

# MicroBeta and TopCount

Scintillation and Luminescence Counters



## Counters That Work

the Way You Do

# Two Great Counters

— One Just Right for You

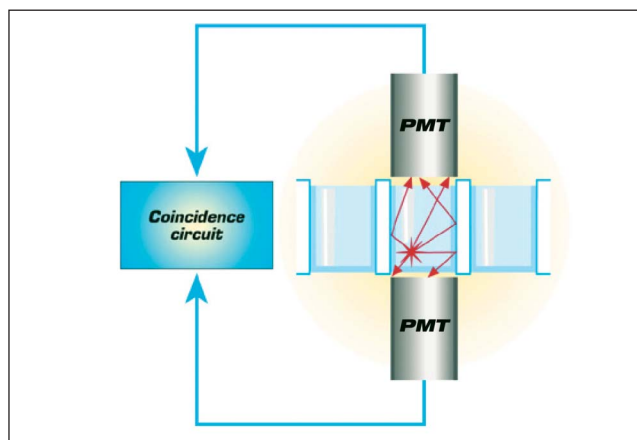
Scientists like you made the MicroBeta® and TopCount® the most popular scintillation and luminescence counters in the world for low and medium throughput applications. So how do you decide which one to choose? It's easy. Consider the applications you do and how you prefer to format them. Of these two great counters, one is just right for you.

## MicroBeta TriLux and MicroBeta JET Scintillation and Luminescence Counters

If you need a sensitive counter that can handle a variety of applications in different sample formats, choose MicroBeta. This scintillation and luminescence counter detects beta, gamma and glow luminescence. Add the optional JET and you'll get flash luminescence detection capabilities.

MicroBeta's versatility is due to its unique detector design. Each detector consists of two photomultiplier tubes (PMT), positioned above and below the sample. These count the sample from the top and bottom at the same time. The result is true coincidence counting, the classically employed method for liquid scintillation counting that results in exceptional sensitivity while maintaining low backgrounds.

MicroBeta's unique cassette-based sample changing mechanism provides a versatile sample support system for all kinds of sample types, from microplates to microcentrifuge tubes to 4 mL LSC vials. Just load your samples into the appropriate cassette and count!



MicroBeta's two photomultiplier tubes form the basis of highly sensitive coincidence counting for different sample formats.



MicroBeta

### MicroBeta's Key Features and Benefits:

- **Maximum flexibility** in counting formats.
- **ParaLux™ count mode** to enhance performance for scintillation proximity assays.
- **Best counting efficiency** for filtermats.
- **Optional detector cooler for upper PMTs** for better luminescence sensitivity.
- **Flash luminescence measurement capabilities** with MicroBeta JET.
- **Adaptable to opaque plates** by counting with just the upper PMT.
- **Single and dual label CPM and DPM** counting modes.
- **Handles 24/96- or 96/384-well microplates** (depending on the model), flexible plates, microcentrifuge tubes, filtermats, and 4 mL liquid scintillation counting vials.
- **16-plate or 32-plate capacity models.** Alternatively, the Robot Loading System (RLS) accepts one plate at a time loaded manually or set up to operate in an automated laboratory environment.

- **Choice of 1, 2, 3, 6 or 12 detector models** (for MicroBeta TriLux) or **1, 2, 3 or 6 detector models** (for MicroBeta JET).
- **Built-in barcode reader** identifies permanent barcode on cassette for identification of up to 100 counting protocols and other counting commands.
- **Optional plate barcode reader** for positive plate identification.

## TopCount NXT Scintillation and Luminescence Counter

When you need performance, sample capacity and throughput, choose TopCount. TopCount delivers high efficiency, low background counting of beta, gamma, and glow luminescence samples in 24-, 96- and 384-well microplates and microvials.

The TopCount's performance is a result of its unique counting technology. A patented single photomultiplier tube (PMT) time resolved counting method results in virtually crosstalk-free counting when used with opaque plates. High sensitivity is attained by using TR-LSC technology, a method that discriminates between background and true counts by analyzing the decay period of each scintillation event. The results are high signal-to-noise ratios, superior sensitivity, and linearity over a wide dynamic range.

TopCount's fast photon counting and temperature controls make it an ideal counter for luminescence assays. Its unique circuitry enables counting of more photons per second than even most dedicated microplate luminescence detection systems. Plus its small PMTs have very low intrinsic backgrounds. The result is high signal and low background in applications sometimes difficult to measure optimally with other counters, especially very small, low count rate samples.



TopCount's time resolved counting method provides high performance counting in opaque plates.



TopCount

Load TopCount's external stackers with up to 40 microplates and it will count them completely unattended. For luminescent samples, throughput can be more than 50,000 samples/day. You can load new plates and unload counted plates without interrupting the counting process!

### TopCount's Key Features and Benefits:

- **Very low scintillation and luminescence backgrounds.**
- **Excellent counting efficiency in opaque microplates.**
- **Ideal for scintillating plates, such as FlashPlate® microplates.**
- **Compatible with filterplates and filtermats.**
- **Temperature-controlled counting chamber** ensures reproducible counting environments, so sensitivity remains constant from day-to-day, assay-to-assay.
- **Single and dual label CPM and single label DPM count modes.**
- **External standardization** (24-well format) for increased counting accuracy with low count rate single label samples and dual label DPM measurements.
- **Accepts 24/96-, 96- or 96/384-well microplates and microvials**, depending on model.
- **Reads up to 12 samples at a time** for maximum throughput.
- **Choice of 2, 4, 6 or 12 detector models.**
- **External removable stackers** for 20 or 40 microplates.
- **Easy to integrate into robotic systems.**
- **Built-in barcode reader** for positive plate identification.

## Both Counters Feature:

- **High sensitivity luminescence counting.** Fast photon counting circuitry provides linearity to over  $20 \times 10^6$  CPS.
- **Crosstalk correction algorithms** (for assay types that might exhibit isotopic crosstalk, most notably large volume  $^{32}\text{P}$  and  $^{125}\text{I}$  samples).
- **Ability to measure  $^{32}\text{P}$  in water** (Cerenkov measurement), saving reagent and disposal costs.
- **Built-in GLP compliant software** including extensive data logging and charting options of key parameters such as efficiency and background of each detector.
- **Optional 21 CFR Part 11 compatible software package.** Features include instrument access security, electronic record security and audit logs.

## Common Applications and Methods Include:

- Cell viability assays
- Proliferation assays
- Reporter gene assays
- Solid-phase scintillation proximity assays
- Dry and liquid scintillation counting
- Filtration assays
- In-plate binding assays
- Direct analysis of adherent cells
- Wipe tests
- Cerenkov counting



## Additional Information

Visit [www.perkinelmer.com/mbtc](http://www.perkinelmer.com/mbtc)

[MicroBeta 21 CFR Part 11 Compatibility](#)

[TopCount 21 CFR Part 11 Compatibility](#)

[TopCount Specifications](#)

[MicroBeta TriLux Features Guide](#)

[MicroBeta JET Features Guide](#)

[Cerenkov Counting Performance on the TopCount Microplate Scintillation and Luminescence Counter](#)

## Super Sensitive Luminescence Measurements

Thanks to high speed photon counting circuitry, MicroBeta and TopCount have best-in-class glow-type luminescence performance with linear responses in excess of 20 million CPS and backgrounds below 100 CPS. Temperature control features guarantee the optimum counting conditions for luminescence assays.

If your applications require flash luminescence, choose MicroBeta JET. It uses one or more reagent injectors for measuring prompt (or 'flash') reactions. MicroBeta JET can be used for flash luminescence applications such as aequorin/ $\text{Ca}^{2+}$  measurement and dual label reporter gene assays.

## PerkinElmer Microplates for Luminescence Assays

### MicroBeta

- Isoplate™ black 96-well microplates with clear wells
- Isoplate black & white 96-well microplates
- Isoplate white 96-well microplates with clear wells
- Visiplate™ black 24-well microplates with clear bottoms
- Visiplate white 24-well microplates with clear bottoms

### TopCount

- CulturPlate™ black 96- and 384-well microplates
- CulturPlate white 24-, 96- and 384-well microplates
- OptiPlate™ black 96- and 384-well microplates
- OptiPlate white 24-, 96- and 384-well microplates
- ViewPlate™ black 96- and 384-well microplates with clear bottoms
- ViewPlate white 96- and 384-well microplates with clear bottoms

## PerkinElmer Luminescence Assay Systems

PerkinElmer's luminescence assay systems offer exceptional efficiency, speed and simplicity for research and drug discovery applications.

### Reporter Gene Assays

- brite**lite**™
- fire**lite**™\*
- luc**lite**®
- steady**lite** HTS™

### Cell Viability Assays

- ATP**lite**™
- cyto**lite**™
- ATP**lite**™ 1step
- easy**lite**-Kinase™

## Application Notes

Visit [www.perkinelmer.com/mbtc](http://www.perkinelmer.com/mbtc)

[Cell lines expressing recombinant aequorin and a G-protein coupled receptor for functional screening \(MicroBeta\)](#)

[Determination of Neutrophil Activation by Chemiluminescence Using the TopCount Microplate Scintillation and Luminescence Counter](#)

[High Throughput Luminescence Assays Using Six Detectors on TopCount](#)

[Nucleic Acid Quantification by Chemiluminescence Assay of Polymerase Chain Reaction Products](#)

[Reporter Gene Assays on TopCount](#)

[The Measurement of Luminescence on TopCount](#)

# Radiometric Measurements

in Any Format

## Filtration Assays

MicroBeta and TopCount are excellent counters for heterogeneous cell proliferation and receptor binding assays because they accommodate different filtration platforms. Add a PerkinElmer harvester and minimize preparation time, consumables costs and waste.

### FilterMate Universal Harvester

This compact versatile system simultaneously harvests and washes samples from 96- or 24-well regular or deep well microplates onto solid filter supports such as UniFilter® plates or filtermats. FilterMate™ can be adjusted to cut individual filter disks or leave the filtermat intact. Cut filters are easily transferred into gamma or liquid scintillation counting vials. FilterMate is an ideal solution for rapid processing of cell proliferation assays, receptor binding assays, and other applications.



### Filtermats — Best on MicroBeta

MicroBeta has the best counting efficiency for filtermats due to its dual PMT coincidence detector setup. A variety of cassettes are available which support the appropriate filtermat. Either liquid scintillator (Betaplate Scint) or solid scintillator (Meltilex®) can be used. TopCount offers the flexibility to count filtermats as well.

### UniFilter Harvesting Microplates — Ideal with TopCount

24- and 96-well UniFilter microplates have built-in glass fiber filters disks in GF/B or GF/C material (96-well format only). Each filter area is physically and optically isolated from neighboring wells to prevent optical crosstalk and, of particular importance in receptor assays, sample migration. Simply harvest the plate into the FilterMate Harvester, add 20–150 µL of MicroScint™ cocktail to each well, seal the plates, stack and count on TopCount.

### Millipore MultiScreen Plates — Easy to Use with Either Counter

Directly count MultiScreen® plates on MicroBeta with the Millipore cassette or on TopCount using a MultiScreen Adaptor. Just add MicroScint Cocktail, cover and count.

### PerkinElmer Microplates and Filtermats for Filtration Assays

#### MicroBeta

- AcroWell™ Filter Plate, 96-well microplate, 0.45 µ pore size
- DEAE filtermat, suitable for assays using any negatively charged labeled compound
- Filtermat A, 24- and 96-well GF/C glass fiber filtermats printed on both sides
- Filtermat B, 24- and 96-well thick GF/C glass fiber filtermats printed on both sides
- GF/P30 filtermat, suitable for assays using positively-charged labeled compounds

#### TopCount

- Harvest Plate, white 96-well microplate, 1.2 µ pore size, GF/C filter
- OmniFilter™ white 96-well Barex microplate to count any type of filter
- UniFilter white 24- and 96-well Barex microplate, 1 µ pore size, GF/B filter
- UniFilter white 96-well Barex microplate, 1.2 µ pore size, GF/C filter

### Application Notes

Visit [www.perkinelmer.com/mbtc](http://www.perkinelmer.com/mbtc)

[33P Counting Performance on the TopCount and TopCount NXT™ Microplate Scintillation and Luminescence Counters](#)

[Cell Proliferation Assays \(TopCount\)](#)

[Counting filter samples on MicroBeta TriLux and MicroBeta JET Counting Radioisotopic and Luminescent Labels on Filters and Membranes with the FlexiFilter™ Plate \(TopCount\)\\*](#)

[The direct measurement of Millipore MultiScreen Filterplates in the MicroBeta](#)

[Two Methods of Harvesting Receptor Binding Assays \(TopCount\)](#)

\*FlexiFilter is now sold under the name OmniFilter.

## Solid Phase Homogeneous Assays

Immunoassays, other types of binding assays, enzyme assays and even functional cellular assays have been simplified and accelerated by the availability of scintillating plates and beads that provide homogeneous assay platforms, all readily measured on MicroBeta and TopCount counters.

### FlashPlate

White polystyrene FlashPlate microplates are designed for homogeneous radiometric assays, based upon the principle of scintillation proximity. The interior of each well is permanently coated with a thin layer of scintillant which provides a platform for non-separation assays using a variety of isotopes without adding liquid scintillation cocktail. FlashPlates can be measured directly on TopCount with optimum performance. MicroBeta can also read FlashPlates in a mode where only the top PMTs are used. FlashPlate microplates come in a variety of formats that allow you to build an assay according to your needs.

### FlashBlue

FlashBlue™ GPCR beads are scintillating beads specifically designed for high throughput homogeneous GPCR-radioligand binding assays. These beads are 3-microns in diameter and consist of a polystyrene core covered by a hydrophilic coating that reduces non-specific binding. Wheat germ agglutinin (WGA) is covalently attached to the surface of FlashBlue GPCR beads for the capture of cellular membranes. In GPCR binding assays, radioligand molecules bound to the membranes' receptors activate the scintillating beads and trigger a blue light emission. FlashBlue GPCR beads can be used in both 96- and 384-well formats and measured on either the MicroBeta or TopCount.

### Application Notes

Visit [www.perkinelmer.com/mbtc](http://www.perkinelmer.com/mbtc)

[33P Counting Performance on the TopCount and TopCount NXT Microplate Scintillation and Luminescence Counters](#)

[Coated Plate Immunoassay on the MicroBeta — e.g. TSH - IRMA Counting FlashPlates on the MicroBeta](#)

[P-33 SPA Using Caesium Chloride Bead Suspension](#)

[Quench Correction in Scintillation Proximity Assays](#)

[Scintillation Proximity Assay on the TopCount Microplate Scintillation Counter](#)

[Solid-phase RIA in Microplates \(TopCount\)](#)

[FlashBlue GPCR: Scintillating Beads for GPCR Radioligand Binding Assays](#)

## Adherent Cell Culture Assays

Adherent cell assays can also be made directly in crosstalk-free in-plate format. PerkinElmer offers a range of 24- and 96-well tissue culture plates compatible with MicroBeta and TopCount for adherent cell studies.

### PerkinElmer Microplates for Cellular Assays

#### MicroBeta

- Isoplate black 96-well sterile, tissue culture-treated individually-wrapped microplates with clear wells and lids
- Isoplate white 96-well sterile, tissue culture-treated individually-wrapped microplates with clear wells and lids
- SpectraPlate™ clear 96- and 384-well sterile, tissue culture-treated individually-wrapped microplates with lids
- Visiplate black 24-well sterile, tissue culture-treated microplates with clear bottoms and lids
- Visiplate white 24-well sterile, tissue culture-treated microplates with clear bottoms and lids

#### TopCount

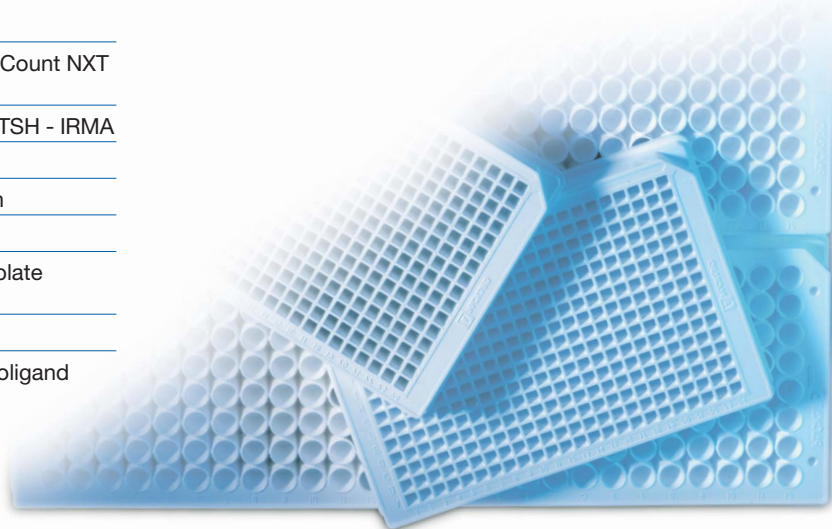
- CulturPlate black 96- and 384-well sterile, tissue culture-treated microplates with lids
- CulturPlate white 24-, 96- and 384- well sterile, tissue culture-treated microplates with lids
- ViewPlate black 96- and 384-well sterile, tissue culture-treated microplates with clear bottoms and lids
- ViewPlate white 96- and 384-well sterile, tissue culture-treated microplates with clear bottom and lids

### Application Notes

Visit [www.perkinelmer.com/mbtc](http://www.perkinelmer.com/mbtc)

[Cell Viability Testing Using Isoplates \(MicroBeta\)](#)

[ViewPlates: Methodology for Counting Isotopic and Luminescent Labels for Use in Adherent Cell Assays](#)



## Miniaturize Your LSC Assays—and Minimize Cocktail Use

Reduce sample volumes, save reagents and reduce waste by converting your 6 mL or 20 mL LSC assays to 24- or 96-well microplate format. For larger volume assays (e.g. wipe tests), or just for convenience, convert your arrays to Eppendorf microtubes (up to 2 mL) or to 4 mL plastic counting vials and count on MicroBeta.

How? Use scintillation cocktails with high sample loading capacities that do not damage the plastic microplates. For TopCount, PerkinElmer's MicroScint™ PS is recommended. For MicroBeta, use OptiPhase SuperMix, OptiPhase HiSafe® 3 or Ultima Gold™ XR.

## Solid (Cocktail-free) Scintillation Counting

Simplify procedures, save cocktail waste and improve sensitivity with LumaPlate™. Designed for TopCount but also compatible with MicroBeta, this plate provides an alternative to the use of cocktail. Simply add your sample to the coating of solid scintillator in each well, dry and the sample is ready to be counted. Application Notes are available for a number of assays on LumaPlate including chromium release and HPLC fraction measurement in metabolic studies.

### PerkinElmer Microplates for Solid Scintillation Counting

- LumaPlate white 96-well microplate with scintillant coated on the bottom
- LumaPlate white 96-well deep well microplate with scintillant coated on the bottom



## Application Notes

Visit [www.perkinelmer.com/mbtc](http://www.perkinelmer.com/mbtc)

Counting 4 mL vials, Eppendorf and other tubes on MicroBeta TriLux

Counting <sup>51</sup>Cr Released in Cytotoxicity Assays

Counting Aqueous Samples with the TopCount

Counting Non-Aqueous Samples in the TopCount Microplate Scintillation and Luminescence Counter

Solid Scintillation Counting (TopCount)

The measurement of Chromium-51 on the MicroBeta

Using the TopCount Microplate Scintillation and Luminescence Counter and Deep-Well LumaPlate Microplates in Combination with Micro Separation Techniques for Metabolic Studies

## Even Do Your Wipe Tests

Transfer your wipe tests to MicroBeta or TopCount. There's no need to reserve a second counter for monitoring contamination in your laboratory—wipe-test protocols are available for both instruments.

## Application Notes

Visit [www.perkinelmer.com/mbtc](http://www.perkinelmer.com/mbtc)

MicroBeta Counting Protocol For Measuring Wipe Test Samples

Use of the TopCount for Radioactivity Determinations in Wipe Test

## Get the Counter That's Right For You

For help, contact your local PerkinElmer sales representative. Or for more information about the MicroBeta and TopCount Scintillation and Luminescence Counters and to download literature and application notes, visit [www.perkinelmer.com/mbtc](http://www.perkinelmer.com/mbtc).



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