

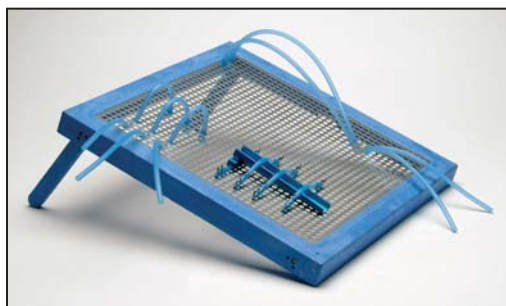
Delivery & Sampling



NEW Infu-Disk™ Single Use Pumps, see pages B2 and B3



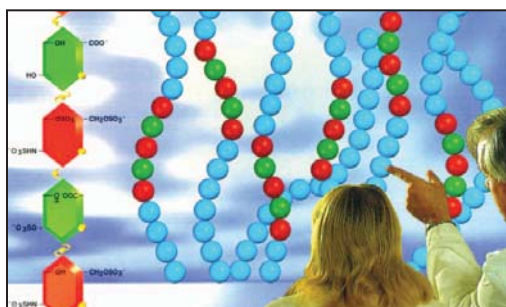
NEW Harvard/Insteck Multi-Channel Swivel, see page B6



NEW Advance Infusion Table, see page B9



NEW Harvard/Insteck/Covance Infusion Harness™, see page B13



NEW SoloCath™ Catheters with CBAS™ Long-Term Heparin Coating, see page B33

NEW Infu-disk Miniature Disposable Pumps.....see pages B2 - B3

- Stainless Steel Swivelssee page B4 - B5

NEW Multi-Channel Swivelsee page B6

NEW Precision Disposable Swivelssee page B7

NEW Large Animal Swivelssee page B8

NEW Advance Infusion Table.....see page B9

NEW Swivel Brackets and Mounts.....see pages B9 - B10

NEW Button Tethers and Head Block Tethers.....see pages B11 - B12

NEW Covance Infusion Harness.....see page B13

NEW Pillow Collars, Animal Jackets and Sling Framessee pages B14 - B17

NEW Injection Needlessee page B17 - B25

- Feeding Needles and Skin Tunneling Needles.....see page B26 - B27

- Vascular Access Ports.....see pages B28 - B32

NEW Funnel-Cath Mouse Catheter.....see page B32

NEW SoloCath™ Catheters.....see pages B33 - B34

NEW Catheters, Tubing, Connectors and Luer Stubs.....see pages B35 - B41

NEW Gelatin Drug Delivery Capsules.....see pages B42 - B43

NEW Implantable Infusion Pumps.....see page B44

Economy Infusion Pump

NEW Infu-Disk™ Single Use/Disposable Pumps



Infusion research is greatly simplified with the use of Infu-Disk™ infusion pumps. This family of single-use/disposable pumps provides an efficient, cost effective solution for infusion research that minimizes animal stress. Infu-Disk™ pumps attach easily and securely to a custom jacket called Infu-Jacket™ and connect to the external end of a catheter.

Infusion using Infu-Disk™ pumps significantly reduces complexities and costs normally associated with other infusion systems. This “tetherless” approach to infusion minimizes stress in the animal and allows for normal mobility, crucial to tests that involve the study of behavioral effects.

Infu-Disk™ infusion pumps are also ideal for pain management. Providing continuous delivery for up to 2 weeks, Infu-Disk™ provides an effective solution for the delivery of analgesics.

Other applications include long-term catheter maintenance and other unique uses such as hormone delivery.

Applications

- Ideal for drug research, toxicology, pain management, catheter patency and hormone delivery
- Ideal for large studies and small studies with aggressive time and cost restraints

Features/Benefits

- Flow rates from 0.03 to 4.0 ml/hr
- Continuous delivery
- 5 or 10 ml reservoir
- “Tether-less”, minimal stress inducing infusion
- Minimally invasive
- Quick and easy to fill and attach
- Reliable and cost effective

Specifications

	5 ml Infu-Disk™	10 ml Infu-Disk™
Flow Rate Range	0.03 to 1.0 ml/hr	0.03 to 4.0 ml/hr
Fluid Volume	4.9 to 5.1 ml	10.1 to 10.3 ml
Diameter	4.1 cm (1.6 in)	5.1 cm (2 in)
Height	1.3 cm (0.5 in)	1.6 cm (0.63 in)
Empty Weight	< 12 g	< 20 g
Delivered Volume	> 98%	> 98%
Accuracy	± 10%	± 10%
Tubing Length	3.8 cm (1.5 in)	3.8 cm (1.5 in)
Connector Type	Male Luer Lock Adaptor or Cannula	

Note: Flow rates are for 25 °C with 6 inch H2O fluid pressure

Infu-Disk™ Miniature Disposable Pumps, Sterile

Flow Rate	Luer Lock Catalog No.	\$	Adaptor Cannula Catalog No.	\$
5 ml Volume				
0.03 ml/hr	BS4 72-6315		BS4 72-6325	
0.042 ml/hr	BS4 72-6316		BS4 72-6326	
0.07 ml/hr	BS4 72-6317		BS4 72-6327	
0.11 ml/hr	BS4 72-6318		BS4 72-6328	
0.21 ml/hr	BS4 72-6319		BS4 72-6329	
10 ml Volume				
0.06 ml/hr	BS4 72-6320		BS4 72-6330	
0.083 ml/hr	BS4 72-6321		BS4 72-6331	
0.14 ml/hr	BS4 72-6322		BS4 72-6332	
0.21 ml/hr	BS4 72-6323		BS4 72-6333	
0.42 ml/hr	BS4 72-6324		BS4 72-6334	

Note: Alternate flow rates available, please contact customer service.

For Continuous Delivery Implantable Pumps, see Special Application Pumps Section A.

Economy Infusion Pump

NEW Infu-Disk™ Single Use/Disposable Pumps



Catheters for Infu-Disk™ Pump

These Catheters are optimized for use with Infu-Disk™ Infusion Pumps. They are made of silicone or polyurethane and quickly and easily connect to the outlet of the Infu-Disk™ Pump. All Catheters include movable retention beads and rounded distal tips. Silicone Catheters are provided with insertion depth markings.

Catheters for Infu-Disk™ Pumps						
Application	Rat, up to 300 g	Rat, 200 to 350 g	Rat, 300+ g Rabbit	Rat, 300+ g Rabbit	Rabbit	Rabbit
Length	15 cm	15 cm	15 cm	60 cm	60 cm	60 cm
Size	2 French	3 French	3.5 French	3.5 French	5 French	7 French
Polyurethane Catheter						
Luer Connection \$	BS4 72-6366	BS4 72-6367	BS4 72-6368	BS4 72-6369	BS4 72-6370	BS4 72-6371
Cannula Connection \$	BS4 72-6372	BS4 72-6373	BS4 72-6374	BS4 72-6375	BS4 72-6376	BS4 72-6377
Silicone Catheter						
Luer Connection \$	BS4 72-6378	BS4 72-6379	BS4 72-6380	BS4 72-6381	BS4 72-6382	BS4 72-6383
Cannula Connection \$	BS4 72-6384	BS4 72-6385	BS4 72-6386	BS4 72-6387	BS4 72-6388	BS4 72-6389



Animal Jacket for Infu-Disk™ Pump

This Animal Jacket is designed specifically to securely hold Infu-Disk™ Infusion Pumps. These durable Jackets are very easy to use, minimizing test setup time, especially for large studies. For small animals, Infu-Disk™ Pumps are held to the Jacket using Velcro®, while for larger animals the pump is held in a pocket. Both designs allow for quick and simple pump attachment and removal. The Infu-Jacket™ is available for most species and in a variety of sizes.

Catalog No.	\$	Jacket Size
BS4 72-6355		Rat, X-Small, 100 to 150 g
BS4 72-6356		Rat, Small, 150 to 250 g
BS4 72-6357		Rat, Medium, 250 to 350 g
BS4 72-6358		Rat, Large, 350 to 500 g
BS4 72-6359		Rat, X-Large, > 500 g
BS4 72-6360		Guinea Pig, Small
BS4 72-6361		Guinea Pig, Medium
BS4 72-6362		Guinea Pig, Large
BS4 72-6363		Rabbit, Small
BS4 72-6364		Rabbit, Medium
BS4 72-6365		Rabbit, Large

Note: For alternate Jacket sizes, please contact customer service.

Delivery & Sampling

Swivels and Tethers

Harvard/Instech Stainless Steel Swivels

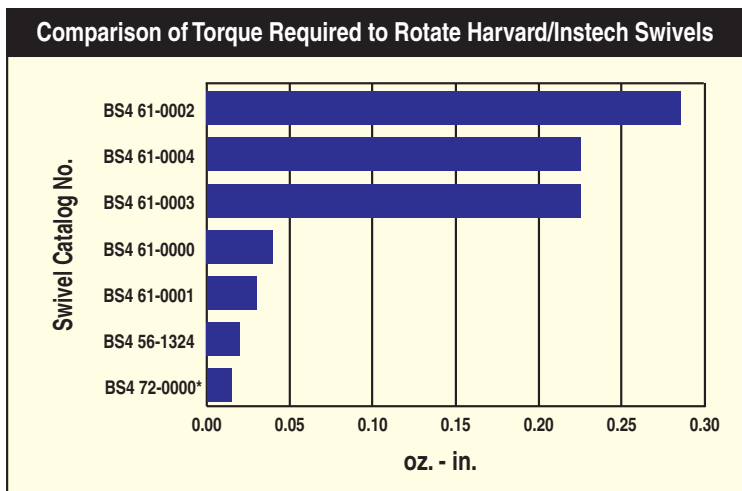


- New dual channel swivel that is truly suited for microdialysis in mice
- Setting the industry standard for 25 years
- Lifetime warranty on single channel swivels
- Single & dual channel models available
- Fully autoclavable

Introducing the latest breakthrough in swivel technology, the new BS4 72-0000 Dual Channel Microdialysis Swivel for Mice! The torque required to rotate this remarkable new swivel is even lower than our BS4 56-1324 Single Channel Swivel, making it the first dual channel swivel that can be used with mice. (See chart below.) Furthermore, it has quartz lining on both channels, making it the ultimate microdialysis swivel for mice, rats or any other small animal!

The swivel, a device that rotates to keep the cannula from tangling, is a critical part of any continuous animal infusion system. The Harvard/Instech Fluid Swivels have been in laboratory use for more than 30 years and have earned a reputation as the finest in the industry.

Every swivel is precision machined to ensure ease of rotation, durability and reliability. The design minimizes internal dead volume and eliminates stagnant regions along the fluid path. Fluids passing through the swivel touch only stainless steel tubing and special self-adjusting Teflon seals. The BS4 61-0004 Dual Channel 22 Gauge Swivel, designed specifically for microdialysis in rats, has a quartz-lined center channel to reduce dead volume and prevent oxidization of neurotransmitters. These Swivels are fully autoclavable and can be reused hundreds of times. In fact, our single channel swivel is so durable that it comes with a lifetime warranty!

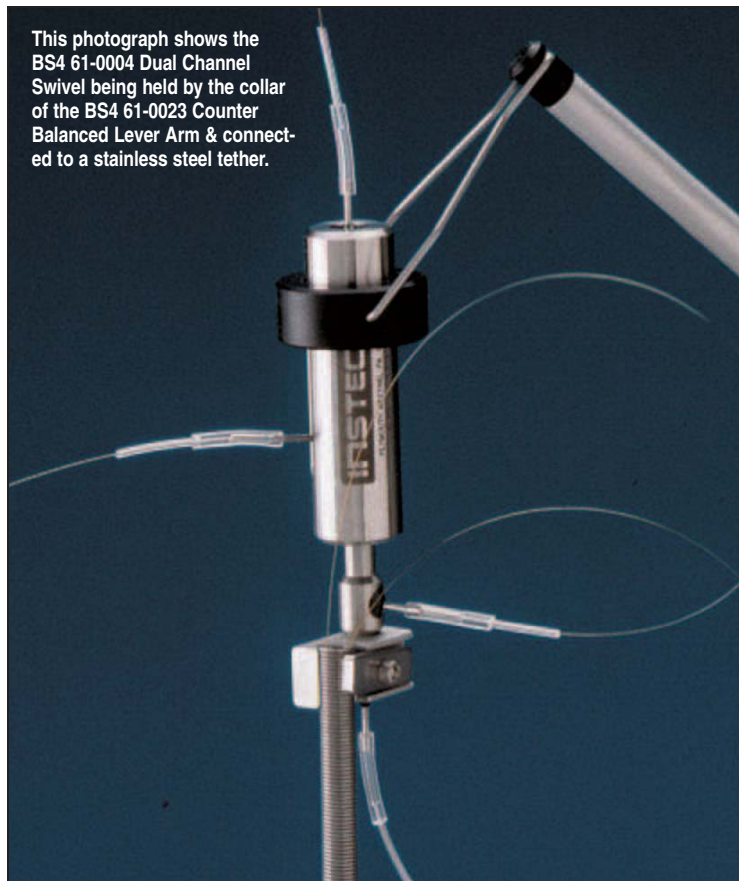


* Lowest torque of any commercially available swivel

For **NEW** Multi-Channel Swivel,
see page B6.

For Harvard Precision Syringe
Infusion Pumps, see Section A, Pumps.

Harvard/Instech Stainless Steel Swivels



This photograph shows the BS4 61-0004 Dual Channel Swivel being held by the collar of the BS4 61-0023 Counter Balanced Lever Arm & connected to a stainless steel tether.

- A variety of sizes
- Tether included
- Custom swivels available by special order

Our standard swivels are typically used with rats and mice, but work with rabbits, guinea pigs and, with a strain relief, larger animals as well. Each swivel includes a Universal Swivel-to-Tether Clamp, see page B6, that connects to all of our standard spring tethers. The standard swivels are manufactured in a variety of sizes, a few of which are listed below. For a complete listing of available sizes and custom orders or to select the best swivel for your application please call Harvard Apparatus Customer Service.

Harvard Apparatus also has a variety of complete infusion systems that contain the equipment you need to carry out an infusion study. Please visit our website for details at www.harvardapparatus.com. Custom swivels available by special order. Call for details.

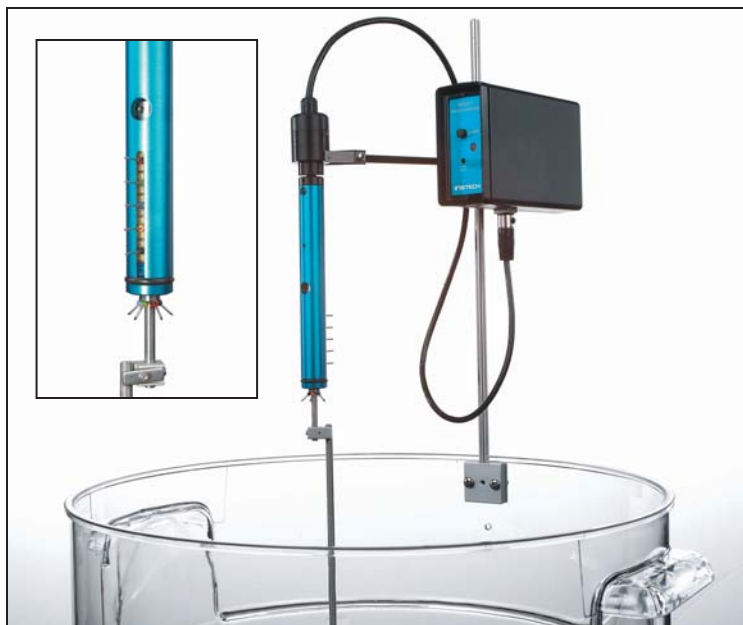
Application	Single Channel Swivels			Dual Channel Swivels			
Microdialysis for Mice					•		
Standard Infusion of Mice			•				
Standard Infusion of Rats		•				•	
Blood Pressure Measurements, Rapid Infusions, IV Feeding	•			•			
Microdialysis with Rats							•
Specifications							
Inlet & Outlet Tube Gauge	20	22	25	20	22	22	22
Compatible Tubing	BS4 59-8329**	BS4 59-8325**	BS4 59-8323**	BS4 59-8329**	BS4 59-7023*	BS4 59-8325**	BS4 59-7023*
Center Channel ID	0.023 in	0.016 in	0.010 in	0.023 in	0.006 in	0.016 in	0.006 in
Center Channel Dead Volume	16 µl	8 µl	3 µl	18 µl	1.8 µl	8 µl	1.4 µl
Side Channel ID	–	–	–	0.023 in	0.006 in	0.016 in	0.016 in
Side Channel Dead Volume	–	–	–	18 µl	2.8 µl	18 µl	18 µl
Size (OD x L)	0.375 x 2.25 in	0.375 x 2.25 in	0.375 x 2.25 in	0.375 x 2.38 in	0.375 x 2.38 in	0.375 x 2.38 in	0.375 x 2.38 in
Catalog No.	BS4 61-0000	BS4 61-0001	BS4 56-1324	BS4 61-0002	BS4 72-0000	BS4 61-0003	BS4 61-0004
\$							

* Microdialysis Tubing, see our website.

** Note: see Section A, Pump Accessories for complete details.

Swivels and Tethers

NEW Harvard/Instech Multi-Channel Swivel



- Five, low dead volume channels for microdialysis
- Proportional control for fine continuous movement
- Minimal stress on animal

This Multi-Channel Swivel features five low dead volume channels for dual-probe microdialysis, plus another channel for infusion. The fluid paths are lined to protect sensitive neurotransmitters. The swivel includes a counter-balanced arm to remove all vertical forces from the animal. The electronic control unit mounts to the vertical portion of the counter-balanced arm and is powered by a 12 VDC adapter.

The practical limit on the number of lines in a traditional fluid swivel is two; each additional channel seal set adds to the torque required by the animal to turn the swivel as it moves about its cage. Swivels with three or more channels are typically impossible for a rodent to turn and often have large dead volumes and problems with cross-channel leakage.

Harvard/Instech's Multi-Channel Swivel senses the rotation demanded by the animal and, with a small motor, drives the swivel core to follow the animal. Unlike other switch-based systems, this swivel features a proportional control, allowing fine continuous movement that further reduces stress on the animal. The torque felt by the animal is similar to that of an Instech single channel swivel. This power-assisted proportional control technology was first introduced in 2000 in Instech's patented Swivelless Swivel™, but is now applied to a swivel that can be used with conventional stationary caging of the researcher's choice. Please contact Customer Service for pricing, availability and other configurations.

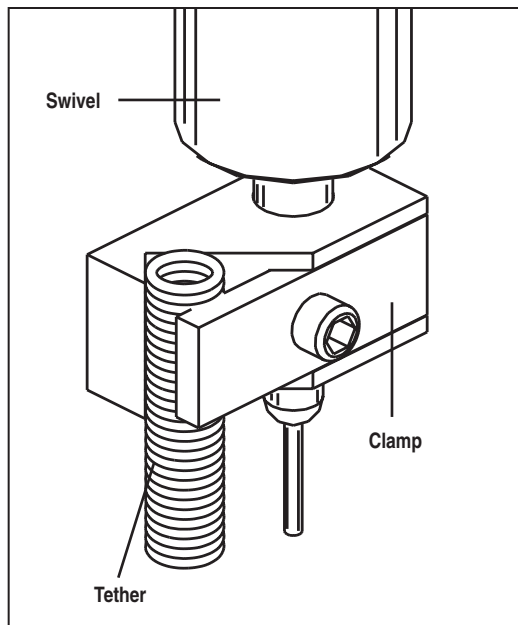
Specifications

Number of Channels	5
Dead Volume	2 to 4 µl per channel
Channel ID	0.0087 in
Channel OD	0.028 in (22 G)
Dimensions, L x Dia.	17.8 x 1.5 cm (7 x 0.6 in)

Catalog No. \$ Product

BS4 72-6134 Powered Multi-Channel Swivel, 5 Microdialysis Channels, pkg. of 1

Universal Swivel-to-Tether Clamp



For use with:

- Single channel stainless steel swivels
- Dual channel stainless steel swivels
- Multi-channel swivel

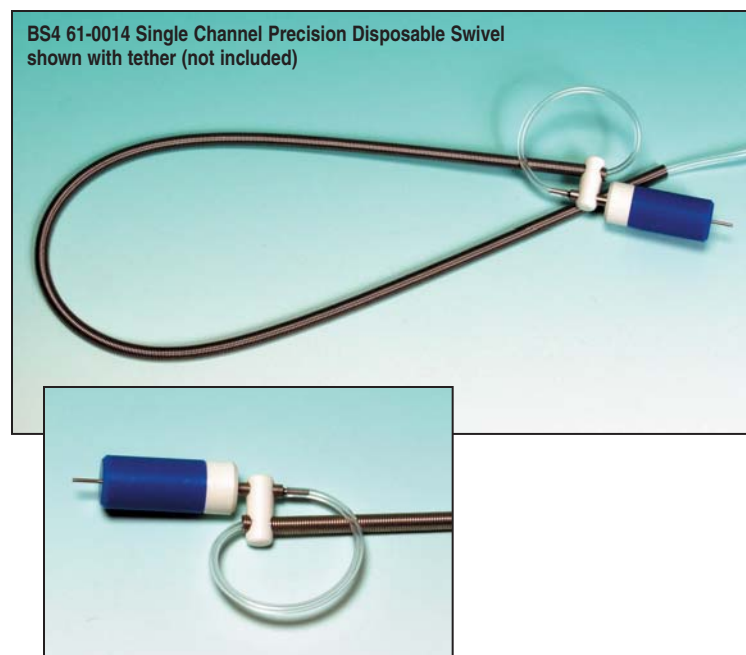
This Clamp provides an offset attachment of the spring tether which effectively transmits torque from the animal's movements to the swivel. It fastens to the rotating portion

of the swivel. A V-block mount accommodates spring tethers from 0.08 to 0.2 inch OD. Supplied 5 per package. (Illustration with Tether and Swivel to the right)

Catalog No. \$ Product

BS4 61-0052 Universal Swivel-to-Tether Clamp, pkg. of 5

Harvard/Instech Precision Disposable Swivels



- **NEW** 25 gauge swivel is ideal for mice
- Plastic Swivel-to-tether clamp included
- Single use, low cost, precision swivels
- Meets Harvard Apparatus' and Instech's strict quality standards
- Available in 3 sizes: 20 gauge, 22 gauge and 25 gauge

Introducing the first plastic swivel worthy of the Harvard/Instech names. This single-channel swivel has been designed for researchers that require components touching the fluid path to be replaced after each experiment.

Autoclavable (Once)

Unlike the Harvard/Instech stainless steel swivels, which carry a lifetime warranty and can stand up to hundreds of autoclavings, these swivels are meant to be autoclaved once, used, and then thrown away. Repeated autoclavings will weaken the adhesive.

Harvard/Instech Quality on the Inside

While we have used a polysulfone plastic body in order to reduce the price, we have made no compromises in terms of functionality. In fact, the critical internal components (the Teflon seal, the stainless steel seal cup, and the stainless steel spring) are common between these and our stainless steel swivels. As a result, these swivels feature our unique self-adjusting seals, which do not loosen with use (thereby preventing leaks) and have low rotational friction. This superior design has been proven reliable in many thousands of studies over the past 30 years.

As with all Harvard/Instech swivels, fluids traveling through them touch only stainless steel hypodermic tubing and a Teflon seal. Internal dead volumes in these swivels are even lower than in our stainless steel swivels.

Standard Configurations

These disposable swivels are available in single-channel models only with either 20, 22 or 25 gauge tubing. The new 25 gauge swivel mates with standard PE20 catheter tubing and is ideal for the infusion of mice. The 22 gauge swivel is most commonly used with rats because it mates with standard PE50 catheter tubing. Use the 20 gauge version when working with more viscous solutions, or at higher flow rates. The 20 gauge swivel is ideal for use with rabbits and other animals of a similar size.

These swivels are supplied in packages of five and include a plastic swivel-to-tether clamp. See ordering chart to the left.

Precision Disposable Swivels, pkg. of 5			
Applications	20 Gauge	22 Gauge	NEW 25 Gauge
Standard Infusion of Mice			•
Standard Infusion of Rats		•	
Blood Pressure Measurement, Rapid Infusions, IV Feeding	•		
Specifications			
Inlet and Outlet Tube Gauge	20	22	25
Compatible Tubing	PE90	PE50	PE20
Channel ID	0.023 in	0.016 in	0.010 in
Internal Dead Volume	12 µl	6 µl	2.5 µl
Size, Diameter x Length	0.375 x 1.69 in	0.375 x 1.69 in	0.375 x 1.69 in
Catalog No.	BS4 61-0011	BS4 61-0014	BS4 72-6121
\$			

Swivels and Tethers

3-Channel Fluid Swivels



- For rabbits, dogs, swine, and primates
- Suitable for a multitude of applications including:
 - Multiple infusions
 - Simultaneous infusion and blood sampling
 - Physiological measurements
 - Bile duct cannulation
- Select from economical high impact plastic or long life stainless steel

Introducing the latest addition to our extensive line of swivels and tethers to meet your delivery and sampling needs. These 3-Channel Fluid Swivels are ideal for large animal infusion and sampling applications. They are available in a choice of high impact plastic or stainless steel. Constructed from thermoplastic, the Plastic Swivels provide high strength, rigidity, and dimensional stability as well as a high resistance to repeated impact.

Manufactured from a single solid piece of raw material, both the

stainless steel and high impact plastic Swivels have an outer casing that is full bearing for rugged durability. Historically, Stainless Steel Swivels provide an extremely long life.

Both the Stainless Steel and Plastic Swivels are supplied with a C-clamp and bolts for mounting onto an animal's cage. Other large animal swivels and tethers are available; please contact Harvard Apparatus' technical support department for details.

Catalog No.	\$	Product
BS4 72-0023		3-Channel Fluid Swivel, High Impact Plastic, 17 ga
BS4 72-0024		3-Channel Fluid Swivel, High Impact Plastic, 20 ga
BS4 72-0025		3-Channel Fluid Swivel, Stainless Steel, 17 ga
BS4 72-0026		3-Channel Fluid Swivel, Stainless Steel, 20 ga

Tethers and End-Plates



These rugged stainless steel Tethers and End-Plates are for use with the 3-Channel Fluid Swivels described to the left. They are used to connect the Swivel to an animal jacket, see Large Animal Jackets on page B15. Designed to protect the catheter from damage and interference, the Tethers are constructed from a flexible, interlocking stainless steel coil. Aluminum end-pieces have set screws which fit into the corresponding slot on the Swivel and the Tether End-Plate. The Tether End-Plate connects the Tether to a reinforced anchoring point mounted on an Animal Jacket. The End-Plate is manufactured from a single piece of stainless steel providing a durable and reliable connection to the jacket.

Catalog No.	\$	Product
BS4 72-0027		Tether for 3-Channel Fluid Swivel, Stainless Steel, 61 cm (2 ft)
BS4 72-0028		Tether for 3-Channel Fluid Swivel, Stainless Steel, 91.4 cm (3 ft)
BS4 72-0029		Tether for 3-Channel Fluid Swivel, Stainless Steel, 122 cm (4 ft)
BS4 72-0030		Tether End Plate for BS4 72-0027, BS4 72-0028, and BS4 72-0029

For Harvard Precision Syringe Infusion Pumps, and Peristaltic Pumps, see Section A, Pumps.

Counter Balanced Lever Arm

Harvard/Instech Swivel Mounts

Mounting a swivel to your particular animal cage can be one of the most frustrating steps in setting up your continuous animal infusion system. To make your life easier, we have designed custom systems to create a complete line of swivel mounts – from a simple swivel bracket to our popular, highly-responsive counter balanced lever arm.



BS4 61-0023 Counter Balanced Lever Arm.
Swivel and Animal Container sold separately

- Minimizes stress on microdialysis probes & animal
- Unimpeded animal movement
- Available for mice

Designed to minimize stress on microdialysis probes, Harvard/Instech's Counter-Balanced Lever Arm moves with the animal to prevent slack in the tether. Most other lever arms use a mass as the counterbalance; ours uses an adjustable spring, making it lighter and more responsive.

The mounting plate can be adjusted for mounting to the side or top of many types of cages, including our BS4 61-0042 Animal Container, see Section C, Animal Handling

and Containment. If you are using a shoebox-type cage, a counter balanced lever arm can prevent the tether from tangling.

The BS4 61-0023 is a 6 inch arm that is typically used in studies with rats; the BS4 61-0024 is a 3.5 inch arm is practically a requirement for any continuous infusion study involving mice.

Catalog No.	\$	Product
BS4 61-0023		6 inch Adjustable Spring Counter-Balanced Lever Arm
BS4 61-0024		3.5 inch Adjustable Spring Counter-Balanced Lever Arm

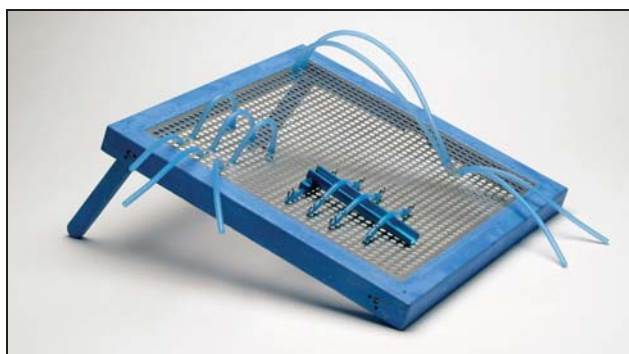
NEW Single-Axis Lever Arms



This mount is designed for standard infusion of rats in shoebox cages. The mount pivots in the vertical plane to remove slack from the tether but allows enough length to reach all corners of an asymmetrical cage. The adjustable counter-weight can be set to balance the weight of our swivels plus a tether. The crossbar in the wire top must be clipped in the slot that the tether is placed in for maximum travel. Supplied individually. For mouse work or microdialysis use the more responsive Multi-Axis Lever Arms are recommended.

Catalog No.	\$	Product
BS4 72-4063		Single-Axis Lever Arm for Polysulfone Swivels
BS4 72-4064		Single-Axis Lever Arm for Stainless Steel Swivels

NEW Advance Infusion Table



- Easy to customize to size of animal
- Optional angled display
- Washable cage

The Advance Infusion Table is the latest design in tail infusions for rats. This unique setup allows for tail infusions lasting up to three hours. The table has four folding legs that allow for an optional angled display and compact storage. Positioning of the animal can be customized using the silicone tubing and perforated table top.

Specifications

Dimensions	40 x 40 cm (15.7 x 15.7 in)
Height (legs open)	16.5 cm (6.5 in)

Catalog No.	\$	Product
BS4 72-6070		Advance Infusion Table

Swivel Bracket



This simple swivel bracket easily mounts to most screen and solid material cages. This bracket includes an additional backing plate and swinging tether support to mount the swivel horizontally on the front of the cage (a great benefit with cage rack systems).

Catalog No.	\$	Product
BS4 61-0018		Swivel Bracket, Mounting Hardware, Backing Plate for Top or Side Mounting, Swinging Tether Arm

Heavy Duty Swivel Mount/Strain Relief Adapter



- Heavy duty swivel mount
- Ideal for dogs and other large animals
- Simple and easy to clean

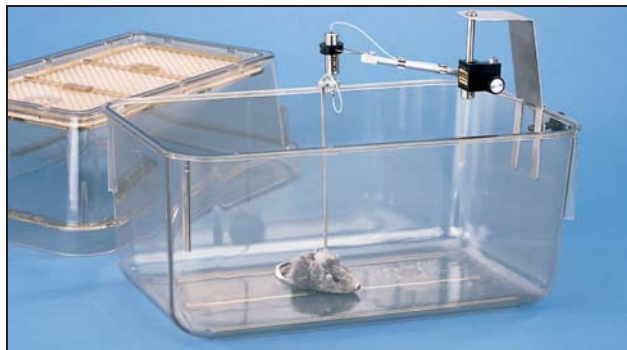
This heavy duty swivel holder bolts to the top of the cage and allows all of Harvard/Instech's industry-standard infusion swivels to be used with dogs, monkeys, and other large animals.

This Adapter was specifically designed to work with the BS4 61-0005 Single Channel 17 Gauge or BS4 61-0010 Dual Channel 17 Gauge Swivel. These are the recommended swivels for large animals which typically require 17 gauge channels.

This Adapter features phenolic and glass ball bearings which transfer the forces from the animal to the cage, thus protecting the swivel and cannulae. For cleaning, simply remove the swivel and stainless steel posts and send the rest of it through a cage washer. It's that simple. The mount couples directly with standard 0.5 inch ID large tethers. For complete details on the large size tethers, see page B8.

Catalog No.	\$	Product
BS4 61-0026		Heavy Duty Swivel Mount/Strain Relief Adapter
BS4 61-0005		Stainless Steel Single Channel 17 Gauge Swivel
BS4 61-0010		Stainless Steel Dual Channel 17 Gauge Swivel

NEW Mouse Micro-Isolator Cage Mount



Now you can continuously infuse mice while maintaining a safe micro-environment for your nudes and transgenics. This Micro-Isolator Cage Mount is designed to attach to the standard micro isolator cage (such as those made by Allentown Caging and Lab Products) with no modifications to the cage or cover. Simply remove the wire lid and install the swivel system. This Mount includes a spring counter-balanced lever arm attached to a bracket with holes to protect the IV lines as they enter and exit the cage. A feeder and water bottle are available separately.

Catalog No.	\$	Product
BS4 72-4060		Mouse Micro-Isolator Cage Mount
BS4 72-4061		Feeder for Mouse Micro-Isolator Cages
BS4 72-4062		50ml Water Bottle for BS4 72-0460

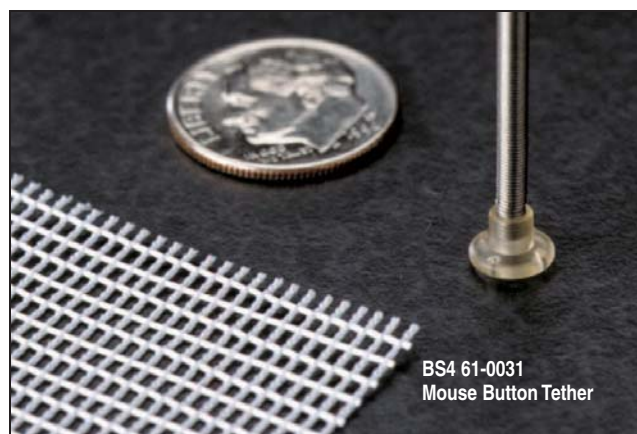
Fixed Swivel Mount for Nalgene™ Metabolic Cages



This mount is supplied complete with new cage top. Swivel sold separately.

Catalog No.	\$	Product
BS4 61-0021		Fixed Swivel Mount for Nalgene Metabolic Cages

Harvard/Instech Button Tethers

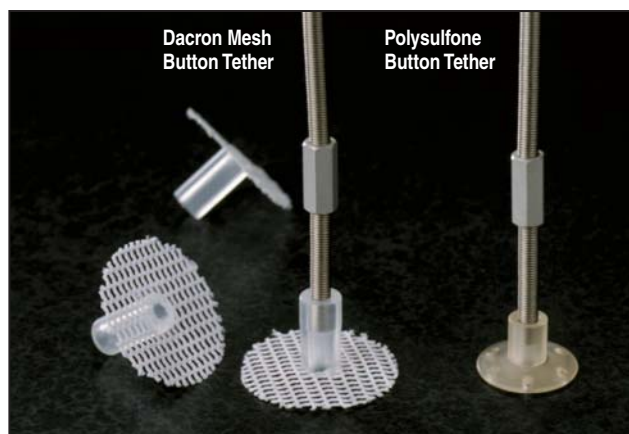


- **NEW** Small size which is ideal for mice
- Reduced animal stress for better research results
- Quick and easy tether attachment and removal

These button tethers are easy to use and well-tolerated by animals. All of the variations of this type of tether are based on the same design: the cannula passes through the stalk of a button which has been surgically attached to the animal (usually

under the skin), into a length of spring which protects the cannula and transmits torque to the swivel, and up to a swivel mounted outside the cage.

Both of our standard button types have a low profile stalk that reduces stress on the sutures as the animal moves about. Simply twist the spring into the button stalk to attach it; the expansion force of the spring will hold it in place. You do not need extra tools, and the tether is free of obstructions for the cannula. Each tether also includes a quick disconnect coupler which sits about one inch above the animal. It lets you detach and reattach the tether easily, which further minimizes stress on the animal.



Polysulfone Button Tethers

These autoclavable buttons are designed for short- to medium-term studies. The lightweight plastic will not cause adverse tissue reactions as stainless steel sometimes does.

Dacron Mesh Button Tethers

These single-use buttons are designed for long-term implantation. After one to two weeks the subcutaneous tissue will actually grow into the Dacron mesh, making the sutures irrelevant.

Special Tethers

In addition to these standard tethers, we offer a range of special tether products including durable stainless steel buttons, custom length tethers, and beryllium copper spring stock for NMR studies. Two additional tethers are listed below. For details, please call Harvard Apparatus.

Button Tethers					
Applications	Polysulfone Button Tethers		Dacron Mesh Button Tethers		
Mouse Infusion	•				
Rat Infusion Single Channel		•		•	
Rat Infusion Dual Channel			•		•
Experiment Duration	1 to 30 days	1 to 10 days	1 to 10 days	10 to 60+ days	10 to 60+ days
Specifications					
Clear Lumen	0.062 in	0.090 in	0.105 in	0.090 in	0.105 in
Stainless Steel Spring	12 in	12 in	12 in	12 in	12 in
Button Diameter	0.25 in	0.625 in	0.625 in	1.0 in	1.0 in
System Weight	3.0 g	7.5 g	9.2 g	7.2 g	9.2 g
Parts Included:	Button, spring	Button, spring, quick disconnect coupler	Button, spring, quick disconnect coupler	3 buttons, spring, quick disconnect coupler	3 buttons, spring, quick disconnect coupler
Catalog No.	BS4 61-0031	BS4 59-8408	BS4 61-0027	BS4 61-0033	BS4 61-0034
\$					

Swivels and Tethers

Harvard/Instech Head Block Tethers



BS4 61-0037
Head Block
Tether for Mice



BS4 61-0036
Head Block
Tether for Rats

- Makes microdialysis in awake mice possible
- Ideal for microdialysis in rats
- Little risk of animal infection
- Most frequently used microdialysis tether

Our head block tether assemblies were designed for microdialysis, but also work well for standard infusion applications. In fact, we have found that the head block tether is the best option for all applications when working with mice. It provides a solid attachment to the animal with little risk of infection.

We recommend using our Counter-Balanced Lever Arms, see page B9, to remove slack in the head block tether and to give your animal the greatest possible freedom of movement.

Head Block Tether for Rats

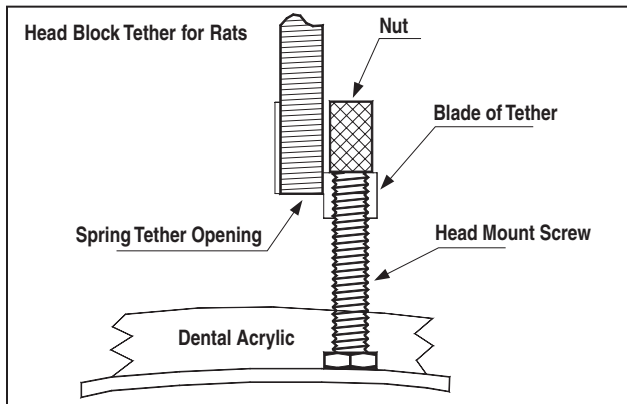
This large lumen tether can accommodate two standard microdialysis probes allowing it to be set up in a number of configurations. A 3/4 inch slotted screw attaches to the animal's skull with Dental Acrylic as do the BS4 59-7351 Skull Mounting Screws and Probe Guides, see our website. A blade on the end of the stainless steel spring tether slides into the head mount screw and is secured with a knurled tubular nut.

Head Block Tether for Mice

Instead of a spring, the mouse head block tether uses a fine 0.010 inch diameter looped wire making it extremely light weight and allowing it to easily transmit torque to the swivel as the mouse moves.

A small peg attaches to the animal's skull with dental acrylic. The wire tether is easily attached by inserting it into a hole in the peg and sliding a sleeve over it.

The tether can attach directly to the clamp on our low-torque single channel swivel for normal infusion applications, or to a collection tube holder mounted on the rotating portion of the swivel for microdialysis.



Head Block Tethers		
Applications	Rats	Mice
Single Channel Infusion of Rats	•	
Dual Channel Infusion of Rats	•	
Microdialysis with Rats	•	
Mice (All Applications)		•
Experiment Duration	1 to 60+ days	1 to 60+ days
Specifications		
Clear Lumen	0.115 in	0.070 in
Tether	Stainless steel 12 in	Looped wire 12 in
System Weight	10 g	0.3 g
Parts Included		
	5 head block screws	5 head mount pegs
	Miniature nut	Peg sleeve
	Tether with blade	Looped wire tether
Catalog No.	BS4 61-0036	BS4 61-0037
\$		

Catalog No.	\$	Product
BS4 61-0051		Collection Tube Holder for Looped Wire Tethers Holds 1/4 ml Tubes. Mounts on rotating portion of Single-or Dual-Channel Swivels. Made of anodized aluminum

Harnesses, Jackets and Slings

Harvard/Instech/Covance Infusion Harness™



- Ideal for studies using dermal patches
- Less animal stress than normal jackets
- Proven effective on hundreds of animals

Covance Laboratories, one of the world's leaders in drug screening, and Harvard/Instech Laboratories have teamed up to bring you a tether that combines the best features of jacket and button tethers. It has been proven effective on hundreds of animals in Covance's drug screening laboratories.

The tether consists of a soft molded elastomer saddle with a vented dome that protects the catheter, adjustable belly bands to secure the saddle to the animal, and standard stainless steel tether to protect cannulae and transmit torque to a swivel. When used without the spring tether, the Harness is also effective in holding down and protecting dermal patches.

Benefits

No Surgery Required

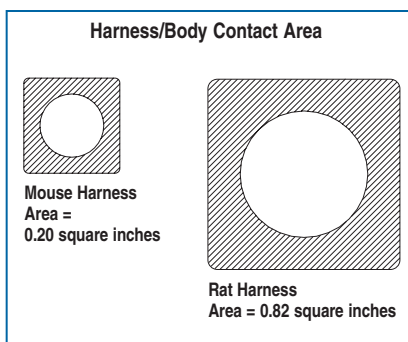
Like standard jacket tethers, the Harvard/Instech/Covance Infusion Harness™ does not need to be surgically attached. However, its unique design offers a range of benefits which, until now, have only been achieved by using a surgically implanted button.

Lower Stress Levels

This harness causes less stress to the animal because it is less abrasive than jacket tethers. As a result, mice or rats stay calmer and are less likely to chew at the harness. This also reduces replacement costs.

More Normal Body Temperatures

The Harvard/Instech/Covance Harness™ covers less surface area than traditional jackets, thereby reducing elevated body temperatures. Results obtained are therefore more accurate.



Promotes More Rapid Healing

Air circulates freely under the dome of the harness promoting rapid healing at the wound site.

Harness Grows with the Animal

This Harness is easy to adjust and grows with the animal. Just loosen the belly bands from the top as the animal gets larger. This cuts down the number of harnesses required reducing costs.

Longer Life

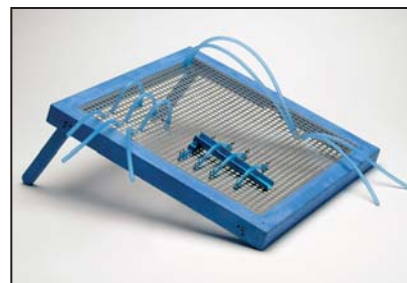
This Harness is washable and reusable extending its life span. Also, calmer animals tend not to chew at the harness reducing replacement costs and extending its usefulness.

Available for Rats and Mice

It is currently available for single or dual channel infusion with rats and for single channel infusion of mice. Each Harness is supplied complete with spring tether, saddle, and belly bands.

Infusion Harness			
Infusion	Rats	Rats	Mice
Single Channel	•		•
Dual Channel		•	
Specifications			
Clear Lumen	0.090 in	0.105 in	0.062 in
Body Surface Contact Area	0.82 sq in	0.82 sq in	0.20 sq in
Saddle Size	1.125 sq in	1.125 sq in	0.563 sq in
Spring	12 in	12 in	12 in
Belly Band Length	Adjustable up to 22.9 cm (9 in)	Adjustable up to 22.9 cm (9 in)	Adjustable up to 11.4 cm (4.5 in)
System Weight:			
With Spring	12 g	12 g	3.0 g
Without Spring	5 g	5 g	0.7 g
Catalog No.	BS4 61-0041	BS4 61-0238	BS4 61-0269
\$			

NEW Advance Infusion Table



- Easy to customize to size of animal
- Optional angled display
- Washable cage

The Advance Infusion Table is the latest design in tail infusions for rats. This unique setup allows for tail infusions lasting up to three hours. The table has four folding legs that allow for an optional angled display and compact storage. Positioning of the animal can be customized using the silicone tubing and perforated table top.

Specifications

Dimensions	40 x 40 cm (15.7 x 15.7 in)
Height (legs open)	16.5 cm (6.5 in)

Catalog No.	\$	Product
BS4 72-6070		Advance Infusion Table

Harnesses, Jackets and Slings

NEW Pillow Collars



- Combined with an infusion jacket to protect surgical sites and equipment
- On it's own to support and protect small devices such as infusion pumps
- To protect the animal in a post surgical or treatment situation
- Collars available for dogs and rabbits

These Pillow Collars are designed for a wide range of applications in both dogs and rabbits. They are manufactured from an extremely durable "ballistic" canvas fabric with a foam pillow inside the casing. These Collars are available for use with dogs and rabbits in either black or white. The Dog Collars range in size from small to extra large and are 3 inches thick. The rabbit collars are available in small and medium sizes and are 1.5 inches thick. All Collars are fully washable. By special order, all collars may be fitted with fasteners to attach to a jacket or harness. Please call for details.

Pillow Collars						
White	\$	Black	\$	Size	Wt. Range	Int. x Ext. Diameter
Pillow Collars for Dogs						
BS4 72-4004		BS4 72-4008		Small	5 to 7 kg	8.26 x 20.3 cm (3.25 x 8 in)
BS4 72-4005		BS4 72-4009		Medium	8 to 12 kg	10.2 x 20.3 cm (4 x 8 in)
BS4 72-4006		BS4 72-4010		Large	13 to 18 kg	12.7 x 24.1 cm (5 x 9.5 in)
BS4 72-4007		BS4 72-4011		X-Large	18 to 25 kg	14 x 32.4 cm (5.5 x 12.75 in)
Pillow Collars for Rabbits						
BS4 72-4012		BS4 72-4014		Small	up to 3.5 kg	6.4 x 14 cm (2.5 x 5.5 in)
BS4 72-4013		BS4 72-4015		Medium	over 3.5 kg	6.4 x 19.1 cm (2.5 x 7.5 in)

Guinea-Pig Jacket



- Velcro® fasteners for simple easy closure
- Edges and leg openings bound with cotton jersey for maximum comfort

For use in intravenous infusion and other applications or to accommodate portable equipment, these jackets are made of nylon canvas. The edges and leg openings are bound with cotton jersey for comfort. Velcro® fasteners permit easy adjustment to fit the animal's size. Five hooks provide added security. Available in three sizes.

Catalog No.	\$	Product
BS4 62-0069		Guinea-Pig Jacket, Small, Up to 350 grams
BS4 62-0070		Guinea-Pig Jacket, Medium, 350 to 600 grams
BS4 62-0071		Guinea-Pig Jacket, Large, 600+ grams

Rat, Hamster & Mouse Jackets



- Velcro® fasteners for simple easy closure
- Sizes available for rats, hamsters, and mice

Manufactured with Lycra®/spandex, these jackets are suitable for a wide range of continuous intravenous infusion applications. The Mouse Jackets have a double layer of Lycra®/spandex for additional durability. The jackets close by means of a Velcro® fastener and supplemental hooks provide additional security and better fit. Available in five sizes for rats and three sizes each for hamsters and mice, jacket inserts are available for both the rat and mouse jackets. The inserts are for studies where test articles are dermally applied. They are a non-occlusive covering for the application site that helps prevent oral ingestion while allowing in-line investigations to be carried out with ease.

Catalog No.	\$	Product
BS4 62-0064		Mouse Jacket, Small, Up to 25 g
BS4 62-0065		Mouse Jacket, Medium, 25 to 30 g
BS4 62-0066		Mouse Jacket, Large, 30+ g
BS4 62-0056		Rat Jacket, X-Small, 100 to 150 g
BS4 62-0057		Rat Jacket, Small, 150 to 250 g
BS4 62-0058		Rat Jacket, Medium, 250 to 350 g
BS4 62-0059		Rat Jacket, Large, 350 to 500 g
BS4 62-0060		Rat Jacket, X-Large, 500+ g
BS4 62-0061		Hamster Jacket, Small, Up to 100 g
BS4 62-0062		Hamster Jacket, Medium, 100 to 175 g
BS4 62-0063		Hamster Jacket, Large, 175+ g
BS4 62-0067		Rat Jacket Insert for Dermal Studies
BS4 62-0068		Mouse Jacket Insert for Dermal Studies

Ferret Jacket

- 3/4-length design for long lean body shape
- Velcro® fasteners for simple easy closure

These Jackets are made of double layer nylon canvas. With edges and leg openings bound by cotton jersey for comfort.

Velcro® fasteners adjust garment to the size of the animal, helping to compensate for any change in seasonal body weight. Available in three sizes.

Catalog No.	\$	Product
BS4 62-0072		Ferret Jacket, Small, Up to 750 g
BS4 62-0073		Ferret Jacket, Medium, 750 to 1000 g
BS4 62-0074		Ferret Jacket, Large, 1000+ g

Harnesses, Jackets and Slings

Large Animal Jackets



BS4 62-0089 Dog Jacket
with Optional Zipper Pocket



BS4 62-0086
Cat Jacket

- Double-layered 100% polyester mesh for air circulation
- Double stitched for superior strength
- Leg openings bound with cotton jersey for added comfort
- Back panel made from Lycra®/spandex for better fit and animal comfort

This wide range of jackets offers biomedical researchers the most advanced jackets using the latest manufacturing techniques and materials. They are fastened by two zippers attached to a Lycra®/Spandex expansion panel which provides better fit and comfort. Equipment pockets are available separately, and must be ordered with the jacket. See page B17 for complete details.

Dog Jackets

Designed primarily for beagles and hound-type dogs. Velcro® fasteners at the neck and/or base of the jacket provide added security and adjustment. They are available in 3/4 or full length with rear leg enclosures.

Cat Jackets

These jackets are designed for comfort and fit in three sizes to fit your size feline. All are full length with rear leg enclosures.

Rabbit Jackets

Designed to be used with the New Zealand White rabbit. They are available 3/4 length or full length with rear leg enclosures. Not pictured.

Swine Jackets

Swine Jackets are available by special order. Breeds available include micro, mini, Yucatan, as well as specific farm or market swine from juvenile through market weight. All jackets feature expandable panels made of Lycra®/Spandex which permits growth of the abdominal area and ensures both comfort and fit. Please call for additional information.

Custom Jackets

Custom Jackets to fit other species are available on an individual basis. Prices are based on the complexity and quantity of the order. Please call for details.

Catalog No.	\$	Product
BS4 62-0088		Dog Jacket Full Length with Rear Leg Enclosures, X-Small, 2.5 to 5 kg
BS4 62-0089		Dog Jacket Full Length with Rear Leg Enclosures, Small, 5 to 7 kg
BS4 62-0090		Dog Jacket Full Length with Rear Leg Enclosures, Medium, 8 to 12 kg
BS4 62-0091		Dog Jacket Full Length with Rear Leg Enclosures, Large, 13 to 18 kg
BS4 62-0092		Dog Jacket Full Length with Rear Leg Enclosures, X-Large, 18 to 25 kg
BS4 62-0093		Dog Jacket 3/4 Length, X-Small, 2.5 to 5 kg
BS4 62-0094		Dog Jacket 3/4 Length, Small, 5 to 7 kg
BS4 62-0095		Dog Jacket 3/4 Length, Medium, 8 to 12 kg
BS4 62-0096		Dog Jacket 3/4 Length, Large, 13 to 18 kg
BS4 62-0097		Dog Jacket 3/4 Length, X-Large, 18 to 25 kg
BS4 62-0085		Cat Jacket, Small, Up to 2.5 kg
BS4 62-0086		Cat Jacket, Medium, 2.5 to 4.5 kg
BS4 62-0087		Cat Jacket, Large, 4.5+ kg
BS4 62-0075		Rabbit Jacket Full Length with Rear Leg Enclosures, X-Small, Up to 2.7 kg
BS4 62-0076		Rabbit Jacket Full Length with Rear Leg Enclosures, Small, 2.7 to 3.6 kg
BS4 62-0077		Rabbit Jacket Full Length with Rear Leg Enclosures, Medium, 3.6 to 4.5 kg
BS4 62-0078		Rabbit Jacket Full Length with Rear Leg Enclosures, Large, 4.5 to 5.4 kg
BS4 62-0079		Rabbit Jacket Full Length with Rear Leg Enclosures, X-Large, 5.4+ kg
BS4 62-0080		Rabbit Jacket 3/4 Length, X-Small, Up to 2.7 kg
BS4 62-0081		Rabbit Jacket 3/4 Length, Small, 2.7 to 3.6 kg
BS4 62-0082		Rabbit Jacket 3/4 Length, Medium, 3.6 to 4.5 kg
BS4 62-0083		Rabbit Jacket 3/4 Length, Large, 4.5 to 5.4 kg
BS4 62-0084		Rabbit Jacket 3/4 Length, X-Large, 5.4+ kg
BS4 62-0105		Jacket Pocket, 3 x 7 x 2 in
BS4 62-0106		Jacket Pocket, 7 x 5.5 x 1.5 in, with 11 in Zipper
BS4 62-0107		Jacket Pocket, 6 x 4 x 2 in, with 7 in Zipper
BS4 62-0108		Jacket Pocket, 5.25 x 3.5 x 1.5 in, with 9 in Zipper

Harnesses, Jackets and Slings

Rodent Sling Suit and Frame



BS4 72-0050 Sling Suit
with BS4 72-0048 Frame

- Rugged sling suits withstand repeated laundering for long life
- Large animal frames constructed of stainless steel for superior quality and easy cleaning
- Large animal sling suits available for rabbits, cats and dogs

The Sling Suit is manufactured from two fabrics for durability. The underside of the suit is made from a polyester mesh fabric which allows air to circulate while the animal is being restrained. The upper portion of the suit is made from a nylon-coated canvas with Velcro® fasteners for a custom fit. The Rodent Sling Frame is manufactured with a durable high impact plastic base and adjustable connectors and supports made of stainless steel for dependability and easy cleaning. The suits and frames are sold separately.

Rodent Sling Suits and Frames						
Size	Catalog No.	\$	Rat Weight	Catalog No.	\$	Rabbit Weight
X-Small	BS4 72-0032		100 to 150 g	BS4 72-0038		up to 2.7 kg
Small	BS4 72-0033		150 to 250 g	BS4 72-0039		2.7 to 3.6 kg
Medium	BS4 72-0034		250 to 350 g	BS4 72-0040		3.6 to 4.5 kg
Large	BS4 72-0035		350 to 500 g	BS4 72-0041		4.5 to 5.4 kg
X-Large	BS4 72-0036		500+ g	BS4 72-0042		5.4+ kg
Frame	BS4 72-0031		–	BS4 72-0037		–

Large Animal Sling Suits and Frames

Similar to the Rodent Sling Suits, the Large Animal Sling Suits are manufactured from a polyester mesh fabric sewn in double layers. The jacket portion of the suit is closed with two zippers attached to an expandable spandex insert allowing for an adjustable fit. All jackets are unisex and all edges and leg openings are bound with cotton jersey fabric for added comfort. The suit attaches to the frame with detachable zippered sleeves along the length of the jacket. This enables the animal to be removed from the frame without removing the jacket. The bars of the frame slip through these detachable sleeves. The Frames are constructed from square stainless steel tube, which is mounted onto a UPVC base for superior quality and easy cleaning. The suits and frames are sold separately.

Large Animal Sling Suits and Frames						
Size	Catalog No.	\$	Cat Weight	Catalog No.	\$	Dog Weight
X-Small	–		–	BS4 72-0049		2.5 to 5 kg
Small	BS4 72-0044		Up to 2.5 kg	BS4 72-0050		5 to 7 kg
Medium	BS4 72-0045		2.5 to 4.5 kg	BS4 72-0051		8 to 12 kg
Large	BS4 72-0046		4.5+ kg	BS4 72-0052		13 to 18 kg
X-Large	–		–	BS4 72-0053		18 to 25 kg
Frame	BS4 72-0043		–	BS4 72-0048		–

Large Animal Restraint Unit



Restraint Frame



Restraint Sling

- The ideal way to immobilize large animals
- The rugged hammock provides stable, immobile support with comfort
- Frame is constructed from durable 2.5 cm (1 in) sq. stainless steel rod for exceptional quality and long life
- Available for dogs, cats and swine/sheep

This restraint units includes two parts: the rugged sling hammock and the heavy duty restraint frame. The sling hammock is made from washable canvas type material that can withstand repeated washing. All leg and waste openings are edged with cotton jersey material for comfort. Nylon webbing is added to key points where extra strength is required. Heavy brass grommets allow the use of neck restraints to minimize the animal's head movement. Three sizes are available for use with adult cats, dogs, and swine/sheep.

The restraint frame is manufactured durable 1 inch square stainless steel rods which provides exceptional strength while being light weight. Each corner has self-locking, quick release cleats for limb ropes. These cleats help to prevent entanglement or accidental release. A deep 'V' opening permits unimpeded access to the head of the animal. The hammock slides onto the two upper horizontal rods. Once attached to the rods, simply load the animal into the hammock lift the entire unit onto the frame. The frame has a deep opening on one side to minimize lifting of the animal.

Two sizes of restraint frames are available. The large restraint frame measures, H x W x D, 99 x 61 x 91.4 cm (39 x 24 x 36 in). The extra-large restraint frame is slightly longer measuring, H x W x D, 99 x 61 x 121.9 cm (39 x 24 x 48 in). Both Frames are mounted on four heavy duty caster for mobility. Two have foot-activated brakes.

Catalog No.	\$	Product
BS4 72-0054		Complete Dog Restraint Unit, Includes Large Frame and Dog Sling Hammock
BS4 72-0057*		Complete Swine/Sheep Restraint Unit: Includes X-Large Frame and Swine/Sheep Sling Hammock
BS4 72-0047		Adult Cat Sling Hammock Only (For Use with BS4 72-0059)
BS4 72-0055		Dog Sling Hammock Only
BS4 72-0058		Swine/Sheep Sling Hammock Only
BS4 72-0059		Large Restraint Frame Only
BS4 72-0060		X-Large Restraint Frame Only

* Must specify sex of the animal.

上海达域仪器有限公司 电话: 021-56479651 网址: www.dayulab.com 邮箱: Sales@dayulab.com

11,000 Specialty Products to Enhance Your Bioresearch

Harnesses, Jackets and Slings

Rhesus Primate Jackets



BS4 62-0099
Small Rhesus
Primate Jacket

- Seven sizes for Rhesus primates
- Light padding at the neck opening and waist for comfort
- Velcro® closures ensure proper fit

These Jackets are double-layered, 100% polyester mesh which permits air circulation. The expandable back panel has two zippers that secure the jacket. All the zippers can be secured by a clip to help prevent the animal from tampering with the jacket. These Jackets are double

stitched for durability. Other primate jackets are available by special order. Call Harvard Apparatus for details.

Catalog No.	\$	Product
BS4 62-0098		Rhesus Primate Jacket, X-Small, up to 2 kg
BS4 62-0099		Rhesus Primate Jacket, Small, 2 to 3 kg
BS4 62-0100		Rhesus Primate Jacket, Medium, 3 to 5.5 kg
BS4 62-0101		Rhesus Primate Jacket, Large, 5.5 to 7 kg
BS4 62-0102		Rhesus Primate Jacket, X-Large, 7 to 8 kg
BS4 62-0103		Rhesus Primate Jacket, XX-Large, 8 to 10 kg
BS4 62-0104		Rhesus Primate Jacket, XXX-Large, 10+ kg

Jacket Pockets for Large Animal and Primate Jackets

Four standard pockets are offered as an accessory to our large animal and primate jackets. They must be ordered at the same time as the jacket. Custom size pockets are available by special order.

Catalog No.	\$	Product
BS4 62-0105		Jacket Pocket, 3 x 7 x 2 in
BS4 62-0106		Jacket Pocket, 7 x 5.5 x 1.5 in, with 11 in Zipper
BS4 62-0107		Jacket Pocket, 6 x 4 x 2 in, with 7 in Zipper
BS4 62-0108		Jacket Pocket, 5.25 x 3.5 x 1.5 in, with 9 in Zipper

For Large Animal Jackets, see page B15.

NEW Primate Capture Nets



Primate Capture Nets

Designed to retain animals while protecting both the subject and the handler. The net is manufactured from a fray resistant polyester mesh fabric, double sewn and lock stitched for strength and durability. A reinforced channel is

sewn in to accommodate a thick braided cord, this is tightened once the subject is inside the net. The hoop is fabricated from stainless steel with rounded corners retaining strength and safety. Four standard sizes are available. For all, the pole is 122 cm (48 in) long. By special order the net and pole are available in multiple combinations to match the size, weight and strength of the subject. Please call for details.

Catalog No.	\$	Product
BS4 72-4000		Primate Capture Net, X-Small with 25.4 cm (10 in) Hoop
BS4 72-4001		Primate Capture Net, Small with 33 cm (13 in) Hoop
BS4 72-4002		Primate Capture Net, Medium with 40.6 cm (16 in) Hoop
BS4 72-4003		Primate Capture Net, Large with 50.8 cm (20 in) Hoop

Micro Injection Needles



- Reduces clotting & trauma
- Micro size is ideal for working with smaller species
- Provides greater volume control
- Stainless steel needle with 12° bevel point at tip
- Autoclavable

These Micro Injection Needles are ideal for portal vein, thymus, and bile duct injections. They can also be used for blood/fluid extractions. Their small size helps to reduce blood clotting and trauma at the injection site. They should be used with the BS4 62-0044 1 cc Plastic Syringe listed below. Needles and syringe are supplied individually.

Catalog No.	\$	Product
BS4 62-0042		Micro Injection Needle, 32 ga, Straight, 0.009 x 0.003 x 10 mm (OD x ID x L)
BS4 62-0043		Micro Injection Needle, 32 ga, 45° Angled, 0.009 x 0.003 x 10 mm (OD x ID x L)
BS4 62-0044		Plastic Syringe, 1 cc, For Use with BS4 62-0042 & BS4 62-0043 Micro Injection Needles

Reusable Hypodermic Needles

These Hypodermic Needles are precision made and designed to ensure strict adherence with U.S. Government specification GG-N-196. Points are machine ground to assure uniform sharpness and minimal discomfort due to tearing of the skin. Precision grinding, micro-bead jet blasting and ultrasonic cleaning assure freedom from burrs and debris. All needle cannulae are fabricated of Type 304 Stainless Steel Tubing. They are regular walled Needles.

The Needle Hubs are brass chrome plated and machine made to comply exactly with Luer Taper Specifications Z70.1 of the American Standards Association. This assures interchangeable fit with mating Luer Slips and Luer Locks made by all manufacturers, either in the reusable or disposable style. Contoured hub cavity facilitates cleaning and wiring. Each hub carries a gauge number. Needles are supplied non-sterile and are autoclavable.

Standard Hypodermic Needles, pkg. of 12

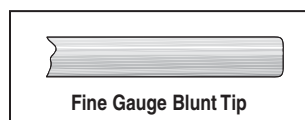
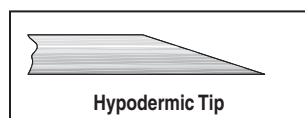
Needle Gauge	Length mm (inches)							
	9.5 mm (0.375 in)	12.7 mm (0.5 in)	19.0 mm (0.75 in)	25.4 mm (1.0 in)	31.8 mm (1.25 in)	38.2 mm (1.5 in)	50.8 mm (2.0 in)	76.2 mm (3.0 in)
28 \$	BS4 72-5737	BS4 72-5738	BS4 72-5739	BS4 72-5740	BS4 72-5741	BS4 72-5742	–	–
27 \$	BS4 72-5731	BS4 59-8523	BS4 59-8525	BS4 59-8526	BS4 72-5735	BS4 72-5736	–	–
26 \$	BS4 72-5725	BS4 59-8529	BS4 59-8531	BS4 59-8532	BS4 72-5729	BS4 59-8533	–	–
25 \$	BS4 72-5719	BS4 59-8535	BS4 59-8537	BS4 59-8538	BS4 72-5723	BS4 59-8539	BS4 59-8540	–
24 \$	BS4 72-5712	BS4 59-8541	BS4 59-8543	BS4 59-8544	BS4 59-8545	BS4 59-8546	BS4 72-5718	–
23 \$	BS4 72-5705	BS4 59-8547	BS4 59-8549	BS4 59-8550	BS4 59-8551	BS4 59-8552	BS4 59-8553	–
22 \$	BS4 72-5697	BS4 72-5698	BS4 72-5699	BS4 59-8554	BS4 59-8555	BS4 59-8556	BS4 59-8557	BS4 72-5704
21 \$	BS4 72-5689	BS4 72-5690	BS4 72-5691	BS4 59-8559	BS4 59-8560	BS4 59-8561	BS4 59-8562	BS4 72-5696
20 \$	BS4 72-5681	BS4 72-5682	BS4 72-5683	BS4 59-8563	BS4 59-8564	BS4 59-8565	BS4 59-8566	BS4 72-5688
19 \$	–	–	–	–	BS4 59-8569	BS4 59-8570	BS4 59-8571	–
18 \$	BS4 72-5673	BS4 72-5674	BS4 72-5675	BS4 59-8573	BS4 72-5677	BS4 59-8574	BS4 59-8575	BS4 72-5680
17 \$	BS4 72-5665	BS4 72-5666	BS4 72-5667	BS4 72-5668	BS4 72-5669	BS4 72-5670	BS4 59-8576	BS4 72-5672
16 \$	BS4 72-5657	BS4 72-5658	BS4 72-5659	BS4 59-8590	BS4 72-5661	BS4 72-5662	BS4 59-8593	BS4 59-8595
15 \$	–	–	–	BS4 59-8598	–	–	BS4 59-8601	BS4 59-8603
14 \$	BS4 72-5649	BS4 72-5650	BS4 72-5651	BS4 59-8606	BS4 72-5653	BS4 72-5654	BS4 59-8609	BS4 59-8611
13 \$	–	–	BS4 72-5643	BS4 72-5644	BS4 72-5645	BS4 72-5646	BS4 72-5647	BS4 72-5648
12 \$	–	–	BS4 72-5637	BS4 59-8614	BS4 72-5639	BS4 72-5640	BS4 59-8617	BS4 59-8619
11 \$	–	–	BS4 72-5631	BS4 72-5632	BS4 72-5633	BS4 72-5634	BS4 72-5635	BS4 72-5636
10 \$	–	–	BS4 72-5625	BS4 72-5626	BS4 72-5627	BS4 72-5628	BS4 72-5629	BS4 72-5630

Reusable Fine Gauge Needles



Standard Hypodermic Needles

These regular medical point needles have standard walls and a medical style point. They are for intramuscular, subcutaneous, and other injections and are available in a wide range of gauges and lengths. They have an oversized chrome plated luer lock hub and are supplied 12 per package. These needles are supplied non-sterile and are autoclavable.



Fine Gauge Needles

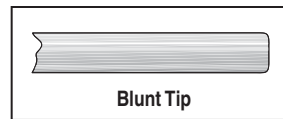
These fine gauge needles are regular walled with either a medical style point or blunt tip. Their small size allows insertion into very fine vessels or tubing. These needles are available in 4 gauges of several lengths and are packaged with a special protector. The needles also have an oversized chrome plated Luer lock hub. They are supplied 12 per package. These needles are supplied non-sterile and are autoclavable.

Fine Gauge Needles, pkg. of 12						
Needle Type	Needle Gauge	Length mm (inches)	12.7 mm (0.5 in)	15.9 mm (0.625 in)	19.0 mm (0.75 in)	25.4 mm (1.0 in)
Hypodermic \$	33	BS4 72-5526	BS4 72-5527	BS4 72-5528	BS4 72-5529	BS4 72-5530
Hypodermic \$	32	BS4 72-5521	BS4 72-5522	BS4 72-5523	BS4 72-5524	BS4 72-5525
Hypodermic \$	31	BS4 72-5516	BS4 72-5517	BS4 72-5518	BS4 72-5519	BS4 72-5520
Hypodermic \$	30	BS4 72-5511	BS4 72-5512	BS4 72-5513	BS4 72-5514	BS4 72-5515
Blunt \$	33	BS4 72-5506	BS4 72-5507	BS4 72-5508	BS4 72-5509	BS4 72-5510
Blunt \$	32	BS4 72-5501	BS4 72-5502	BS4 72-5503	BS4 72-5504	BS4 72-5505
Blunt \$	31	BS4 72-5496	BS4 72-5497	BS4 72-5498	BS4 72-5499	BS4 72-5500
Blunt \$	30	BS4 72-5491	BS4 72-5492	BS4 72-5493	BS4 72-5494	BS4 72-5495

Needle Specifications						
Standard Hypodermic, Fine Gauge, Probe Point (Blunt) and Huber Point						
Needle Gauge	OD in	mm	ID in	mm	Volume µl/in	µl/mm
33	0.0083	0.21	0.0040	0.11	0.20	0.01
32	0.0093	0.24	0.0043	0.11	0.20	0.01
31	0.0103	0.26	0.0053	0.13	0.34	0.01
30	0.0123	0.31	0.0063	0.16	0.45	0.02
28	0.0143	0.36	0.0073	0.18	0.63	0.02
27	0.0163	0.41	0.0083	0.21	0.80	0.03
26	0.0183	0.46	0.0103	0.26	1.25	0.05
25	0.0225	0.51	0.0103	0.26	1.25	0.05
24	0.0223	0.57	0.0123	0.31	1.80	0.07
23	0.0253	0.64	0.0133	0.34	2.17	0.09
22	0.0283	0.72	0.0163	0.41	3.35	0.13
21	0.0323	0.82	0.0203	0.51	5.19	0.20
20	0.0358	0.91	0.0238	0.60	6.71	0.26
19	0.0420	1.07	0.0270	0.69		
18	0.0500	1.27	0.0330	0.84	14.08	0.55
17	0.0578	1.47	0.0420	1.07	22.84	0.90
16	0.0650	1.65	0.0470	1.19	28.25	1.11
15	0.0720	1.83	0.0540	1.37		
14	0.0830	2.11	0.0630	1.60	51.07	2.01
13	0.0950	2.41	0.0710	1.80	64.63	2.54
12	0.1090	2.77	0.0850	2.16	93.07	3.66
11	0.1200	3.05	0.0940	2.39	113.00	4.45
10	0.1340	3.40	0.1060	2.69	143.28	5.64

Reusable Probe Point (Blunt) Needles

These needles have a flat blunt tip which is ideal for dispensing, aspirating, and obtaining liquid samples. They are also useful for making cannulae when inserted into Polyethylene tubing and other tubing. The needles are regular walled with oversized chrome plated Luer lock hubs. They are supplied 12 per package. These needles are supplied non-sterile and are autoclavable.



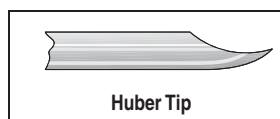
Probe Point (Blunt) Needles, pkg. of 12								
Length mm (inches)								
Needle Gauge	9.5 mm (0.375 in)	12.7 mm (0.5 in)	19.0 mm (0.75 in)	25.4 mm (1.0 in)	31.8 mm (1.25 in)	38.2 mm (1.5 in)	50.8 mm (2.0 in)	76.2 mm (3.0 in)
28 \$	BS4 72-5483	BS4 72-5484	BS4 72-5485	BS4 72-5486	BS4 72-5487	BS4 72-5488	BS4 72-5489	BS4 72-5490
27 \$	BS4 72-5475	BS4 72-5476	BS4 72-5477	BS4 72-5478	BS4 72-5479	BS4 72-5480	BS4 72-5481	BS4 72-5482
26 \$	BS4 72-5467	BS4 72-5468	BS4 72-5469	BS4 72-5470	BS4 72-5471	BS4 72-5472	BS4 72-5473	BS4 72-5474
25 \$	BS4 72-5459	BS4 72-5460	BS4 72-5461	BS4 72-5462	BS4 72-5463	BS4 72-5464	BS4 72-5465	BS4 72-5466
24 \$	BS4 72-5451	BS4 72-5452	BS4 72-5453	BS4 72-5454	BS4 72-5455	BS4 72-5456	BS4 72-5457	BS4 72-5458
23 \$	BS4 72-5443	BS4 72-5444	BS4 72-5445	BS4 72-5446	BS4 72-5447	BS4 72-5448	BS4 72-5449	BS4 72-5450
22 \$	BS4 72-5435	BS4 72-5436	BS4 72-5437	BS4 72-5438	BS4 72-5439	BS4 72-5440	BS4 72-5441	BS4 72-5442
21 \$	BS4 72-5427	BS4 72-5428	BS4 72-5429	BS4 72-5430	BS4 72-5431	BS4 72-5432	BS4 72-5433	BS4 72-5434
20 \$	BS4 72-5419	BS4 72-5420	BS4 72-5421	BS4 72-5422	BS4 72-5423	BS4 72-5424	BS4 72-5425	BS4 72-5426
18 \$	BS4 72-5411	BS4 72-5412	BS4 72-5413	BS4 72-5414	BS4 72-5415	BS4 72-5416	BS4 72-5417	BS4 72-5418
17 \$	BS4 72-5403	BS4 72-5404	BS4 72-5405	BS4 72-5406	BS4 72-5407	BS4 72-5408	BS4 72-5409	BS4 72-5410
16 \$	BS4 72-5395	BS4 72-5396	BS4 72-5397	BS4 72-5398	BS4 72-5399	BS4 72-5400	BS4 72-5401	BS4 72-5402
14 \$	BS4 72-5387	BS4 72-5388	BS4 72-5389	BS4 72-5390	BS4 72-5391	BS4 72-5392	BS4 72-5393	BS4 72-5394
13 \$	BS4 72-5379	BS4 72-5380	BS4 72-5381	BS4 72-5382	BS4 72-5383	BS4 72-5384	BS4 72-5385	BS4 72-5386
12 \$	BS4 72-5371	BS4 72-5372	BS4 72-5373	BS4 72-5374	BS4 72-5375	BS4 72-5376	BS4 72-5377	BS4 72-5378
11 \$	BS4 72-5363	BS4 72-5364	BS4 72-5365	BS4 72-5366	BS4 72-5367	BS4 72-5368	BS4 72-5369	BS4 72-5370
10 \$	BS4 72-5355	BS4 72-5356	BS4 72-5357	BS4 72-5358	BS4 72-5359	BS4 72-5360	BS4 72-5361	BS4 72-5362

For Needle Cleaning Kits, see Pumps Section A.

For a needle cross reference guide, see Pumps Section A Appendix.

Reusable Huber Point Needles

Huber point needles have a deflected bevel top making the cutting surface approximately perpendicular to the needle shaft. This design reduces the coring of tissue and septa samples. The needles are regular walled with oversized chrome plated Luer lock hubs. They are supplied 12 per package. These needles are supplied non-sterile and are autoclavable.



Huber Point Needles, pkg. of 12								
Length mm (inches)								
Needle Gauge	9.5 mm (0.375 in)	12.7 mm (0.5 in)	19.0 mm (0.75 in)	25.4 mm (1.0 in)	31.8 mm (1.25 in)	38.2 mm (1.5 in)	50.8 mm (2.0 in)	76.2 mm (3.0 in)
28 \$	BS4 72-5619	BS4 72-5620	BS4 72-5621	BS4 72-5622	BS4 72-5623	BS4 72-5624	-	-
27 \$	BS4 72-5613	BS4 72-5614	BS4 72-5615	BS4 72-5616	BS4 72-5617	BS4 72-5618	-	-
26 \$	BS4 72-5607	BS4 72-5608	BS4 72-5609	BS4 72-5610	BS4 72-5611	BS4 72-5612	-	-
25 \$	BS4 72-5601	BS4 72-5602	BS4 72-5603	BS4 72-5604	BS4 72-5605	BS4 72-5606	-	-
24 \$	BS4 72-5594	BS4 72-5595	BS4 72-5596	BS4 72-5597	BS4 72-5598	BS4 72-5599	BS4 72-5600	-
23 \$	BS4 72-5587	BS4 72-5588	BS4 72-5589	BS4 72-5590	BS4 72-5591	BS4 72-5592	BS4 72-5593	-
22 \$	BS4 72-5579	BS4 72-5580	BS4 72-5581	BS4 72-5582	BS4 72-5583	BS4 72-5584	BS4 72-5585	BS4 72-5586
21 \$	BS4 72-5571	BS4 72-5572	BS4 72-5573	BS4 72-5574	BS4 72-5575	BS4 72-5576	BS4 72-5577	BS4 72-5578
20 \$	BS4 72-5563	BS4 72-5564	BS4 72-5565	BS4 72-5566	BS4 72-5567	BS4 72-5568	BS4 72-5569	BS4 72-5570
18 \$	BS4 72-5555	BS4 72-5556	BS4 72-5557	BS4 72-5558	BS4 72-5559	BS4 72-5560	BS4 72-5561	BS4 72-5562
17 \$	BS4 72-5547	BS4 72-5548	BS4 72-5549	BS4 72-5550	BS4 72-5551	BS4 72-5552	BS4 72-5553	BS4 72-5554
16 \$	BS4 72-5539	BS4 72-5540	BS4 72-5541	BS4 72-5542	BS4 72-5543	BS4 72-5544	BS4 72-5545	BS4 72-5546
14 \$	BS4 72-5531	BS4 72-5532	BS4 72-5533	BS4 72-5534	BS4 72-5535	BS4 72-5536	BS4 72-5537	BS4 72-5538

For Needle Cleaning Kits, see Pumps Section A.

For a needle cross reference guide, see Pumps Section A Appendix.

NEW Pipetting Needles



These pipetting needles are for use in laboratory procedures. All needles are made with type 304 stainless steel cannulae. Select from three hub materials. There is standard chrome plated Luer hubs. For use with more corrosive materials or critical applications, select the 304 stainless steel hub. They are also ideal for both manual and

automatic volumetric dispensers, dilutors and pipettors.

For applications requiring the use of plastic syringes with pipetting needles, select the Micro-Mate hub pipetting needles. They are constructed from 316 stainless steel cannulae and have a special 316 stainless Micro-Mate female Luer hub. These hubs provide a secure leak-proof mating of plastic Luer tip syringes with metal Luer pipetting needles.

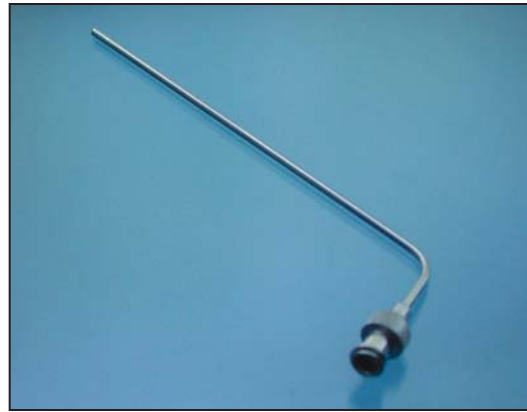
These needles are available in a variety of sizes and lengths and are supplied in a package of 12 needles. They are non-sterile and autoclavable.

Pipetting Needles with Chrome Plated Hubs, pkg. of 12						
Gauge	Needle Length					
	1"	1-1/2"	2"	4"	6"	
24G \$	BS4 72-5209	-	-	-	-	
22G \$	-	BS4 72-5210	-	-	-	
20G \$	-	BS4 72-5211	-	BS4 72-5212	BS4 72-5213	
18G \$	-	-	BS4 72-5214	BS4 72-5215	BS4 72-5216	
16G \$	-	-	BS4 72-5217	BS4 72-5218	-	
15G \$	-	-	-	BS4 72-5219	-	
14G \$	-	-	-	BS4 72-5220	BS4 72-5221	

Pipetting Needles with 316 Stainless Steel Micro-Mate Hub, pkg. of 12						
Gauge	Needle Length					
	2"	\$	4"	\$	6"	\$
20G	-		BS4 72-5235		-	
18G	BS4 72-5233		-		BS4 72-5234	
16G	-		BS4 72-5231		BS4 72-5232	
14G	-		-		BS4 72-5230	

4" Pipetting Needles with Stainless Steel Hub, pkg. of 12								
Gauge	20G	19G	18G	17G	16G	15G	14G	13G
Catalog No.	BS4 72-5222	BS4 72-5223	BS4 72-5224	BS4 72-5225	BS4 72-5226	BS4 72-5227	BS4 72-5228	BS4 72-5229
\$								

NEW Dissolution Cannula



Ideal for dissolution testing. Features 316 stainless steel hub and tubing. Supplied individually.

Catalog No.	\$	Product
BS4 72-5236		Stainless Steel Dissolution Testing Cannula 14RW x 4-3/8" - 316 Stainless Steel Hub and 316 Stainless Steel Tubing
BS4 72-5237		Stainless Steel Dissolution Testing Cannula 14RW x 7-1/2" - 316 Stainless Steel Hub and 316 Stainless Steel Tubing

For a needle cross reference guide, see Pumps Section A Appendix.

NEW Non-Coring Needles



These precision made stainless steel needles with deflected (septum) point, and standard female Luer hub are

extensively used with micro syringes. They are ideal for applications such as gas and liquid chromatography and nuclear magnetic resonance spectroscopy procedures as well as many others.

These deflected non-coring septum penetration needles are made from stainless steel tubing with a deflected point to minimize or eliminate coring when needles are used to penetrate septa or rubber closures. Micro-Mate® Non-Coring needles were designed with special hubs to provide an easy, secure, leak-proof mating of plastic Luers while minimizing stripping of plastic during repeated use.

These needles are available in a variety of sizes and lengths and are supplied in a package of 12 needles. They are non-sterile and autoclavable.

Deflected Non-Coring Septum Penetration Needles, pkg. of 12 with Micro-Mate Hub

Gauge	Needle Length			
	1"	6"	8"	12"
22G \$	-	BS4 72-5208	-	-
20G \$	BS4 72-5204	BS4 72-5205	BS4 72-5206	BS4 72-5207
18G \$	-	BS4 72-5202	-	BS4 72-5203

Deflected Non-Coring Septum Penetration Needles with Chrome Plated Hub, pkg. of 12

Gauge	Needle Length										
	3/8"	1/2"	3/4"	1"	1-1/2"	2"	4"	6"	8"	10"	12"
26G \$	BS4 72-5167	BS4 72-5168	-	-	-	-	-	-	-	-	-
25G \$	BS4 72-5169	-	BS4 72-5170	BS4 72-5171	-	-	-	-	-	-	-
23G \$	-	-	-	BS4 72-5172	-	-	-	-	-	-	-
22G \$	-	-	-	BS4 72-5173	BS4 72-5174	BS4 72-5175	BS4 72-5176	BS4 72-5177	-	-	-
21G \$	-	-	-	BS4 72-5178	BS4 72-5179	-	BS4 72-5181	BS4 72-5182	-	-	-
20G \$	-	-	-	BS4 72-5183	-	BS4 72-5184	BS4 72-5185	BS4 72-5186	BS4 72-5187	-	BS4 72-5188
19G \$	-	-	-	-	-	BS4 72-5189	BS4 72-5190	BS4 72-5191	-	BS4 72-5201	-
18G \$	-	-	-	-	BS4 72-5192	BS4 72-5193	BS4 72-5194	BS4 72-5195	-	BS4 72-5200	BS4 72-5196
16G \$	-	-	-	-	-	-	-	BS4 72-5197	-	BS4 72-5198	BS4 72-5199

FastBreak Cannulas™



- Quick and easy insertion
- 3 sizes
- Color-coded

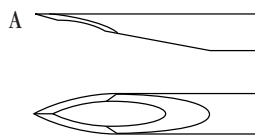
These splittable in-troducer cannulae are the ideal way to quickly and easily introduce a fluid line into an animal. Simply thread the line through the needle and introduce into the animal. Now pull back the needle by the butterfly wings and split the needle in half to remove it from the line. It's that simple! Available in three color coded sizes for easy size recognition.

Catalog No.	\$	Product
BS4 62-0036		FastBreak Cannulas™, 17 ga, Red, 22 x 1.50 x 1.34 mm (L x OD x ID), pkg. of 10
BS4 62-0037		FastBreak Cannulas™, 20 ga, Green, 17 x 0.95 x 0.75 mm (L x OD x ID), pkg. of 10
BS4 62-0038		FastBreak Cannulas™, 22 ga, Blue, 17 x 0.70 x 0.50 mm (L x OD x ID), pkg. of 10

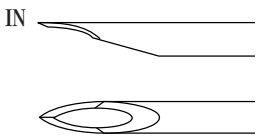
Monoject™ Hypodermic Needles

Sterile Single Use Needles

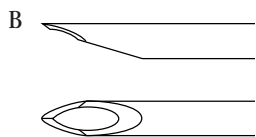
A wide range of sizes and styles of Monoject™ Needles are available. Each needle is packaged in a rigid pack with a tamper-evident sword. All hypodermic needles feature an ultrasharp tri-beveled anti-coring stainless steel needle and are available in one of three bevels: regular hypodermic bevel (A), intermediate bevel (IN) and short bevel (B).



Regular Bevel (A)
For all intramuscular and subcutaneous injections.



Intermediate Bevel (IN)
For testing and for injections in the skin.



Short Bevel (B)
For intravenous and intra-arterial injections, also for nerve blocks.

Needle Gauges are Color-Coded



14 ga
Tan



15 ga
Clear



16 ga
Gray



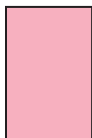
17 ga
Pale Green



18 ga
Green



19 ga
Lime



20 ga
Pink



21 ga
Lavender



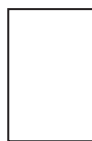
22 ga
Blue



23 ga
Orange



25 ga
Red



26 ga
White



27 ga
Yellow

Blunt Needles with Aluminum Hub



- Stainless steel cannula
- Aluminum luer lock hub
- Color-coded needle sheath with charcoal grey cap
- Autoclavable in rigid pack for use in OR/procedure packs
- Sterile

These cannulae have a blunt tip and are available in 9 sizes. Select from a box of 25 or a case of 100.

Blunt Needles with Aluminum Hub				
Gauge	Length (in)	Bevel Type	Box 25 Catalog No.	Case 100 Catalog No.
15 \$	1.5	Blunt	BS4 72-2341	BS4 72-2350
16 \$	1.5	Blunt	BS4 72-2342	BS4 72-2351
17 \$	1.5	Blunt	BS4 72-2343	BS4 72-2352
18 \$	1	Blunt	BS4 72-2344	BS4 72-2353
19 \$	1.5	Blunt	BS4 72-2345	BS4 72-2354
20 \$	1.5	Blunt	BS4 72-2346	BS4 72-2355
21 \$	1	Blunt	BS4 72-2347	BS4 72-2356
22 \$	1.5	Blunt	BS4 72-2348	BS4 72-2357
23 \$	1	Blunt	BS4 72-2349	BS4 72-2358

For a needle cross reference guide, see Pumps Section A Appendix.

Hypodermic Needles with Aluminium Hub



- Ultra-sharp, tri-beveled, anti-coring, stainless steel needle
- Precision machined Luer lock hub
- Autoclavable in rigid pack for use in OR/procedure packs

These needles are available with either a regular, intermediate or short bevel tip type in various sizes. A selection of thin walled needles is also available. Supplied sterile in a box of 100 or a case of 1000.

Hypodermic Needles with Aluminum Hub						
Gauge	Length (in)	Bevel Type	Box 100 Catalog No.	\$	Case 1000 Catalog No.	\$
14	1	IN	BS4 72-2277		BS4 72-2309	
14	1.5	IN	BS4 72-2278		BS4 72-2310	
14	2	IN	BS4 72-2279		BS4 72-2311	
15	1.5	B	BS4 72-2280		BS4 72-2312	
16	0.625	B	BS4 72-2281		BS4 72-2313	
16	1	A	BS4 72-2282		BS4 72-2314	
16	1.5	A	BS4 72-2283		BS4 72-2315	
16	1.5	B	BS4 72-2284		BS4 72-2316	
18	1	A	BS4 72-2285		BS4 72-2317	
18	1	B	BS4 72-2286		BS4 72-2318	
18	1.5	A	BS4 72-2287		BS4 72-2319	
18	1.5	B	BS4 72-2288		BS4 72-2320	
20	1	A	BS4 72-2289		BS4 72-2321	
20	1	B	BS4 72-2290		BS4 72-2322	
20	1.5	A	BS4 72-2291		BS4 72-2323	
20	1.5	B	BS4 72-2292		BS4 72-2324	
20	3	A	BS4 72-2293		-	-
21	1	A	BS4 72-2294		BS4 72-2326	
21	1.5	A	BS4 72-2295		BS4 72-2327	
21	2	A	BS4 72-2296		BS4 72-2328	
22	1	A	BS4 72-2297		BS4 72-2329	
22	1.5	A	BS4 72-2298		BS4 72-2330	
23	1	A	BS4 72-2299		BS4 72-2331	
25	0.625	A	BS4 72-2300		BS4 72-2332	
25	1.25	A	BS4 72-2301		BS4 72-2333	
25	2	A	BS4 72-2302		BS4 72-2334	
27	0.5	IN	BS4 72-2303		BS4 72-2335	
27	1.25	A	BS4 72-2304		BS4 72-2336	
19 TW*	1	A	BS4 72-2305		BS4 72-2337	
19 TW*	1.25	A	BS4 72-2306		BS4 72-2338	
19 TW*	1.5	A	BS4 72-2307		BS4 72-2339	
19 TW*	1.5	B	BS4 72-2308		BS4 72-2340	

**Package of 300 Needles

上海达域仪器有限公司 电话: 021-56479651 网址: www.dayulab.com 邮箱: Sales@dayulab.com
U.S. Toll Free: (800) 272-2775 • Fax: (508) 429-5732 • Online: www.harvardapparatus.com

Hypodermic Needles with Polypropylene Hub



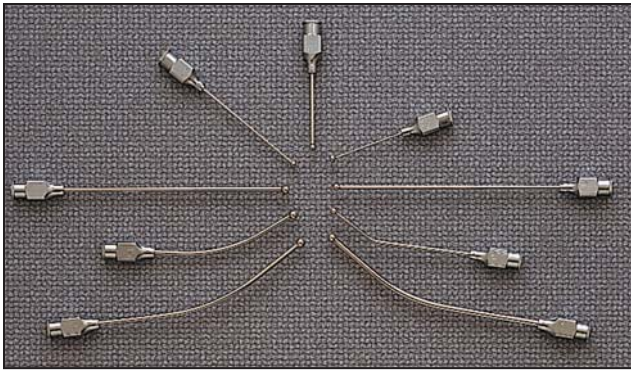
- Ultra-sharp, tri-beveled, anti-coring, stainless steel needle
- Translucent, color-coded luer lock hub shows blood 'flashback'
- Epoxy attachment of needle to hub assures compatibility with specialized drugs
- Color-coded cap on rigid pack with clear needle sheath
- Autoclavable in rigid pack for use in OR/procedure packs
- Sterile

These needles are available with two different tip types and various sizes. A selection of thin walled needles is also available. Select from a box of 100 or a case of 1000.

Hypodermic Needles with Polypropylene Hub						
Gauge	Length (in)	Bevel Type	Box 100 Catalog No.	\$	Case 1000 Catalog No.	\$
18	1	A	BS4 72-2231		BS4 72-2254	
18	1	B	BS4 72-2232		BS4 72-2255	
18	1.5	B	BS4 72-2233		BS4 72-2256	
19 TW*	1	B	BS4 72-2234		BS4 72-2257	
19 TW*	1.5	B	BS4 72-2235		BS4 72-2258	
19 TW*	1	A	BS4 72-2236		BS4 72-2259	
20	1	A	BS4 72-2237		BS4 72-2260	
20	1.5	A	BS4 72-2238		BS4 72-2261	
20	1	B	BS4 72-2239		BS4 72-2262	
20	1.5	B	BS4 72-2240		BS4 72-2263	
21	1	A	BS4 72-2241		BS4 72-2264	
21	1.5	A	BS4 72-2242		BS4 72-2265	
21	1.5	B	BS4 72-2243		BS4 72-2266	
22	1	A	BS4 72-2244		BS4 72-2267	
22	1.5	A	BS4 72-2245		BS4 72-2268	
22	1.5	B	BS4 72-2246		BS4 72-2269	
23	0.75	A	BS4 72-2247		BS4 72-2270	
23	1	A	BS4 72-2248		BS4 72-2271	
25	0.625	A	BS4 72-2249		BS4 72-2272	
25	1	A	BS4 72-2250		BS4 72-2273	
25	1.5	A	BS4 72-2251		BS4 72-2274	
26	0.5	B	BS4 72-2252		BS4 72-2275	
30	0.75	A	BS4 72-2253		BS4 72-2276	

*Note: TW designates thin wall needle.

Stainless Steel Feeding Needles



- For intubation of mice, rats, guinea pigs, rabbits and other small laboratory animals
- Sterile
- Autoclavable

These precision-crafted stainless steel balls and tubing will not injure sensitive tissues. They are the ideal choice when a single use disposable feeding needle is not required. They are supplied in a package of 12.

Disposable Animal Feeding Needles



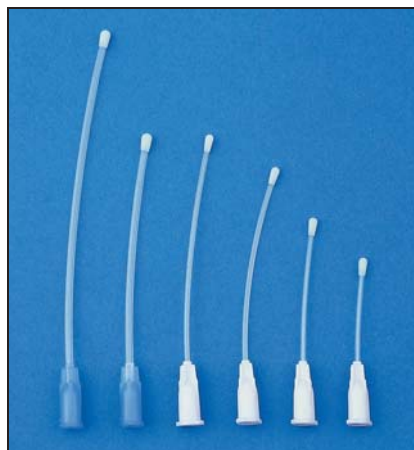
- Sterile, non-toxic, non-pyrogenic

These feeding needles feature plastic luer hubs and silicone tips. Supplied straight, but can be bent to desired shape. Available in three sizes. They are supplied in sterile, Tyvek® peel pouches containing five needles each.

Stainless Steel Feeding Needles, pkg. of 12						Animal Species/Weight				
Catalog No.	\$	Gauge	Length mm (in)	Ball Diam. mm	Needle Shape	Mice	Rats	Hamsters	Guinea Pigs	Rabbits
BS4 52-4009		24	25.4 (1)	1.25	Straight	00 to 14g	-	-	-	-
BS4 52-4017		22	25.4 (1)	1.25	Straight	15 to 20g	-	-	-	-
BS4 52-4025		22	38.1 (1-1/2)	1.25	Straight	15 to 20g	-	-	-	-
BS4 52-4033		20	25.4 (1)	2.25	Straight	20 to 25g	50 to 75g	-	-	-
BS4 52-4041		20	38.1 (1-1/2)	2.25	Straight	20 to 25g	50 to 75g	-	-	-
BS4 52-4157		20	38.1 (1-1/2)	2.25	Curved	20 to 25g	-	-	-	-
BS4 52-4058		20	76.2 (3)	2.25	Straight	20 to 25g	-	-	-	-
BS4 52-4165		20	76.2 (3)	2.25	Curved	20 to 25g	-	-	-	-
BS4 52-4066		18	25.4 (1)	2.25	Straight	25 to 30g	50 to 75g	-	-	-
BS4 52-4074		18	38.1 (1-1/2)	2.25	Straight	25 to 30g	50 to 75g	-	-	-
BS4 52-4173		18	38.1 (1-1/2)	2.25	Curved	25 to 30g	50 to 75g	-	250 to 300g	-
BS4 52-4082		18	50.8 (2)	2.25	Straight	25 to 30g	-	-	-	-
BS4 52-4181		18	50.8 (2)	2.25	Curved	25 to 30g	100 to 200g	60 to 200g	250 to 300g	-
BS4 52-4090		18	76.2 (3)	2.25	Straight	25 to 30g	-	-	-	-
BS4 52-4199		18	76.2 (3)	2.25	Curved	30 to 35g	100 to 200g	-	-	-
BS4 52-4108		18	76.2 (3)	3	Straight	-	100 to 200g	-	-	-
BS4 52-4249		18	50.8 (2)	3	Bent	-	-	-	-	-
BS4 52-4116		16	50.8 (2)	3	Straight	-	100 to 200g	-	-	-
BS4 52-4207		16	50.8 (2)	3	Curved	-	100 to 200g	-	-	-
BS4 52-4124		16	76.2 (3)	3	Straight	-	150 to 300g	-	-	-
BS4 52-4215		16	76.2 (3)	3	Curved	-	150 to 300g	-	350 to 450g	1 to 3 kg
BS4 52-4223		16	101.6 (4)	3	Curved	-	150 to 300g	-	350 to 450g	1 to 3 kg
BS4 52-4231		14	76.2 (3)	4	Curved	-	200 to 350g	-	400 to 600g	-
BS4 52-4140		13	76.2 (3)	4	Straight	-	200 to 350g	-	400 to 600g	-

To prevent cross infections and to maximize convenience, keep a supply of needles on hand at least equal to the number of animals under investigation.

NEW Harvard/Instech Plastic Feeding Tubes



- Flexibility reduces risk of perforation
- Soft rubber tip minimizes trauma
- No labor-intensive cleaning/sterilizing
- Reduced risk of residual compound
- Reduced risk of cross-contamination

Many researchers have converted to the plastic feeding tube for the increased tubing flexibility which reduces trauma and perforation and for the simplicity of a low cost, disposable device. These tubes feature medical grade materials designed to minimize the risk of interactions with test compounds. The tube is constructed of polypropylene which is the same material used in plastic syringes. The soft, bulb-shaped tip is fabricated from medical grade silicone (though virtually none of the tip is in the fluid path). The soft, bulb-shaped tip is designed to obviate inadvertent tube placement in the trachea and to reduce the risk of trauma and perforation.

Instead of using the solvents and glues used by other plastic feeding tubes, the manufacturing process insert molds the luer and the rubber tip directly to the tube. This method, though more costly, improves the bond strength of these connections and assures more consistent quality.

These feeding tubes are available in a variety of diameters and lengths to allow for use in most small laboratory animals. They are supplied in sterile packs of 5 tubes, 250 tubes (50 packs) per box.

Specifications

Tube Sizes	18 gauge and 15 gauge
Material	Materials Medical-grade polypropylene (Luer and tube), medical-grade silicone (tip)
Tube OD x ID:	
18 Gauge	1.2 x 0.7 mm
15 Gauge	1.8 x 1.2 mm
Color:	
18 Gauge	Pink
15 Gauge	Blue

Catalog No.	\$	Product
BS4 72-4442		Disposable Feeding Tubes, 18 Ga x 30mm long, pkg. 250
BS4 72-4443		Disposable Feeding Tubes, 18 Ga x 38mm long, pkg. 250
BS4 72-4444		Disposable Feeding Tubes, 18 Ga x 50mm long, pkg. 250
BS4 72-4445		Disposable Feeding Tubes, 18 Ga x 75mm long, pkg. 250
BS4 72-4446		Disposable Feeding Tubes, 15 Ga x 78mm long, pkg. 250
BS4 72-4447		Disposable Feeding Tubes, 15 Ga x 100mm long, pkg. 250

Skin Tunneling Needles



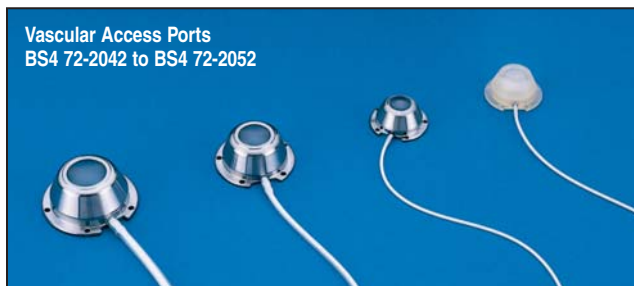
- Assure minimal trauma to the animal
- Reduce the number of skin incisions and the time required to make a tunnel
- Fully auto-clavable

These needles provide a quick and easy method of making subcutaneous tunnels in research animals for routing catheters and electrode leads to convenient exterior sites. They are constructed of tempered heavy wall stainless steel tubing and come with semi-blunt 45° bevel points. The needles are made with a through-hole in the handle, which is a continuation of the needle lumen, to allow catheter feed-through. For bundles of catheters and electrode leads that are too large for the lumen of the needles, suture wire can be passed through the needles and used to pull the bundles through the subcutaneous tunnel. Supplied in a set of 3.

Skin Tunneling Needles

Catalog No.	OD x ID	Lengths
BS4 72-0680	3.2 x 2.5 mm	15.2, 22.9, 30.5 cm
\$	(1/8 x 1/10 in)	(6, 9, 12 in)
BS4 72-0679	4.8 x 3.2 mm	22.9, 30.5, 40.6 cm
\$	(3/16 x 1/8 in)	(9, 12, 16 in)
BS4 72-0678	6.4 x 4.8 mm	30.5, 45.7, 61 cm
\$	(1/4 x 3/16 in)	(12, 18, 24 in)

Vascular Access Ports



- Easy to Use
- MRI compatible

The vascular access port has evolved from being an intravascular access port into a multi-purpose access port for use in intestinal, biliary, intraspinal, cranial, ventricular, and other applications. It is available in a variety of configurations for most species and catheter sizes.

The catheter may be pre-attached during manufacture or attached intraoperatively by the surgeon. These ports are fabricated from the highest quality biomaterials.

Ports are entirely implanted catheter devices which do not exit through the animal's skin. There is little concern about the animal disturbing the port thereby obviating the need for a jacket or other protective apparatus. Because there is no chronic exit site wound, infection risks associated with ports are considerably lower than with external catheters. The use of ports has provided many new research opportunities, and it represents a refined technique which has reduced animal use and minimized stress.

The port was originally intended for intermittent bolus infusions and periodic sampling and access, but it is now widely used in protracted and continuous infusions. The port is also used in a tethered model for longer boluses (one hour, for example) or for intermittent periods of blood pressure monitoring.

Catheter Biomaterials

The field of biomaterials for intravascular catheters has moved relatively slowly over the past three decades. Silicone rubber continues to be the most common material; however, polyurethanes have proven to be more hemocompatible than silicone. And the CBAS™ heparin coated polyurethane has proven to be the most thromboresistant material of all available technologies. This catalog offers a full range of silicone, polyurethane, and CBAS™-coated polyurethane catheters in sizes for all species.

Rounded Tips

Another vital catheter feature is the rounded distal tip. Both data and intuition confirm the benefits. The rounded tip is less traumatic to the intimal lining of blood vessels. Square cut or bevel cut catheters have sharp edges which irritate the blood vessel's intimal lining thus hastening the host's thrombogenic response. Rounded tips are available on polyurethane and CBAS™-coated polyurethane catheters.

CBAS™ Long-Term Heparin Coating

The Carmeda BioActive Surface (CBAS™) is the product of Carmeda AB in Stockholm, Sweden. Carmeda has an extensive bibliography of CBAS™ applications, particularly in human-use devices. CBAS™ applications in humans include central venous catheters, coronary stents, ventricular assist devices, extracorporeal blood circuits, blood sampling devices, and vascular grafts. CBAS™ is used to coat devices from J&J, Medtronic, and Gore. In lab animal research, CBAS™-coated catheters are used for arterial and venous access. Also, CBAS™ provides dramatic improvement in catheter patency for chronic lymphatic access.

CBAS™ is a patented process for applying heparin to the surfaces of biomaterials. Unlike TDMAC heparin, the CBAS™ covalent bonds last several months. The "active sequence" of the heparin molecule serves to halt the clotting cascade.

The endothelial lining of blood vessels contains a heparin-like substance which performs like CBAS™. The novel aspect of CBAS™ is that the active sequence remains available over and over to bind with antithrombin. No other coating can achieve this long-term function.

CBAS™ is the most respected thromboresistant coating available in the human-use medical device industry. Unlike hydrogels, CBAS™ is bioactive, not passive. It has been proven repeatedly to minimize the thrombogenicity of intravascular devices.

CBAS™ is not consumed. The heparin "active sequence" repeatedly binds to antithrombin to prevent clotting. As such, half-life is not an issue. CBAS™ is "end-point attached" to the catheter surface and does not elute into the bloodstream.

Specifications

Specification	Vascular Access Port Size			
	Rodent	Small	Intermediate	Large
Materials	Plastic	Titanium	Titanium	Titanium
Height	0.257 in (7.0mm)	0.257 in (7.0mm)	0.395 in (10.0mm)	0.460 in (11.7mm)
Weight	2.6 g	2.9 g	6.7 g	10.4 g
Dead Volume	0.13ml	0.13ml	0.38ml	0.65ml
Catheter Sizes	2 to 7 F	2 to 7 F	3 to 7 F	3 to 7 F
Sterilization	EIO Steam	EIO Steam	EIO Steam	EIO Steam

(Note: CBAS™ and PU are sterilized by EIO only)

Species	Vascular Access Port Size			
	Rodent	Small	Intermediate	Large
Rat	•			
Ferret	•	•		
Rabbits			•	
NHP (≥ 3 kg)		•		
NHP (≥ 3 kg)			•	
Dog (≥ 14 kg)			•	
Dog (≥ 14 kg)				•
Pig (ear)			•	
Pig (scapulae)				•

Vascular Access Ports

Large Vascular Access Ports



- For use with dogs, pigs, large primates and other large animals

Specifications

Port Model	Titanium
Port Volume	0.65 ml
Dimensions:	
Height	1.2 cm (0.5 in)
Top Diameter	1.5 cm (0.6 in)
Base Diameter	2.7 cm (1.1 in)
Weight (port body)	10.4 g
Punctures with 22 Ga Huber Point Needle	2,000
Catheter Length	60 cm (24 in), with 2 retention beads

Intermediate Vascular Access Ports



- For use with small primates and small animals including large rodents and rabbits

Specifications

Port Model	Titanium
Port Volume	0.38 ml
Dimensions:	
Height	1.0 cm (0.4 in)
Top Diameter	1.2 cm (0.5 in)
Base Diameter	2.3 cm (0.9 in)
Weight (port body)	6.7 g
Punctures with 22 Ga Huber Point Needle	2,000
Catheter Length	60 cm (24 in), with 2 retention beads

Delivery & Sampling

Large Vascular Access Ports, pkg. of 1					
Size, Fr	Catheters Silastic	\$	CBAS™-coated PU	\$	Uncoated PU
Pre-Attached Catheters					
3 Fr	BS4 72-4300		BS4 72-4304		BS4 72-4308
3.5 Fr	BS4 72-4301		BS4 72-4305		BS4 72-4309
5 Fr	BS4 72-4302		BS4 72-4306		BS4 72-4310
7 Fr	BS4 72-4303		BS4 72-4307		BS4 72-4311
Detachable Catheters					
3 Fr	BS4 72-4312		BS4 72-4316		BS4 72-4320
3.5 Fr	BS4 72-4313		BS4 72-4317		BS4 72-4321
5 Fr	BS4 72-4314		BS4 72-4318		BS4 72-4322
7 Fr	BS4 72-4315		BS4 72-4319		BS4 72-4323

Intermediate Vascular Access Ports, pkg. of 1					
Size, Fr	Catheters Silastic	\$	CBAS™-coated PU	\$	Uncoated PU
Pre-Attached Catheters					
3 Fr	BS4 72-4324		BS4 72-4328		BS4 72-4332
3.5 Fr	BS4 72-4325		BS4 72-4329		BS4 72-4333
5 Fr	BS4 72-4326		BS4 72-4330		BS4 72-4334
7 Fr	BS4 72-4327		BS4 72-4331		BS4 72-4335
Detachable Catheters					
3 Fr	BS4 72-4336		BS4 72-4340		BS4 72-4344
3.5 Fr	BS4 72-4337		BS4 72-4341		BS4 72-4345
5 Fr	BS4 72-4338		BS4 72-4342		BS4 72-4346
7 Fr	BS4 72-4339		BS4 72-4343		BS4 72-4347

For Non-Coring Needles, see page B23.

Vascular Access Ports

Small Vascular Access Ports

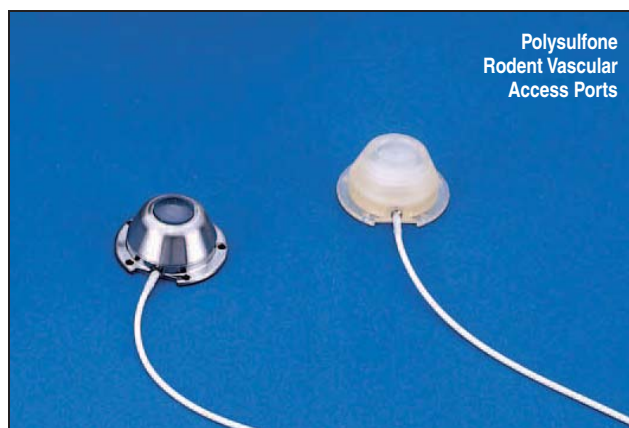


- For use with small primates, rodents and other small species

Specifications

Port Model	Titanium
Port Volume	0.13 ml
Dimensions:	
Height	0.7 cm (0.3 in)
Top Diameter	1.0 cm (0.4 in)
Base Diameter	1.7 cm (0.7 in)
Weight (port body)	2.9 g
Punctures with 22 Ga Huber Point Needle	1,000
Catheter Length	60 cm (24 in), with 2 retention beads

Rodent Vascular Access Ports



- For use with rats and other small species

Specifications

Port Model	Plastic
Port Volume	0.13 ml
Dimensions:	
Height	0.7 cm (0.3 in)
Top Diameter	1.0 cm (0.4 in)
Base Diameter	1.7 cm (0.7 in)
Weight (port body)	2.6 g
Punctures with 22 Ga Huber Point Needle	1,000
Catheter Length	30 cm (12 in), with 2 retention beads

Small Vascular Access Ports, pkg. of 1

Size, Fr	Catheters		CBAS™-coated		Uncoated	
	Silastic	\$	PU	\$	PU	\$
Pre-Attached Catheters						
2 Fr	BS4 72-4348		BS4 72-4353		–	–
3 Fr	BS4 72-4349		BS4 72-4354		BS4 72-4359	
3.5 Fr	BS4 72-4350		BS4 72-4355		BS4 72-4360	
5 Fr	BS4 72-4351		BS4 72-4356		BS4 72-4361	
7 Fr	BS4 72-4352		BS4 72-4357		BS4 72-4362	
Detachable Catheters						
3 Fr	BS4 72-4363		BS4 72-4367		BS4 72-4371	
3.5 Fr	BS4 72-4364		BS4 72-4368		BS4 72-4372	
5 Fr	BS4 72-4365		BS4 72-4369		BS4 72-4373	
7 Fr	BS4 72-4366		BS4 72-4370		BS4 72-4374	

Rodent Vascular Access Ports, pkg. of 1

Size, Fr	Catheters		CBAS™-coated		Uncoated	
	Silastic	\$	PU	\$	PU	\$
Pre-Attached Catheters						
2 Fr	BS4 72-4375		–	–	–	–
3 Fr	BS4 72-4376		BS4 72-4381		BS4 72-4386	
3.5 Fr	BS4 72-4377		BS4 72-4382		BS4 72-4387	
5 Fr	BS4 72-4378		BS4 72-4383		BS4 72-4388	
7 Fr	BS4 72-4379		BS4 72-4384		BS4 72-4389	
Detachable Catheters						
3 Fr	BS4 72-4390		BS4 72-4394		BS4 72-4398	
3.5 Fr	BS4 72-4391		BS4 72-4395		BS4 72-4399	
5 Fr	BS4 72-4392		BS4 72-4396		BS4 72-4400	
7 Fr	BS4 72-4393		BS4 72-4397		BS4 72-4401	

For Non-Coring Needles, see page B23.

Skin Parallel Access Ports



- For continuous infusion in large animals
- Parallel access
- Polysulfone

Specifications

Port Volume	0.48 cc
Dimensions:	
Height	1.5 cm (0.6 in)
Base Length	3.6 cm (1.4 in)
Weight (Port Body)	5 g
Punctures with 22 Ga Huber Point Needle	2,000
Catheter Length	60 cm (24 in), with 2 retention beads on silicone catheters only

Skin Parallel, pkg. of 1

Ports Size, Fr	Catheters Silastic	IntiSil	Hydrocoat
5 \$	BS4 72-2142	BS4 72-2145	BS4 72-2148
7 \$	BS4 72-2143	BS4 72-2146	BS4 72-2149
9 \$	BS4 72-2144	BS4 72-2147	-

Shunting Access Ports



- For shunting applications such as bile, thoracic duct, and portal vein access
- Polysulfone

The Shunting Ports each have two outlet tubes to connect to a variety of catheters for your shunting applications including bile, thoracic duct and portal vein access.

Specifications

Port Model	Large	Small
Port Volume	0.20 cc	0.10 cc
Dimensions:		
Height	1.2 cm (0.5 in)	0.8 cm (0.3 in)
Base Length	3.3 cm (1.3 in)	1.52 cm (0.6 in)
Weight (port body)	5 g	2 g
Punctures with 22 Ga Huber Point Needle	1,000	350
Catheter Length	30 cm (12 in) with 2 retention beads on silicone catheters only	

Shunting Ports, pkg. of 1

Ports Size, Fr	Catheters Silastic	IntiSil	Hydrocoat
----------------	--------------------	---------	-----------

For Small Animals

2 \$	BS4 72-2173	-	-
3 \$	BS4 72-2174	BS4 72-2176	BS4 72-2178
3.5 \$	-	-	BS4 72-2179
4 \$	BS4 72-2175	BS4 72-2177	-

For Large Animals

5 \$	BS4 72-2180	BS4 72-2183	-
7 \$	BS4 72-2181	BS4 72-2184	BS4 72-2186
9 \$	BS4 72-2182	BS4 72-2185	-

PeriPort Access Port



- Very little dead space makes it ideal for CSF access
- In-line access provides superior needle stability
- Simple cone-shaped design promotes efficient infusion
- Light weight, low profile

This access port is a unique port that permits side access. The detachable catheter allows the catheter to be inserted prior to connecting it to the port. Depth markings enhance the placement accuracy. Two suture rings help anchor the port in place. This access port is supplied with one 22 gauge Huber point needle.

Specifications

Port Body

Material	Polysulfone body with Titanium fitting, silicone septum and suture loops
Diameter x Length	10.2 x 19.5 mm (0.4 x 0.77 in)
Internal Volume	0.07 ml
Septum Diameter	5.7 mm (0.22 in)
Punctures with 22 ga Huber Point Needle	1,000

Catheter

Material/Length	Polyurethane, 76.0 mm (3 in) with 5 cm increment markings
ID/OD	1.0 mm/1.7 mm, 5 french
Volume	0.0079 ml/cm
Markings	5 cm increments
Tip	Rounded distal tip

Catalog No.	\$	Product
BS4 72-2107		PeriPort Access Port, 5 French, pkg. of 1

For Non-Coring Needles, see page B23.

Access Ports and Catheters

Squirt™ Micro Implantable Port



- Ideal for mice
- Economical - uses standard needles
- Easy to use - large septum target
- Easy to implant - low profile shape with trimmable suture band

These unique Implantable Ports are small enough to implant in mice greater than 18 grams and can be used for fluid injection, infusion, or withdrawal. In spite of its small size, the port has a very large septum. This feature makes the ports easy to access. No other implantable port offers this combination of large septum target and low profile.

The Implantable Port's implant-grade stainless steel body and silicone rubber septum are compatible with a wide range of drugs, and durable enough to withstand hundreds of punctures with inexpensive, standard hypodermic needles (27 gauge or smaller). The ports are available with either a 1.3 Fr or 2.1 Fr pre-attached silicone catheter. A trimmable suture band extends from the perimeter of the port to enable secure attachment to the underlying tissue. The ports are autoclavable and crematable.

Specifications

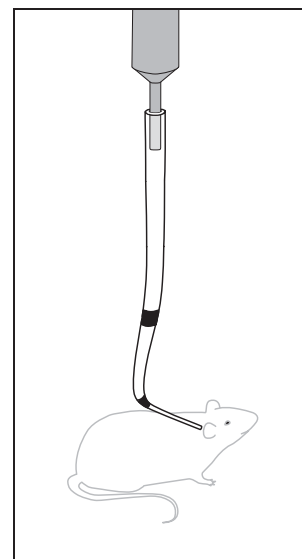
Materials	Stainless Steel, Silicone Rubber
Dimensions, Dia x H	13 x 6 mm (0.51 x 0.24 in)
Septum Target Diameter	6.5 mm (0.26 in)
Internal Volume	0.1 ml
Weight	0.9 g (0.032 lbs)
Outlet Catheter:	
Materials	Silicone
Outer Diameter REF 5110	0.38 mm (0.015 in)
Outer Diameter REF 5120	0.63 mm (0.025 in)
Inner Diameter	0.18 mm (0.007 in)

Catalog No.	\$	Product
BS4 72-4617		Squirt™ Micro Implantable Port, 1.3 Fr, pkg. of 10
BS4 72-4618		Squirt™ Micro Implantable Port, 2.1 Fr, pkg. of 10

NEW Funnel-Cath™ Mouse Catheter



- Allows easy catheterization of mice
- Permits attachment to a standard 25 gauge or 22 gauge swivel
- Two sizes available:
 - 1.2 French to 2 French for use with 25 gauge swivels
 - 1.2 French to 3 French for use with 22 gauge swivels
- Extruded tube provides a seamless connection for no leaking!



The increase in catheterization of mice has brought to light a vexing problem: how to attach a tiny catheter to conventional devices such as swivels and luer stubs. The solution is the innovative Funnel-Cath™.

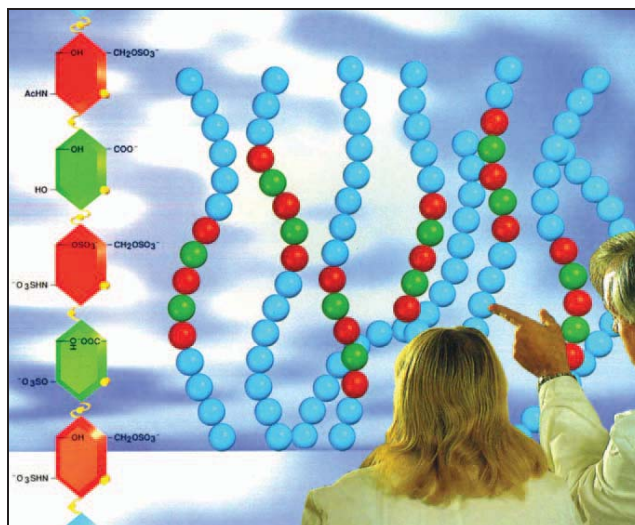
Funnel-Cath™ is extruded from the same implant-grade polyurethane used in our SoloCaths, see page B33, though a bit stiffer to facilitate placement in mice. We offer two sizes: (1) a 2Fr proximal end for attachment to a 25ga swivel, tapering down to a 1.2Fr intravascular segment, and (2) a 3Fr proximal end for attachment to a 22ga swivel, also tapering down to 1.2Fr.

Before the Funnel-Cath™ there were two ways of tapering a catheter. The first involved “pulling down”, or stretching, tubing using an open flame or hot oil. This method was cumbersome and the catheters were inconsistent. The second method involved bonding a smaller catheter to a larger one. Catheters produced this way were typically vulnerable to breakage and leaks. The new Funnel-Cath™ is the first and only catheter tapered during the extrusion process, making it seamless and consistent catheter to catheter, batch to batch.

These Catheters are uncoated polyurethane with a clear, rounded distal tip, two movable suture bulbs, and an attachment sleeve. They are supplied individually.

Catalog No.	\$	Product
BS4 72-4440		Funnel-Cath™ Proximal 2Fr / Distal 1.2 Fr, 60 cm, no beads, pkg. of 1
BS4 72-4441		Funnel-Cath™ Proximal 3Fr / Distal 1.2 Fr, 60 cm, no beads, pkg. of 1

NEW SoloCath™ Catheters



- Venous access
- Arterial access
- Blood collection circuits
- Lymphatic access

CBAS™ Long-Term Heparin Coating

The Carmeda BioActive Surface (CBAS™) is the product of Carmeda AB in Stockholm, Sweden. Carmeda has an extensive bibliography of CBAS™

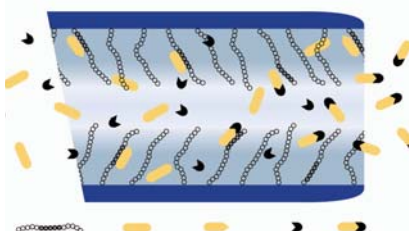
applications, particularly in human-use devices. CBAS™ applications in humans include central venous catheters, coronary stents, ventricular assist devices, extracorporeal blood circuits, blood sampling devices, and vascular grafts. CBAS™ is used to coat devices from J&J, Medtronic, and Gore. In lab animal research, CBAS™-coated catheters are used for arterial and venous access. Also, CBAS™ provides dramatic improvement in catheter patency for chronic lymphatic access.

How It Works

CBAS™ is a patented process for applying heparin to the surfaces of biomaterials. Unlike TDMAC heparin, the CBAS™ covalent bonds last several months. The “active sequence” of the heparin molecule serves to halt the clotting cascade.

The endothelial lining of blood vessels contains a heparin-like substance which performs like CBAS™. The novel aspect of CBAS™ is that the active sequence remains available over and over to bind with antithrombin. No other coating can achieve this long-term function.

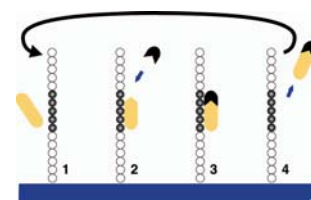
CBAS™ is the most respected thromboresistant coating available in the human-use medical device industry. It is under license for use in laboratory animal research applications. Unlike hydrogels, CBAS™ is bioactive, not passive. It has been proven repeatedly to minimize the thrombogenicity of intravascular devices.



Long-Term, Non-Leaching

CBAS™ is not consumed. The heparin “active sequence” repeatedly binds to antithrombin to prevent clotting. As such, half-life is not an issue. CBAS™ is “end-point attached” to the catheter surface and does not elute into the bloodstream.

- 1) CBAS™ heparin “active sequence” is available to bind with antithrombin.
- 2) Antithrombin conforms to accelerate binding with thrombin and other coagulation factors.
- 3) Coagulation effect of thrombin is neutralized by formation of thrombin-antithrombin complex.
- 4) Thrombin-antithrombin complex washes away. CBAS™ heparin “active sequence” remains intact and is available repeatedly to bind with antithrombin.



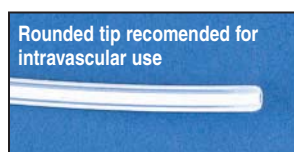
Reduces Infections

Human clinical studies using CBAS™ and other heparin coatings document a clear anti-infective benefit from heparin coatings. While heparin is not an antimicrobial per se, it does remove the blood nidus for microorganisms thereby minimizing the nutrients and binding sites for many of the unfavorable blood proteins. Appelgren et al demonstrated a 50% reduction in infections from CBAS™ coated catheters in humans. Visit www.carmeda.com for additional information and complete CBAS™ bibliography (200+ references).

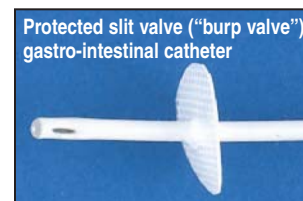
Specifications

Duration	Long-term; remains bioactive for several months
Stability	Non-leaching; does not come off of catheter
Systemic effect	Non-leaching; coating is undetectable in blood
Half-life	Coating is not consumed; same heparin works repeatedly
Reactivity	Coating is non-reactive with almost all compounds
Sterilization	EtO only
Availability	Currently available on polyurethane catheters

Distal Tip Options



Gastro-Intestinal Options



Internal lumen is sealed at tip. Slit is normally closed to preclude ingesta occlusion. During infusion, slit opens to allow infusion of fluids.

Internal lumen is sealed at tip. Slit is protected by sleeve to provide further protection from ingesta. Slit and sleeve open during infusion of fluids.

NEW SoloCath™ Catheters (Continued)



- Most thromboresistant material
- Rounded distal tip is less traumatic to intimal lining of blood vessels

We offer a full range of silicone, polyurethane and heparin coated polyurethane catheters in sizes for all species. With nearly 20 years of experience designing and manufacturing laboratory animal catheters, we can help you choose the the ideal catheter for your application.

Biomaterials

Silicone rubber continues to be the most popular catheter material; however, polyurethanes have been proven to be more hemocompatible than silicone. The CBAS™ heparin-coated polyurethane has proven to be the most thromboresistant of all available technologies.

Rounded Tips

We recommend rounded tips for intravascular catheters as they are less traumatic to the intimal lining of blood vessels. The sharp edges on square-cut or bevel-cut catheters can irritate the vessel's intimal lining and hasten the host's thrombogenic response.

Additional catheter options include retention beads, suture flanges, depth markings, and special holes and slits for organ perfusion, bladder and gastro-intestinal catheterization.

Specifications

Silicone	1Fr	2Fr	3Fr	3.5Fr	5Fr	7Fr
OD (in)	0.016	0.025	0.037	0.047	0.065	0.095
OD (mm)	0.41	0.64	0.94	1.19	1.65	2.41
ID (in)	0.008	0.012	0.020	0.025	0.030	0.050
ID (mm)	0.20	0.30	0.51	0.64	0.76	1.27
Polyurethane	1Fr	2Fr	3Fr	3.5Fr	5Fr	7Fr
OD (in)	0.016	0.026	0.038	0.047	0.066	0.096
OD (mm)	0.41	0.66	0.97	1.19	1.68	2.43
ID (in)	0.008	0.013	0.024	0.027	0.040	0.052
ID (mm)	0.20	0.33	0.61	0.69	1.02	1.32

Applications (approximate for jugular vein, carotid artery, femoral artery/vein)

	1Fr	2Fr	3Fr	3.5Fr	5Fr	7Fr
Mouse	x	x				
Rat <100g	x	x				
Rat 100-200g		x				
Rat 200-300g		x	x			
Rat 300-350g			x	x		
Cat				x	x	
Rabbit				x	x	x
Dog >8kg					x	x
Mini-pig, adult					x	x
Pig, adult						x
Nonhuman primate <1kg			x	x		
Nonhuman primate 1-2kg				x		
Nonhuman primate 3-5kg				x	x	
Nonhuman primate >5kg				x	x	x

CBAS™ Heparin Coated Polyurethane Catheters

Clear, rounded distal tip, two movable suture bulbs and attachment sleeve.

Catalog No.	\$	Product
BS4 72-4403		CBAS™ Heparin Coated Polyurethane, 3 Fr, 80 cm, no Luer, pkg. of 1
BS4 72-4404		CBAS™ Heparin Coated Polyurethane, 3.5 Fr, 80 cm, no Luer, pkg. of 1
BS4 72-4305		CBAS™ Heparin Coated Polyurethane, 5 Fr, 60 cm, no Luer, pkg. of 1
BS4 72-4406		CBAS™ Heparin Coated Polyurethane, 7 Fr, 60 cm, no Luer, pkg. of 1

Polyurethane Catheters

Clear, rounded distal tip, two movable suture bulbs and attachment sleeve.

Catalog No.	\$	Product
BS4 72-6127		Polyurethane, 2 Fr, 60 cm, no Luer (beveled tip), pkg. of 1
BS4 72-6128		Polyurethane, 3 Fr, 60 cm, no Luer, pkg. of 1
BS4 72-4410		Polyurethane, 3.5 Fr, 60 cm, no Luer, pkg. of 1
BS4 72-4411		Polyurethane, 5 Fr, 60 cm, no Luer, pkg. of 1
BS4 72-4412		Polyurethane, 7 Fr, 60 cm, no Luer, pkg. of 1

Silicone Catheters

Rounded distal tip, two movable suture bulbs, attachment sleeve and depth markings.

Catalog No.	\$	Product
BS4 72-4413		Silicone, 2 Fr, 80 cm, no Luer, clear, pkg. of 1
BS4 72-6129		Silicone, 3 Fr, 60 cm, no Luer, clear, pkg. of 1
BS4 72-4416		Silicone, 3.5 Fr, 60 cm, female Luer, clear with stripe, pkg. of 1
BS4 72-4417		Silicone, 5 Fr, 60 cm, female Luer, clear with stripe, pkg. of 1
BS4 72-4418		Silicone, 7 Fr, 60 cm, female Luer, clear with stripe, pkg. of 1
BS4 72-4419		Silicone, 8 Fr, 60 cm, female Luer, clear with stripe, pkg. of 1

Silicone Gastro-Intestinal Catheters

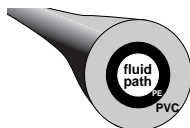
Catalog No.	\$	Product
BS4 72-4420		Gastro-Intestinal, 5 Fr, 60 cm open end, pkg. of 1
BS4 72-4421		Gastro-Intestinal, 5 Fr, 60 cm slit end, pkg. of 1
BS4 72-4422		Gastro-Intestinal, 5 Fr, 60 cm burp end, pkg. of 1
BS4 72-4423		Gastro-Intestinal, 7 Fr, 60 cm, open end, pkg. of 1
BS4 72-4424		Gastro-Intestinal, 7 Fr, 60 cm, slit end, pkg. of 1
BS4 72-4425		Gastro-Intestinal, 7 Fr, 60 cm, burp end, pkg. of 1

NEW CO-EX™ External Infusion Tubing



Protects sensitive compounds from:

- Absorption into tubing
- Evaporation through tubing
- Leaching plasticizers
- Kinked tubing



CO-EX™ was developed to address the problem in drug infusion studies where-by compounds can be lost due to absorption into the tubing or evaporation through the tubing, or altered due

to the leaching of plasticizers from the tubing. In humans, CO-EX™ is used to infuse insulin, nitroglycerine, and Taxol® (Eli Lilly) -- compounds which are not compatible with traditional PVC infusion tubing.

For these reasons, PE traditionally has been used for drug infusion studies. Unfortunately, PE is prone to kinking. CO-EX™ has PE on the ID fluid path and PVC on the OD which adds thickness to the tubing to minimize kinking.

CO-EX™ is designed to attach to commonly used 22 and 25 gauge swivels and blunt cannula. It is ideal for attachment between swivels and pumps and between swivels and cannulae. It is not designed for intravascular use. CO-EX™ is available in bulk, non-sterile 100 ft (30.5m) rolls.

Specifications

Compatible Swivel	Inner Diameter	Outer Diameter	Color
Inlet/Outlet 22 ga	0.024 in (0.61 mm)	0.064 in (1.60 mm)	Clear
Inlet/Outlet 25 ga	0.017 in (0.43 mm)	0.051 in (1.30 mm)	Clear

Catalog No.	\$	Product
BS4 72-4426		CO-EX™ External Infusion Tubing, 22 ga
BS4 72-6122		CO-EX™ External Infusion Tubing, 25 ga

NEW Polyurethane Intra-Vascular Tubing



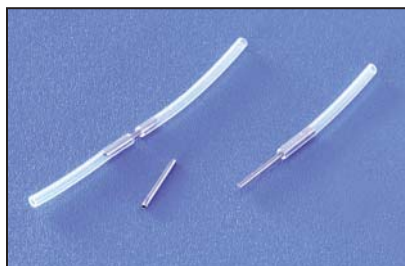
Bulk PU tubing is provided non-sterile. It is clear and supplied as 50 individual lengths measuring 60 cm (24 in) each.

Specifications

Size	2Fr	2Fr stiff	3Fr	3Fr stiff	3.5Fr	5Fr	7Fr
OD (in)	0.026	0.026	0.038	0.038	0.047	0.066	0.096
OD (mm)	0.66	0.66	0.97	0.97	1.20	1.68	2.44
ID (in)	0.013	0.013	0.024	0.024	0.027	0.040	0.052
ID (mm)	0.33	0.33	0.61	0.61	0.69	1.02	1.32

Catalog No.	\$	Product
BS4 72-6130		Polyurethane Intra-Vascular Tubing, 2 Fr, clear
BS4 72-6131		Polyurethane Intra-Vascular Tubing, 2 Fr Stiff, clear
BS4 72-4429		Polyurethane Intra-Vascular Tubing, 3 Fr, clear
BS4 72-4430		Polyurethane Intra-Vascular Tubing, 3 Fr Stiff, clear
BS4 72-4431		Polyurethane Intra-Vascular Tubing, 3.5 Fr, clear
BS4 72-4432		Polyurethane Intra-Vascular Tubing, 5 Fr, clear
BS4 72-4433		Polyurethane Intra-Vascular Tubing, 7 Fr, clear

NEW Stainless Steel Tubing Connectors



These tubing couplers are used to connect catheters to external infusion tubing. The plug can be used to seal off an externalized catheter before an infusion experiment begins. The couplers and plugs are supplied non-sterile in packages of 100.

Specifications for Stainless Steel Tubing Connectors

Catalog No.	Length	Tubing	OD	ID
Coupler				
BS4 72-6124	0.4in (10 mm)	25 ga	0.020 in (.51 mm)	0.010 in (.25 mm)
BS4 72-4434	0.3in (8 mm)	23 ga	0.025 in (.64 mm)	0.013 in (.33 mm)
BS4 72-4437	0.6in (15 mm)	22 ga	0.028 in (.71 mm)	0.016 in (.41 mm)
BS4 72-6123	0.6in (15 mm)	20 ga	0.036 in (.91 mm)	0.024 in (.61 mm)
Plug				
BS4 72-4436	0.5in (12 mm)	23 ga	0.025 in (.64 mm)	NA
BS4 72-4438	0.5in (12 mm)	22 ga	0.028 in (.71 mm)	NA
BS4 72-6132	0.5in (12 mm)	20 ga	0.036 in (.91 mm)	NA

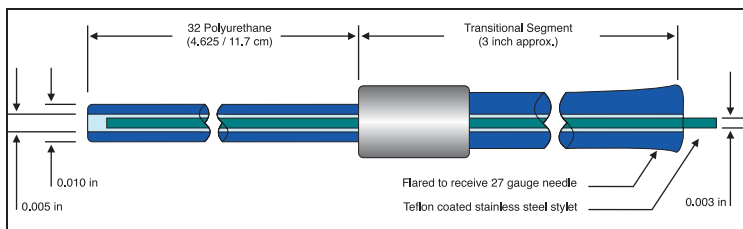
Catalog No.	\$	Product
BS4 72-4434		Stainless Steel Tubing Coupler, 23 ga, 8mm (0.3 in) length, pkg. of 100
BS4 72-4436		Stainless Steel Tubing Plug, 23 ga, 12mm (0.5 in) length, pkg. of 100
BS4 72-4437		Stainless Steel Tubing Coupler, 22 ga, 15mm (0.6 in) length, pkg. of 100
BS4 72-4438		Stainless Steel Tubing Plug, 22 ga, 12mm (0.5 in) length, pkg. of 100
BS4 72-6123		Stainless Steel Tubing Coupler, 20 ga, 15mm (0.6 in) length, pkg. 100
BS4 72-6124		Stainless Steel Tubing Coupler, 25 ga, 10mm (0.4 in) length, pkg. 100
BS4 72-6132		Stainless Steel Tubing Plug, 20 ga, 15mm (0.6 in) length, pkg. 100

NEW Luer Stubs

Use these 22 gauge female Luer stubs to connect infusion tubing (such as CO-EX™ or PE50) or catheters to syringes or other male Luer connectors. The stub is 0.5 in (13mm) long. They are available non-sterile in quantities of 100.

Catalog No.	\$	Product
BS4 72-4439		Luer Stub, 22 ga, 13mm (0.5 in) length, pkg. of 100
BS4 72-6125		Luer Stub, 25 ga, 13mm (0.5 in) length, pkg. of 100
BS4 72-6126		Luer Stub, 18 ga, 13mm (0.5 in) length, pkg. of 100

Intrathecal Catheter System

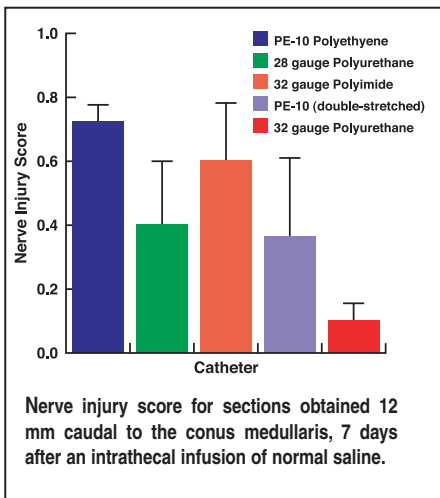


- Reduces catheter-induced histopathology
- 32 Gauge
- Polyurethane catheter material causes substantially less nerve injury compared to other catheter materials
- For delivery of drugs to the brain
- Ideal for rats and other small animals

This 32 gauge Intrathecal Catheter is the key component of a delivery system specifically developed for use in the rat and other small research animals. A significant advancement over the standard polyethylene-based products generally used for such research, its material and size combine to produce a minimally reactive device, thereby reducing catheter induced histopathology that could obscure other observations. Functional studies might also benefit from these properties as subclinical nerve injury could potentially alter the behavioral response to an intrathecal agent.

While studying the effects of intrathecally-injected anesthetics, researchers at the University of California at San Francisco encountered morphologic changes apparently induced by the implanted catheter. Micor was approached for its assistance in identifying a material that could reduce the nerve damage that was observed. These efforts suggested that 32 gauge polyurethane had the desired properties. (See graph.) Accordingly, a study was conducted comparing catheters composed of this material versus polyethylene or polyamide. Although sensory function did not differ significantly, nerve injury was substantially lower in animals implanted with 32 gauge polyurethane catheters.¹

This material is now incorporated into a commercially available device, the 32 gauge Intrathecal Catheter System. This system contains an 11.7 cm (4.6 in) catheter, a bonded connection assembly, and a stylet to facilitate placement. It is individually packaged and sterilized. Other configurations available.

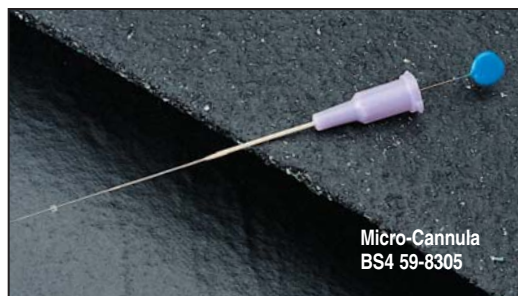


Catalog No.	\$	Product
BS4 72-0484		Intrathecal Catheter System, 32 Gauge, pkg. of 1, Sterile

References:

- 1) Sakura S, Hasimoto K, Bollen AW, Ciriales R, Drasner K: Intrathecal catheterization in the rat: Improved technique for morphologic analysis of drug-induced injury. ANESTHESIOLOGY 1996; 85:1184-9 (Reprints of this report are available through Micor, Inc., upon request.)

Micro-Cannula



- For insertion in very small blood vessels
- Can be used with radio labeled compounds

This Micro-Cannula has been designed for quick and easy insertion into the arteries and veins of small animals such

as rats, mice and hamsters. The Cannula tip is contoured for easy insertion and is fitted with an adjustable shoulder or barb for 'tie-in' to the animal to prevent accidental removal. The stainless steel trochar aids in vascular penetration and allows for a maximum range of cannula manipulation during insertion.

The Micro-Cannula tubing is made from a perfluorocarbon material that is biocompatible. One end of the Cannula has a female connection allowing convenient linkage to infusion lines.

This Micro-Cannula has been utilized effectively for the rapid cannulation of hamster carotid and femoral arteries and for the cannulation of mouse carotid arteries. It has also been used as an 'indwelling' catheter during experiments spanning an entire day.

Projected uses include the injection of small amounts of expensive radiolabeled compounds or monoclonal antibodies intra-arterially, for more effective distribution to vital organs. It can also be used to inject drugs directly into the circulation or to measure pressure in the femoral artery without compromising blood flow to the brain.

The Micro-Cannula is supplied individually in a non-sterile package. With care, this Micro-Cannula can be reused.

Specifications

Tip Size:	
OD	0.4 mm (0.016 in)
ID	0.2 mm (0.008 in)

Catalog No.	\$	Product
BS4 59-8305		Micro-Cannula, pkg. of 1, Non-Sterile

Butterfly Catheter Infusion Sets



BS4 59-8504 Standard Butterfly Infusion Set

- Firm needle control for better positioning
- Standard Butterfly sets are available with three different needle diameters and have a 30.5 cm (12 in) length of tubing
- Intermittent Butterfly sets are for intermittent procedures. The adapter terminates in a resealing injection site which allows injection or blood sampling
- Large Bore Butterfly sets are for high flow uses in hemodialysis. The needle has an inside bore diameter from 15 to 13 gauge
- Small Animal Butterfly sets have the smallest Butterfly Needle, with outside diameters ranging from 25 to 27 gauge

These Butterfly Infusion Sets consist of a stainless steel needle with butterfly wings, a length of tubing and an adapter. This adapter fits any standard IV, blood set or syringe and contains a flange to accept secure lock.

These Butterfly Catheters make veni-puncture easier with automatic alignment of the needle in bevel up position, eliminating needle roll during insertion. After veni-puncture the wings spread flat to provide a firm anchor for taping. Since there is no bulky needle hub to tape down, there is less chance for pressure irritation to develop.

The short needle shaft, ultra-flexible tubing, and firm anchorage minimize the possibility of needle movement within the vein.

The needle has thin walls and is double bevel ground. The open end needle guard permits priming with the guard in place so the needle can remain covered until the moment of use. A transparent cap covering the adapter keeps it sterile after the package is opened.

Harvard Apparatus offers four different Butterfly Catheter Infusion Sets. For easy recognition the adapter is color coded according to the gauge size. Supplied in quantities noted.

Butterfly Catheter Infusion Sets						
Set Type	\$	Needle Gauge	Needle Length	Tubing Length	Tubing Volume	Qty. Supplied
Small Animal Butterfly Sets						
BS4 72-5966		25	19.1 mm (3/4 in)	30.5 cm (12 in)	0.25 ml	50
BS4 72-5965		25	9.5 mm (3/8 in)	20.3 cm (8 in)	0.17 ml	100
BS4 72-5967		27	9.5 mm (3/8 in)	20.3 cm (8 in)	0.17 ml	100
Standard Butterfly Sets						
BS4 59-8500		19	22.2 mm (7/8 in)	30.5 cm (12 in)	0.45 ml	120
BS4 72-5963		21	19.1 mm (3/4 in)	30.5 cm (12 in)	0.25 ml	50
BS4 72-5964		23	19.1 mm (3/4 in)	30.5 cm (12 in)	0.25 ml	50
Intermittent Butterfly Sets						
BS4 72-5961		19	22.2 mm (7/8 in)	8.9 cm (3-1/2 in)	0.13 ml	100
BS4 72-5962		21	19.1 mm (3/4 in)	8.9 cm (3-1/2 in)	0.07 ml	100

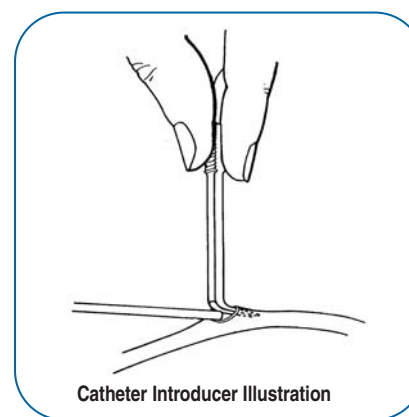
Catheter Introducer



BS4 59-8383 Catheter Introducer

- Makes catheter introduction simple and easy
- For use with the 'cut-down catheter' procedure

This simple Introducer will aid researcher with the introduction of catheters into small vessels. The tapered tip of the introducer is inserted into an incision in a vessel. The catheter then easily slides into the vessel by placing the catheter tip in the grooved underside of the Introducer. The Introducer is then removed allowing the catheter to be advanced to the desired position. Supplied sterile in a package of 100.



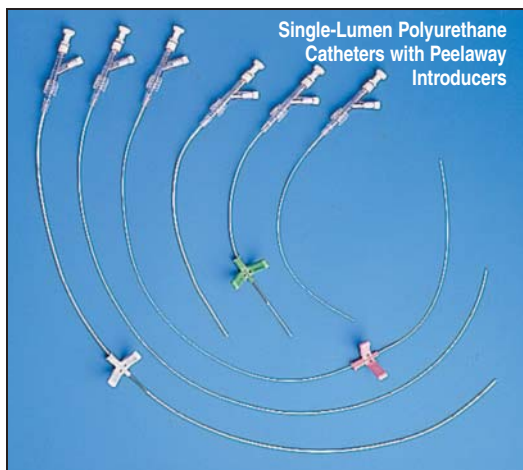
Catheter Introducer Illustration

Catalog No.	\$	Product
BS4 59-8383		Catheter Introducer, pkg. of 100

References:

- 1) Disposable Guide for Introducing Catheters into Small Vessels from AMERICAN HEART JOURNAL, Vol. 73 No. 5, Pages 716-717, Harvey L. Chernoff, M.D., Marshal B. Kreidberg, M.D.

Catheters with Peelaway Introducers



Single-Lumen

- Pre-inserted triple braided stainless steel stylet for easy insertion

Dual-Lumen

- Side-by-side "D-shaped" 60/40 lumens
- Available in 20, 18 & 16 gauge sizes



Polyurethane Catheters with Peelaway Introducers

- Single-Lumen and Dual-Lumen Polyurethane Catheters available in 20, 18, and 16 gauge sizes, see below and to right
- Micro Polyurethane Catheters available in 28, 24 and 20 gauge sizes, see page B39
- U-Wing peelaway needle introducer
- Soft, biocompatible, sheer, and kink-resistant radiopaque polyurethane increases patient comfort and mobility
- Catheter trimming tool included

These Polyurethane Catheters have thinner stronger catheter walls and allow maximum flow rates.

Each Catheter features a patented U-Wing, peelaway stainless steel needle introducer which permits improved access to small veins and subsequent easy removal from the catheter. These easy-to-use introducers require minimal insertion force reducing vein trauma and pain. They have a standard Luer hub for a splash-back chamber and/or syringe attachment to reduce blood exposure.

Single-Lumen Polyurethane Catheters with Peelaway Introducers

These Catheters have a protective sleeve that maintains sterility throughout the procedure. A pre-attached Y-site connector permits flushing of the Catheter before, during, and after the insertion with or without the stylet in place.

Supplied in 20, 18 and 16 gauge sizes and two lengths. Numbered markings every 5 cm make precise insertions easy.

Single-Lumen Polyurethane Catheter with Peelaway Introducer							
Catalog No.		Lumen			Introducer Needle		
Pkg. of 1	Pkg. of 10	Ga	Size	OD/ID	Ga	Length	
20 cm Catheter							
BS4 60-5044 \$	BS4 60-5040	20	2.6 Fr	0.9/0.4 mm	19	20 mm	
BS4 60-5046 \$	BS4 60-5038	18	3.5 Fr	1.2/0.7 mm	17	25 mm	
BS4 60-5048 \$	BS4 60-5036	16	5.0 Fr	1.7/1.2 mm	14	25 mm	
60 cm Catheter							
BS4 60-5045 \$	BS4 60-5039	20	2.6 Fr	0.9/0.4 mm	19	20 mm	
BS4 60-5047 \$	BS4 60-5037	18	3.5 Fr	1.2/0.7 mm	17	25 mm	
BS4 60-5049 \$	BS4 60-5035	16	5.0 Fr	1.7/1.2 mm	14	25 mm	

Dual-Lumen Polyurethane Catheters with Peelaway Introducers

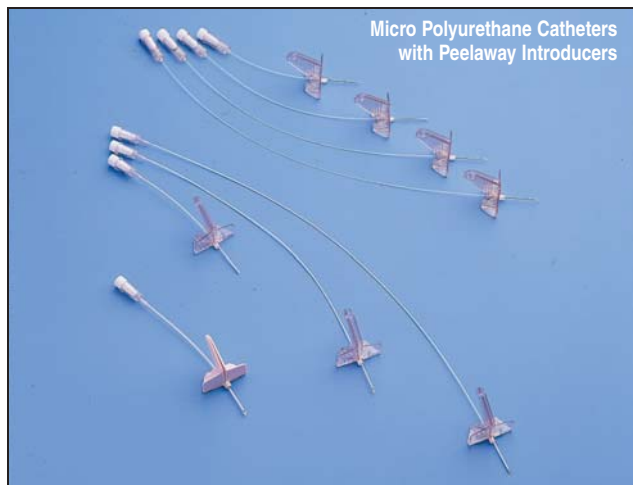
These radiopaque Dual-Lumen Polyurethane Catheters feature side-by-side 60/40 lumens allowing a wide range of IV therapy solutions and permitting easy distal tip trimming. The staggered pigtail Luer hubs attached to the Catheter are marked with the lumen size for easy identification and handling.

These Catheters have a protective sleeve that maintains sterility throughout the procedure. A pre-attached Y-site connector permits flushing of the Catheter before, during, and after the insertion with or without the stylet in place. These Catheters 60 cm long, are available in three sizes, and are packaged either individually or in a package of 10.

Dual-Lumen Polyurethane Catheter with Peelaway Introducer								
Catalog No.		Catheter			Lumen*		Introducer Needle	
Pkg. of 1	Pkg. of 10	Ga	Size (Fr)	OD (mm)	Ga	ID (mm)	Ga	Length
BS4 60-5050 \$	BS4 60-5043	20	2.6	0.9	23	0.25	19	20
BS4 60-5051 \$	BS4 60-5042	18	3.5	1.2	21	0.41	17	25
BS4 60-5052 \$	BS4 60-5041	16	5.0	1.7	19	0.69	15	25
					18	0.48		

* Note: Dimensions given are equivalent lumens converted to a circular ID for comparison.

Micro Polyurethane Catheters with Peelaway Introducers



- Available in 28, 24 and 20 gauge sizes allowing access to veins in subjects as small as 600 grams
- Minimal insertion force reduces vein trauma and pain
- 5 catheter lengths available to accommodate tip placement needs & eliminate trimming

This Micro Polyurethane Catheter is pre-threaded through the unique lightweight peelaway needle introducer providing just the right amount of firmness during insertion, minimizing blood exposure, insuring easy venous access and virtually eliminating traumatic 'shutdown' procedures. A protective sleeve maintains catheter sterility throughout the procedure.

Micro Polyurethane Catheter with Peelaway Introducer							
Catalog No.		Catheter			Introducer	Needle	
Pkg. of 1	Pkg. of 10	Length (cm)	Ga	Size (Fr)	OD/ID (mm)	Ga	Length (mm)
BS4 60-5053 \$	BS4 60-5031	8	28	1.2	0.4 / 0.15	24	19
BS4 60-5054 \$	BS4 60-5032	14	28	1.2	0.4 / 0.15	24	19
BS4 60-5055 \$	BS4 60-5033	20	28	1.2	0.4 / 0.15	24	19
BS4 60-5056 \$	BS4 60-5034	25	28	1.2	0.4 / 0.15	24	19
BS4 60-5057 \$	BS4 60-5028	8	24	1.9	0.6 / 0.35	20	19
BS4 60-5058 \$	BS4 60-5029	19	24	1.9	0.6 / 0.35	20	19
BS4 60-5059 \$	BS4 60-5030	30	24	1.9	0.6 / 0.30	20	19
- \$	BS4 60-5027	8	20	2.6	0.9 / 0.40	19	19

Silastic® Catheters



These Silastic® Catheters are the first externalized catheters designed specifically to address the problems inherent to rodent and small animal catheterization. They are manufactured with unique features that make them the logical choice for routine animal catheterization.

The Catheters are made of Silastic®, a soft biocompatible medical grade silicone rubber that reduces clotting and vessel trauma during insertion.

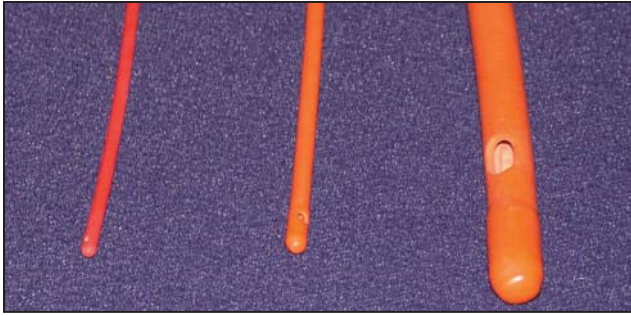
The Catheter has two positional retention rings to facilitate anchoring within or outside the vessel. A reinforced sleeve provides protection and alleviates exit site kinking. This Catheter is available in three sizes. Each Catheter has a polycarbonate female Luer fitting.

These Catheters are 45 cm (18 in) long and can be easily trimmed if a shorter length is required. The low profile female Luer fitting has a suture hole which allows "flat-to-the-skin" anchoring. They are available individually or in a package of 10.

Silastic® Catheters				
Pkg. of 1	Pkg. of 10	Size (Fr)	Lumen mm (in)	OD mm (in)
BS4 60-5061 \$	BS4 59-8262	2	0.3 (0.012)	0.6 (0.025)
BS4 60-5062 \$	BS4 59-8263	3	0.5 (0.020)	0.9 (0.037)
BS4 60-5063 \$	BS4 59-8264	4	0.6 (0.025)	1.2 (0.047)

Catheters

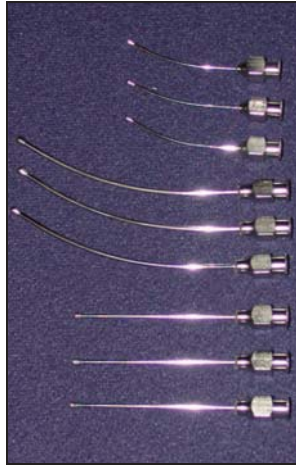
NEW Dosing Catheters (Rubber)



Moulded in rubber with side eye outlets near the tip. Other sizes of rubber catheters available on request. For easy connection to a syringe, see the Catheter Adaptors on page B41.

Catalog No.	\$	Model	Product
BS4 34-0334		7.17.0	Dosing Catheter, 8 french, 39 cm, 1 Eye, pkg. of 5
BS4 34-0335		7.17.1	Dosing Catheter, 10 french, 39 cm, 1 Eye, pkg. of 5
BS4 34-0337		7.17.3	Dosing Catheter, 12 french, 38 cm, 1 Eye, pkg. of 5
BS4 34-0336		7.17.2	Dosing Catheter, 14 french, 35 cm, 1 Eye, pkg. of 5
BS4 34-0338		7.17.4	Dosing Catheter, 20 french, 38 cm, 1 Eye, pkg. of 1
BS4 34-0339		7.17.5	Dosing Catheter, 28 french, 77 cm, 1 Eye, pkg. of 1

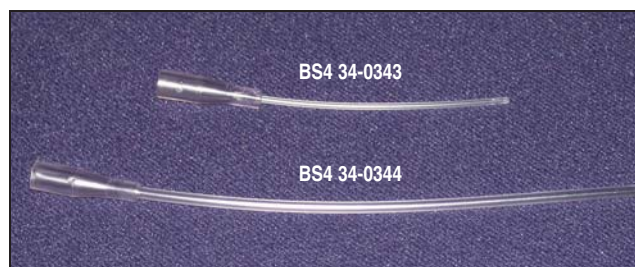
NEW IMS Dosing Cannulae



Suitable for small animals, reptiles and birds, these cannulae are made of stainless steel with a Luer fitting and a bulbous tip. They can be sterilized and re-used.

Catalog No.	\$	Model	Product
BS4 34-0326		7.8.0	Dosing Cannula, 200 mm x 12G, Lawton curved, pkg. of 2
BS4 34-0327		7.9.0	Dosing Cannula, 125 mm x 14G, Lawton curved, pkg. of 2
BS4 34-0316		7.4.0	Dosing Cannula, 75 mm x 16G, Curved, pkg. of 3
BS4 34-0317		7.4.1	Dosing Cannula, 75 mm x 16G, Straight, pkg. of 3
BS4 34-0318		7.5.0	Dosing Cannula, 50 mm x 18G, Curved, pkg. of 3
BS4 34-0319		7.5.1	Dosing Cannula, 50 mm x 18G, Straight, pkg. of 3
BS4 34-0320		7.6.0	Dosing Cannula, 25 mm x 20G, Curved, pkg. of 3
BS4 34-0321		7.6.1	Dosing Cannula, 25 mm x 20G, Straight, pkg. of 3
BS4 34-0322		7.6.2	Dosing Cannula, 38 mm x 20G, Curved, pkg. of 3
BS4 34-0323		7.6.3	Dosing Cannula, 38 mm x 20G, Straight, pkg. of 3
BS4 34-0324		7.7.0	Dosing Cannula, 38 mm x 22G, Curved, pkg. of 3
BS4 34-0325		7.7.1	Dosing Cannula, 38 mm x 22G, Straight, pkg. of 3

NEW Dosing Catheters (PVC)



All Catheters are single packed, non-sterile. Each catheter has one side eye and a Luer fitting. Supplied individually.

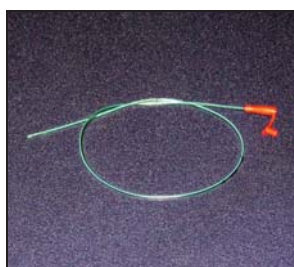
Catalog No.	\$	Model	Product
BS4 34-0342		7.20.3	Dosing Catheter, 8Fg x 100 mm, pkg. of 1
BS4 34-0343		7.20.4	Dosing Catheter, 4.5Fg x 60 mm, pkg. of 1
BS4 34-0344		7.20.5	Dosing Catheter, 8Fg x 120 mm, pkg. of 1
BS4 34-0345		7.20.6	Dosing Catheter, 6Fg x 300 mm, pkg. of 1
BS4 34-0346		7.20.7	Dosing Catheter, 10Fg x 100 mm, pkg. of 1

NEW Small Dosing Catheters (PVC)

These catheters are for dosing very small animals or neonates. Each has a Luer fitting. The 1.02mm OD catheter has a side eye. The 0.61mm OD catheter has an open tube end, which can be cut to the required length. All Catheters are single packed, non-sterile.

Catalog No.	\$	Model	Product
BS4 34-0347		7.20.8	Dosing Catheter OD 1.02 mm ID 0.58 mm length 40 mm, pkg. of 1
BS4 34-0348		7.20.9	Dosing Catheter, OD 0.61 mm ID 0.28 mm length 40 mm, pkg. of 1

NEW Portex Catheters



We supply the complete PORTEX range of catheters and esophageal tubes. Available in sterile, single use packs. Select from a package of 10 or 50 catheters.

Catalog No.	\$	Model	Product
BS4 34-0340		7.20.0	Portex Catheters, Luer 8FG 500 mm long, pkg. of 50
BS4 34-0341		7.20.1	Portex Catheters, Luer 8FG 400 mm long, pkg. of 10

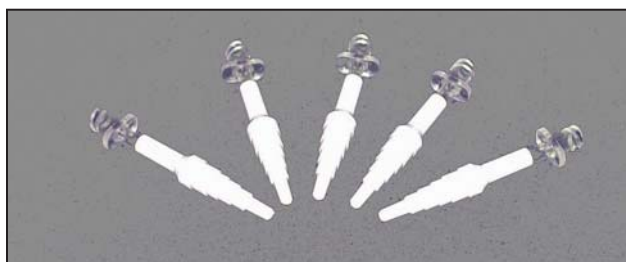
NEW Dosing Gags



These Gags are an invaluable aid when introducing dosing catheters into the esophageal tract. Full instructions for use, including checks for correct positioning, are included. They are available in three sizes, and supplied individually.

Catalog No.	\$	Model	Product
BS4 34-0331		7.14.0	Dosing Gags, Size 1, for guinea pigs, rabbits, cats, etc., pkg. of 1
BS4 34-0332		7.14.1	Dosing Gags, Size 2, for dogs, etc., pkg. of 1
BS4 34-0333		7.14.2	Dosing Gags, Size 3, for pigs, etc., pkg. of 1

NEW Catheter Adaptor

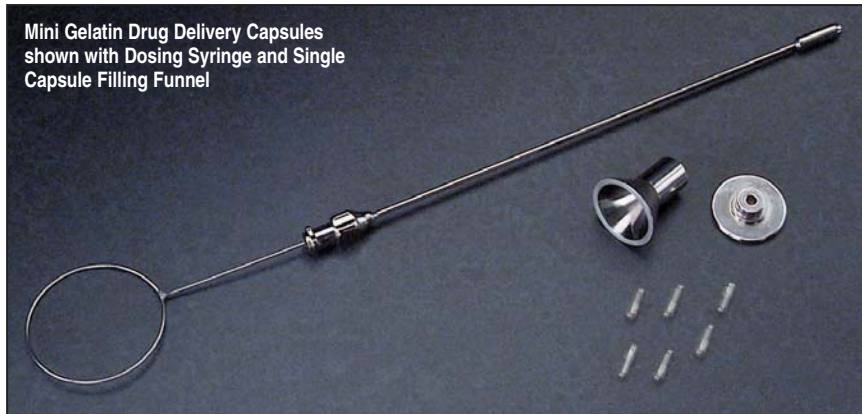


This adaptor enables a Luer syringe to be inserted into a wide mouth catheter. The luer lock adaptor is fused into the connector. Fits catheters from 10 french to 28 french (3.3 to 9.3 mm OD). They are individually wrapped and are non-sterile. Supplied in packs of 10.

Catalog No.	\$	Model	Product
BS4 34-0330		7.12.0	Catheter Adaptor, pkg. of 10

Mini Gelatin Drug Delivery Capsule

Mini Gelatin Drug Delivery Capsules shown with Dosing Syringe and Single Capsule Filling Funnel



Mini Gelatin Capsule Filling Funnel



- New mini size is the only available gelatin capsule small enough for use with rats
- Ideal for encapsulating and dosing materials that are insoluble, form poor suspensions, are effected by excepients, or are odorous and distasteful to the animal
- Saves time and money by eliminating validation of suspension/solution homogeneity
- Excellent alternative to gavage
- Release of dose within 10 minutes of reaching stomach
- For use with:
 - Rats that are 200 grams and larger
 - Guinea pigs that are 300 grams and larger
- Oral delivery of dry materials (powder, beadlets, crystals, paint flakes), pastes, and non-aqueous liquids
- With enteric coating it is suitable for lower GI drug delivery in guinea pigs

This is the only capsule on the market today that is small enough for dosing rats. It is also suitable for guinea pigs. It is ideal for the delivery of dry materials (powder, beadlets, crystals, paint flakes, etc.), pastes, and non-aqueous liquids. They can also be used to encapsulate and dose materials that are insoluble, form poor suspensions, are effected by excepients, or are odorous and distasteful to the animal. The capsules are made from hard gelatin. It is the same process and substance used for capsule manufactured for human use. They meet all FDA standards as well as USA, European, and Japanese Pharmacopeia

standards. Additionally, with an enteric coating they are suitable for lower GI drug delivery in guinea pigs.

Easy-to-Fill

The small size capsule is filled with the desired substance using the convenient filling funnel. Simply place the capsule body into the holder, place the funnel over the holder and fill. They can be filled either with a premeasured dose or by weight. To fill by weight, simply place the whole setup on a precision balance prior to filling. Tare it and then fill the capsule. When the desired amount of the substance is in the capsule, remove the funnel and place the capsule cap onto the body. You are now ready to administer the capsule to the animal. A multiple capsule filler is available which will accommodate 36 capsules simultaneously.

Simple Delivery

Delivery of these capsules is simple and easy. The filled capsule is placed in the dosing syringe. The delivery tube of the dosing syringe is inserted into the animal's esophagus. When in place, the syringe plunger is pressed and placement of the capsule is complete. Regardless of the location of the capsule in the esophagus, provided normal peristaltic action occurs, the capsule will reach the stomach and then discharge its contents within 10 minutes. The capsules may also be used for dosing rectally, vaginally, or subcutaneously.

For first time users it is recommended that you practice with empty capsules. This allows both the researcher and the animal to acclimate to the procedure.

These drug delivery capsules are clear and supplied in a package of 100. The dosing syringe and filler funnels must be purchased separately. Large size delivery capsules available, see page B43.

Specifications

Capsules

Fill Material	Dry materials (powder, beadlets, crystals, paint flakes), pastes, non-aqueous liquids
Capsule Capacity	Holds 25 mg per capsule with density of 1 g/ml
Capsule Disinteg. Time	Within 10 mins. of reaching stomach
Capsule Dimensions:	
External Diameter	2.65 mm(max.)
Length Closed	8.4 mm(max.)
Average Weight	9 mg with cap and body
Dosing Time	< 1 min. per animal
Acceptance	> 98% successful dosing after minimal experience (3 to 4 placebo doses per rat)

Dosing Syringe

Material	Stainless steel, stiff
OD End Cup	3.5 mm(0.13 in)
Length	125 mm(4.9 in) from hub to tip

Catalog No.	\$	Product
BS4 72-1690		Drug Delivery Capsule, Clear, pkg. of 100
BS4 72-1691		Dosing Syringe for Drug Delivery Capsule, pkg. of 1
BS4 72-1692		Single Capsule Filling Funnel, pkg. of 1
BS4 72-1693		Multiple Capsule Filler, pkg. of 1

References:

- 1) "A Simple Method for Administration of Drugs in Solid Form to Fully Conscious Rats," Lax, E.R., et al, *Laboratory Animals* (1983) 187, 50-54

For larger size drug delivery capsules, see page B43.

Small Animal Gelatin Drug Delivery Capsules



These drug delivery capsules are similar to the Mini Drug Delivery Capsule on page 105, just larger in size. They are ideal for the delivery of dry materials (powder, beadlets, crystals, paint flakes, etc.), pastes, and non-aqueous liquids. They can also be used to encapsulate and dose materials that are insoluble, form poor suspensions, are effected by excepients, or are odorous and distasteful to the animal. The capsules are made from hard gelatin. It is the same process and substance used for capsules manufactured for human use. They meet all FDA standards as well as USA, European, and Japanese Pharmacopeia standards.

These gelatin capsules are designed to dissolve in vivo at 37°C (98°F) within 15 minutes. Gelatin is physiologically inert so it will not react with most test materials or effect their bioavailability. When using capsules for dosing animals, you can be sure that the exact and complete dose has been administered. And unlike gavage, when you use capsules you don't have the problem of solution validation or the possibility of lung aspiration. Capsules are convenient and easy to handle and in most cases it takes only one person to dose an animal.

These drug delivery capsules are clear and available in 8 sizes. They are supplied in a package of 100. Larger sizes are available by special order. Please call for details.

The following capsule size chart and table of specifications will aid in determining which size capsule is appropriate for the specific animal being dosed and the amount of test material to be administered.

A filling funnel is available separately for each size capsule. They are supplied individually and make filling the capsules simple and fast.



- 8 sizes available for use with kittens to dogs*
- Ideal for encapsulating materials that are insoluble, form poor suspensions, are effected by excepients, or are odorous and distasteful
- Saves time and money by eliminating validation of suspension/solution homogeneity
- An excellent alternative to gavage
- In compliance with US, European and Japanese Pharmacopeias
- Fillable with almost any dry materials, pastes, and non-aqueous liquids
- Machine fillable

Small Amount Gelatin Drug Delivery Capsules

Capsule Size	5	4	3	2	1	0	00	000
Fill Weight	**	**	**	**	**	**	**	**
Theoretical Volume	0.13 ml	0.21 ml	0.30 ml	0.37 ml	0.50 ml	0.68 ml	0.95 ml	1.37 ml
External Diameter:								
Cap	4.83 mm	5.31 mm	5.82 mm	6.35 mm	6.91 mm	7.65 mm	8.53 mm	9.91 mm
Body	4.64 mm	5.05 mm	5.56 mm	6.07 mm	6.63 mm	7.34 mm	8.18 mm	9.55 mm
Locked Length	11.0 mm	13.9 mm	15.5 mm	17.5 mm	19.0 mm	21.2 mm	23.3 mm	26.1 mm
Drug Delivery Capsule \$	BS4 72-1694	BS4 72-1695	BS4 72-1696	BS4 72-1697	BS4 72-1698	BS4 72-1699	BS4 72-1700	BS4 72-1701
Filling Funnel \$	BS4 72-4150	BS4 72-4151	BS4 72-4152	-	BS4 72-4154	BS4 72-4155	BS4 72-4156	BS4 72-4157

NEW

* Note: The correct size capsule to use for dosing depends on the species, animal size and age, and other physiological characteristics. If uncertain of what size is appropriate for a specific animal, refer to a veterinarian or pharmacist for a recommendation.

** Note: Actual fill weight is dependent on fill material bulk density.

Other Delivery Products

NEW Implantable Infusion Pumps



- Completely Implantable
- Refillable
- Innovative suture band
- Wide range of reservoir volumes and flow rates
- Immune to ambient pressure changes
- Minimally sensitive to changes in ambient temperature
- Start drug delivery at any time
- Enables verification of amount of drug delivered
- Functions as either an implantable or portable external unit
- Crematable

These Implantable Infusion Pumps have been designed to be accurate, versatile, and easy to use. The pumps are available in a range of reservoir sizes and with a wide range of flow rates to give you maximum flexibility in designing your studies. Some of the features of these pumps are not available on any other implantable pumps.

The pump is filled by percutaneously accessing the pump's refill septum. Once filled, the pump will continuously deliver fluid at a substantially constant, factory-set flow rate without any operator intervention until the pump is empty. Drug infusion can be stopped at

any time by percutaneously emptying the pump. Drug delivery can be verified at any time by percutaneously accessing the pump reservoir and observing the volume of infusate remaining in the reservoir.

Each pump size is available with a variety of flow rates, offering from 1 to 50 days between refills. This provides maximum flexibility to match the pump to the requirements of the experiment. In addition, longer infusion periods or higher infusion rates can be achieved by sequentially refilling the pumps. Interruptions in therapy can likewise be achieved by using the pump to infuse a benign fluid (e.g., saline or the diluent), until the next phase of the experiment is to begin. At the end of the experiment, these pumps can be safely cremated.

These pumps are fully implanted devices, and they have no external connections. This enables animals to be co-housed and reduces the chance of infection. This feature, in conjunction with their unattended operation, reduces the need to monitor subjects, and can eliminate the need for repeated nighttime or weekend dosing.

These Implantable Pumps incorporate a pre-attached pump outlet catheter. These pumps have been used for the intravenous, intra-arterial, intrainstestinal, intraspinal, intraventricular, intra-articular, intraperitoneal, intraocular delivery of a variety of fluids. Subcutaneous infusion is not recommended unless pilot studies verify an adequate drug absorption rate through the fibrous sheath that inevitably encapsulates the subcutaneous segment of the catheter within about two weeks of implantation.

For full details on Implantable Infusion Pumps, see page A22 and A23.

Series 100

Series 100 pumps have 1 ml reservoir capacity. Although they can be used for animals of any size (>150 g) they are particularly appropriate for implantation in small animals, such as rats. The pumps are available in a range of nominal flow rates from 0.75 ml/24 hr (one day flow period) to 0.040 ml/24 hr (25 day flow period). In Series 100 pumps, the diaphragm functions as the fill septum, pressure source, and front wall of the pump reservoir. The pumps can be percutaneously refilled at least 100 times.

Series 2500

Series 2500 pumps have 25 ml reservoir volume and are designed for use on larger animals. They have been used successfully in animals as small as rabbits (>4 kg), and as large as livestock. The pumps are available in a range of nominal flow rates from 18.75 ml/24h (one day flow period) to 0.50 ml/24hr (50 day flow period). These pumps can be percutaneously refilled at least 500 times.

Note: Nominal flow rates are quoted for water at 37°C with no backpressure. Infusate viscosity, temperature, and backpressure affect the pump flow rate.

Specifications

	Series 100	Series 2500
Animal	Rats (>150 g) and larger	Rabbits (>4 kg) and larger
Power Source	Diaphragm	Diaphragm
External Dimensions, (Dia. x H)	25 x 6 mm	75 x 25 mm
Weight (empty)	5 g	120 g
Usable Volume	1 ml	25 ml
Reservoir Pressure:		
Psi	4	8
Bar	0.27	0.55
Refill Septum:		
Compatible Needles (max size)	26 G	22 G
Needle Type	Hypodermic	Non-coring
Puncture Life* (min punctures)	200	500
Internal Filter Pore Size	0.2	0.2

* Rated with compatible needles. Incompatible needles will reduce septum puncture life.

Catalog No. \$ Flow Rate Flow Period

Series 100 Continuous Flow Implantable Infusion Pump, pkg. of 5

BS4 72-4245	0.10 ml/day	10 Days
BS4 72-4246	0.75 ml/day	1 Day
BS4 72-4247	0.40 ml/day	2 Days
BS4 72-4248	0.25 ml/day	4 Days
BS4 72-4249	0.17 ml/day	6 Days
BS4 72-4250	0.06 ml/day	17 Days
BS4 72-4251	0.04 ml/day	25 Days

Series 2500 Continuous Flow Implantable Infusion Pump, pkg. of 1

BS4 72-4605	18.75 ml/day	1 Day
BS4 72-4606	10.0 ml/day	2 Days
BS4 72-4607	6.25 ml/day	4 Days
BS4 72-4608	4.25 ml/day	6 Days
BS4 72-4609	2.50 ml/day	10 Days
BS4 72-4610	1.50 ml/day	17 Days
BS4 72-4611	1.00 ml/day	25 Days
BS4 72-4612	0.75 ml/day	33 Days
BS4 72-4613	0.50 ml/day	50 Days