

SPECIALTY PAPERS

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Qualitative Filter Papers

- **100% alpha cotton cellulose**
- **pH tolerant** 0 to 12
- **Temperature maximum** 120°C
- **Wide selection** – seven types
- **Higher ash** than quantitative

APPLICATIONS

- Clarify and remove precipitates
- Preparation for qualitative analysis

ORDERING INFORMATION

See page 34



Seven grades of qualitative filter papers are available in 7 standard diameters.

CHARACTERISTICS AND APPLICATIONS: CONVERSIONS – QUALITATIVE PAPERS

Type	Comments	Weight (g/m ²)	Thickness (mm)	Flow Time ¹ (sec)	Absorption speed ² (cm)	Wet Strength ³ (cm H ₂ O)	Retention Character- istic (μm)	Collection Efficiency (%, 0.3 μm DOP)	Conversion ⁴	
									Whatman	Schleicher & Schuell
No. 1	Retains large crystalline particles and gelatinous precipitates. Fast flow rate, smooth surface, normal hardness	90	0.20	45	9.0	15	6 Coarse	65	4	604
No. 2	Retains medium crystalline precipitates, fast flow rate, smooth surface, normal hardness	125	0.26	80	8.0	18	5 Medium	80	1	591-A or 597
No. 231	Retains crystalline precipitates, moderate flow rate, smooth surface, normal hardness	95	0.18	130	7.5	-	Medium	-	1	-
No. 232	Retains medium to medium-fine particulates, slow flow rate, smooth, normal hardness	90	0.18	250	5.0	-	Med./Med.-Fine	-	-	-
No. 131	High retention efficiency for fine crystalline precipitates like barium sulfate, slow flow rate, smooth surface, normal hardness	140	0.25	240	6.0	20	3 Med.-Fine	90	3 or 6	593-a
No. 235	Highest retention efficiency, retains very fine particulates, very slow flow rate, smooth	95	0.17	1200	4.0	-	Very Fine	-	5	-
No. 101	Seed germination, retains large particles	80	0.21	50	8.0	15	6-7 Coarse and gelatinous	-	1	-

1. Flow time is the time in seconds required to filter 100 ml of distilled water at 20°C under pressure supplied by a 10 cm water column through a 10 cm² section of filter paper.

2. Absorption speed is the distance in cm that water will travel in an upright strip of filter paper in ten (10) minutes at 20°C.

3. Wet strength is the height in cm of a water column that will rupture a 10 cm² section of filter paper.

4. Conversions between manufacturers are not absolute. Use these conversions as a guideline.

Quantitative Filter Papers

- **Highest quality** alpha cotton cellulose
- **Low ash**
- **Acid washed:** Double acid washed in hydrochloric then hydrofluoric acid (No. 3, 5A, 5B, 5C, 6), then rinsed with ultrapure water to neutralize. No. 4A is further treated with nitric acid before washing

APPLICATIONS

- Gravimetric analysis
- Environmental monitoring



Seven quantitative filter papers are available in 7 different diameters.

CHARACTERISTICS AND APPLICATIONS: CONVERSIONS – QUANTITATIVE PAPERS

Type	Comments	Weight (g/m ²)	Thickness (mm)	Flow Time ¹ (sec)	Absorption speed ² (cm)	Wet Strength ³ (cm H ₂ O)	Retention Character- istic (μm)	Collection Efficiency (%, 0.3 μm DOP)	Conversion ⁴	
									Whatman	Schleicher & Schuell
No. 3 Ashless	Medium retention (5-10 μm), fast flow rate Analysis of soils, fertilizers, cement, and minerals	113	0.23	130	7.5	20	Medium	80	6	593-A
No. 5A Ashless	Fast flow rate, retains coarse particulates and gelatinous precipitates (>10 μm). Filter hydroxides and metallic aerosols, environmental monitoring, determine silica content in steel	97	0.22	60	9.5	15	Coarse and gelatinous	75	41	589 Black
No. 5B Ashless	Retains medium particles (5-10 μm) such as CaCO ₃ , PbSO ₄ , CaCO ₄ , MnCO ₃ , ZnCO ₃ , ZnS, AgCl	108	0.21	195	7.0	20	Medium	90	40	598 White
No. 5C Ashless	Collect fine precipitates (<5 μm) such as SrSO ₄ , BaSO ₄ , HgCrO ₄ , and colloidal dispersions; gravimetric analysis	118	0.22	570	6.0	25	Fine	93	42	589 Red
No. 6 Ashless	Retains medium-fine particulates (2-10 μm), trace and precious metals	103	0.20	300	6.0	15	Medium Fine	90	44	589 Blue
No. 7 Ashless	Highest purity for retaining medium particles (5-10 μm), precise gravimetric analysis	87	0.18	200	7.0	12	Medium	85	43	589 Green
No. 4A Hardened Ashless	High wet strength, suitable for use under high pressure, high chemical and pH resistance, retains fine crystalline precipitates (<5 μm), slow flow	96	0.12	915	4.0	90	Very Fine	90	50	576 or 577

Footnotes: See facing page

Ash content of Quantitative Papers (mg per disk)

cm	No.3	No.5A	No.5B	No.5C	No.6	No.7
5.5	0.03	0.02	0.03	0.03	0.02	0.02
7.0	0.04	0.04	0.04	0.05	0.04	0.03
9.0	0.07	0.06	0.07	0.08	0.07	0.06
11.0	0.11	0.09	0.10	0.11	0.10	0.08
12.5	0.14	0.12	0.13	0.15	0.13	0.11
15.0	0.20	0.17	0.19	0.21	0.18	0.15
18.5	0.30	0.26	0.29	0.32	0.28	0.23

ORDERING INFORMATION: QUALITATIVE PAPERS

Available in disks in the following diameters (cm): 4.25, 5.5, 7.0, 9.0, 11.0, 12.5, 15.0, 18.5
Additional sizes available upon request.
Order by specifying first the type of filter then the diameter, e.g. No.1125CM (No.1, 12.5 cm) No.23255CM (No. 232, 5.5 cm)
Package of 100

ORDERING INFORMATION: QUANTITATIVE PAPERS

Available in disks in the following diameters (cm): 5.5, 7.0, 9.0, 11.0, 12.5, 15.0, 18.5
Additional sizes available upon request.
Order by specifying first the type of filter then the diameter, e.g. No.1125CM (No.1, 12.5 cm), No.23255CM (No. 232, 5.5 cm)
Package of 100

Pure Nitrocellulose for Blotting and Hybridization

- **Pure esters of nitrocellulose**, free of acetate and other esters
- **Maximal protein/nucleic acid binding**, up to 80-100 $\mu\text{g}/\text{cm}^2$
- **Low background**
- **Two pore sizes** available: 0.45 μm is suitable for most blotting applications, 0.2 μm sizes for lower molecular weights

ORDERING INFORMATION: NITROCELLULOSE

	Quantity per package	0.20 μm	0.45 μm
Sheets (Dimensions in cm)			
20 x 20	10	A020A204D	A045A204D
30 x 30	10	A020A304D	A045A304D
Rolls			
33 cm x 3 M	1	A020A330R	A045A330R
Circles (Diameter in mm)			
82	25	A020A082C	A045A082C
137	25	-	A045A137C



Pure Nitrocellulose and Blotting Paper

Blotting/Chromatography Paper

- **High quality papers** are carefully tested for spot formation, capillary action, water flow rate and absorption speed to assure uniformity and reproducibility
- **Better resolution** with slower flow rate papers

APPLICATIONS

- Chromatography
- Electrophoresis and blotting
- Separation of heavily loaded solutes

SPECIFICATIONS AND CONVERSION GUIDE

Grade	Weight (g/m ²)	Thickness (cm)	Absorption Speed ¹ (cm)	Wet Strength (cm H ₂ O)	Ash (mg/g)	Whatman equivalent
50	140	0.25	6.0	20	0.1	-
51A	87	0.18	7.5	15	0.01	-
151B	87	0.17	7.0	15	0.06	1 Chr
1514A	185	0.32	7.5	25	0.06	3MMChr
526	325	0.70	11.0	50	0.1	17 Chr

1. Absorption speed is the distance in cm that water will travel in an upright strip of filter paper in ten (10) minutes at 20°C.

ORDERING INFORMATION

All grades above are available in the following dimensions (cm) and quantities:

2 x 40	100/pkg
20 x 20	50/pkg
46 x 57	100/pkg
60 x 60	50/pkg

151B is also available in 6 x 23 cm, 50/pkg

1514A is also available in 33 cm x 3 M rolls

526 is also available in 40 x 40 cm, 50/pkg

Order by specifying first the grade of paper then the dimensions, e.g. No.51A20X20CM, No.1514A33X3M.

Products for Food Analysis

SUGAR PAPER

- **Fast flow rate**
- **Creped surface** available

APPLICATION

- Clarify sugar and syrup solutions prior to polarimetric determination of sucrose concentration

SPECIFICATIONS

Grade	Weight (g/m ²)	Thickness (mm)	Water Flow Time ¹ (sec)	Dry Burst Strength (kg/cm ²)	Wet Burst Strength (kg/cm ²)	Ash content (%)	Particle Retention (µm)	Surface	Wet Strengthened
106	60	0.14	42.5	1.0	0.3	0.1	-	Smooth	No
102	100	0.30	28	0.7	-	-	3	Creped	No
107	80	0.21	50	1.0	-	-	-	Creped	No
60	125	0.56	7	0.5	-	-	-	Smooth	No
1591	64	0.165	30	1.1	2	0.1	-	Creped	Yes

1. Flow time is the time in seconds required to filter 100 ml of distilled water at 20°C under pressure supplied by a 10 cm water column through a 10 cm² section of filter paper.

ORDERING INFORMATION

- Available in disks in the following diameters (cm): 15.0, 18.5, 20.0
- Available in sheets: 8 x 8 inches, 60 x 60 cm
- Packages of 100 or 1000
- Order by specifying first the grade of paper then the diameter, e.g. No.106150CM, No.608X8IN

Gridded and Ruled Papers for Extraneous Materials

- **Green grid or ruled lines** (5 mm) are resistant to aqueous and non-aqueous solutions
- **Characteristics:** High wet strength, rapid flow rate

APPLICATION

- Microscopic examination of extracted samples for the presence of extraneous materials or particulates

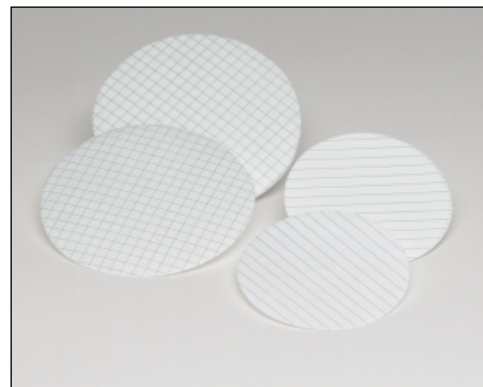
SPECIFICATIONS

- Weight: 60 g/m²
- Thickness: 0.14 mm
- Particle retention: 8 µm

ORDERING INFORMATION

- Grades available: No. 1405G (gridded) and No. 1405R (ruled)
- Both grades are available in disks in the following diameters: 5.5, 7.0, 7.5, 9.0 cm
- Packages of 100

Order by specifying first the grade of paper then the diameter, e.g. No.1405G9.0CM.



Both gridded and ruled papers are available in disks.

Special Purpose Filters for Food Analysis

THIMBLES FOR SOXHLET TYPE EXTRACTIONS

Type 84 is often used for food analysis including Soxhlet-type gravimetric determinations of fats and oils from foods, feeds, or oil seeds. It is also used to extract and concentrate non-aqueous chemicals or additives from a solid sample for analysis (such as HPLC or gas chromatography for PCB and pesticides).

Ordering information and specifications on page 42.

Phase Separating Filters

- **Separate** aqueous and non-aqueous phases of mixtures
- **Hydrophobic** filters retain aqueous phase while non-aqueous phase passes through
- **Choice of materials:** Grade 2S is silicon treated cellulose
Polyflon is pure PTFE (Teflon)

SPECIFICATIONS

Grade code	Substrate	Weight (g/m ²)	Thickness (mm)	Retentive Particle (μm)
2S	Silicone treated cellulose	120	0.26	5
PF020	PTFE	500	0.54	2
PF040	PTFE	500	0.95	4
PF050	PTFE	210	0.36	5
PF060	PTFE	240	0.50	6
PF100	PTFE	500	1.00	10

ORDERING INFORMATION

Grade 2S:

- Available in disks in the following diameters (cm): 5.5, 7.0, 9.0, 11.0, 12.5, 15.0, 18.5, 24.0, 27.0
- Available in sheets: 28 x 46 cm
- Packages of 100

Polyflon – all grades:

- Available in disks in the following diameters (mm): 13, 25, 47, 55
- Available in sheets: 8 x 10 inches
- Packages of 10

Order by specifying first the grade of paper then the diameter, e.g. PF04025MM.

Products for Industrial Hygiene

Advantec MFS provides a selection of products for industrial hygiene applications including asbestos monitoring. Mixed Cellulose Esters and PVC membrane can be used with cellulose support pads in standard 25 and 37 mm cassette type filter holders. Fully assembled 37 mm cassettes are available in addition to the units without membrane, see page 41.

Cellulose Support Pads

Type 25S cellulose support pads fit standard 25 and 37 mm cassette type filter holders.

MCE (Mixed Cellulose Ester) Membrane

- **Standard** 0.8 μ m pore size, white plain membrane fits standard 25 and 37 mm cassette type filter holders
- **High quality** raw materials used in manufacture
- **Low contamination:** Cutting and packaging operations are carried out under clean room conditions to keep non-asbestos fiber contamination to an absolute minimum

Note: Filters may be cleared using either the acetone vapor method or the dimethylphthalate diethyloxalate method.

PVC for Industrial Hygiene Monitoring

- **Characteristics:** naturally hydrophobic, excellent weight stability
- **Silica free,** contain no additives or modifiers
- **Suitable** for particulate analysis

Description	Size	Surface	Qty/Pkg	Catalog No.
0.8 μ m MCE	25 mm disk	White Plain	100	A080X025A
	25 mm disk	White Grid	100	A080X025B
	37 mm disk	White Plain	100	A080X037A
	37 mm disk	White Grid	100	A080X037B
0.5 μ m PVC	25 mm disk	White Plain	50	P050A025A
0.8 μ m PVC	25 mm disk	White Plain	50	P080A025A
	37 mm disk	White Plain	100	P080A037A
	47 mm disk	White Plain	50	P080A047A
	8 x 10 in sheet	White Plain	10	P0808x10IN
5.0 μ m PVC	25 mm disk	White Plain	50	P500A025A
	37 mm disk	White Plain	100	P500A037A
	8 x 10 in sheet	White Plain	10	P5008x10IN
Cellulose Pads	25 mm disk	White Plain	100	TYPE25S25MM
	37 mm disk	White Plain	100	TYPE25S37MM
Cassettes, 2-piece	37 mm diameter	-	50	370S200ON
Cassettes, 3-piece	37 mm diameter	-	50	370S300ON

Advantec MFS continually works with customers to develop special filter media to suit their specific application needs. Direct inquiries to our Technical Services Department.

Products for Air Pollution Monitoring

Several products from Advantec MFS have been developed especially to meet the needs of persons concerned with air pollution monitoring.

QUARTZ FIBER FILTER – QR100

- Increased chemical and thermal resistance compared to GB100R
- Prefired at 1000°C for 2 hours to reduce organic contamination
- Available in sheets and disks

Specifications and ordering information on pages 27–29.

PURE FIBROTIC PTFE FILTERS – POLYFLON PF050

- Polyflon filters neither adsorb acid gases nor do they contribute any trace metal contamination during assay procedures
- Superior handling characteristics compared to either glass or quartz
- Available in sheets and disks

Specifications and ordering information on page 30.

Thimbles

Thimbles are available in the following materials:

Material	Type
Cellulose	84
Glass	86R
Silica	88R
High Temperature Silica	88RH
PTFE	89
PTFE/Silica	89S

For detailed specifications and ordering information, see page 42.

Advantec MFS continually works with customers to develop special filter media to suit their specific application needs. Direct inquiries to our Technical Services Department.



Four grades of fibrous filter media are available in sheets, discs, and thimble form for air pollution monitoring.

37 MM MONITORS FOR MICROBIAL AND CONTAMINATION ANALYSIS

Preassembled devices contain a membrane filter (Mixed Cellulose Ester) and a pure cotton cellulose support pad in a styrene housing. Available as a two- or three-piece unit for ease in sampling, collecting, and transporting samples from the field to the laboratory. Sample collected on the press fit membrane surface can be cultured in place or removed for further analysis or study.



MFS 37

Applications	Recommended product	
	Unit:	Membrane:
Microbiology – bacterial	2- or 3-piece	0.45 μm , white grid or black grid
Microbiology – yeast and mold	2- or 3-piece	0.80 μm , white grid or black grid
Aerosol analysis	2-piece	0.45 μm or 0.80 μm , white plain
Contamination analysis	2- or 3-piece	0.45 μm or 0.80 μm , white plain or grid

0.8 μm MF is green grid lines on white background, 0.45 and 0.65 μm have black grid lines.

SPECIFICATIONS

- Housing Material: styrene acrylonitrile
- Filtration Area: 9.0 cm² (6.7cm² for Hydrophobic Edge types)
- Dimensions: 42 mm diameter, 28.7 mm height
- Weight: 1.2 kg (2.5 lbs)

ORDERING INFORMATION

Two-Piece Units with Mixed Cellulose Ester Membrane

Pore Size (μm)	Color	Surface	Hydrophobic edge	Quantity per package	Catalog No.	
					Sterile	Nonsterile
0.45	White	Plain	Yes	50	-	37AS245AN-HE
0.45	White	Grid	Yes	50	37AS245BS-HE	-
0.45	Black	Grid	Yes	50	37AS245PS-HE	-
0.80	White	Plain	No	50	37AS280AS	37AS280AN
0.80	White	Grid	No	50	37AS280BS	-

Three-Piece Units with Mixed Cellulose Ester Membrane

Pore Size (μm)	Color	Surface	Hydrophobic edge	Quantity per package	Catalog No.	
					Sterile	Nonsterile
0.45	White	Plain	No	50	-	37AS345AN
0.45	White	Grid	No	50	37AS345BS	-
0.45	Black	Grid	No	50	37AS345PS	-
0.80	White	Plain	No	50	-	37AS380AN
0.80	White	Grid	No	50	37AS380BS	37AS380BN
0.80	Black	Grid	No	50	-	37AS380PN

Units without Membrane

Assembly type	Quantity per package	Catalog No.
2 Piece, with plugs	50	37OS200ON
3 piece, with plugs	50	37OS300ON

Extraction Thimbles

High purity, seamless filters with a characteristic thimble shape. Applications include analysis of fats, oils, grease, pesticides, pollutants, other organics and additives in plastics and rubber materials.

Cellulose Thimbles – No. 84

- Suitable for Soxhlet extractions of organic components
- Dust sampling
- Lipid content <0.1% by weight

Glass Fiber Thimbles – No. 86R

- Borosilicate glass
- High temperature extractions or dust monitoring ($\leq 500^{\circ}\text{C}$)
- Acid resistant (except hydrofluoric)
- Acid washed for minimum trace metal content

Silica Fiber Thimbles – No. 88R and 88RH

- Use up to 1000°C
- No. 88RH is treated at 900°C for 4 hours to stabilize the weight prior to use
- Both 88R and 88RH are tapered for ease in loading into stack samplers

PTFE Fiber and PTFE/Silica Fiber Thimbles – No. 89 and 89S

- Durable, temperature-resistant
- Non-adsorptive with respect to acid gases
- PTFE is inherently hydrophobic
- Little or no trace metal contamination



Thimbles

SPECIFICATIONS

Type	Material	Nominal rating (μm)	Thickness (mm)	Weight (g per 25 x 90 thimble)	Pressure drop (mm H_2O / 5 cm / sec)	Efficiency %	Max operating temp ($^{\circ}\text{C}$)	Heating loss rate (%)	Conversion	
									Whatman	S&S
84	Cellulose	8	1.5	3.6	25	89	120	-	2800	603
86R	Glass Fiber	1	1.6	1.8	30	>99.9	500	0.2	2814	603G
88R	Silica Fiber	-	1.6	2.2	45	>99.9	1000	-	-	-
88RH	Silica Fiber	-	1.6	2.2	45	>99.9	1000	0.1	2813	-
89	PTFE Fiber	-	1.8	11.0	450	>99.9	260	-	-	-
89S	PTFE/Silica Fiber	-	1.6	6	55	>99.9	400	0.07	-	-

ORDERING INFORMATION

Sizes are expressed as internal diameter ($\pm 3\%$) x height ($\pm 1.5\%$).

Type 84 (diameter x height, mm), 25 thimbles per package

-	22 x 65	25 x 60	-	-	-	-
-	22 x 80	25 x 80	-	30 x 80	33 x 80	-
19 x 90	-	25 x 90	-	-	33 x 94	-
-	-	25 x 100	28 x 100	30 x 100	33 x 100	43 x 123

Type 86R (diameter x height, mm), 25 thimbles per package

19 x 90	-	25 x 90	-	30 x 80	-	43 x 123
-	-	25 x 100	-	30 x 100	-	-

Type 88R (diameter x height, mm), 25 thimbles per package

19 x 90	-	25 x 100	30 x 80	30 x 100	33 x 80	43 x 123
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Types 88R, 88RH, 89, and 89S

Available in 25 x 90 mm size, 10 thimbles per package.

1-800-334-7132

Filter Badge – NO₂

- Monitor ambient levels of nitrogen dioxide with this passive, portable sampler
- Attach to subject's clothing or mount on a stationary object
- Plastic case contains an adsorbent pad saturated with triethanolamine and a fibrous PTFE filter to control wind effects
- Use enclosed foil pouch or other hermetic container to transport to the laboratory where NO₂ levels can be determined spectrophotometrically

SPECIFICATIONS

- Dimensions: 5 cm x 4 cm x 1 cm
- Sampling method: passive diffusion
- Sensitivity: 66 ppb.hr
- Accuracy: $\pm 30\%$
- Maximum exposure: 1 month in ambient air
- Relative humidity range: 40 – 80%
- Weight: 16 g (0.56 oz)

ORDERING INFORMATION

	Catalog No.
Filter Badge – NO ₂	800600



Filter Badge – NO₂

Nobuto Blood Filter Strips

- Collect blood on the narrow end of the strip and allow to dry on the convenient drying rack for easy and efficient sample handling
- Strip holds approximately 0.1 ml of blood or 0.04 ml of serum
- High purity cellulose paper yields a fine, textile like structure ideal for uniform sampling
- Dried samples can be analyzed, stored, or mailed without refrigeration

Typical blood collection applications:

- Toxoplasmosis (HA)
- Hanta Virus
- New Castles Disease (HI)
- Canine Distemper (VN)
- Measles (Rubeola) (HI)
- Japanese Encephalitis (HI, VN)
- Mycoplasmosis (AG)
- Hog Cholera (VN)

ORDERING INFORMATION

		Catalog No.
Nobuto Blood Filter Strips	100/package	800700
Filter Strip Drying Rack	Each	800701



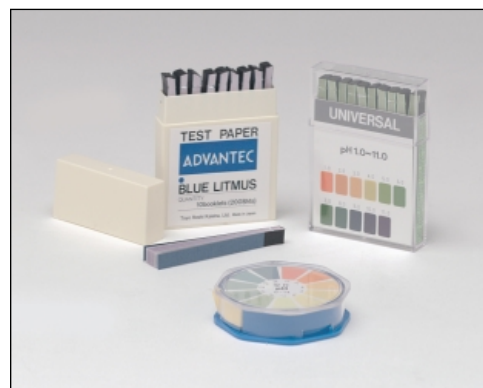
Nobuto Blood Filter Strips and Drying Rack.

pH Indicator and Acid Alkali Test Papers

- Determine pH easily and inexpensively, without instrumentation
- Color changes instantaneously, compare to chart for determination
- Two convenient formats: Booklet of 20 strips, 7 x 70 mm
Roll, 9 mm wide in dispenser

ORDERING INFORMATION

Type	pH range	Packaging	Catalog No.
Universal	1 – 11	Booklet	UNIV-B
Universal	1 – 11	Roll (9 mm x 6 m)	UNIV-R
Whole Range	0 – 14	Roll (9 mm x 5.5 m)	W-R
Congo Red	3 – 5	Booklet	07810073
Litmus Blue	Qualitative	Booklet	07020010
Litmus Red	Qualitative	Booklet	07020020



pH and Test Paper

Blaine Test Papers

- Standard for testing cement using the Blaine air permeation test
- 12.7 mm diameter disks

ORDERING INFORMATION

		Catalog No.
Blaine Test paper	250/package	01511012



Blaine Test Filter Paper



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