

Simply
illuminating.



revvity

Solutions for liquid scintillation counting



Introduction

With over 60 years of experience, Revvity provides our customers with total liquid scintillation counting (LSC) solutions for a wide variety of applications.

Revvity's LSC cocktails are easy-to-use, save time, and minimize laboratory errors. Our carefully controlled scintillant blending and quality assurance procedures provide high performance, batch homogeneity, and lot-to-lot uniformity for accurate liquid scintillation counting every time.

Our products include:

- Nonylphenol ethoxylate (NPE)-free LSC cocktails for a safe environment
- Safer LSC cocktails for lower toxicity
- Traditional LSC cocktails for maximum performance
- Application, instrument and sample specific cocktails, and specialty chemicals
- Radiation decontaminants and cleaners

At Revvity, we're committed to high performance, user and environmental safety.

You can trust Revvity's Total Solution of radiochemicals, instruments, cocktails, and consumables for all your radiometric research needs.



Safer cocktails

Occupational safety in laboratories is of unquestioned importance. Classical liquid scintillation counting (LSC) cocktail formulations contain flammable solvents that permeate through polyethylene. Revvity addresses this challenge by offering several ranges of safer LSC cocktails.

Our portfolio of safer liquid scintillation cocktails includes:

Ultima Gold™ Family

High flash point solvent base with high counting efficiency and quench resistance makes the Ultima Gold Family the premier choice for LSC applications.

OptiScint® NPE-Free Family

Versatile, high flash point, NPE-free cocktail family optimized for a variety of LSC applications.

HiSafe™ Family

Improved safety without compromising performance, using di-isopropylnaphthalene (DIN) as a solvent.

Opti-Fluor™ Family

Universal LSC cocktails designed for use with polyethylene vials. The LAB (linear alkyl benzene) solvent base provides an economical medium counting efficiency.

Other Safer Cocktail Products

Our range also includes LAB-based (linear alkyl benzene) and high efficiency mineral oil scintillator cocktails.

Safer cocktails: Ultima Gold Family

The Ultima Gold™ Family is our most popular range of liquid scintillation counting cocktails. These have a very flash point solvent base, which makes them the premier choice for liquid scintillation applications.

- High flash point
- Low vapor pressure
- High counting efficiency
- Quench resistant
- Can be used for scientific R&D use, as defined in Article 3 of the REACH regulations



Ultima Gold is a multipurpose liquid scintillation counting cocktail for a wide range of aqueous and non-aqueous samples. Ultima Gold has a high counting efficiency and is quench resistant. The typical sample load capacity is 4 to 5 mL per 10 mL of cocktail.

Ultima Gold AB is specifically designed for α/β discrimination in liquid scintillation counting and provides the necessary slow pulse decay characteristics. Exhibits high counting efficiencies with high sample uptake capacities for heavy metals and mineral acids. Ten milliliters (10 mL) of cocktail can accommodate > 2 mL of sample and up to 2M mineral acid samples.

Ultima Gold XR is a liquid scintillation cocktail with high sample load capacity for aqueous samples. Use Ultima Gold XR for counting large sample volumes, and for miniaturizing assays from larger to smaller vials. For dilute aqueous salt solutions and buffers with no gel formation, 10 mL of cocktail can accept up to 10 mL water.

Ultima Gold F is a high efficiency cocktail for counting dry filter supports and non-polar organic samples. For α/β liquid scintillation counting, it is an ideal diluent for Ultima Gold AB, increasing energy pulse-shape resolution for small volume samples.

Ultima Gold LLT is ideal for determination of low levels of 3H in a wide range of water samples. Ultima Gold LLT has a large sample load capacity, extremely low background, designed for α/β discrimination, and is quench resistant. It is suitable for urine samples and can accept up to 50% sea water.

Ultima Gold uLLT is preferred for environmental study samples. Made without biogenic materials, Ultima Gold uLLT is the choice for liquid scintillation applications requiring ultra low background values.

Ultima Gold MV is a low viscosity formulation with high counting efficiency for rapid uptake of aqueous and non-aqueous samples. It is recommended for counting small volumes and glass fiber filters. The typical sample load capacity is 2 to 3 mL of aqueous or buffer solutions per 10 mL of cocktail.



Safer cocktails: Ultima Gold Family

	Ultima Gold	Ultima Gold LLT	Ultima Gold uLLT	Ultima Gold AB	Ultima Gold XR	Ultima Gold F	Ultima Gold MV
Versatile	✓	✓					
High sample load		✓		✓	✓		
α/β discrimination		✓		✓		✓	
Filters						✓	✓
Low volume		✓				✓	✓
Low background		✓	✓				
High counting efficiency	✓			✓			✓
Quench resistant	✓	✓			✓		
Environmental samples			✓				
Non-polar organic samples						✓	
Low velocity							✓

Safer cocktails: OptiScint NPE-Free Family

Our range of OptiScint cocktails do not contain NPEs either as a base or derivative component. While scintillation cocktails containing NPEs can still be used for scientific R&D purposes under Article 3 of REACH regulations, OptiScint allows labs a choice to use NPE-free products for greater peace of mind. OptiScint is compliant with regulations, such as the EEC directive 2003/53/EC and REACH, without compromising performance.

- NPE-free
- High flash point, low vapor pressure
- High counting efficiency
- Quench resistant



OptiScint MP is a multipurpose liquid scintillation counting cocktail for a wide range of aqueous and non-aqueous samples. NPE-free and a high flash point makes this cocktail versatile and the choice for most sample types. Ten milliliters (10 mL) of OptiScint MP can accept > 4 mL of many aqueous salt and buffer solutions.

OptiScint LLT is ideal for determination of low levels of 3H in a wide range of aqueous samples. With a high flash point and sample load capacity, low background and α/β discrimination, OptiScint LLT is the choice for low level liquid scintillation counting applications such as environmental sample counting. Ten milliliters (10 mL) of cocktail can accept 12 mL of water. OptiScint LLT is also suitable for urine samples and sea water.

OptiScint F is a high efficiency cocktail for counting dry filter supports and non-polar organic samples. To increase energy pulse shape resolution for small volume samples, it can be used as a diluent for OptiScint AB for α/β counting. It is NPE-free and has a high flash point.

OptiScint Flow is designed for use with flow scintillation analyzers. It is suitable for multipurpose flow counting applications and allows fast and easy mixing without gelling. OptiScint Flow will accept a wide range of HPLC solvents and gradients including ammonium phosphate.



Safer cocktails: OptiScint NPE-Free Family

	OptiScint MP	OptiScint LLT	OptiScint F	OptiScint Flow
Versatile	✓			
High sample load		✓		
α/β discrimination		✓	✓	
Filters			✓	
Low volume				
Low background		✓		
High counting efficiency	✓		✓	
Quench resistant	✓	✓		✓
Environmental samples		✓		
Non-polar organic samples	✓		✓	
Low velocity				
Solids				



Safer cocktails: HiSafe and Opti-Fluor Families

Our **HiSafe cocktails** use di-isopropylnaphthalene (DIN) as the solvent to provide you with improved safety without compromising performance.

- High flash point; low vapor pressure
- Low toxicity; virtually odorless and colorless
- No permeation through plastic vials
- Low background and high 3H counting efficiency

OptiPhase HiSafe 3 is a liquid scintillation cocktail capable of handling a broad range of solutes, making it ideal for a variety of scintillation applications. It combines good counting efficiency with a very high level of sample acceptance, particularly for high ionic strength solutes.

BetaPlate Scint is a HiSafe cocktail for samples harvested or spotted onto dry filter membranes. High counting efficiency may eliminate sample pre-treatment often necessary with conventional cocktails. Ideal for use with samples in organic solutions.

Our **Opti-Fluor cocktails** are universal, safer cocktails designed for use with polyethylene vials. The LAB (linear alkylbenzene) solvent base provides an economical alternative for applications where medium counting efficiency is sufficient.

- Versatile LSC applications
- No diffusion through polyethylene vials
- High flash point; low toxicity

Opti-Fluor is based on the high flash point solvent LAB and shows no diffusion through the walls of polyethylene vials (observed with many LSC cocktails containing toluene, xylene, or pseudocumene). Ten mL Opti-Fluor can accept more than 2 mL of many aqueous buffer solutions.

Opti-Fluor O is used for counting organic (non-aqueous) samples. It can replace classical toluene-, xylene- or pseudocumene-based cocktails for organic samples. It is ideally suited for counting radon in water when a safer cocktail is preferred.

Safer cocktails: Other

We also offer other safer cocktails that are LAB-based (linear alkyl benzene) and high efficiency mineral oil scintillator cocktails to support your lab's research.



Emulsifier-Safe™ is a LAB-based cocktail that is economically priced for aqueous and organic samples. Aqueous samples and many buffer solutions are accepted in a single liquid phase up to a 10 to 15% sample load.

High Efficiency Mineral Oil Scintillator is the cocktail of choice for the detection of radon in water and soil samples. It yields a high counting efficiency and provides the same accuracy as solid detectors for radon. It has a low volatility and a high flash point (79 °C/175 °F).



Classical cocktails

Revvity offers classical LSC cocktail formulations that are optimized for high counting efficiency and maximum sample holding capacity.

Our range of classic liquid scintillation cocktails includes:

Sample Oxidizer cocktails

Our pseudocumene-based oxidizer cocktails are designed for use with Revvity's sample oxidizers to ensure superior performance and consistently reliable results.

Other Classical cocktails

We offer a range of other classical cocktails to support your application needs.





Classical cocktails: Sample Oxidizer cocktails and consumables

These pseudocumene-based oxidizer cocktails are designed for use with Revvity's sample oxidizers to ensure superior performance and consistently reliable results.

Cocktails:

PermaFluor™ E+ is uniquely designed for counting $^{14}\text{CO}_2$ samples that are trapped in Carbo-Sorb E.

MonoPhase™ S will accept up to 23% water, forming a clear fluid that yields outstanding counting efficiencies. It does not foam and does not form a gel, even at extreme mixing ratios (washing cycle). It is the cocktail of choice for obtaining high 3H counting performance from sample oxidizers.

Consumables:

COMBUSTAID can be added to assist in the combustion of difficult-to-burn liquid samples and is designed for use with Revvity sample oxidizers.

Carbo-Sorb™ E is a high-capacity radioactive carbon dioxide absorber compatible with the counting cocktail PermaFluor E+.



Revvity A307 Sample
Oxidizer System



Classical cocktails:

Other Classical cocktails

We offer a range of additional classical cocktails to support your application needs. All our classical cocktails have been optimized for counting efficiency and sample holding capacity.

Insta-Fluor™ Plus is a pseudocumene-based cocktail blended for optimal counting of organic samples and non-aqueous solutions. Compatible with Soluene-350 tissue solubilizer.

Insta-Gel™ Plus is the pseudocumene-based cocktail of choice for a large variety of applications. Due to the very high sample holding capacity and its typical gel formation, Insta-Gel Plus is ideal for counting large volumes of water, thin layer chromatography (TLC) scrapings, and suspended solids.



Pico-Fluor™ Plus is an NPE-free liquid scintillation counting cocktail for counting aqueous samples and buffer solutions. It is compatible with alkaline tissue solubilizers and alkaline samples. It is also resistant to quench and chemiluminescence.

Filter-Count™ is specifically formulated for counting membrane filters. It eliminates self-absorption and accepts wet and dry filters. Filter-Count dissolves cellulose nitrate, mixed cellulose esters, and polyvinyl chloride (PVC) filters and makes other filters transparent.

Hionic-Fluor™ is a cocktail for counting alkaline and concentrated salt samples. Hionic-Fluor exhibits extremely fast chemiluminescence decay with alkaline solutions and tissue solubilizers such as Soluene®-350 and SOLVABLE™.

Emulsifier Scintillator Plus™ is a complete, pseudocumene based ready for-use liquid scintillation cocktail for counting aqueous and non-aqueous samples. It has a maximum sample uptake of 12% for aqueous solutions.

Flow cocktails

Our flow detection cocktails are specially designed for use in flow counting applications.



Ultima-Flo™ AP is a safer cocktail with low viscosity for use in flow scintillation analyzers. Ultima-Flo AP accepts gradients of up to 2.0 M ammonium phosphate with fast and easy mixing without gel formation. It demonstrates high counting efficiency and quench resistance for a wide variety of sample types.

Our **Flo-Scint™ cocktails** are classical pseudocumene-based flow cocktails that are resistant to chemiluminescence and are non-gelling.

- **Flo-Scint II** can be used with polar solvents methanol and acetonitrile and dilute aqueous buffers.
- **Flo-Scint A** is especially formulated for acetonitrile/water gradients and dilute buffer solutions.



Quenched standards

Quenched LSC standards are used to establish efficiency correlation curves, which are applicable to a wide variety of scintillation cocktails and quenching agents.

They are supplied in sets of ten, each containing the same amount of radioactivity, but with progressively higher levels of quench. The toluene-based standards are prepared in PPO/Dimethyl POPOP/toluene, argon-purged and flame-sealed in borosilicate glass ampoules, and the quenching agent is nitromethane. The Ultima Gold and OptiScint standards are based on special cocktail formulations with PPO/Bis-MSB scintillators and nitromethane quenching agent. We offer conventional 20 mL size standards and 7 mL Pico standards.

- **Ultima Gold and OptiScint Quenched Standards and Sets**
- **Ultima Gold and OptiScint Quenched ^3H Standards**
- **Ultima Gold and OptiScint Quenched ^{14}C Standards**
- **Ultima Gold and OptiScint Low Level Quenched Standards and Sets**
- **Quenched ^3H Standards**
- **Quenched ^{14}C Standards**
- **Low Level Quenched Standards and Sets**
- **Extended Range Quenched Standards and Sets**
- **Combined Quenched Standards**



Specialty products

We offer a selection of specialty products to complement our safer, classic, and flow cocktail ranges and to support all your LSC cocktail needs.

Microplate formats

Choose from our MicroScint™ and Meltilex™ ranges for working with samples in microplates.

Tissue solubilizers

Safer and classical tissue solubilizers for you to select from to meet the needs of your research.





Specialty products: Microplate formats

MicroScint™ LSC cocktails for microplate formats

MicroScint-20 cocktail accepts dilute aqueous samples at up to 20% (up to 25 μL in 100 μL MicroScint-20). It is compatible with moist filters. MicroScint-20 has an absolute, unquenched tritium efficiency of approximately 52% when measured in a 24-well white polystyrene OptiPlate™ microplate.

MicroScint-PS cocktail is specifically formulated for polystyrene compatibility and accepts up to 20% of many samples. MicroScint-PS cocktail has an absolute, unquenched tritium efficiency of approximately 48% when measured in a 24-well white polystyrene OptiPlate microplate.

MicroScint-O cocktail is used for counting non-aqueous samples and dried filters. MicroScint-O cocktail has an absolute, unquenched tritium efficiency of approximately 58% when measured in a 24-well white polystyrene OptiPlate microplate.



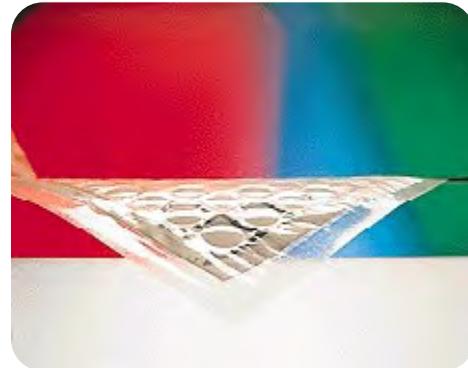
MicroBeta² Microplate Scintillation and Luminescence Counter for Radiometric and Luminescence Detection



MicroBeta² LumiJET Microplate Counter for Radiometric and Luminescence Detection

Specialty products: Microplate formats

MultiLex Solid scintillators for microplate formats



MultiLex® melt-on solid scintillator is an attractive alternative to traditional scintillation cocktails if the sample needs to be permanently fixed to the filter or a solid waste is preferred. Simply place a sheet of Meltilex on a filtermat or filterplate and apply gentle heat; for example, using a heat sealer or hot plate.

- Easy to use – simply melt onto a filtermat completely encapsulating the samples
- Fixes samples in position, eliminating the risk of sample migration or partial elution into cocktail
- Ensures stable counting conditions and long-term storage
- Available in a variety of sizes and thicknesses

Specialty products: Tissue solubilizers

Choose from our safer or classical tissue solubilizers to meet your lab's research and application needs.

SOLVABLE is our **safer tissue solubilizer**. It is aqueous-based and has an excellent capacity for the solubilization of wet tissue, aqueous tissue homogenates, proteins, nucleotides, and other substances into a solution. With the exception of plant material, SOLVABLE can replace the classical solubilizer Soluene-350 for many applications, increasing safety in the laboratory due to its aqueous nature. SOLVABLE is compatible with Ultima Gold and OptiScint MP and has a superior mixing ratio with safer cocktails (2.5 mL sample in 10 mL cocktail).



Soluene-350 is a strong organic base formulated with toluene. It has an excellent capacity for the solubilization of wet tissue, aqueous tissue homogenates, proteins, nucleotides, plant material, and other substances into a solution compatible with liquid scintillation cocktails. Compatible with Hionic-Fluor (4 mL sample in 10 mL cocktail) and Ultima Gold (1 mL sample in 10 mL cocktail).

Hyamine Hydroxide 10-X is a quaternary ammonium hydroxide solution in methanol. It can be used to solubilize many biological tissues and as a $^{14}\text{CO}_2$ trapping agent for helicobacter pylori and urea "breath" test studies.

Compatible with classical cocktail Insta-Fluor Plus (7.5 mL of Hyamine Hydroxide saturated with carbon dioxide in 10 mL cocktail) and safer cocktail Emulsifier-Safe (3 mL of Hyamine Hydroxide saturated with carbon dioxide in 10 mL cocktail)

Specialty chemicals

Our portfolio for liquid scintillation includes a selection of specialty chemicals for your lab.

EN3HANCE™ Liquid Autoradiography Enhancer

- Greatly simplifies gel processing as compared to Bonner and Lasky's method:
 - Requires no dehydration and has a short preparation time (from 1.5 – 3 hours).
 - Overall processing time is reduced from 5 hours to 90 minutes.
- Can be used for both polyacrylamide and agarose gels: method of choice for agarose gels.
- Performs equivalent to PPO/DMSO and eliminates gel distortion.
- Contains concentrated acetic acid, no DMSO.



ENLIGHTNING Rapid Autoradiography Enhancer

- Safer alternative for gels: water-based.
- Involves a single-step process: requires no more than a half hour to perform.
- Produces high-quality fluorograms.
- Effective with polyacrylamide and mixed gels.
- Contains no DMSO, odorless.

LIDIPEX 5000 is a column packing material for liquid chromatography used to separate a variety of steroids, prostaglandins, lipids, and other natural products. LIPIDEX-5000 is an alkoxy group derivative of Sephadex* LH-20, 50% substituted with an average alkoxy group chain length of 15 carbons, delivered as a suspension in methanol.

*Registered trademark of Pharmacia Fine Chemicals AB, Uppsala, Sweden



Radioactive decontaminants and cleaners

We offer a range of decontaminants and cleaners, so you can clean up radioactive spills quickly and effectively - essential supplies for your lab.

AbSolve™ Glassware Cleaner

- Easily and inexpensively removes serious RNase or DNA contamination (autoclaving does not destroy DNA). Simply soak plastic and glassware in a 2% solution for 30 minutes, rinse, and use.
- Ideal for prewashing plastic tubes for PCR. AbSolve™ prevents DNA contamination of storage and reaction vessels from exogeneous sources.
- Use to clean glassware for electrophoresis. Glass plates rinse easily and AbSolve leaves no residue to interfere with gel polymerization or silver staining.
- Safe, non-abrasive AbSolve does not etch glass, contain strong acids, or emit toxic fumes.

Pico-Kleen N is a versatile all purpose liquid detergent developed as a cleaning agent and radioactive decontaminant. It is specifically formulated and therefore recommended for cleaning and decontaminating of non-ferrous metals, such as aluminum or zinc.

Pico-Kleen N removes difficult soils like blood and plasma samples, proteins, resins, silicone greases, fatty components, oils, etc. from all kinds of laboratory metals and glassware.





Radioactive decontaminants and cleaners

We offer a range of decontaminants and cleaners, so you can clean up radioactive spills quickly and effectively - essential supplies for your lab.

COUNT-OFF Liquid Concentrate

- Ideal, all-purpose decontaminant: safe, efficient, and economical.
- Quickly and effectively cleans up even the most persistent leftovers: proven most effective cleanser for removing radioactive residues (3H, 14C, 32P and 125I), stopcock and vacuum greases, lanolin and petroleum jelly, dried blood and serum, fatty and amino acids, protein complexes, and polymer films and other stubborn residues.
- Stable under extreme temperature fluctuations (-50 °C to 150 °C).
- Safer than strongly acidic cleaners, such as chromic acid: solutions will not produce toxic gases from substrates containing 14C, 131I, 35S, or 36Cl.
- Easy to use: adjust concentration, soaking time and temperature as needed to speed up decontamination or for particularly stubborn substances such as dried blood.

COUNT-OFF Surface Cleaner

- Quickly and safely decontaminates small radioactive spills from benches, shields, and appliances: also efficiently cleans instrument housings, hood corners, centrifuge cups and heads, and LSC counter mechanisms.
- Traps and suspends radioactive particles in foam: makes clean-up easy and reduces the likelihood of spreading contamination to hands and clothing.
- Removes both ionic and non-polar radioactivity.
- Cleans-up stubborn grease, resins, blood and wax, even from rough surfaces.
- Available as a concentrate or a ready to use pump bottle.



All part of a total solution

- Address any LSC need with Revvity's liquid scintillation cocktails, tissue solubilizers and specialty chemicals, and even cleaners to take care of spills.
- You can be confident that our products meet high standards of performance, user safety, environmental safety, and user convenience.
- With over 60 years of experience, we can assist you with even the most complex LSC applications you perform in your research.
- No matter where your lab is, our global distribution network will ensure that the products you order reach you reliably and on time.
- You won't find a better source of liquid scintillation products and support services than Revvity.

Our product range includes:

- Liquid scintillation cocktails, tissue solubilizers, specialty chemicals and cleaners: a complete range to address all your LSC needs
- NEN® Radiochemicals: Wide variety of 3H, 14C, 32P, 125I, and 35S labelled compounds, radionuclides and more for your research
- High quality counting vials: choose from glass or plastic in a range of sizes and with a choice of caps
- Bulk quantities of scintillant components available
- Market-leading radiometric detection instrumentation
 - MicroBeta2 and MicroBeta2 LumiJET microplate counters with 1, 2, 6, and 12 detector options
 - Quantulus GCT liquid scintillation counters
 - Tri-Carb liquid scintillation counters
 - Wizard2 Gamma Counter with 1, 2, 5, and 10 detector options



www.revivity.com

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Revvity, Inc.
940 Winter Street
Waltham, MA 02451 USA
www.revivity.com

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