The Complete Guide to Protein Labelling and Detection

18-1138-07

Amersham Biosciences

Contents

Introduction

The key to scientific advances is experimental reproducibility. The most effective way to achieve reproducible results is to use products with proven performance and compatibility. With decades of experience in protein electrophoresis, labelling and detection, Amersham Biosciences **is able to offer a comprehensive range of products for the labelling and detection of proteins.**

Hoefer™ electrophoresis and transfer equipment, ECL™ chemiluminescent reagents, ECF™ chemifluorescent* reagents and radioactive detection systems, and sophisticated visualization equipment provide a powerful combination of tools for protein labelling and detection that deliver optimal performance and reliability.

See page 48 for licensing information.

SDS-PAGE and IEF Electrophoresis Systems

SDS-PAGE (polyacrylamide gel electrophoresis) and IEF (isoelectric focusing) are the most widely used techniques for the characterization and analysis of proteins. Amersham Biosciences **provides an exclusive range of both vertical and flatbed electrophoresis systems.**

Hoefer miniVE Vertical Electrophoresis System

The miniVE system sets a new standard in the concept of fast set-up, casting, electrophoresis and blotting for a mini-vertical unit. The consolidation of small parts into a modular design offers everything you need for electrophoresis and blotting in one compact system.

Convenient One piece to both cast and run mini-gels

Versatile Modular design for running and transferring gels in one system

Compatible Designed to accept most manufacturers' pre-cast gels

Fast Complete semi-dry blotting requires only 45 minutes

Fig 1. miniVE System with 2 gel modules.

Ordering information

Product	Quantity	Code
Hoefer miniVE, complete with combs and spacers (order Blot Module separately)	1	80-6418-77
Blot Module	1	80-6418-96
EPS 301	1	18-1130-01

Fig 2. SE 600 vertical slab units run gels 8, 16 or 24 cm long.

Hoefer SE 600 Standard Vertical Units

SE 600 ensures uniform heat distribution, a key factor for outstanding reproducibility. Immersing the gel in the lower buffer ensures uniform heat transfer, and a magnetic stirrer circulates buffer around the vertically suspended heat exchanger to maintain a homogeneous lower buffer temperature.

Reproducible	Heat exchanger maintains temperature from 1–45 °C for faster runs without sacrificing quality
Durable	Buffer reservoirs moulded or fabricated of lightweight durable plastic, resistant to mild acids, bases, and common buffers
Economical	Optional buffer saver reduces buffer requirements by 1.5 litres - 35%
Versatile	Customize gel configurations with a wide array of accessory combs and spacers

Ordering information

Product	Quantity	Code
18 x 16 cm gels		
SE 600 Standard Dual Cooled Vertical Unit, complete with combs and spacers	1	80-6171-96
18 x 24 cm gels		
SE 660 Standard Dual Cooled Vertical Unit, complete with combs and spacers	1	80-6171-82

PhastSystem Mini-Flatbed Electrophoresis System

The combination of PhastSystem™ Mini-Flatbed Electrophoresis Systems and precast PhastGel™ gel media and buffer strips provides an electrophoresis system of outstanding quality, flexibility and reproducibility.

PhastSystem consists of the electrophoresis and system control unit with integral 2000V power supply and Peltier solid state temperature control, and the post-separation staining unit. The optional PhastTransfer™ semi-dry transfer accessory quickly converts the system into a semi-dry blotting unit.

Versatile	Precast mini gels (4–5 cm) for SDS or native PAGE and IEF
Convenient	Automatic sample application, separation and staining in one system
Fast	Complete semi-dry blotting requires only 10–30 minutes

Fig 3. PhastSystem provides automated protein and nucleic acid electrophoresis with ready-to-use gels, buffer strips, stain kits, and proven protocols.

Fig 4. With PhastTransfer, there's no need to buy separate blotting equipment. Just add PhastTransfer accessory kit to PhastSystem for a complete, highly efficient blotting system.

Ordering information

Product	Quantity	Code
PhastSystem 120 VAC	1	18-1018-23
PhastSystem 220 VAC	1	18-1018-24
PhastTransfer Kit	1	18-1001-23

Multiphor II Flatbed Electrophoresis System

Multiphor™ II Flatbed Electrophoresis System is the most versatile system available for SDS or native PAGE, IEF, immuno-electrophoresis, 2-D electrophoresis and semi-dry blotting. A wide range of precast gel media offers high throughput separations. The NovaBlot Kit converts Multiphor II Electrophoresis Unit into a large format (20 × 25 cm) semi-dry blotting unit.

Convenient Precast gels for SDS or native PAGE, IEF and 2-D electrophoresis

Versatile Modular design accommodates gels of different sizes

Fast Complete semi-dry blotting in 1 hour or less

The optional FilmRemover separates a Multiphor II precast gel from its plastic backing.

For detailed information on FilmRemover and NovaBlot Kit request the Multiphor II brochure, 18-1101-95.

Ordering information

Product	Quantity	Code
Multiphor II Electrophoresis Unit	1	18-1018-06
NovaBlot Kit	1	18-1016-86
FilmRemover	1	18-1013-75

Fig 5. Complete Multiphor II Flatbed Electrophoresis System is designed for 1-D or 2-D electrophoresis.

2-D Electrophoresis Systems

Amersham Biosciences **is the most complete supplier of precast gel media and systems for convenient and reproducible 2-D electrophoresis. The immobilized pH gradient (IPG) gel isoelectric focusing technique was pioneered by Amersham** Biosciences **and today is the preferred method for easy and reproducible first dimension IEF separations. Immobiline™ DryStrip IPG gels are available in four strip lengths 7, 11, 13 and 18 cm and in several pH ranges, narrow and wide, from pH 3.5–11.**

Fig 7. 2-D Electrophoresis Using Immobilized pH Gradients: Principles and Methods is a comprehensive lab handbook on performing 2-D electrophoresis.

Fig 6. IPGphor Isoelectric Focusing System, a novel system for the IEF dimension of 2-D electrophoresis.

For the first dimension choose either the dedicated IPGphor™ Isoelectric Focusing System or the Multiphor II Electrophoresis Unit with Immobiline DryStrip Kit.

For the second dimension choose from four systems–mini format to large format and high throughput SDS-PAGE systems, either vertical or flatbed format. Electrophoretic blotting units are available for all formats and sizes.

To help select the right 2-D system and to learn more about 2-D electrophoresis, from sample preparation to troubleshooting, request our 50 page comprehensive technical manual "2-D Electrophoresis Using Immobilized pH Gradients: Principles & Methods."

Ordering information

Product	Quantity	Code
2-D Technical Manual	1	80-6429-60

Power Supplies

Fig 9. EPS601 is the standard for SDS-PAGE and general molecular biology applications.

Amersham Biosciences **provides a range of power supplies to suit every electrophoresis and blotting application. Designed for performance, you can rely on these products for safety and reproducibility.**

The EPS 301 and 601 power supplies are flexible, economical units for mini and standard vertical gel electrophoresis. The Hoefer EPS 2A200 is ideal for high current applications such as electroblotting.

Fig 8. Hoefer EPS2A200 Power Supply is suitable for all types of electrophoretic blotting.

Precise	Easy-to-read digital display with readout resolutions of 1 mA, 1 W and 1 V
Flexible	Timed or continuous runs, with end-of-run alarm, if desired
Protective	Automatic parameter limit crossover to prevent overheating and to protect experiments and equipment
Convenient	Dual power outlets (sheathed, recessed 4 mm style) for parallel blotting units
Safe	All units designed to meet the requirements of the Low Voltage Directive (LVD) 73/23/EEC, EMC Directive 89/336/EEC, UL and CSA. CE marked

Ordering information

Product	Quantity	Code
EPS 301	1	18-1130-01
EPS 601	1	18-1130-02
EPS 2A200	1	80-6406-99

Table 1. Power supply selection guide

Product	Description	Voltage	Current	Max Watts
EPS 301	A power supply for mini-vertical gels and blotting	300	400	80
EPS 601	A power supply for general electrophoresis	600	400	100
EPS 2A200	A high current power supply for electrophoretic blotting	200	2000	200

Molecular Weight Markers

Amersham Biosciences **supplies a comprehensive range of labelled and unlabelled molecular weight markers, each designed for a particular application.**

Rainbow Molecular Weight Markers

Rainbow™ Molecular Weight Markers are a mixture of individually coloured recombinant or native proteins which are visible both during electrophoresis and following transfer, enabling quick assessment of electrophoresis and transfer efficiency.

Fig 10. Full Range Rainbow Molecular Weight Markers separated on a 12% SDS-polyacrylamide gel.

Ordering information

Product	Quantity	Code
Full Range Rainbow Molecular Weight Markers	500 ml	RPN800
High-Range Rainbow Molecular Weight Markers	250 ml	RPN756
Low-Range Rainbow Molecular Weight Markers	250 ml	RPN755

Components of Molecular Weight Marker Kits

Kit	Protein	M_r
Full-Range Rainbow Recombinant Protein Molecular Weight Markers		
		10 000
		15 000
		25 000
		30 000
		35 000
		50 000
		75 000
		105 000
		160 000
		250 000
Low-Range Rainbow Molecular Weight Markers		
	Insulin chain A	2 500
	Insulin chain B	3 500
	Aprotinin	6 500
	Lysozyme	14 300
	Trypsin inhibitor	20 100
	Carbonic anhydrase	30 000
	Ovalbumin	45 000
High-Range Rainbow Molecular Weight Markers		
	Lysozyme	14 300
	Trypsin inhibitor	20 100
	Carbonic anhydrase	30 000
	Ovalbumin	45 000
	Bovine serum albumin	66 000
	Phosphorylase b	97 000
	Myosin	220 000

ECL Western Blotting Molecular Weight Markers

ECL™ Western Blotting Molecular Weight Markers are biotinylated proteins, with defined molecular weights in the range 14 400–97 000 for molecular weight determination in Western blots. Markers are visualized using a luminol-based, light-producing reaction using ECL detection reagents.

Fig 11. ECL Western Blotting Molecular Weight Markers separated on a 12% SDS-polyacrylamide gel.

Ordering information

Product	Quantity	Code
ECL Western Blotting Molecular Weight Markers	1	RPN2107
ECL Protein Molecular Weight Markers with Streptavidin-Horseradish Peroxidase	1	RPN2280

Components of ECL Western Blotting Molecular Weight Markers

Protein	M_r
Insulin chain A	
Insulin chain B	
Cytochrome c	
Lysozyme	14 400
Trypsin inhibitor	20 100
Carbonic anhydrase	31 000
Ovalbumin	45 000
Albumin	66 000
Phosphorylase b	97 000
Myosin	

Molecular Weight Markers

^{14}C-Protein Molecular Weight Markers

Carbon-14 radiolabelled marker proteins enable molecular weight determination of samples on Western blots.

Table 2. Selection guide for ^{14}C-labelled Protein Molecular Weight Markers

	M_r	High Range	Low Range	Rainbow ^{14}C-Low Range	Rainbow ^{14}C-High Range
Insulin chain A	2 350		○	○	
Insulin chain B	3 400		○	○	
Aprotinin	6 500		○	○	
Cytochrome c	12 500		○		
Lysozyme	14 300	○		○	○
Trypsin inhibitor	20 100		○	○	○
Carbonic anhydrase	30 000	○	○	○	○
Ovalbumin	45 000	○		○	○
Bovine serum albumin	66 000	○			○
Phosphorylase b	97 000	○			○
Myosin	220 000	○			○

Ordering information

Product	Quantity	Code
^{14}C-Methylated High Range Protein Molecular Weight Markers	37 kBq, 1 µCi 185 kBq, 5 µCi	CFA626-1 µCi CFA626-5 µCi
^{14}C-Methylated Low Range Protein Molecular Weight Markers	37 kBq, 1 µCi 185 kBq, 5 µCi	CFA645-1 µCi CFA645-5 µCi
Rainbow ^{14}C-Low Range Protein Molecular Weight Markers	37 kBq, 1 µCi	CFA755-1 µCi
Rainbow ^{14}C-High Range Protein Molecular Weight Markers	37 kBq, 1 µCi	CFA756-1 µCi

Unlabelled Protein and Peptide Molecular Weight Markers

Use unlabelled markers for accurate molecular weight determinations in stained gels.

Ordering information

Product	Quantity	Code
Peptide Marker Kit	1 vial (2 mg)	80-1129-83
LMW Marker Kit	10 vials (575 µg/vial)	17-0446-01
HMW-SDS Marker Kit	10 vials (175 µg/vial)	17-0615-01
HMW Native Marker Kit	10 vials (250 µg/vial)	17-0445-01

Components of Molecular Weight Calibration Kits

Kit	Protein	M_r	Amount (µg)
Peptide Marker Kit (2 512–16 949)	Horse myoglobin peptides	16 949 14 404 10 700 8 159 6 214 2 512	
HMW-SDS (53 000–220 000)	Myosin	220 000	25
	α-2-Macroglobulin	170 000	100
	β-Galactosidase	116 000	16
	Transferrin	76 000	17
	Glutamate dehydrogenase	53 000	18
LMW (14 400–97 000)	Phosphorylase b	97 000	67
	Albumin	66 000	83
	Ovalbumin	45 000	147
	Carbonic anhydrase	30 000	83
	Trypsin inhibitor	20 100	80
	α-Lactalbumin	14 400	116
HMW Native (66 000–669 000)	Thyroglobulin	669 000	76
	Ferritin	440 000	50
	Catalase	232 000	36
	Lactate dehydrogenase	140 000	48
	Albumin	66 000	40

Detection Equipment and Gel

Amersham Biosciences **offers a complete range of products for visualizing and quantifying proteins and for processing polyacrylamide gels after electrophoresis.**

Fig 12. Processor Plus equipped with Blot Processing Tray. Processor Plus automates blot processing and gel staining for reproducible results.

Hoefer Processor Plus

Processor Plus™ is an intelligent, fluid delivery system that automates Western blot processing and acrylamide gel staining. Changing from one application to another is done by a fast, simple switch of trays. Select a programmed protocol and push 'Start' – Processor Plus will fill and empty the tray with the right solution at the right time, freeing you for more challenging and productive tasks.

Versatile	Prepares blots for high sensitivity ECL detection and chromogenic detection; Prepares Coomassie™ Blue and silver stain gels for proteins and nucleic acids analysis
Convenient	Programmable control of protocol, solution, volume, and processing time
Consistent	Proven design for consistent, reliable performance every time

Ordering information

Product	Quantity	Code
Hoefer Processor Plus (Includes Base Unit, Reagent Tubing, and Protocol Key, order tray pack seperately)	1	80-6444-04
Blot Processing Tray Pack (Complete with Tray Base, Disposable Mini- and Standard Tray, Lid, Reagent Bottles and Rack, Waste bottle)	1	80-6444-23
Staining Tray Pack 19 x 29 cm (Complete with Gel Staining Tray base, PTFE coated tray, lid)	1	80-6444-80
Staining Tray Pack 29 x 35 cm (Complete with Gel Staining Tray Base, PTFE coated tray, lid)	1	80-6445-18

Staining Reagents

PlusOne Silver Staining Kit, Protein

Silver staining of proteins in polyacrylamide gels using PlusOne™ Silver Staining Kit, Protein is a sensitive method providing permanent results with clean backgrounds.

Sensitive 100 times more sensitive than Coomassie Blue staining

Fast Results obtained in less than 2 hours

Convenient Minimum reagent preparation

Ordering information

Product	Quantity	Code
Silver Staining Kit, Protein	1	17-1150-01

(Each kit contains sodium acetate, 5% sodium thiosulphate, EDTA-Na_2, sodium carbonate, 2.5% silver nitrate, 37% formaldehyde, and 25% glutaraldehyde.)

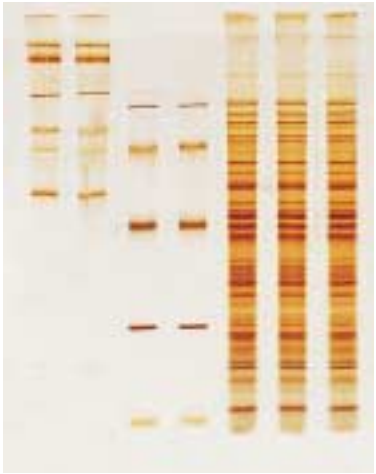


Fig 14. Visualization of proteins using PlusOne Silver Staining Kit, Protein and Hoefer Processor Plus.

Fig 13. Silver staining kits for sensitive and convenient staining of proteins and DNA.

PlusOne Coomassie Blue R Tablets

These tablets contain Coomassie™ Blue R-350, which is more sensitive than the commonly available R-250 and R-150 stains.

Ordering information

Product	Quantity	Code
PhastGel Blue R	40 tablets	17-0518-01

AuroDye Forte Kit

AuroDye™ Forte Kit* contains stabilized colloidal gold reagents at a low pH, ensuring that the particles bind selectively to proteins on nitrocellulose or PVDF membranes. For higher sensitivity, staining can be enhanced by silver intensification with IntenSE™ BL.

Ordering information

Product	Quantity	Code
IntenSE BL Silver Enhancement Reagent	1 kit	RPN492
AuroDye Forte Kit	Sufficient for 15 blots	RPN490

(Each kit contains the following reagents, sufficient for 15 blots (10–15 cm): 500 ml reagent and 10 ml Tween 20.)

*See page 48 for licensing information.

Gel Dryers and Spectrophotometers

Hoefer SE 1200 Easy Breeze Air Gel Dryer

SE 1200 Easy Breeze™ Air Gel Dryer is an economical system for drying multiple gels. A built-in fan and heater blow warm air across gels suspended between two sheets of cellophane. Gels are dry in 2–3 hours without a vacuum pump or trap. With a removable Mylar sheet on one side, gels can be dried for autoradiography.

Efficient Dry up to 6 gels 21 x 25 cm or 24 gels 8–10 cm without a vacuum pump

Convenient Add and remove gels at any time without affecting other users

Versatile Choose 2 warm air temperatures for rapid drying, or no heat for controlled drying of problem gels

Ordering information

Product	Quantity	Code
SE 1200 Easy Breeze Air Gel Dryer		
115 VAC	1	80-6121-61
230 VAC	1	80-6121-80
Includes: two 20x20 cm gel frames, loading platform and 50 cellophane sheets.		

Accessories and Replacement Parts

Gel frame *(up to 20 x 20 cm gels)*	1	80-6122-37
Gel loading platform *(works with 80-6122-37)*	1	80-6122-94
Gel frame, large *(up to 21 x 25 cm gels)*	1	80-6429-22
Gel loading platform *(works with 80-6429-22)*	1	80-6429-41

Fig 15. SE 1200 Easy Breeze Air Gel Dryer, an economical system for drying multiple gels.

Hoefer GD 2000 Vacuum Gel Dryer System

The GD 2000 Vacuum Gel Dryer System uses an 800 W heating element and heavy aluminium plates to distribute heat uniformly from below the gel and avoid the problems sometimes encountered with top-heating gel dryers. VP 200 Vacuum Pump is solvent-resistant, oil-free, unusually quiet, and occupies only 23 x 25 cm bench space. A chemistry pump, it is highly resistant to water vapour, acid and the fumes of gel staining solutions.

Convenient Oil-free diaphragm pump does not require a cold trap

Versatile Uniformly dry gels up to 33 x 44 cm using temperatures from 40 to 80 °C

Flexible Time heat and vacuum separately

Ordering information

Product	Quantity	Code
GD 2000 Vacuum Gel Dryer System		
115 VAC	1	80-6428-84
230 VAC	1	80-6429-03
(Includes: GD2000 Gel Dryer, VP 200 Vacuum Pump, and VT 3 Vacuum Tubing.)		
GD 2000 Vacuum Gel Dryer		
115 VAC	1	80-6428-27
230 VAC	1	80-6428-46
(Includes: stainless steel screen, 10 sheets of filter paper, 50 sheets of porous cellophane, Mylar sheet and porous polyethylene sheet.)		
VP 200 Vacuum Pump (Vacuubrand Chemistry Diaphragm Pump)		
115 VAC	1	80-6225-54
230 VAC	1	80-6225-73
(Includes: two separators and pump stand.)		

Fig 16. GD 2000 Vacuum Gel Dryer System dries acrylamide and agarose gels evenly.

GeneQuant pro

GeneQuant™ pro is a 'mini' spectrophotometer that requires little space, yet provides rapid, reliable, and accurate results for all the common laboratory operations involving measurement of nucleic acids, proteins or cell cultures. Protein determinations can be made at 595 nm using the Bradford protein assay or directly at 280 nm based on the Christian Warburg equation. GeneQuant pro features a multi-purpose interface port for output to a PC or to a printer.

Specialized Measures at specific wavelengths for common molecular biology measurements and calculations (230, 260, 280, 320, 595, 600 nm)

Versatile Reads at UV and visible wavelengths for nucleic acid quantification at 260 nm, protein determination at 595 nm, and cell culture measurement at 600 nm

Convenient Press-to-read system provides instant use and instant results with no waiting for warm-up

Fig 17. GeneQuant pro RNA/DNA Calculator can quantify proteins, DNA, RNA oligonucleotides, and cell culture OD.

Ordering information

Product	Quantity	Code
GeneQuant pro (includes dust cover)	1	80-2109-98

Hybond Membranes for

Hybond™ membranes are renowned for their excellent performance and reproducibility. Take advantage of our many years of experience to guide you to the correct membrane for your application.

Individual technical advice is available via e-mail at:

Hybond_Help@eu.apbiotech.com

Table 3. Protein blotting membranes – recommended applications

Application	Hybond-P	Hybond ECL	Hybond-C extra
Western blotting			
Detection method			
ECL	*highly recommended*	*highly recommended*	*suitable*
ECL Plus	*highly recommended*	*recommended*	*suitable*
chromogenic	*recommended*	*highly recommended*	*suitable*
colloidal gold	*recommended*	*highly recommended*	*not recommended*
ECF	*highly recommended*	*suitable*	*not recommended*
radioactive	*suitable*	*highly recommended*	*recommended*
Reprobing Westerns	highly recommended	not recommended	suitable
Glycoprotein	highly recommended	recommended	suitable
Expression screening	suitable	not recommended	highly recommended

Hybond-P

A hydrophobic polyvinylidene difluoride (PVDF) membrane optimized for use in protein transfers. With higher physical strength than unsupported nitrocellulose, Hybond-P offers significant handling advantages and is ideal for reprobing. It is particularly recommended for use with ECL Plus™ Western Blotting Detection Reagents* and gives excellent results with ECL Glycoprotein Detection Systems. Hybond-P must be wetted in 100% methanol then soaked in distilled water before use.

Strong High mechanical strength with a protein binding capacity of 125 µ/cm²

Stable Chemically stable, allowing the use of a range of solvents for rapid destaining

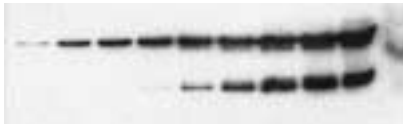


Fig 18. ECL Plus detection of β-tubulin in rat brain homogenate transferred to Hybond-P.

Ordering information

Product	Quantity	Code
Hybond-P (20 x 20 cm)	10 sheets	RPN2020F
Hybond-P (30 cm x 3 m)	1 roll	RPN303F
Hybond-P (14 x 16 cm)	15 sheets	RPN1416F

*See page 48 for licensing information.

Protein Blotting

Fig 20. Hybond ECL special packaging provides better handling and consistent membrane performance.

Hybond ECL

An unsupported 100% nitrocellulose membrane that delivers excellent sensitivity, resolution and low background for all labelling and detection systems and especially when used with ECL Western Blotting System.

Compatible Validated for use with ECL Western Blotting System

Consistent Special packaging features enhance membrane performance in terms of handling and consistency of results

Versatile Special sizes available on request

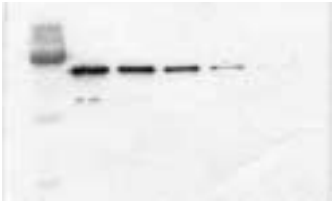


Fig 19. Iodine-125 Western blot using Hybond ECL.

Ordering information

	Product	Quantity	Code
new	Hybond ECL (82 mm)	50 discs	RPN82D
new	Hybond ECL (132 mm)	50 discs	RPN132D
new	Hybond ECL (137 mm)	50 discs	RPN137D
	Hybond ECL (6 x 8 cm)	50 sheets	RPN68D
new	Hybond ECL (7 x 8 cm)	50 sheets	RPN78D
new	Hybond ECL (9 x 10 cm)	10 sheets	RPN910D
new	Hybond ECL (10 x 10 cm)	10 sheets	RPN1010D
new	Hybond ECL (15 x 15 cm)	10 sheets	RPN1515D
new	Hybond ECL (15 x 20 cm)	10 sheets	RPN1520D
	Hybond ECL (20 x 20 cm)	10 sheets	RPN2020D
new	Hybond ECL (20 cm x 3 m)	1 roll	RPN203D
new	Hybond ECL (30 cm x 3 m)	1 roll	RPN3032D*
	Hybond ECL (30 cm x 3m)	1 roll	RPN303D

**0.2 µm pore size*

Hybond-C extra

A supported mixed ester nitrocellulose with high physical strength. Hybond-C extra may be used in all protein transfer and detection procedures, but is particularly recommended for expression screening as it gives low background, high signal and is easy to handle.

Strong Supporting web allows multiple reprobings without loss of membrane integrity

Versatile Special sizes available on request

Ordering information

Product	Quantity	Code
Hybond-C extra (82 mm)	50 discs	RPN82E
Hybond-C extra (137 mm)	50 discs	RPN137E
Hybond-C extra (20 x 20 cm)	10 sheets	RPN2020E
Hybond-C extra (30 x 50 cm)	5 sheets	RPN3050E
Hybond-C extra (20 cm x 3 m)	1 roll	RPN203E
Hybond-C extra (30 cm x 3 m)	1 roll	RPN303E

Blotting and Hybridization

Protein blotting involves the transfer of proteins onto a solid support membrane such as nitrocellulose or polyvinylidene difluoride (PVDF). Blotting allows the use of immunodetection and staining procedures which would otherwise be difficult or impossible to perform using gels alone.

Methods for transferring proteins onto membranes include standard electro-blotting techniques using tanks systems, semi-dry blotting which uses low voltages and minimal buffer volumes, and direct blotting of protein solutions onto membranes using manifold systems.

Table 4. Transfer unit selection guide

Unit	Type	Heat exchanger	Buffer volume (l)	Max. gel size (cm)	No. of gels	Recommended power supply
TE42	tank	optional	5	15 x 21	4, 2*	EPS 2A200
TE62	tank	built-in	5	15 x 21	4	EPS 2A200
MiniVE Module	semi-wet	N/A	0.3	9 x 10	2	EPS 301
TE22	tank	built-in	1	9 x 10	4	EPS 2A200
TE70	semi-dry	N/A†	0.2	14 x 16	3	EPS 301
TE77	semi-dry	N/A	0.2	21 x 26	3	EPS 2A200

* *With optional heat exchanger in place.*
† *N/A = not applicable*

Fig 21. TE 62 Transphor Tank with built in heat exchanger and optional power lid delivers consistent results by applying a uniform electric field.

Hoefer Transphor Tank Transfer Units

Transphor™ units use transverse electrophoresis to transfer proteins from polyacrylamide gels onto nitrocellulose and PVDF membranes. The optional Transphor power lid delivers up to 1.5 A and 100 V in constant current mode. An optional heat exchanger is also available.

Equipment

Fig 22. TE 22 Mini Tank Transphor Unit

Reliable Performs complete and even transfers of proteins

Versatile Transfers four 15 x 21 cm gels or up to sixteen 7 x 10 cm gels at once

Convenient Cassettes load easily with even contact between gel and transfer membrane

Safe Sturdy electrode panels lock safely in place automatically

Ordering information

Product	Quantity	Code
TE 62,Transphor II Cooled Unit	1	80-6209-58
TE 42, Transphor Unit	1	80-6205-97
TE 50X, Optional Transphor Power Lid		
115 VAC	1	80-6207-87
230 VAC	1	80-6208-06
Optional Heat Exchanger for TE 42	1	80-6207-49
EPS2A200	1	80-6406-99

TE 22 Mini Tank Transphor Unit

The Mini Tank Transphor Unit can transfer proteins to nitrocellulose or PVDF membrane in 30–60 minutes using only 1 litre of buffer. The built-in alumina-covered heat exchanger and magnetic stirrer, which circulates the buffer, ensures that a constant temperature is maintained during transfer. The temperature rises no more than 5 °C when running tap water through the heat exchanger.

Fast Perform protein transfers from four mini-gels at once in less than one hour

Consistent Uniform electric field ensures complete and even transfers

Uniform Maintain transfer temperature with built-in heat exchanger

Convenient Snap-close cassettes for easy loading and firm, even pressure

Ordering information

Product	Quantity	Code
TE 22 Mini Tank Transphor Unit	1	80-6204-26

Blotting and Hybridization

Fig 23. Semi-Dry Transfer Units transfer gels using low current and a minimal amount of buffer.

Hoefer TE 70 Series Semi-Dry Transfer Units

Hoefer TE 70 Series Semi-Dry Transfer Units are designed to deliver outstanding electrophoretic transfer results using low current and voltage with a minimal amount of buffer. The TE 70 is suitable for gels up to 14 x 16 cm, such as from SE 600 units, or two mini-gels, side-by-side, from miniVE units. The TE 77 accepts gels up to 21 x 26 cm, or four mini-gels, side-by-side.

Fast Complete, uniform electrotransfer of proteins from polyacrylamide gels in less than an hour

Efficient Transfer multiple gels simultaneously

Economical Minimal buffer use, just enough to saturate blotting papers and membranes

Clean Contamination-free transfers from durable platinum and stainless steel electrodes

Ordering information

Product	Quantity	Code
TE 70 Semi-Dry Transfer Unit, 14 x 16 cm	1	80-6210-34
(Includes 25 sheets of Blotter Paper, 50 sheets of Cellophane, 2 Solid Masks, Masks for 7 x 8 cm and 14 x 16 cm gels.)		
TE 77 Semi-Dry Transfer Unit, 21 x 26 cm	1	80-6211-86
(Includes 25 sheets of Blotter Paper, Solid Mask and Mask for 14 x 16 cm gels.)		

Hoefer Slot Blotting Manifold

The slot blot unit is made from precision machined, durable acrylic plates with alignment pins for accurate assembly. The unit is clamped together by large-headed stainless steel screws.

The Slot Blot Manifold has 4 rows of 12 slots, both with standard 9 mm multi-channel spacing. The membrane area exposed in each slot is 2.6 mm^2 (6.5 x 0.4 mm) with a well volume of 1 ml.

Efficient Screen 48 protein samples simultaneously

Effective Raised slot edges prevent cross-contamination and produce clean-edged blots

Convenient Slots empty into a lower chamber fitted with a connector for attaching a vacuum pump or aspirator

Ordering information

Product	Quantity	Code
48-well Slot Blot Manifold	1	80-6095-58

Equipment

Fig 24. Slot Blot Manifold with 48 sample filtration slots.

Hoefer Processor Plus

Automated Western blot processor, see page 12 for further details

Hybridization Oven/Shaker

The Hybridization Oven/Shaker rigidly controls temperature and shaking/rotation frequency, ensuring the stringency of hybridization and washing steps. Developed for use with Amersham Biosciences radioactive and non-radioactive labelling systems, a choice of hybridization modes is available using either a variable speed rotisserie or a platform shaker in the oven.

Versatile Temperature controlled oven containing a rotisserie or shaking platform for the hybridization and incubation of Northern, Southern and Western blots

Efficient Bottle hybridizations minimize probe volumes, providing enhanced sensitivity and reduced reagent costs

Safe Acrylic/polycarbonate door minimizes exposure to beta radiation

Ordering information

Product	Quantity	Code
Hybridization Oven/Shaker 220/240 V, 50 Hz	1	RPN2510
Hybridization Oven/Shaker 110/115 V, 60 Hz	1	RPN2511
Hybridization Oven/Shaker 100 V, 60 Hz	1	RPN2512

(Each instrument is supplied with a Rotisserie and six Hybridization Bottles.)

Fig 25. The Hybridization Oven/Shaker provides a choice of hybridization modes: variable speed rotisserie or platform shaker.

Western Blotting Detection Systems

A specific protein immobilized on a Western blot can be visualized using immunodetection. Figure 26 shows the indirect assay in which a primary antibody is used to identify the protein of interest. A labelled secondary antibody, against the species in which the primary antibody was raised, is used to locate the primary antibody-antigen complex. The secondary antibody can be labelled with a variety of detectable molecules including enzymes, gold particles, fluorophores, or radiolabels.

The type of label used for immunodetection will determine the image detection method required. Enzyme-labelled antibodies can be detected in a number of ways. Chemiluminescent and chemifluorescent methods involve the generation of light through the use of an appropriate enzyme substrate. These methods are highly sensitive and yield hard copy results within minutes, if not seconds, on autoradiography film (chemiluminescence) or using Molecular Dynamics™ scanning instruments (chemifluorescence). Colorimetric detection methods involve the deposition of a coloured precipitate at the site of the bound antibody. Colorimetric results are semi-permanent and prone to fading. Radiolabelled antibodies can be detected by autoradiography. This method yields permanent results, but can require hours to days to generate hard copy data. The various Western blotting detection methods are summarized in Table 5.

Fig 26. Diagrammatic representation of the indirect method of immunodetection.

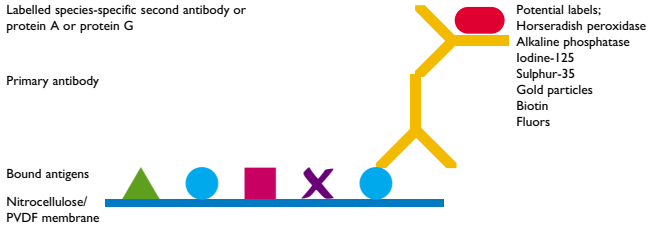


Table 5. Western blotting detection methods

	ECL Plus	ECL	ECF	Colorimetric	Radioactive	Colloidal Gold
Sensitivity	excellent	very good	very good	good	acceptable	good (with enhancement)
Antibody economy	excellent	very good	very good	good	acceptable	poor
Reprobing	recommended	recommended	recommended	not recommended	not recommended	not recommended
Quantification	very good	very good	excellent	acceptable	very good	acceptable
Permanence	permanent	permanent	permanent	semi-permanent (will fade)	permanent	semi-permanent (will fade)
Emission	24–48 h	1–2 h	24–48 h		several weeks	
Recommended applications	high sensitivity Western blotting	routine Western blotting applications	quantification of Western blots	low sensitivity Western blots	repeated exposures	low sensitivity Western blots

ECL and ECL Plus Western Blotting Detection Systems

ECL Plus utilizes an acridan-based substrate that releases a high level, sustained output of light. The system is particularly suited to the detection of low abundance proteins.

Sensitive	Up to 20 times more sensitive than ECL Western Blotting System
Stable	Significant signal still visible 24–48 hours after detection when using PVDF membranes
Economical	Lower antibody concentrations and sample volumes saves on the cost of primary antibodies and target protein
Quantifiable	Easily quantified on the Molecular Dynamics Storm and other flourescent imagers

Ordering information

Product	Quantity	Code
ECL Plus Western Blotting Detection System		
	1 000 cm^2 membrane	RPN2132
	3 000 cm^2 membrane	RPN2133
(Each system contains the following reagents, sufficient for detection of 1 000 cm^2 or 3 000 cm^2 membrane: ECL Plus Detection Reagents A and B.)		
ECL Plus Western Blotting Reagent Pack		
	10 mini blots	RPN2124
(Each reagent pack contains the following, sufficient for 10 mini blots: Anti-Rabbit Horseradish Peroxidase Conjugate, Anti-Mouse Horseradish Peroxidase Conjugate and Blocking Reagent)		

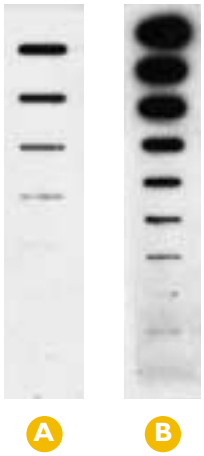


Fig 27. Target: mouse IgG slot blotted onto PVDF (Hybond-P, RPN2020F); loadings: doubling dilutions starting at 5ng; detection: 1:2500 dilution of anti-mouse Ig HRP conjugate (NA931) using (A) ECL detection reagents (RPN2106) and (B) ECL Plus detection reagents (RPN2132); exposure: on Hyperfilm ECL (RPN2103) for 5 minutes.

ECL Western Blotting Detection System

ECL Western Blotting Detection System uses horseradish peroxidase conjugated anti-mouse and anti-rabbit antibodies for luminol-based detection of Western blots.

Sensitive	Up to 10 times more sensitive than colorimetric methods; detect sub-picogram quantities of protein
Fast	Results obtained in minutes, if not seconds on X-ray film
Quantifiable	Linear response in the range 0.2–2.0 O.D. units using pre-flashed Hyperfilm™ ECL autoradiography film
Proven	The most widely referenced, commercially available detection system

Ordering information

Product	Quantity	Code
ECL Western Blotting System	1 kit	RPN2108
(Each system contains the following reagents, sufficient for detection of 1 000 cm^2 membrane: Anti-Mouse Horseradish Peroxidase Conjugate, Anti-Rabbit Horseradish Peroxidase Conjugate and ECL Detection Reagents.)		
ECL Western Blotting Detection Reagents		
	1 000 cm^2 membrane	RPN2109
	2 000 cm^2 membrane	RPN2209
	4 000 cm^2 membrane	RPN2106
	6 000 cm^2 membrane	RPN2134
ECL Blocking Agent	40 g	RPN2125

Fig 28. Detection of actin using ECL Western Blotting System. Ten-fold serial dilutions of actin (from 100 ng to 195 pg) were separated by electrophoresis and proteins were transferred to Hybond-P membrane. Primary antibody was mouse anti-actin (product code N350). Detection was performed using ECL detection reagents and Hyperfilm ECL.

ECF Western Blotting Kit

ECF™ Western Blotting Detection Kit uses fluorescein-labelled anti-species secondary antibodies to recognize primary antibodies. The secondary antibody can often be detected directly by fluorescence scanning equipment such as Molecular Dynamics FluorImager™ instrument. Where signal amplification is required, an anti-fluorescein alkaline phosphatase conjugated tertiary antibody and ECF substrate are used.

ECF substrate is a chemifluorescent reagent for alkaline phosphatase-based detection of protein blots. Using ECF substrate, alkaline phosphatase catalyses the formation of stable fluorophores that can be detected and quantified by fluorescence scanning equipment such as Molecular Dynamics FluorImager and Storm™ instruments.

ECF Western Blotting Detection Kit

Convenient	Supplied with both anti-rabbit and anti-mouse reagents and protocols
Stable	Blots can be stripped and reprobed
Versatile	Suitable for use with Western blots, slot blots and dot blots

Ordering information

Product	Quantity	Code
ECF Western Blotting Kit	1 kit	RPN5780

(Each kit contains the following reagents, sufficient for detection of 2 500 cm^2 membrane: Anti-Mouse Fluorescein-Linked Whole Antibody, Anti-Rabbit Fluorescein-Linked Whole Antibody, Anti-Fluorescein Alkaline Phosphatase Conjugate, Membrane Blocking Agent and ECF Substrate.)

ECF Western Blotting Reagent Packs

ECF Western Blotting Reagent Packs use ECF substrate and alkaline phosphatase conjugated secondary antibodies for the chemifluorescent detection of proteins immobilized on membranes.

Sensitive Sensitivity equivalent to ECL detection

Compatible Suitable for use with Molecular Dynamics FluorImager and Storm instruments

Ordering information

Product	Quantity	Code
ECF Substrate	2 500 cm^2 membrane	RPN5785
ECF Western Blotting Reagent Pack, mouse		
	2 500 cm^2 membrane	RPN5781
	5 000 cm^2 membrane	RPN5782
ECF Western Blotting Reagent Pack, rabbit		
	2 500 cm^2 membrane	RPN5783
	5 000 cm^2 membrane	RPN5784

(Each pack contains the following reagents, sufficient for detection of 2 500 to 5 000 cm^2 membrane [depending on product ordered]: Anti-Mouse or Anti-Rabbit Alkaline Phosphatase Conjugate, Membrane-Blocking Agent and ECF Substrate.)

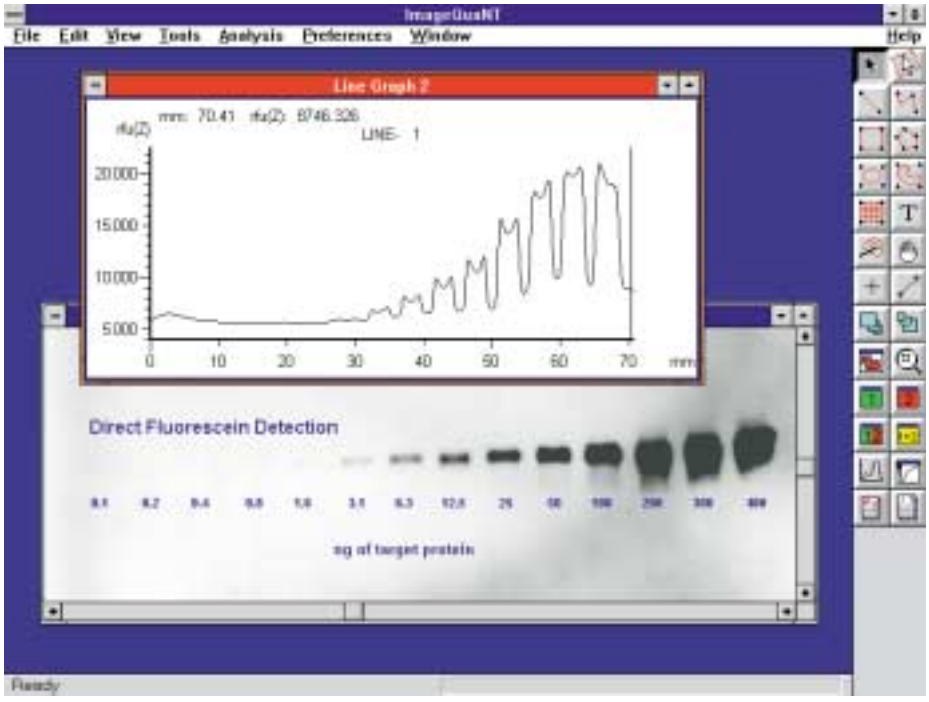


Fig 29. A dilution series of tubulin was separated on 12% acrylamide gel, then transferred to Hybond-P. The blot was probed according to the ECF Western Blotting Kit protocol and scanned using FluorImager fluorescence scanner immediately after addition of the fluorescein-labelled secondary antibody. Low nanogram levels of target protein could be detected in this scan.

Labelled Secondary Antibodies

Species-specific secondary antibodies are available as horseradish peroxidase conjugates and as radiolabelled antibodies, which allows the use of a variety of detection methods.

Fig 30. Detection of beta-tubulin in rat brain homogenate. Proteins were transferred to Hybond-P membrane. Primary antibody was mouse anti-beta-tubulin (product code N357). Secondary antibody was sheep anti-mouse IgG conjugated to HRP (product code NA931). Detection was performed using ECL Plus reagents and Hyperfilm™ ECL.

Peroxidase-labelled antibodies

These secondary antibodies are optimized for use with ECL and ECL Plus Western blotting reagents for the rapid, sensitive immunodetection of HRP on membranes.

Optimized Protocols are optimized for use with ECL and ECL Plus detection

Specific Highly purified species-specific reagents with low cross-reactivities

Ordering information

Product	Source	Quantity	Code
Human Ig, HRP linked	Sheep	1 ml	NA933
Mouse Ig, HRP linked Whole Ab	Sheep**	1 ml	NXA931
Mouse Ig, HRP linked Whole Ab	Sheep	1 ml	NA931
Rabbit Ig, HRP linked $F(ab')_2$ Fragment	Donkey*	1 ml	NA9340
Rabbit Ig, HRP linked Whole Ab	Donkey	1 ml	NA934
Rat Ig, HRP linked $F(ab')_2$ Fragment	Sheep	1 ml	NA9320
Rat Ig, HRP linked Whole Ab	Sheep	1 ml	NA932

* Highly species-specific ** General screening reagent

Radiolabelled antibodies

^{125}I and ^{35}S are used to label antibodies and other proteins without causing significant loss in biological activity. These radiolabelled antibodies are suitable for use in immunodetection and *in situ* hybridization.

Specific Highly purified species-specific reagents with low cross-reactivities

Quantifiable Film results are quantifiable by densitometry

Ordering information

Product	Specific activity	Source	Quantity	Code
Human Ig $F(ab')_2$ Fragment, [^{125}I]	19–74 TBq/mmol 500–2 000 Ci/mmol	Sheep	1.85 MBq, 50 µCi 3.7 MBq, 100 µCi	IM1330-50 µCi IM1330-100 µCi
Human Ig Whole Ab, [^{125}I]	28–111 TBq/mmol, 750–3 000 Ci/mmol	Sheep	3.7 MBq, 100 µCi 18.5 Bq, 500 µCi	IM133-100 µCi IM133-500 µCi
Mouse Ig $F(ab')_2$ Fragment, [^{125}I]	19–74 TBq/mmol 500–2 000 Ci/mmol	Sheep	1.85 MBq, 50 µCi 3.7 MBq, 100 µCi	IM1310-50 µCi IM1310-100 µCi
Mouse Ig Whole Ab, [^{125}I]	28–111 TBq/mmol 750–3 000 Ci/mmol	Sheep	1.85 MBq, 50 µCi 3.7 MBq, 100 µCi 18.5 MBq, 500 µCi	IM131-50 µCi IM131-100 µCi IM131-500 µCi
Mouse Ig Whole Ab, [^{35}S]	7.4–74 TBq/mmol, 200–2 000 Ci/mmol	Sheep	370 kBq, 10 µCi 1.85 MBq, 50 µCi 2 x 1.85 MBq, 100 µCi	SJ431-10 µCi SJ431-50 µCi SJ431-100 µCi
Rabbit Ig $F(ab')_2$ Fragment, [^{125}I]	19–74 TBq/mmol, 500–2 000 Ci/mmol	Donkey	1.85 MBq, 50 µCi 3.7 MBq, 100 µCi	IM1340-50 µCi IM1340-100 µCi
Rabbit Ig Whole Ab, [^{125}I]	28–111 TBq/mmol, 750–3 000 Ci/mmol	Donkey	1.85 MBq, 50 µCi 3.7 MBq, 100 µCi 18.5 MBq, 500 µCi	IM134-50 µCi IM134-100 µCi IM134-500 µCi
Rabbit Ig Whole Ab, [^{35}S]	7.4–74 TBq/mmol, 200–2 000 Ci/mmol	Donkey	370 kBq, 10 µCi 1.85 MBq, 50 µCi 2 x 1.85 MBq, 100 µCi	SJ434-10 µCi SJ434-50 µCi SJ434-100 µCi
Rat Ig $F(ab')_2$ Fragment, [^{125}I]	19–74 TBq/mmol 500–2 000 Ci/mmol	Sheep	1.85 MBq, 50 µCi 3.7 MBq, 100 µCi	IM1320-50 µCi IM1320-100 µCi
Rat Ig Whole Ab, [^{125}I]	28–111 TBq/mmol, 750–3 000 Ci/mmol	Sheep	1.85 MBq, 50 µCi 3.7 MBq, 100 µCi	IM132-50 µCi IM132-100 µCi

Labelled Secondary Antibodies

Colloidal gold-labelled antibodies

AuroProbe™ gold-labelled secondary antibodies* yield semi-permanent results with very little background. Antigens detected using gold-labelled secondary antibodies result in a pink coloration that is prone to fading. The signal can be amplified using the appropriate IntenSE™ Silver Enhancement Reagent.

Optimized	Optimized for blotting applications
Specific	Highly purified species-specific reagents with low cross-reactivities
Convenient	Supplied with dilution guidelines

Ordering information

Product	Gold size	Source	Quantity	Code
AuroProbe BLplus-Labelled				
AuroProbe BLplus Rabbit IgG (H+L)	10 nm	Goat	2 ml	RPN460
AuroProbe BLplus Mouse IgG (Fc)	10 nm	Goat	2 ml	RPN461
IntenSE BL Silver Enhancement Reagent			1 kit	RPN492
AuroProbe EM-Labelled				
AuroProbe EM Rat IgG (H+L)	10 nm	Goat	1 ml	RPN435
IntenSE M Silver Enhancement Reagent			1 kit	RPN491
AuroProbe LM-Labelled				
AuroProbe LM Mouse IgG (Fc)	5 nm	Goat	1 ml	RPN451
IntenSE M Silver Enhancement Reagent			1 kit	RPN491

See page 48 for licensing information.

Fluorescent dye-labelled antibodies

Fluorescently labelled antibodies can be used in flow cytometry, *in situ* hybridization, and immunodetection. Fluorescently labelled antibodies can be detected and quantified using fluorescence scanning systems such as Molecular Dynamics FluorImager and Storm systems (see right).

Specific Highly purified species-specific reagents with low cross-reactivities

Convenient Dilution guidelines provided for relevant applications

Table 6. Relative sensitivities of fluorescence scanning systems for various fluorophores

	Scanning System	
Fluorophore	**FluorImager**	**Storm**
fluorescein	+++	+
Texas Red™	–	+++
Cy™3	+++	–
Cy5	–	+++

+++ = highly sensitive
+ = somewhat sensitive
– = not compatible

Ordering information

Product – Antibody to:	Source	Quantity	Code
Mouse Ig, Fluorescein Linked Whole Ab	Sheep	1 ml	N1031
Mouse Ig, Texas Red Linked Whole Ab	Sheep	1 ml	N2031
Rabbit Ig, Fluorescein Linked Whole Ab	Donkey	1 ml	N1034
Rabbit Ig, Texas Red Linked Whole Ab	Donkey	1 ml	N2034
Mouse IgG, Cy3 Linked	Goat	1 mg	PA43002
Rabbit IgG, Cy3 Linked	Goat	1 mg	PA43004
Mouse IgG, Cy5 Linked	Goat	1 mg	PA45002
Rabbit IgG, Cy5 Linked	Goat	1 mg	PA45004

Biotin and Streptavidin Detection

In addition to direct labelling, the secondary antibody can be labelled with biotin. Biotin itself cannot produce a detectable signal, but it binds strongly to streptavidin, which can be labelled with a variety of molecules, including enzymes, radioisotopes, fluorescent dyes, and gold. Antibodies can be biotinylated to a high degree without affecting binding properties. Biotin-streptavidin-based detection methods are highly sensitive due to signal amplification resulting from complex binding patterns.

Biotinylated antibodies

Specific Highly purified species-specific reagents with low cross-reactivities

Convenient Dilution guidelines provided for relevant applications

Ordering information

Product Antibody to:	Source	Quantity	Code
Goat/Sheep Ig (Whole Ab) Screening	Donkey	2 ml	RPN1025
Human Ig (Whole Ab)	Sheep	2 ml	RPN1003
Mouse Ig (Whole Ab)	Sheep	2 ml	RPN1001
Mouse IgG (Whole Ab)	Goat	1 ml	RPN1177
Rabbit Ig (Whole Ab)	Donkey	2 ml	RPN1004
Rat Ig (Whole Ab)	Sheep	2 ml	RPN1002

Streptavidin-Enzyme Conjugates

Streptavidin conjugated to reporter enzyme molecules are suitable for use in blotting and *in situ* hybridization applications.

Specific Highly purified species-specific reagents with low cross-reactivities

Convenient Dilution guidelines provided for relevant applications

Ordering information

Product	Quantity	Code
Streptavidin-Alkaline Phosphatase Conjugate	2 ml	RPN1234
Streptavidin-Biotinylated Horseradish Peroxidase Complex	2 ml	RPN1051
Streptavidin Horseradish Peroxidase Conjugate	2 ml	RPN1231
ECL *in vitro* Translation Streptavidin-HRP conjugate (500 µl) and Blocking Reagent (44 g dried milk powder)	2 000 cm^2 membrane	RPN2195

Radiolabelled Streptavidin

Radiolabelled streptavidin is suitable for use in blotting, immunoassay and *in situ* hybridization applications.

Specific Highly purified species-specific reagents with low cross-reactivities

Convenient Dilution guidelines provided for relevant applications

Ordering information

Product	Specific activity	Quantity	Code
[^{125}I] Streptavidin	0.74–1.5 MBq/mg 20–40 mCi/mg	1.85 MBq, 50 µCi 3.7 MBq, 100 µCi 18.5 MBq, 500 µCi	IM236-50 µCi IM236-100 µCi IM236-500 µCi
[^{35}S] Streptavidin	7.4–74 TBq/mmol 200–2 000 Ci/mmol	1.85 MBq, 50 µCi 3.7 MBq, 100 µCi	SJ436-50 µCi SJ436-100 µCi

Reagents

Streptavidin-Fluor Conjugates

Streptavidin conjugated to CyDye™* and other fluorescent dyes are suitable for use in the fluorescent analysis of biotinylated samples.

Specific Highly purified species-specific reagents with low cross-reactivities

Convenient Dilution guidelines provided for relevant applications

Ordering information

Product	Quantity	Code
FluoroLink™ Cy™2, Streptavidin	1 mg	PA42001
FluoroLink Cy3, Streptavidin	1 mg	PA43001
FluoroLink Cy5, Streptavidin	1 mg	PA45001
Streptavidin-Fluorescein	2 ml	RPN1232
Streptavidin-Texas Red	2 ml	RPN1233

See page 48 for licensing information.

Labelled Protein A and Protein G

Protein A and Protein G are bacterial cell wall proteins with a specific binding affinity for the Fc region of immunoglobulins. Labelled Protein A and G are useful general purpose reagents for immunodetection applications.

Ordering information

Product	Quantity	Code
Protein A G10 AuroProbe EM, 10 nm Gold	1 ml	RPN438
HRP-labelled Protein A + Substrate	1 pack	N9120
HRP-Labelled Protein A	1 ml	NA9120
[^{125}I]Protein A (Bolton and Hunter Labelled)	370 kBq, 10 µCi 3.7 MBq, 100 µCi 18.5 MBq, 500 µCi	IM112-10 µCi IM112-100 µCi IM112-500 µCi
[^{125}I]Protein A (Affinity Purified for Blotting)	370 kBq, 10 µCi 1.85 MBq, 50 µCi 3.7 MBq, 100 µCi	IM144-10 µCi IM144-50 µCi IM144-100 µCi
[^{125}I]Protein G (Bolton and Hunter Labelled)	370kBq, 10 µCi 1.85 MBq, 50 µCi 3.7 MBq, 100 µCi	IM244-10 µCi IM244-50 µCi IM244-100 µCi

Cell Surface Labelling

The labelling of cellular components enables the tracing of proteins both on the cell surface and within organelles. The understanding of cellular processes has been enhanced by the use of both radioactive and non-isotopic labelling methods.

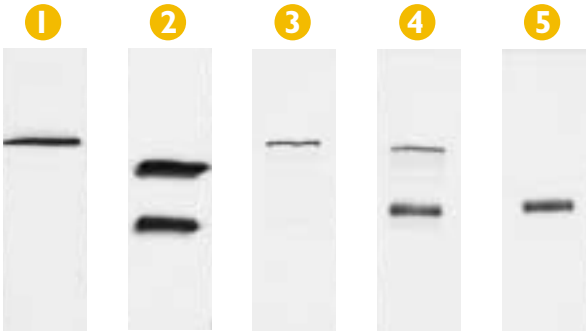


Fig 31. Use of biotinylated primary antibodies to detect immunoprecipitates. Panels 1 and 3 show detection of immunoprecipitated proteins using biotinylated primary antibodies in conjunction with streptavidin-HRP and ECL Detection Reagents. Panels 2, 4 and 5 show detection using anti-species antibodies and the associated interference caused by detection of the immunoprecipitating antibody.

ECL Protein Biotinylation System

ECL Protein Biotinylation System is designed for the direct labelling and detection of sub-picogram amounts of protein. The system is suitable for use in the analysis of cell surface antigens where no antibody is available for Western blotting. The system can also be used for labelling primary antibodies, which avoids the use of anti-species antibodies that can interfere with results during immunoprecipitations by detecting the heavy and light chains of the immunoprecipitating antibody.

Sensitive As sensitive as ^{125}I labelling with high contrast results on film within minutes

Compatible Proven performance with ECL

Versatile Label proteins in solution or cell surface molecules, use in Western blotting and immunoprecipitations, and use for total protein detection on blots.

Ordering information

Product	Quantity	Code
ECL Protein Biotinylation System	25 reactions	RPN2203
ECL Protein Biotinylation Module	25 reactions	RPN2202

(Each system contains the following reagents, sufficient for 25 reactions and detection of 2 000 cm² membrane: Biotinylation Reagent, Sodium Bicarbonate Buffer, Sephadex™ G-25 Columns, Streptavidin-HRP Conjugate, Blocking Reagent and ECL Detection Reagents. ECL Protein Biotinylation Module does not include ECL detection reagents.)

^{125}I Cell Surface Labelling

^{125}I provides robust and sensitive labelling of cell surface proteins. Sodium [^{125}I] iodide is commonly used for labelling tyrosine and histidine residues on the cell surface. Bolton and Hunter reagent is used for labelling free amino groups, especially targets that do not contain histidine or tyrosine residues.

Fast Shorter autoradiography exposure times than tritium

Pure Iodine-125 is isotopically pure, normally < 0.005% ^{126}I and completely free from reducing agents

Ordering information

Product	Specific activity	Quantity	Code
Iodine-125	3.7 GBq/ml, 100 mCi/ml	37 MBq, 1 µCi 74 MBq, 2 µCi 185 MBq, 5 µCi 370 MBq, 10 µCi 740 MBq, 20 µCi	IMS30-1mCi IMS30-2mCi IMS30-5mCi IMS30-10mCi IMS30-20mCi
Iodine-125	13–22 GBq/ml, 350–600 mCi/ml	185 MBq, 5 µCi 370 MBq, 10 µCi 740 MBq, 20 µCi	IMS300-5mCi IMS300-10mCi IMS300-20mCi
Bolton & Hunter reagent for protein iodination	185 MBq/ml, 5 mCi/ml	18.5 MBq, 500 µCi 37 MBq, 1 µCi 185 MBq, 5 µCi	IM5861-500mCi IM5861-1mCi IM5861-5mCi

Metabolic Labelling

Radioisotopes remain the method of choice for metabolic labelling of intracellular proteins. Amersham Biosciences **provides a complete range of sulphur-35 labelled amino acids optimized for use in *in vitro* and *in vivo* cell labelling applications.**

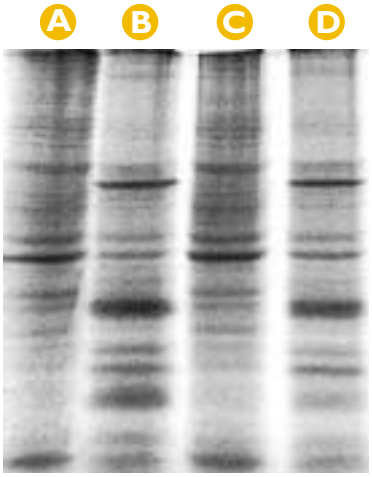


Fig 32. CHO cells were grown as a monolayer culture in 0.5 ml media. Labelling was carried out for 2 hours with 500 µCi [^{35}S] methionine. Results shown are with and without Vaccinia virus infection. SDS PAGE analysis was carried out on the total protein lysate for each condition.

A = SJ1015 -70 °C control, CHO cells only

B = SJ1015 -70 °C control, Vaccinia virus infected CHO cells

C = AG1094 +4 °C Redivue, CHO cells only

D = AG1094 +4 °C Redivue, Vaccinia virus infected CHO cells

Results kindly supplied by Dr B. F. Ink, Imperial Cancer Research Fund, UK

Redivue L-[^{35}S]Methionine

Ready-to-use, easy-to-see, Redivue™ [^{35}S]methionine is ideal for cell labelling, *in vitro* translation and coupled transcription-translation reactions.

Speed	Ready-to-use, no thawing or aliquotting
Handling	Red colour acts as visual check throughout handling
Performance	Improved homogeneity by avoiding freeze/thaw cycles
Reliability	Extensively tested in a wide range of applications

Ordering information

Product	Concentration	Quantity	Code
Redivue L-[^{35}S] Methionine	370 MBq/ml, 10 mCi/ml	18.5 MBq, 500 µCi 37 MBq, 1 mCi 185 MBq, 5 mCi	AG1094-500 µCi AG1094-1 mCi AG1094-5 mCi
Redivue L-[^{35}S] Methionine	555 MBq/ml, 15 mCi/ml	18.5 MBq, 500 µCi 37 MBq, 1 mCi 185 MBq, 5 mCi	AG1594-500 µCi AG1594-1 mCi AG1594-5 mCi

Redivue Pro-mix L-[^{35}S] *in vitro* cell labelling mix

A ready-to-use amino acid mixture containing L-[^{35}S]methionine and L-[^{35}S]cysteine. A low cost alternative to purified L-[^{35}S]methionine for *in vitro* protein labelling and metabolic labelling studies.

Reproducible > 65% L-[^{35}S] Methionine, > 25% L-[^{35}S] Cysteine and < 10% [^{35}S] impurities (e.g. leucine and isoleucine).

Reliable Each batch is quality control tested for radiochemical purity and functionality in a cell labelling assay

Performance Improved incorporation efficiencies compared with use of individually labelled amino acids

Ordering information

Product	Concentration	Quantity	Code
Redivue Pro-Mix L -[^{35}S] *in vitro* cell labelling mix	530 MBq/ml, 14.3 mCi/ml	92.5MBq, 2.5 mCi 265 MBq, 7.15 mCi	AGQ0080-2.5 mCi AGQ0080-7.15 mCi

Fig 33. Comparison of results using Redivue Pro-Mix and the standard formulation Pro-Mix. Cell lysate products from in vitro cell labelling of NIH 3T3 mouse fibroblasts were separated by electrophoresis using an 8% polyacrylamide gel. Lanes 1–4, standard formulation Pro-Mix (0.125, 0.25, 0.5, and 1.0 mCi/ml, respectively). Lanes 5–8, Redivue Pro-Mix ((0.125, 0.25, 0.5, and 1.0 mCi/ml, respectively).

Stabilized L-[^{35}S] Cysteine

Ready-to-use solution for labelling proteins with low methionine content.

Stability Stabilized with pyridine 3,4-dicarboxylic acid for longer shelf life

Convenience High concentration formulation allows product to be used straight from the vial

Performance Tested in tissue culture labelling experiments ensuring compatibility with even the most sensitive systems

Ordering information

Product	Concentration	Quantity	Code
L-[^{35}S] Cysteine	370 MBq/ml, 10 mCi/ml	18.5MBq, 500 µCi 37 MBq, 1 mCi 185 MBq, 5 mCi	SJ15232-500 µCi SJ15232-1 mCi SJ15232-5 mCi

Post-Translational Modification of

Post-translational modification of proteins is a major intracellular event involved in controlling and modifying their biological activity. Understanding when, or if a protein is modified is vital to unravelling biological processes such as transcriptional control

ECL Phosphorylation Module

Protein phosphorylation is a major mechanism for regulating protein function in eukaryotic cells. ECL Phosphorylation Module uses horseradish-peroxidase-conjugated PY20 monoclonal antibody for the highly specific detection of phosphotyrosine.

Specific PY20 monoclonal antibody has a high affinity for phosphotyrosine and low cross-reactivity with other phosphoamino acids

Sensitive ECL detection provides rapid and sensitive results

Ordering information

Product	Quantity	Code
ECL Phosphorylation Module	25 blots	RPN2220

(Each module contains the following reagents, sufficient for probing 25 blots: Anti-Phosphotyrosine-HRP Conjugate and Blocking Reagent. Order ECL detection reagents seperately.)

Proteins

ECL Glycoprotein Detection Module

ECL Glycoprotein Detection Module enables the detection of carbohydrate moieties on proteins by a simple labelling procedure. The carbohydrate portions of a glycoprotein are oxidized using sodium metaperiodate to form aldehyde groups, which spontaneously react with hydrazides. Biotin-x-hydrazide is used to incorporate biotin onto the oxidized carbohydrate. The biotinylated glycoprotein is detected using Streptavidin-HRP Conjugate and ECL Detection Reagents.

Sensitive ECL detection provides rapid and sensitive results

Optimized Optimized for use with nitrocellulose and PVDF membranes

Versatile Labelling can be performed in solution prior to Western blotting or after transfer to a membrane

Fig 34. Total carbohydrate labelling on the membrane using ECL Glycoprotein Detection Module. All lanes contain 80 ng of sample. Lane 1, glycophorin. Lane 2, transferrin. Lane 3, ovalbumin. Lane 4, ribonuclease-B. Lane 5, fetuin. Lane 6, asialoglycophorin.

Ordering information

Product	Quantity	Code
ECL Glycoprotein Detection Module	25 membrane reactions	RPN2190

(Each module contains the following reagents, sufficient for 25 membrane reactions or 50 solution reactions: Sodium Metaperiodate, Sodium Metabisulphate, Biotin Hydrazide, Membrane Blocking Reagent, Streptavidin-HRP Conjugate and Transferrin. Order ECL detection reagents seperately).

Translation Systems

Amersham Biosciences **provides a range of products, both radioactive and non-isotopic, for the labelling of proteins in *in vitro* translation systems. Applications of these systems include: identification of mRNA prior to cDNA cloning, study of the control of protein synthesis and *in vitro* qualitative and quantitative assay of mRNA.**

Rabbit Reticulocyte Lysate

A highly efficient cell-free system for the synthesis of proteins from exogenous RNA templates.

Reliable Extract treated with calcium dependent nuclease to destroy endogenous RNA for low-background results

Consistent Lysate formulation yields increased protein synthesis and contains low endogenous salt levels

Convenient Potassium chloride, potassium acetate and magnesium acetate solutions are supplied to allow optimization of salt concentrations

Compatible Compatible with radiolabelled amino acids (see page 34)

Ordering information

Product	Quantity	Code
Rabbit Reticulocyte Lysate	20 reactions	RPN3150
Rabbit Reticulocyte Lysate	50 reactions	RPN3151

(Each system contains the following reagents, sufficient for 20 or 50 reactions (depending on product ordered): Micrococcal Nuclease Treated Lysate (containing phosphocreatine/phosphocreatine kinase, tRNA mix and haemin), Translation Mixes for use with Labelled Methionine, Cysteine and Leucine, Potassium Chloride, Potassium Acetate and Magnesium Acetate Solutions.)

Autoradiography Films

Our expertise in the labelling and detection of biological molecules supports a range of autoradiography products designed specifically for life science applications, including our own Hyperfilm™ autoradiography films and Kodak™ films.

Use the following table to choose the best possible film and exposure conditions for your application.

Fig 35. The Complete Autoradiography Product Guide details the comprehensive offering of autoradiography products available from Amersham Biosciences

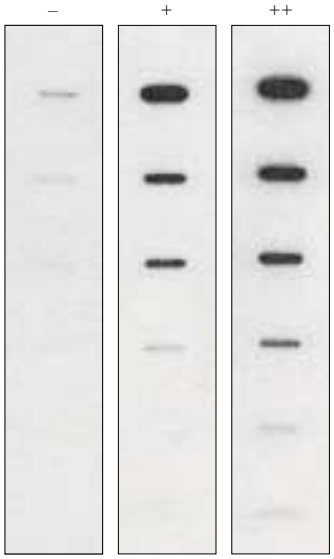
Table 7. Selection guide for autoradiography films.

Application	Result required	Label	Method	Film
Western blots	Maximum speed and sensitivity	^{125}I	Pre-flash and screens at -70 °C	Hyperfilm MP
	Accurate quantification	^{125}I	Screens at -70 °C	BioMax MS film
	Optimum resolution	^{35}S, ^{14}C	Direct autoradiography	Hyperfilm βmax BioMax MR
	Non-radioactive, maximum sensitivity	ECL	Pre-flash and direct detection	Hyperfilm ECL
Protein synthesis, lysates	Maximum speed	^{35}S, ^{14}C, ^{3}H	Pre-flash and fluorography at -70 °C	Hyperfilm MP
	Optimum resolution	^{125}I	Indirect autoradiography Direct autoradiography	BioMax MS Hyperfilm ^{3}H

Autoradiography Films and

Hyperfilm MP

An excellent multipurpose film. The clear base gives high contrast and good resolution while its double sided construction and compatibility with intensifying screens means that it performs well in blotting applications.



– minus Hyperscreen
\+ plus Hyperscreen
++ plus Hyperscreen and pre-flashed with Sensitize

Fig 36.Two-fold serial dilutions of ^{125}I-labelled IgG (100 – 1.56 nCi) were blotted and detected using a 2 h exposure to Hyperfilm MP. – = no screen; + = Hyperscreen used; ++ = Hyperscreen used and pre-flashed with Sensitize pre-flash unit.

Hyperfilm ECL

The recommended film for chemiluminescent applications. The clear base gives high contrast and good resolution while its sensitivity profile matches the emission spectrum of ECL and other chemiluminescent systems.

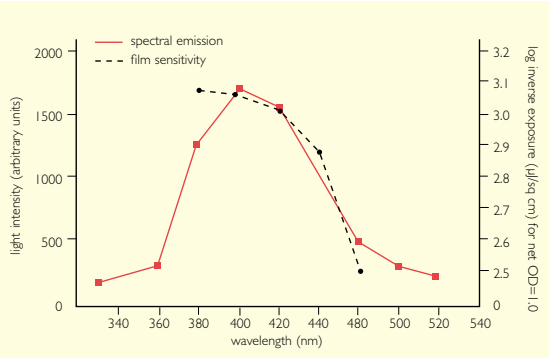


Fig 37. Emission spectrum of luminol enhanced chemiluminescence compared with Hyperfilm ECL sensitivity profiles

Kodak BioMax MR

Kodak BioMax™ MR is an excellent film for the direct autoradiography of ^{35}S and ^{14}C. This clear single sided film gives high resolution and contrast and the special T-grain technology makes it twice as fast as X-Omat™ AR with weak emitters.

Kodak X-Omat AR

A general-purpose film for use with all commonly used isotopes. Coated with emulsion on both sides for both direct exposure and use with intensifying screens.

Accessories

Kodak BioMax MS and Kodak TranScreen HE Intensifying Screen

This film and screen combination offers exceptional sensitivity in ^{125}I applications. The fastest conventional autoradiography film and screen available.

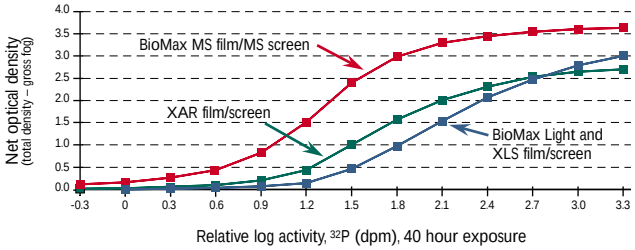


Fig. 38. Comparison of film sensitivity to ^{32}P

Kodak BioMax MS and Kodak TranScreen LE Intensifying Screen

When using ^{35}S the combination of BioMax MS and TranScreen LE allows detection at least 5 times faster than conventional film screen systems.

Related autoradiography accessories

- Hypercassette™ autoradiography cassettes
- Hyperprocessor™ automatic film processor (not available in all countries)
- Hyperscreen™ intensifying screens
- Hypertorch™ darkroom torch
- Kodak BioMax TranScreen intensifying screens
- Safelights
- Sensitize™ preflash unit
- TrackerTape™ phosphorescent tape (not available in all countries)

For further information on the Amersham Biosciences range of autoradiography products, please request a copy of **The Complete Autoradiography Product Guide.**

Fig 39. Hypercassette autoradiography cassettes

Fig 40. Hyperprocessor

Storage Phosphor Screens – Filmless

Storage phosphor screens are used in conjunction with a storage phosphor system such as PhosphorImager™ or Storm™. Storage phosphor screens retain energy from beta particles, X-rays and gamma rays. Typically, 50–90% less exposure time is required compared with an equivalent exposure to conventional film. Screens are reusable and are not degraded by repeated exposure to laboratory levels of radioactivity.

Screen Styles

Mounted screens are permanently fixed to an aluminium backing plate. They require a Molecular Dynamics exposure cassette. PhosphorImager Systems require mounted screens. Mounted screens are also compatible with Storm systems.

Unmounted screens are compatible only with Storm systems. They are available with standard autoradiography cassettes.

Screen Types

General Purpose (GP) Screens

GP screens are reliable for a wide variety of applications and can be used with ^{32}P, ^{125}I, ^{35}S, ^{33}P, and ^{14}C. The durable cellulose acetate coating and the phosphor layer formulation makes the GP screen ideal for ^{32}P and ^{125}I detection and quantification. This is the screen of choice for ^{32}P Northerns and Southerns and ^{125}I Western blots and gels.

Low Energy (LE) Screens

LE screens are the best choice for low energy isotopes such as ^{35}S, ^{33}P, and ^{14}C. Typically, a two-fold improvement in sensitivity with ^{35}S, ^{33}P and ^{14}C is expected compared to the GP screen. A thinner cellulose acetate coating, combined with the presence of iodide increases the efficiency of energy stored and released, resulting in improved image sharpness. The LE screen is ideal for demanding applications such as ^{35}S sequencing and protein gels, and ^{33}P macroarrays.

Tritium (TR) Screens

To detect the weak energy of the ^{3}H signal, TR screens are constructed without a protective cellulose acetate overlay. The highly sensitive screens eliminate the need for fluorographic reagents. Best results are obtained when the ^{3}H signal is on the surface of the sample and available to penetrate the screen.

Autoradiography

Ordering information

INSTRUMENT COMPATIBILITY		PhosphorImager *Models; 400,425,445,PSI & PSF*			
		Storm System Models 820, 830,840,860		Storm System Models 820,830,840,860	
STYLE		**Mounted**		**Unmounted**	
TYPE *GP (General Purpose screen)-For use with ^{125}I, ^{32}P, ^{33}P, ^{35}S, and ^{14}C* *LE (Low Energy Screen)-Optimized for use with ^{33}P, ^{35}S, and ^{14}C*		**GP**	**LE**	**GP**	**LE**
Small Phosphor Screen 20 x 25 cm	Screen & cassette	MD28-147	LE177-906	MD146-808	LE177-978
Screen Only		MD17-991	LE177-928	MD146-931	LE177-956
Large Phosphor Screen 35 x 43 cm	Screen & cassette	MD28-160	LE177-895	MD146-814	LE177-962
Screen Only		MD23-614	LE177-912	MD146-947	LE177-940
Half-size Screen 17.5 x 43 cm	Screen & cassette	MD146-686		MD146-666	
	Screen Only			MD146-658	
Macroarray Phosphor Screen 24 x 30 cm	Screen Only			MD189-985	LE177-934
Tritium Screen 19 x 24 cm	Screen Only	MD125-503		MD125-486	
	Screen Kit	MD 125-519 (1 mounted, 4 unmounted)			

Image Documentation

Fig 41. ImageMaster VDS-CL reduces the cost of gel documentation.

ImageMaster VDS-CL

ImageMaster™ VDS-CL is a simple to use and versatile stand-alone multi-imager capable of producing high quality results in minimal time. The highly automated instrument features a high sensitivity CCD digital camera, combining electric zooming and automatic focusing with micro lens technology, plus a built-in high quality video printer to ensure sharp images and accurate quantitation in any mode. A six-position automatic filter wheel provides accurate fluorescence detection at 475, 525 and 585 nm plus two additional bandpass filters with cut-off at 520 and 580 nm for classical EtBr and other DNA or protein staining. ImageMaster VDS-CL has three sample drawers for chemiluminescence, fluorescence and white light detection. Pre-programmed method files for all Amersham Biosciences DNA or Protein labelling kits are included with the ability to create additional user-defined methods if required. Data produced by ImageMaster VDS-CL are directly compatible with the broad range of imaging software available from Amersham Biosciences including the ImageMaster TotalLab software, providing fast and clear analysis reports of both 1-D and 2-D gels.

Versatile Enables intuitive evaluation of both 1-D and 2-D blots or gels by many different fluorescent or visible light methods.

Economical No need for expensive X-ray films in chemiluminescent measurements.

Convenient Allows automated analyzing of nucleic acids and proteins directly in your gels

Ordering information

Item	Quantity	Code No.
ImageMaster VDS-CL, including: Main body, ECL tray, UV tray, white light tray, 9" monochrome monitor, keyboard, flat field calibrator, Ethernet 3m twisted cable, Windows 95 OEM license and manual 1 roll of Super VDS film and TotalLab software		18-1130-55
TotalLab site license	1	18-1134-34
Super VDS Film (4 rolls/14m)		80-6249-86

ImageMaster Image Analysis Software

ImageMaster Image Analysis Software enables the extraction of quantitative information from complex gel images quickly and simply. Choose ImageMaster 1D software for single-dimension polyacrylamide gels or ImageMaster 2D for two-dimensional gels.

ImageMaster 1D

ImageMaster 1D family includes entry level Prime module, power-user level Elite module, Array module, and optional Database for complex pattern matching and recognition analysis.

ImageMaster TotalLab

- The most simple and automatic analysis software for 1D and dot-slot blots
- Automatic colony counting facility

ImageMaster 1D Prime

- Analyse bands in single gels for size and amount
- Improve results with tools for band detection, lane editing, smile and grimace correction, and background correction
- Present results with convenient pre-formatted reports

ImageMaster 1D Elite

Includes all of the capabilities of the Prime module and more

- Customize the user interface for your specific tasks
- Group multiple gel images into one experiment
- Automate complex lane/band matching
- Build custom report templates

and Analysis

ImageMaster 1D Database

- Add image database search facilities to ImageMaster Elite
- Interpret RAPD, RFLP, VNTR, STR, microsatellite and other fragment patterns automatically
- Select from a variety of clustering methods to construct complex dendrograms
- Identify samples by matches to user-built libraries
- Use different matching coefficients: Pearson, Dice, etc.

ImageMaster 1D Array

The fastest and most powerful tool for your dot-blot and slot-blot repetitive analysis.

ImageMaster 2D Elite, Ver. 3.0

- Speed and improve your results with spot detection and background correction tools using wizard
- Compare and match up to 100 gel images at a time
- Average gels
- Customize the user interface to specific tasks
- Group multiple gel images into one experiment
- Web-federated database access
- Build custom report templates
- Web page report builder

ImageMaster 2D Database

- Add database search facility to ImageMaster Elite
- Search and query across various experiments and images
- Search experiments for quantitative pattern relationships

Ordering information

Product	Quantity	Code
ImageMaster 1D Array	1	18-1129-07
ImageMaster 1D Prime Software	1	80-6350-75
ImageMaster 1D Elite Software	1	80-6350-37
ImageMaster 1D Database Software	1	80-6350-94
ImageMaster 2D Elite Software	1	80-6350-56
ImageMaster 2D Database Software	1	80-6351-13
ImageMaster TotalLab	1	18-1132-28

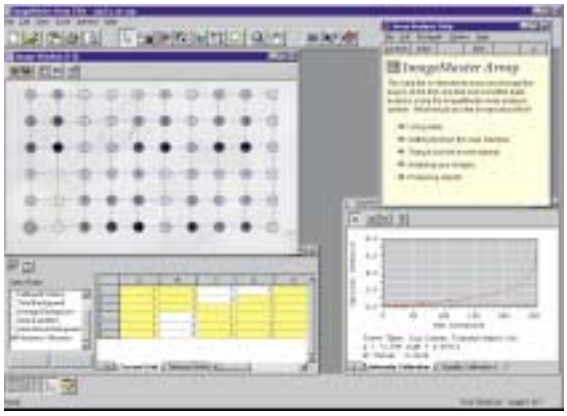


Fig 42. ImageMaster 1D Array it the fastest and most powerful tool for your dot-blot and slot-blot repetitive analyses.

Image Documentation and

ImageScanner Desktop Scanner

Use ImageScanner™ Desktop Scanner to scan electrophoresis gels stained with any colour development method. It handles gels, slides, films, blots, photographs and even TLC plates with equal ease.

Versatile Scan in transmittance or reflection mode

High resolution Pixel resolution to 10 µm (2 400 dpi)

Linear Above 3.4 AU

Quantitative 14 bits/pixel range for accurate quantification

Ordering information

Product	Quantity	Code
ImageScanner 100–240 V	1	18-1134-45

(Includes: ImageScanner, SCSI-2 Interface, SCSI Cable, SCSI Software and Adobe Photoshop™ LE.)

ECL Mini-Camera

The ECL Mini-Camera is a camera luminometer specifically designed for use with ECL systems, in particular Western blots from mini-gels. It allows the chemiluminescent signal to be captured on Polaroid™ film without the need for a darkroom.

Fast Instant results at the bench on Polaroid film

Compact Compact and portable

Versatile Handles blots up to 52 x 77 mm

Ordering information

Product	Quantity	Code
ECL Mini-Camera	1	RPN2069
Replacement Sample Boats	50	RPN2079

Molecular Dynamics Scanning Instruments

Storm

Storm™ system for gel and blot analysis unites proven PhosphorImager system technology with two non-radioactive fluorescent labelling techniques —fluorescence and chemifluorescence. Researchers can make the move to non-radioactive gel and blot analysis without giving up proven radioisotopic techniques. Storm scans storage phosphor screens plus fluorescent gels and chemifluorescent blots in the 35 x 43 cm scanning area. ImageQuant™ image analysis software for Windows NT™ or Macintosh™ is included. ECF detection reagents provide optimized chemifluorescent detection of Western blots on the Storm system.

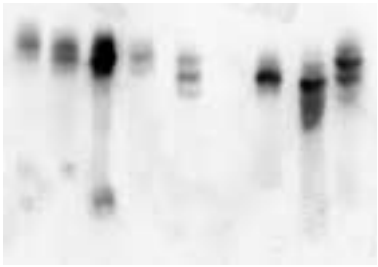


Fig 4.3. Western detection of a-fetoprotein in IEF fractions using ECF Western Blotting Kit and Storm system. Image courtesy of Paul Cheng, Chinese University of Hong Kong.

Analysis

PhosphorImager SI

PhosphorImager™ SI offers advanced technology for autoradiography in a compact design. With a 20 x 25 cm scanning area, PhosphorImager uses storage phosphor screens to capture images produced by X-rays and radioisotopes from radiolabelled blots, gels, arrays, TLC plates, and tissues. Exposure times are reduced by at least 90% relative to an equivalent exposure to autoradiography film. PhosphorImager SI can accurately quantify both strong and weak signals from the same exposure. PhosphorImager SI offers significant advantages in data throughput and analysis.

FluorImager

FluorImager™ systems are multi-purpose fluorescent sample readers for multiple colour analysis of gels, blots, TLC and microplates. Samples are read directly, with no drying or exposure step required. Software for instrument control, quantitative image analysis and printing is included.

Personal Densitometer SI

Personal Densitometer™ SI uses a laser scanner with pinpoint accuracy to quantify stained electrophoresis gels, autoradiography films and blotting membranes. Image analysis software for either Macintosh or Windows NT workstation is included.

For additional information on Molecular Dynamics scanning instruments, visit **www.mdyn.com.**

Fig 44. Personal Densitometer SI provides high-speed imaging with optical accuracy.

Fig 45. Storm system provides filmless documentation and quantification of gels and blots using radioactive, fluorescent, and chemifluorescent detection methods.

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Contact your local office for more information
or visit www.apbiotech.com/typhoon

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