Folded and fluted filter papers

Ready-to-use paper solutions

Many grades of our qualitative and quantitative filter paper are available as fluted circles. We also offer a selection of prefolded cones, quadrant folded, and pyramid folded filter papers. These convenient formats eliminate time consuming manual pleating or folding, streamlining operations in busy labs.

Whatman ready-to-use folded filter papers support your application needs, save valuable time, and provide ease of use when undertaking repetitive or multiple analyses.

Folded and fluted filter papers, 113V

Fluted filter papers

This convenient format has major advantages over flat circles.

- Save time required to quadrant-fold circles to fit conical filter funnels in repetitive or multiple analyses.
- Decreased overall filtration time because of the extra surface area exposed. The slow-down of filtration speed due to the loading of particulate is postponed.
- Increased total loading capacity as more filter area is available.
- Maintained flow rate due to the reduction in filter paper contact with funnel side and the self-supporting shape of the filter itself.
- The prepleating does not significantly affect any of the technical data and the same figures may be used for flat circles.

Additional folded formats

Qualitative and quantitative grades are now available in several convenient folded formats. These ready-to-use paper filters are available in cone, pyramid, and flat quadrant folded formats, in diameters and grades to support your applications.

Pyramid, flat quadrant-folded and cone filters come in a range of media and diameters and fit conical funnels. Convenient stacking and packaging options are available.

Folded and fluted papers

Available formats and grades

Equivalent flat stock grade	Type	Fluted	Quadrant folded	Cone folded	Pyramid folded
1	Qualitative	1V	1 FF	1	1
2	Qualitative	2V	–	2	2
4	Qualitative	4V	–	–	4
5	Qualitative	5V	–	–	–
6	Qualitative	–	–	–	6
40	Ashless	–	40 FF	40	40
41	Ashless	–	41 FF	–	41
42	Ashless	–	–	–	42
113	Wet strengthened	113V	–	–	–
114	Wet strengthened	114V	–	–	–
–	Kieselguhr paper	287 ½	–	–	–
–	Qualitative	512 ½	–	–	–
520 a	General purpose	520 a ½	–	–	–
520 b II	General purpose	520 b FF	–	–	–
540	Hardened ashless	–	–	–	540
–	Qualitative	–	–	–	–
–	Qualitative	593 ½	–	–	–
–	Qualitative	594 ½	–	–	–
595	Qualitative	595 ½	–	–	–
597	Qualitative	597 ½	–	–	–
598	Qualitative	598 ½	–	–	–
602 h	Qualitative	602 h ½	–	–	–
602 eh	Qualitative	602 eh ½	–	–	–
–	Qualitative	604 ½	–	–	–
–	Qualitative	0790 ½	–	–	–
–	Qualitative	802	–	–	–
858	General purpose	0858 ½	0858 FF	–	–
–	Qualitative	0860 ½	–	–	–
1573	Wet strengthened	1573 ½	–	–	–
1574	Wet strengthened	1574 ½	–	–	–
–	Qualitative	2555 ½	–	–	–

Grade 1V and 1 FF (11 µm*)

A folded filter paper for routine applications with medium retention and flow rate. Covers a wide range of laboratory applications and is frequently used for clarifying liquids.

Grade 2V (8 µm*)

Widely used for general purpose filtration. Has excellent particle retention and a good filtration speed and loading capacity.

Grade 4V (25 µm*)

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

Grade 5V (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.

Grade 6

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

Grade 40 and 40 FF

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 and 41 FF

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

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

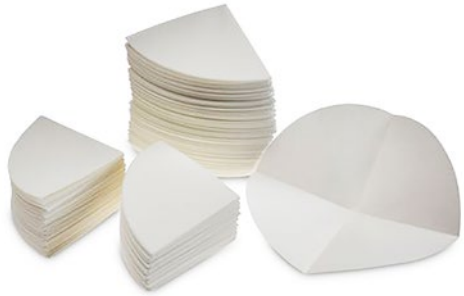
Grade 113V (30 µm*)

Thick and strong filter with creped surface for extremely high loading capacity, particularly in folded form. Fastest flow rate of any qualitative grade. Excellent for coarse particles and gelatinous precipitates.

Grade 114V (25 µm*)

Strong filter with very fast flow rate. Excellent for coarse particles and gelatinous precipitates. Smooth surface.

* *Particle retention rating at 98% efficiency.*



Quadrant flat folded filter papers

Grade 287 ½

Kieselguhr paper with a medium to slow flow rate. Additional adsorption effect (e.g., for the separation of very fine semi-colloidal turbidity, for clarifying milk serum, starch solutions, soil suspensions, or sugar-containing solutions prior to polarimetry or refractometry).

Grade 512 ½

Low phosphate papers approximately 1.5 ppm phosphate, for the filtration of calcium lactate extracts from soil samples for the determination of K and P according to Egnér, Riehm and Lederle

Grade 520 a ½ (15–18 µm*)

A thin paper with great wet strength and a very high flow rate. Frequently used in technical applications such as the filtration of viscous liquids and emulsions (e.g., sweetened juices, spirits and syrups, resin solutions, oils or plant extracts).

Grade 520 b FF

A filter paper with high wet strength offering a very high flow rate.

Pyramid folded filter papers

Grade 540

A general purpose hardened ashless filter paper with medium retention and flow rate. 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 or alkali solutions and in collecting hydroxides after precipitation by strong alkalis.

Grade 593 ½ (5 µm*)

A standard grade filter paper for fine precipitates.

Grade 594 ½ (4 µm*)

A standard grade filter paper for fine precipitates.

Grade 595 ½ (4–7 µm*)

A 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).

Grade 597 ½ (4–7 µm*)

A medium fast filter paper with medium to fine particle retention. Used for a wide variety of analytical routine applications in industries like food testing (e.g., determination of fat content) or removal of carbon dioxide and turbidity from beverages (e.g., beer analysis).

Grade 598 ½ (8–10 µm*)

A thick filter paper with high loading capacity. Combines medium retention with medium-fast to quick filtration speed.

* *Particle retention rating at 98% efficiency.*

Grade 602 h ½ (< 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).

Grade 602 eh ½ (2 µm*)

A qualitative filter paper for very fine precipitates..

Grade 604 ½ (25 µm*)

Grade 604½ qualitative filter paper for coarse precipitates.

Grade 802

A fluted filter for use with a conical filter funnel, offering fast filtration and high loading capacity for analysis involving coarse particles or gelatinous precipitates.

The filter is wet-strengthened and for normal qualitative application it will not introduce any significant impurities into the filtrate. It is not recommended for Kjeldahl nitrogen analysis.

Cone folded filter papers

Grade 0858 ½ and 858 FF (7–12 µm*)

Medium retention and flow rate with a grained surface. A universal filter paper used for the filtration of extracts, oils, beer, and syrups. Also suitable for use in filter presses or for the aspiration of liquids.

Grade 1573 ½ (12–25 µm*)

A fast filter paper with high wet strength. It has a very smooth surface 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).

Grade 1574 ½ (7–12 µm*)

A medium fast filter paper with high wet strength. This paper has the same chemical resistance characteristics as Grade 1573 ½ (see above).

Grade 2555 ½ (12 µm*)

A medium fast filter paper. Used for the filtration of the mash for the determination of the extract in malt and wort and for removing carbon dioxide from beer.

Grade 0790 ½

Acid-washed paper with ash content of approximately 0.01%, low magnesium, and phosphorus for the determination of trace elements (Mg, Mn, Co, Cu, Mo, B).

* *Particle retention rating at 98% efficiency.*

Technical specifications

Fluted grades

Grade	Description	Typical particle retention in liquid (µm)[1]	Filtration speed (approx) herzberg (s)	Nominal thickness (µm)	Nominal basis weight (g/m²)	Typical water flow rate (mL/min)[2]	Nominal ash content (%)[3]
1V	Medium flow	11	–	180	87	57	0.06
2V	–	8	–	190	97	38	–
4V	Very fast	25	–	210	92	247	0.06
5V	Slow	2.5	–	200	92	5	–
113V	Creped	30	–	420	125	774	–
114V	–	25	–	190	75	333	–
287 ½	Kieselguhr	–	330	360	154	–	–
520 a ½	Very fast, creped, high wet strength	15-18	17.5	300	90	–	–
520 b FF	Very fast, wet strength, extra thick	20	30	500	155	–	–
593 ½	Medium to slow	5	450	170	85	–	–
594 ½	Slow	4	800	150	75	–	–
595 ½	Medium fast, thin	4-7	80	150	68	–	–
597 ½	Medium fast	4-7	70	180	85	–	–
598 ½	Medium fast, thick	8-10	50	320	140	–	–
602 h ½	Slow, dense	< 2	375	160	84	–	–
602 eh ½	Very slow, very dense	2	3000	150	85	–	–
604 ½	Fast	25	50	190	80	–	–
802	Fast	–	–	–	73	–	–
0858 ½	Medium fast, grained	7-12	55	170	75	–	–
0860 ½	Medium fast, smooth	12	60	170	75	–	–
1573 ½	Fast, smooth	12-25	25	170	88	–	–
1574 ½	Medium fast, very low fiber release	7-12	85	160	90	–	–
2555 ½	Medium fast	12	55	170	75	–	–

[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

Filter papers: Fluted grades

Dimensions (mm)	Catalog number								Quantity /pack
	Grade 1V	Grade 2V	Grade 4V	Grade 5V	Grade 113V	Grade 114V	Grade 287 ½	Grade 520 a ½	
110	–	–	–	1205-110	–	–	–	–	100
125	1201-125	1202-125	1204-125	–	1213-125	1214-125	–	–	100
125	–	–	–	–	–	–	10310244	–	50
150	–	–	–	–	–	–	10310245	–	50
150	1201-150	1202-150	1204-150	–	1213-150	1214-150		–	100
185	–	–	–	–	–	–	10310247	–	50
185	1201-185	1202-185	1204-0185	1205-185	1213-185	1214-185		–	100
240	1201-240	1202-240	1204-240	–	1213-240	1214-240	–	10331451	100
270	1201-270	1202-270	1204-270	–	1213-270	–	–	–	100
320	1201-320	1202-320	1204-320	–	1213-320	1214-320		–	100
385	–	1202-385	–	–	–	–	–	–	100
400	–	1202-400	–	–	–	–	–	–	100
500	–	1202-500	–	–	1213-500	–	–	10331456	100

Ordering information

Filter papers: Fluted grades

Dimensions (mm)	Catalog number							Quantity /pack
	Grade 520 b FF	Grade 593 ½	Grade 594 ½	Grade 595 ½	Grade 597 ½	Grade 598 ½	Grade 602 h ½	
70	–	–	–	10311641	10311841	–	–	100
90	–	–	–	10311642	10311842	–	10312642	100
110	–	–	–	10311643	10311843	–	–	100
125	–	–	–	–	–	10312244	–	50
125	–	–	–	10311644	10311844	–	10312644	100
150	–	–	–	10311645	10311845	–	10312645	100
185	–	–	–	–	–	10312247	–	50
185	–	10311447	10311547	10311647	10311847		10312647	100
210	–	–	–	10311649	–	–	–	100
240	10331551	–	–	–	–	10312251	–	50
240	–	10311451	–	10311651	10311851	–	10312651	100
270	–	–	–	10311652	10311852	–	–	100
320	10331553	–	–	–	–	–	–	50
320	–	–	–	10311653	10311853	–	–	100
385	10331554	–	–	–	–	–	–	50
385	–	–	–	10311654	10311854	–	–	100
500	10331556	–	–	–	–	10312256	–	50
500	–	–	–	10311656	10311856	–	–	100
600	10331558	–	–	–	–	–	–	50

Ordering information

Filter papers: Fluted grades

Dimensions (mm)	Catalog number							Quantity /pack
	Grade 602 eh ½	Grade 604 ½	Grade 0858 ½	Grade 0860 ½	Grade 1573 ½	Grade 1574 ½	Grade 2555 ½	
110	–	–	–	–	–	10314843	–	100
125	10312544	10312744	–	–	10314744	10314844	–	100
150	10312545	10312745	10334345	–	10314745	–	–	100
185	–	10312747	10334347	10334547	10314747	–	10313947	100
240	–	10312751	10334351	10334551	10314751	–	10313951	100
270	–	–	10334352	–	10314752	–	–	100
320	–	10312753	10334353	10334553	10314753	–	10313953	100
Sheets								
100 mm × 300 mm	–	–	–	10334500	–	–	–	500
570 mm × 870 mm	–	–	10334346	–	–	–	–	100
670 mm × 770mm	–	–	10334435	–	–	–	–	100

Ordering information

Quantitative filter papers: Ashless fluted grades

Dimensions (mm)	Catalog number		Quantity /pack
	Grade 589/1 ½	Grade 589/2 ½	
110	–	10300143	100
150	10300045	10300145	100

For further information on these grades see Quantitative Filter Papers section.

Ordering information

Filter papers: Wet strengthened fluted grades

Dimensions (mm)	Grade 589/1 ½	Grade 589/2 ½	Quantity /pack
125	Grade 802	5802-125	100
150	Grade 802	5802-150	100
185	Grade 802	5802-185	100
240	Grade 802	5802-240	100
240	Grade 802	5802-6698	1000
320	Grade 802	5802-320	100
385	Grade 802	5802-385	100

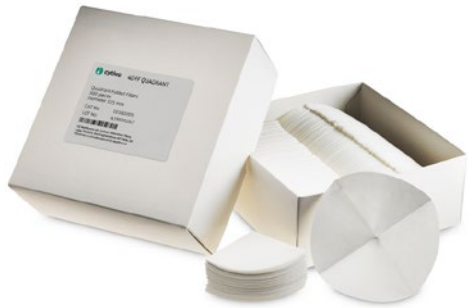
Fluted or prepleated filter papers

Ordering information

Filter papers quadrant folded

Grade	Nominal thickness (µm)	Nominal basis weight (g/m²)	Nominal ash content (%)[1]
1 FF	180	87	0.06
40 FF	210	95	0.007
41 FF	215	85	0.007
0858 FF	170	75	–

[1] *Ash is determined by ignition of the cellulose filter at 900°C in air*



Quadrant-folded flat filter papers

Ordering information

Filter papers quadrant folded

Diameter (mm)	Description	Catalog number	Quantity/pack
110	Grade 1 FF Quadrant	10380404	500
125	Grade 1 FF Quadrant	10380405	500
150	Grade 1 FF Quadrant	10380406	500
110	Grade 40 FF Quadrant	10380004	500
125	Grade 40 FF Quadrant	10380005	500
150	Grade 40 FF Quadrant	10380006	500
110	Grade 41 FF Quadrant	10380204	500
125	Grade 41 FF Quadrant	10380205	500
150	Grade 41 FF Quadrant	10380206	500
185	Grade 0858 FF Quadrant	10334348	100

Ordering information

Filter papers: Pyramid folded and cone grades

Grade	Nominal thickness (µm)	Nominal basis weight (g/m²)	Nominal ash content (%)[1]
1	180	87	0.06
4	210	92	0.06
6	180	100	0.15
40	210	95	0.007
41	215	85	0.007
42	200	100	0.007
540	160	85	0.005

[1] *Ash is determined by ignition of the cellulose filter at 900°C in air*

Ordering information

Filter papers: Pyramid folded grades

Diameter (mm)	Grade	Catalog number	Quantity/pack
90	1	1001-10218	10000
90	42	989610137	1000
90	540	1540-10123	1000
110	1	1001-10116	10000
110	2	1002-10219	10000
110	4	989810116	1000
110	41	989510116	1000
110	42	989610116	1000
110	540	1540-10124	1000
125	1	989710112	1000
125	4	989810112	1000
125	6	9891-128	1000
125	40	9892-128	1000
125	41	989510112	1000
125	42	989610112	1000

Pyramid folded filter papers

Ordering information

Filter papers: Cone folded grades

Diameter (mm)	Grade	Catalog number	Quantity/pack
110	1	990110116	1000
110	2	1002-10240	1000
110	40	990010116	1000
125	40	990010112	1000

The above table is an example of products set-up; please contact us at scientific.support@cytiva.com for a full listing of available products.

Cone folded filter papers

Application specific filter papers

Cytiva offers Whatman cellulose filter papers for use in soil analysis and the sugar industry.

Application filter papers

Grade 0048

Filter mat made from a mixture of cellulose and polyester. This mat is used for optically testing baby food (artificial milk) for textile fibers.

Grade 72

Composite cellulose and glass filter loaded with activated carbon. Used to absorb radioactive iodine in air pollution monitoring and in nuclear installations.

Grade 71

Similar to Grade 72 but has a higher level of activated carbon.

Grade 8 ruled filter paper

A white filter paper with printed green lines for optical assessment (5 mm intervals). For routine investigations of foreign substances in a variety of sample types.

Grade 1450CV

Filter paper for the identification of undissolved dyes in the textile industry.

Grade 0965

A coarse filter mat with high wet strength.

Grade 287 ½

Kieselguhr paper with a medium to slow flow rate. Additional adsorption effect (e.g., for the separation of very fine semi-colloidal turbidity, for clarifying milk serum, starch solutions, soil suspensions, or sugar-containing solutions prior to polarimetry or refractometry). Fluted.

Grade 2555 ½

A medium fast filter paper. Used for the filtration of the mash for the determination of the extract in malt and wort and for removing carbon dioxide from beer. Fluted.

Soil analysis filter papers

Grade 0790 ½

Acid-washed paper with ash content of approximately 0.01%, low magnesium, and phosphorus for the determination of trace elements (Mg, Mn, Co, Cu, Mo, B). Fluted.

Grade 512 ½

Low phosphate papers, approximately 1.5 ppm phosphate for the filtration of calcium lactate extracts from soil samples for the determination of K and P according to Egnér, Riehm and Lederle. Fluted.

Sugar and food industry filter papers

Grade 3459

A creped filter paper, Grade 3459 has good retentivity at a relatively high filtration speed. Used for the clarifying filtration of:

- Dried beet pulp extracts.
- Beet juice after the addition of lead acetate for subsequent polarimetric sugar determination.
- Grade 3459 is specifically designed for the Venema unit (lead acetate method).

Technical specifications

Application specific filters

Grade	Properties	Filtration speed (approx) herzberg (s)	Nominal thickness (µm)	Nominal basis weight (g/m²)
Soil analysis filter papers				
0790 ½	Low Mg and P	225	–	84
512 ½	Low phosphate	375	–	84
Specially for the Venema unit				
3459	Fast, creped	55	–	75
Malt and beer filter				
2555 ½	Medium fast	55	–	75
Food industry mat (cellulose and polyester)				
0048	–	–	0.86	130
Activated carbon loaded paper				
72	–	–	–	195
71	–	–	702-898	160-230
Kieselguhr paper				
287 ½	Kieselguhr	330	360	154
Filter mat				
0965	–	–	250	30
Identification of undissolved dyes				
1450CV	–	30	–	120
Routine investigations				
8	–	–	–	65

Ordering information

Application specific filters

Dimensions (mm)	Catalog number							Quantity /pack
	Grade 0048	Grade 72	Grade 71	Grade 0965	Grade 1450CV	Grade 8	Grade 3459	
Filter circles								
32	10348903	–	–	–	–	–	–	1000
45	–	–	–	–	–	10347004	–	100
47	–	1872-047	–	–	–	–	–	100
50	–	1872-050	–	–	–	–	–	100
55	–	1872-055	–	–	–	–	–	100
60	–	1872-060	–	–	–	–	–	100
70	–	–	–	–	–	10347008	–	100
75	–	–	–	–	–	10347033	–	100
90	–	–	–	–	10313209	–	–	50
90	–	–	–	–	–	10347009	–	100
110	–	–	–	10340810	–	–	–	100
230	–	–	–	–	–	–	10316619	1000

Ordering information

Application specific filters (continuation)

Diameter (mm)	Catalog number				Quantity/pack
	Grade 287 ½	Grade 512 ½	Grade 0790 ½	Grade 2555 ½	
Folded filters					
110	–	10310643	–	–	100
125	10310244	–	–	–	50
150	10310245	–	–	–	50
150	–	10310645	10301645	–	100
185	10310247	10301647	–	–	50
185	–	10310647	10301647	10313947	100
240	–	–	–	10313951	100
320	–	–	–	10313953	100
Sheets					
1060 mm × 560 mm	–	–	10390046	–	100

Seed germination testing papers

Seed testing papers are made from pure cellulose without any additives and do not contain any substances which influence the seed growth. The constant water absorption of the papers provides continuous provision of the required amount of water.

The contrast of the color seed testing papers makes evaluation easier, particularly for seeds with fine white rootlets or under artificial light. The dyes used have been thoroughly investigated and have no influence on the seed growth.

Seed testing papers are available for both the pleated paper (PP) method and the top of paper (TP) method.

Seed germination testing papers, pleated strips

Product selection

Seed germination testing papers

Grade	Description	Nominal thickness (µm)	Nominal weight (g/m²)
PP method			
3014	Pleated strips, white*	0.22	113
3236	Pleated strips, white*	0.22	110
TP method			
597	For Petri dishes or Jacobsen/Copenhagen tanks, white	0.18	85
598	For Petri dishes or Jacobsen/Copenhagen tanks, white	0.32	140
3621	Blotter, light blue	1.44	710
3633	Blotter, light blue	0.65	300
3644	Blotter, blue	1.4	720
3645	Yellow	0.35	165

* *50 double pleats*

Applications

Seed germination testing papers

Grade	Description
597, 598	Small seeds (e.g., grasses, flowers)
3014, 3236	Medium-large and coated seeds (e.g., sugar beet, fodder beet, grain, sunflower, rapeseed, mustard)
3014	Particularly sensitive seeds
3645	Seeds with small white rootlets

Ordering information

Seed germination testing papers

Dimensions (mm)	Grade	Catalog number	Color	Description	Quantity/pack
Circles					
70	597	10311808	–	Circles	100
85	3645	10342555	Yellow	Circles	100
90	597	10311809	–	Circles	100
90	598	10312209	–	Circles	100
90	181	2181-090	White	Circles	100
60	–	1872-060	–	–	–
Sheets					
100 × 100	3645	10342500	–	Sheets	1000
105 × 190	3645	10342596	Yellow	Sheets	1000
110 × 170	3645	10342583	Yellow	Sheets	100
110 × 170	3645	10342594	–	Sheets	1000
115 × 115	3645	10342595		Sheets	1000
140 × 200	3644	10342580	Blue	Sheets	1000
140 × 200	3621	10342579	White	Sheets	1000
280 × 340	3644	10342582	–	Sheets	100
420 × 594	3644	10342581	–	Sheets	50
450 × 690	3645	10342570	Yellow	Sheets	100
Pleated strips					
110 × 20	3014	10344672	White	Double pleated strips, without wrap strips	1000
110 × 20	3014	10344676	White	Double pleated strips, with wrap strips	1000
110 × 20	3236	10345572	Grey	Double pleated strips, without wrap strips	1000
110 × 20	3236	10345576	Grey	Double pleated strips, with wrap strips	1000
110 × 20	3236	10345573	Grey	Double pleated strips	500

Qualitative filter papers, Grade 597