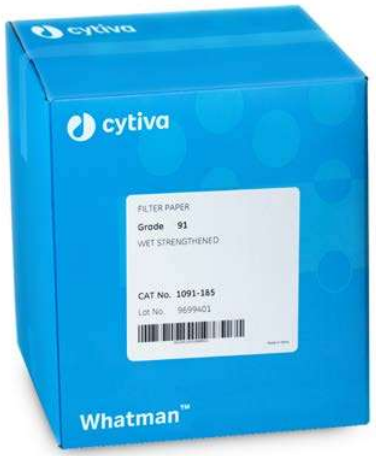
	Catalog number			
Dimensions (mm)	**Grade 540**	**Grade 541**	**Grade 542**	**Quantity/pack**
Filter circles				
21	1540-321	–	–	100
24	1540-324	–	–	100
42.5	1540-042	1541-042	–	100
47	–	1541-047	–	100
55	1540-055	1541-055	1542-055	100
70	–	1541-070	1542-070	100
90	1540-090	1541-090	1542-090	100
110	1540-110	1541-110	1542-110	100
125	1540-125	1541-125	1542-125	100
150	1540-150	1541-150	1542-150	100
185	1540-185	1541-185	1542-185	100
240	1540-240	1541-240	1542-240	100
270	–	1541-270	–	100
320	1540-320	1541-320	–	100
400	–	1541-400	1542-400	100
Filter sheets				
460 × 570	–	1541-917	–	100

Hardened ashless quantitative filter paper circles

Wet strengthened general purpose filter papers

Wet strengthened grades

These extremely strong filter papers have a high wet strength due to the addition of a small quantity of chemically stable resin. Their use in normal qualitative applications will not introduce any significant impurities into the filtrate. The resins do, however, contain nitrogen, so these grades should not be used in Kjeldahl estimations, etc. Some wet strengthened grades are available in folded (fluted) forms.



Qualitative filter papers, Grade 91

Grade 91 (10 µm*)

A general purpose creped filter for less critical routine analysis. Widely used to assay sucrose in cane sugar and within pharmaceutical laboratories for routine filtration.

Grade 93 (10 µm*)

This filter paper is intermediate in speed and retention between Grades 1 and 4. Available in a dispenser pack, which can be attached to the wall or bench, placed on a shelf either upright or flat, and used as a normal carton or as a convenient dispenser. The envelopes are released individually for easy one-at-a-time removal. Package and envelopes are clearly marked for size and content.

Grade 113 (30 µm*)

A fast, open filter paper with creped surface and high loading capacity — making it highly suited for use with coarse or gelatinous precipitates. Fastest flow rate of the qualitative grades.

Also available as Grade 113V.

Grade 114 (25 µm*)

Half the thickness of Grade 113 and suitable for coarse or gelatinous precipitates. Smooth surface for easy recovery of precipitates.

Also available fluted as Grade 114V.

Grade 1573 (12–25 µm*)

A fast filter paper with high wet strength. It has a very smooth surface, making it easy to scrape or wash off precipitate. Resistant against: sulfuric and nitric acid solutions (up to 40% at 50°C), hydrochloric (up to 10% at 100°C, 20% at 60°C, 25% at 20°C) and alkalis (up to 10% at 20°C).

Also available fluted as Grade 1573 ½.

Grade 1574 (7–12 µm*)

A medium fast filter paper with high wet strength. This paper has the same chemical resistance characteristics as Grade 1573 (see above).

Available fluted as Grade 1574 ½.

Grade 1575 (< 2 µm*)

Slow filter paper with high wet strength. This paper has the same chemical resistance characteristics as Grade 1573 (see above).

* *Particle retention rating at 98% efficiency.*

Technical specifications

Wet strengthened grades

Grade	Description	Typical particle retention in liquid (µm)[1]	Filtration speed (approx) herzberg (s)	Nominal air flow (s/100 mL/in²)	Nominal thickness (µm)	Nominal basis weight (g/m²)	Typical water flow rate (mL/min)[2]
91	Creped	10	–	6	205	65	274
93	Medium	10	–	7	145	65	194
113	Creped	30	–	2	420	125	774
114	–	25	–	4	190	75	333
1573	Fast, smooth	12–25	25	–	170	88	–
1574	Medium fast, very low fiber release	7–12	85	–	160	90	–
1575	Slow	< 2	700	–	140	92	–

[1] *Particle retention rating at 98% efficiency*
[2] *For 9 cm diameter*

Ordering information

Wet strengthened grades

	Catalog number							
Dimensions (mm)	Grade 91	Grade 93	Grade 113	Grade 114	Grade 1573	Grade 1574	Grade 1575	Quantity/pack
Filter circles								
90	–	–	1113-090	1114-090	–	–	–	100
110	1091-110	–	–	–	–	–	–	4000†
110	–	1093-110	1113-110	–	–	–	–	100
110	–	1093-111*	–	–	–	–	–	1250
125	1091-125	–	–	–	–	–	–	4000†
125	–	1093-125	1113-125	1114-125	–	–	–	100
125	–	1093-126*	–	–	–	–	–	1250
150	1091-150	1093-6215**	–	–	–	–	–	1000†
150	–	–	1113-150	1114-150	10314712	–	10314915	100
165	1091-165	–	–	–	–	–	–	1000†
185	1091-185	–	–	–	–	–	–	1000†
185	–	–	1113-185	1114-185	10314714	–	10314914	100
190	1091-190	–	–	–	–	–	–	1000†

* *Packed 50 envelopes of 25 circles*
** *Packed 10 bags of 100 circles*
† *Subdivided into 100*

Ordering information

Wet strengthened grades (continuation)

	Catalog number							
Dimensions (mm)	**Grade 91**	**Grade 93**	**Grade 113**	**Grade 114**	**Grade 1573**	**Grade 1574**	**Grade 1575**	**Quantity/pack**
200	–	–	–	–	–	–	10314916	100
240	1091-240	–	–	–	–	–	–	1000†
240	–	–	1113-240	1114-240	10314720	–	–	100
290	–	–	–	–	10314726	–	-	100
320	–	–	1113-320	–	–	–	–	100
330	1091-330	–	–	–	–	–	–	100
400	–	–	–	1114-400	–	–	–	100
500	–	–	1113-500	–	–	–	–	100
685	–	–	–	–	–	10314828	–	100
Filter sheets								
580 mm × 580 mm	–	–	–	1114-930	–	–	–	100
580 mm × 580 mm	1091-930	1093-930	–	–	–	–	–	500
610 mm × 610 mm	1091-935	1093-935	–	–	–	–	–	500
460 mm × 570 mm	–	–	1113-917	–	–	–	–	100
Rolls								
25 mm × 145 m	–	–	–	–	10314769	–	–	1
25.5 mm × 210 m	–	–	–	–	10314766	–	–	1
70 mm × 80 m	–	–	–	–	10314765	–	–	1
70 mm × 100 m	–	–	–	–	–	10314871	–	1

* *Packed 50 envelopes of 25 circles*
** *Packed 10 bags of 100 circles*
† *Subdivided into 100*