

Laboratory Applications for KD Scientific Syringe Pumps



INTRODUCTION

KD Scientific syringe pumps are the research community's pump of choice for micro and macro fluidic applications. Our pumps have a myriad of uses in the laboratory making them an essential piece of equipment for daily use. The touchscreen interface is remarkably easy to set up giving you more time for your research. The pump can even be used in a vertical or horizontal configuration depending upon your experimental setup.

KD Scientific syringe pumps are developed to provide the smoothest flow and most accurate volume delivery in the industry. When compared to competitive syringe pumps, the Legato series provides superior performance and we have the data to prove it.

APPLICATIONS:

The following applications are just a sample of the many uses for KD Scientific syringe pumps in your laboratory.

Drug Infusions

KD Scientific syringe pumps are a superior solution when it is necessary to inject drugs or nutritional compounds with high accuracy and precision of the flow and volume being delivered to the subject. Typically, *in vivo* experiments include investigations into the pathogenesis of infections using live bacteria or their toxins, along with measuring the effects of antibiotics or drugs on a subject. Delivering accurate volumes and flows is critical to maintaining the proper dosing regimens and interpretations of pharmacokinetics and pharmacodynamics data.

For example: A glucose clamp technique is a method for quantifying insulin secretion and resistance. It is used to measure how well an animal metabolizes glucose or how sensitive the animal is to insulin. This technique is a common practice in animal diabetes studies. The syringe pump provides the smooth flow and accurate volume delivery needed to produce repeatable results.

The superior performance of KD Scientific syringe pumps produces the smoothest flow at low flow rates of delivery causing minimal biological distress to the animal.

Microdialysis

Microdialysis is a minimally invasive sampling technique that is used for continuous measurement of free, bound analyte concentrations in the extracellular fluid of virtually any tissue.

KD Scientific syringe pumps provide smooth accurate flow down to the pL/min. When used with a microdialysis probe you can target specific regions of the brain or tissue being tested.

Cell Studies

Cellular studies typically involve the microinjection of very small volumes under controlled conditions. The accurate delivery of microinjections into the cell can be a difficult challenge. However, the requirement for delivery of microliter, nanoliter or picoliter volumes of drugs, proteins or toxins into the cell can be easily satisfied by using a Pump 11 Elite precision syringe pump. KD Scientific syringe pumps also have the option to add a footswitch to start/stop infusion flow on command, giving you additional control over your experiment.

Cell perfusion assay experiments also require the use of a precision syringe pump. One such experiment is shear flow testing. Shear Flow is the creation of forces in a shear flow chamber using a Legato 100 syringe pump to infuse the flow. This setup will emulate the cell environment in the body allowing you to perform biological modeling. For example: *In vivo*, several adherent cell types are exposed to mechanical shear stress in biofluidic systems like blood vessels. Cell perfusion can have a great impact on the physiological behavior and adhesion properties of cells by emulating their natural environment allowing for more accurate data collection.

Titration / Volumetric Analysis

Titration is a common laboratory method of quantitative chemical analysis that is used to determine the unknown concentration of an identified component (analyte). A known concentration and volume of titrant reacts with a solution of the component to determine concentration. Since volume measurements play a key role in titration, it is also known as volumetric analysis.

KD Scientific syringe pumps allow you to easily set the required volume for your titration experiment. The touchscreen interface presents recognizable icons to allow you to quickly set the pump for proper infusion. The +/- 0.5% accuracy of the pump assures that your experiment will yield the proper results.

Results

There are thousands of scientific publications referencing the use of KD Scientific syringe pumps in areas including drug infusion, cell studies, microdialysis, microfluidics, titrations, and more. You can count on our expert technical support to provide product recommendations and application support to advance your studies.

For more information about KD Scientific products, please visit our website at www.kdscientific.com.