Accessories and Disposables

1. 1000 Y-irradiated Microsyringes
   CAT. 90001780
2. 1000 Y-irradiated Sample Beakers
   CAT. 90001790
3. Plate for 15 cm Petri Dishes
   CAT. 90001715
4. Holder for sample beaker box
   CAT. 90001949
5. Holder for Micro-syringe box
   CAT. 90001950
6. Sampling Holder for Beakers
   CAT. 90001974
7. Barcode reader
   CAT. 90005700

Technical data

Reproducibility: > 99%
Time for a full cycle: 30 s
(disposable syringes make disinfection unnecessary)
Spreading modes stored:
22 spread modes (34 counting those for 15mm Petri plates)
Petri plate diameters:
100 and 150 mm
Minimum step volume: < 10 nl
Maximum pipetted volume: 100 µl
Syringe material: Polypropylene
Plunger material: Polyethylene H.D.
Auto checking: Programmed in 6 regions
Touch screen: 5.71 in

Operating system: Windows embedded CE 6.0 R3
External balance connection: Serial RS232 DB9
Printer connection: Serial RS232 DB9
Barcode reader connection: Specific connection for IUL barcode readers
Connection for updates: Ethernet/USB pendrive
Additional connections for peripherals: 2 x USB Host ports
Dimensions (WxHxD):
51.5 x 42 x 50 cm / 20.3 x 16.5 x 19.7 in
Weight: 20 Kg / 44 lb.
Motion control: Microcontroller regulated stepper motors

Specifications subject to change without notice

For more information please visit us at:
www.iul-inst.com

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Cleaner, faster, better
Spiral plater

IUL INSTRUMENTS
www.iul-inst.com
Introduction to spiral plating

Spiral plating is a widely accepted microbiological surface plating technique that was created in the 1970s to reduce the amount of Petri dishes used in surface spreads. Time-consuming serial dilutions required in conventional spread plating are avoided. A single spiral spreaded plate spares the inoculation of 3 Petri plates, drastically reducing operation times and materials.

This technique is based on the usage of an Archimedean spiral spread. Volumes poured along a spiral decrease exponentially so that a single plate hosts several sample concentrations distributed across the spiral. Once incubated, plates are read using a specific counting grid.

Eddy Jet 2 as a leading edge spiral plater

Eddy Jet 2 is an unmatched spiral plater that pushes the outstanding standards of the first EDDY JET even further by adding trendsetting innovations to spiral plating:

* Its state of the art connectivity (featuring an Ethernet connection, 2xUSB ports and 2xRS-232 ports): allow for connection to:
  - a printer: that can print labels and records of the inoculations performed
  - a barcode reader: that allows for plate traceability
  * EJ2’s streamlined intuitive software is commanded from a color touch panel
  * IUL also improved spread times in this device.

EJ2 stands out as the spiral plater with the widest range of spiral distributions: it can make up to 22 different spiral distributions.

Eddy Jet 2 Workflow

1. Eddy Jet 2’s beak grabs a brand new sterile syringe.
2. The syringe draws in a liquid sample.
3. As the agar plate spins, the syringe automatically dispenses accurate volumes of sample over the plate drawing a spiral with the loaded sample.
4. Eddy Jet 2 gets rid of the sample-contaminated syringe.

IUL’s patented syringe method

When IUL released Eddy Jet 1, in 1998, a revolutionary approach to spiral plating was achieved by implementing disposable Gamma-ray sterilized microsyringes to perform sample spreading.

IUL’s world patented microsyringes prevent any cross-contamination from taking place making Eddy Jet 2 the spiral spreader with the highest sensitivity.

Also, Gamma-ray microsyringe sterilization makes cleaning cycles unnecessary, saving large amounts of time.

Unlike other spiral plating devices, Eddy Jet 2 doesn’t require for bleach disinfection. Implying that no leftover bleach may affect sample bacteria, avoiding false negative results. Thus, Eddy Jet 2 offers labs the highest specificity available in the market.
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A FEW WORDS ABOUT EDDY JET.

In 1973, Dr. J. Ed Campbell introduced the spiral inoculation method when he launched the Model A Spiral Plater (Spiral Systems, Cincinnati, OH, U.S.). The spiral method is based on an inoculation pattern that represents the spiral of Archimedes. This kind of spiral describes a curve in which the radius is directly proportional to the angle \((r = a\theta)\).

With the spiral method, a known volume of sample is sowed, from the center to the periphery of the plate. This pattern implies a decrease in the concentration of the sample while the process takes place. This effect is achieved through two ways:
1- The increasing of the angle and the radius
2- The reduction of the sample flow from the center to the outside of the dish.

Thus, the volume of sample deposited per unit area of plate decreases across the spiral resulting in a dilution effect, up to one thousand-fold dilution range.

The spiral method was compared to the pour plate procedure with the use of pure and mixed cultures (Gilchrist et al. 1973). The results did not demonstrate a significant difference in variance. Regression and correlation coefficients between the various methods were all highly significant and the results obtained by the spiral plate method were within the limits of error for traditional quantitative methods. Further comparisons were made in the United States (Donnelly et al. 1976; Gilchrist et al. 1976; Jarvis et al. 1977). Jarvis et al. investigation was carried out by four operators, one of them was not a very experienced microbiologist, and five samples of four types of foodstuff were tested by five plating methods. The results showed no statistically significant differences between the methods at the 5% level of probability. Neither were there significant differences between operators nor interactions (Jarvis et al. 1977).

The methodology has been well accepted, as a way to reduce the number of serial dilutions needed for microbiological testing and also the number of Petri dishes needed. This technique has further advantages i.e. the growth rate of the same species is the same, resulting in colonies of about the same size. Another advantage is that the spiral stops before the meniscus of the agar is reached. Thus, colonies are counted only on the clear, lever portion of the agar (Gilchrist et al. 1973). After those studies and experiments, the Association of Official Analytical Chemists (AOAC) accepted the spiral plate method as an U.S. Official Method (Journal of the AOAC, 60 1977, Methods No. 46.C10-46.C16).

Either 100 or 150 mm. diameter dishes can be used. The only thing that must be done is changing the turntable where the dish is placed. Sample deposition is done through a highly precise disposable 110µl-volume capacity micro-syringe. Sample remains inside the micro-syringe during the whole process, thus avoiding the use of the old complex tubing and pumping system that requires constant cleaning in order to avoid cross-contamination. Moreover, remains of cleaning products such as bleach are also avoided because the syringe is used only once.

Eddy Jet has stored in its memory many different programs. They allow the users to seed different final volumes in different distribution patterns depending on the program used. The use of one or another program has
no further consequence than the seeding of a determined sample volume with a precise distribution pattern: proportional, logarithmic or lineal. If the costumers are already used to an existing specific program they can carry on using it because they will find any of them in the memory of the Eddy Jet. If they are not used to any of them, it doesn’t matter very much which one of them they use for there isn’t a unique program for a specific type of sample.

After incubating the plates, colonies appear distributed along the spiral track showing a radial increased separation. Seeding results are then comparable to those done by hand, either pour or mass, with a correlation higher than 95%. Counting the colonies manually with a grid that follows the same law of distribution, from the periphery to the center of the plate, the method enables the users to establish the concentration of microorganisms in the sample. Otherwise, counting can be done automatically, with a Countermat or Countermat Flash. At least 20 colonies should be counted in a sector (see figure below. A sector is one of the shadowed zones) because the average variance obtained with fewer than 20 colonies per plate showed to be 0.00503 compared to 0.00261 when plates with fewer than 20 colonies were excluded (Gilchrist et al. 1973). Once a sector is counted, the opposite one must be counted too.

Eddy Jet has other additional functions such as the machine checking. Costumers can do it themselves in order to check that both the volume deposed and the position of the syringe onto the plate are the correct ones.

BIBLIOGRAPHY