

autoMACS® Pro Separator

# The gold standard in automated cell separation



Automate & advance

# Technology that inspires

## Complete solutions for pioneering research

Miltenyi Biotec offers a complete portfolio of research tools that enables a seamless workflow, from reproducible sample preparation to a variety of downstream applications.

Move from step to step of your procedure with complete confidence. MACS® Solutions are the perfect companion for inspired research.

### MACS® Sample Preparation

The quality of your results depends on the sample preparation. Miltenyi Biotec offers innovative instruments and reagents for fast and gentle tissue dissociation and homogenization.



### MACS Cell Separation

A large panel of MACS MicroBeads and Cell Isolation Kits is available for the isolation of any cell type. Cells can be separated manually or in an automated fashion. The autoMACS® Pro Separator has been designed for automated walk-away cell sorting of multiple samples.



### MACS Flow Cytometry

Miltenyi Biotec provides a large panel of antibodies for a wide range of research. The innovative MACSQuant® Instruments are extremely compact, easy-to-use, multicolor benchtop flow cytometers. The instruments are fully automated and enable absolute cell count.



### MACS Cell Culture

The product portfolio for cell culture includes specially developed media, reagents for cell activation, and a multitude of cytokines and growth factors for many research applications.



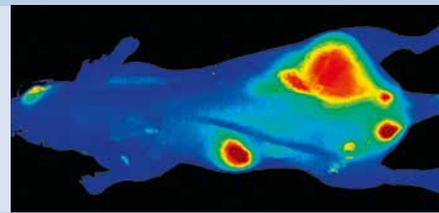
### MACSmolecular

Miltenyi Biotec provides products for analytical protein isolation and detection, gene expression analysis, and microRNA analysis, as well as microarray technologies and instrumentation.



### Viscover™ Imaging Agents

Be at the forefront of tumor monitoring with Viscover™ Imaging Agents. These imaging agents represent the first and only integrated range of *in vivo* contrast agents for pre-clinical imaging in small animals, including the modalities MRI, CT, optical imaging, and ultrasound.



# Introducing the autoMACS® Pro Separator

Performing cell separations has never been easier

More than 15 years ago, we revolutionized cell separation with the first-ever instrument to offer automated magnetic cell isolation. We now provide the latest in walk-away cell separation technology with the autoMACS® Pro Separator.

The autoMACS Pro Separator is a benchtop magnetic cell sorter that allows gentle sorting of more than ten million cells per second from a sample of up to  $4 \times 10^9$  total cells.

- Eliminate tedious manual handling steps
- Save time with fully automated multisample cell separation
- Get reliable results in 3 easy steps
- Be confident with a proven technology and excellent customer support



Learn about the benefits and features of the autoMACS Pro Separator in an interactive web format.



**Figure 1:** The autoMACS Pro Separator comes with the MACS® MiniSampler, Chill Racks, and Reagent Rack for convenient multisample capability. Also included are autoMACS Columns and buffers to get you started fast.

Technical data	
Footprint*	605×343 mm
Footprint with MiniSampler*	605×455 mm
Height	392.5–454 mm (adjustable touchscreen)
Weight	25 kg
Input voltage	100–240 VAC, 50–60 Hz
Power consumption	200 VA
Programs	12 pre-set

\* Depending on the type of power plug chosen, the depth increases by 27 mm or 62 mm.

**Table 1:** Technical specifications for the autoMACS Pro Separator.



**Figure 2:** The robotic needle arm allows accurate and highly reproducible pipetting and enables fully automated cell separation with consistent results.

# Pure cell populations in 3 simple steps

## Convenient multisample cell separation

At the touch of a button, get multisample labeling and cell separation with minimal hands-on time. Discover the convenience of walk-away cell separations, while ensuring the consistency of your results.

### Sort cells in 3 simple steps:

1. Scan reagents using the barcode reader (fig. 2).
2. Position samples and reagents on instrument (fig. 3).
3. Select "run" and walk away.

The barcode recognizes the reagents and selects the appropriate separation and wash program. Hands-free sample processing leads to safe laboratory practices, of vital importance when dealing with hazardous samples.

### Pre-set separation programs

The autoMACS® Pro Separator comes with 12 pre-set separation programs for optimized and reproducible cell isolation. The appropriate program is chosen depending on the separation strategy, target cell frequency, and level of antigen expression.

A high-resolution touchscreen with intuitive menus allows for straightforward and easy operation. The status menu provides continuous monitoring of sample processing.

#### Benefit from hassle-free housekeeping

- Automated startup, cleaning, and shutdown
- Optimized washing, decontamination, and maintenance programs
- Continuous monitoring of buffers and waste levels



Figure 3: Reagent scanning for easy autolabeling.



Figure 4: The MACS® Reagent Rack 4 holds up to four reagent vials for autolabeling of multiple samples.



Figure 5: The autoMACS Pro Separator performs automated startup, cleaning, and shutdown.

# Eliminate the need for manual handling steps

## State-of-the-art sensor technology

### Smart sensor-controlled processes

The autoMACS® Pro Separator includes automated sensor-controlled processes that ensure the absolute safety of your precious samples.

- Bottle illumination indicates instrument status, visible from across the lab
- Constant monitoring of buffer levels and column status
- Automatic detection of hardware peripherals ensures optimal performance

### Exact temperature control

Maintain your samples at 4 °C throughout the labeling and separation process using the MACS® Chill Racks. By eliminating temperature variations, you enjoy higher cell viability rates and avoid alterations in gene expression. Process up to six samples in a single batch in a flexible format: available in 50, 15, or 5 mL tube sizes.

The MACS Mini Sampler accommodates one MACS Chill Rack and one MACS Reagent Rack that holds up to four reagent vials for convenient autolabeling.

### Wash and maintenance programs

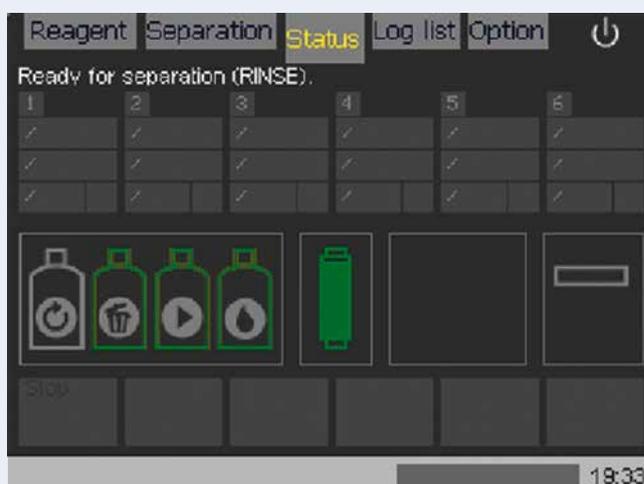
After each cell separation, the autoMACS Pro Separator automatically performs a thorough washing procedure. Following completion of the wash program, the column and tubing systems are filled with Running Buffer.



**Figure 6:** Bottle illumination is designed to indicate instrument status.



**Figure 7:** MACS MiniSampler accommodates MACS Chill Rack and Reagent Rack. Chill Racks are available to fit 50, 15, or 5 mL tubes.



**Figure 8:** Status menu screen displays instrument, fluid container, and column status.

# The gold standard of cell separation

## MACS® MicroBead Technology

**MACS MicroBeads** are 50-nm-sized superparamagnetic particles conjugated to highly specific antibodies that target an antigen on the cell surface. Their small size ensures they do not saturate cell surface epitopes. Unlike larger beads, MACS MicroBeads do not require removal before use in downstream applications.

MACS MicroBeads are provided in colloidal suspensions to achieve:

- faster binding kinetics
- shorter labeling procedures
- elimination of clumping associated with non-colloidal or larger beads

MACS MicroBeads are non-toxic and biodegradable. They have been tested according to the International Standard (ISO 10993) and USP guidelines for biocompatibility.

**MACS Columns** employ a matrix composed of ferromagnetic spheres with a cell-friendly coating. When placed on a magnetic separator, the spheres amplify the magnetic field 10,000-fold to induce a high gradient within the column. Consequently, minimally labeled cells are selectively isolated and sufficient epitopes remain free for concurrent antibody staining.

Cell separation specifications at a glance	
Column capacity	4×10 <sup>9</sup> cells/sample 2×10 <sup>8</sup> magnetically labeled cells/sample
Sample volume input	0.25 mL – 50 mL
Whole blood processing volumes	0.25 mL – 15 mL

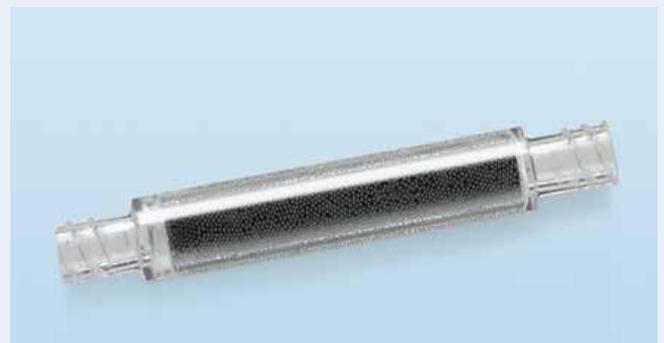
**Table 2:** autoMACS Cell Separation specifications.

**MACS Separators** are available in various formats to accommodate the column option that best fits your needs.

The combination of MACS MicroBeads, MACS Columns, and the autoMACS Pro Separator provides unmatched cell separation results.



**Figure 9:** MACS MicroBead Technology allows the isolation of almost any cell type from any species and a wide range of cell sources.



**Figure 10:** autoMACS Columns are specifically designed for use on the autoMACS Pro Separator.

# Isolate virtually any cell type

## MACS® MicroBead Kits

The autoMACS® Pro Separator is compatible with more than 250 MACS® Cell Separation Reagents for easy and fast isolation of virtually any cell type from any source. Our MACS MicroBead Kits are used routinely in immunology, stem cell, cancer, and neurology research.

### Flexible cell labeling strategies

Magnetic labeling of cells with MACS MicroBeads can be performed either directly or indirectly. Both labeling options enable effective enrichment or depletion of cells and are compatible with flow cytometry.

**Direct labeling** is the fastest method of magnetic labeling, in which MACS MicroBeads bind directly to a specific cell surface marker protein.

- Quick and specific isolation of just the cells you want to work with
- Efficient separation of rare cell subsets, such as cytokine-secreting cells

**Indirect labeling** is a two-step procedure in which the cells are first labeled with a primary antibody directed against a cell surface marker. Next the cell is magnetically labeled with MACS MicroBeads that bind either to the primary antibody or a molecule conjugated to the primary antibody.

- Use the primary antibody of your choice
- Sort cells according to weakly expressed antigens



**Figure 11:** The MACS MicroBead Kits are designed for ease of use. Enjoy simple protocols and streamlined workflows.

#### **Application highlight: Sort cells directly from whole blood**

Isolate cells directly from whole blood or bone marrow while avoiding red blood cell lysis and density-gradient centrifugation steps.

The Whole Blood MicroBeads are simply added to blood samples treated with anticoagulant; leukocyte subsets are subsequently purified on the autoMACS Pro Separator.

- No density-gradient centrifugation
- Minimized cell loss, optimal for small blood volumes
- Easy and safe handling of hazardous samples

# Experimental creativity at its best

## Wide variety of applications

### Malaria research

The development of new antimalarial drugs requires pure preparations of parasite-infected red blood cells (RBCs) that are relatively free of uninfected RBCs. Purify *Plasmodium falciparum*-infected RBCs using the autoMACS® Pro Separator.

### Chimerism and HLA analysis

High-purity cells are a prerequisite for sensitive lineage-specific chimerism analysis, cross-match analysis, and HLA applications. Direct isolation from whole blood on the autoMACS Pro Separator provides cells ready for functional studies.

### Multiple myeloma research

Isolate plasma cells directly from bone marrow using Whole Blood CD138 MicroBeads and the autoMACS Pro Separator. We have developed an SOP for an automated multisample processing method to deliver cells with high sample integrity in a single day. This protocol can increase the sensitivity of your downstream applications.

### HIV research

Minimize virus exposure, sample handling, and manual manipulations in HIV research with the autoMACS Pro Separator and Whole Blood MicroBeads. Simply load your whole blood samples and let the instrument perform the isolation of lymphocytes.

### Hematopoietic stem cells

Benefit from a broad range of cell separation reagents for isolating hematopoietic stem cells (HSCs) and hematopoietic progenitor cells (HPCs). Our CD34 MicroBead Kit has been cited more than 2,000 times since its release.

### Yeast cell isolation

Whether using isolated yeast cells as cancer models or purifying antibody libraries, the autoMACS Pro Separator can accommodate 50-mL samples for effective isolation of tagged target cells.

### An alternative to flow sorting

Isolating cells on the autoMACS Pro Separator can take as little as 30 minutes, as compared to the lengthy process of flow sorting. With the high-throughput capability of more than ten million cells per second, you can maximize your time while obtaining viable cells.

### Molecular applications

The best results come from samples of the highest quality. Get pure and viable cells ready for sensitive downstream molecular analysis, such as whole genome arrays, SNP arrays, and next-generation sequencing.

Check out further applications at [www.automacspro.com](http://www.automacspro.com)



# Protect your investment

## Support and service contracts

Miltenyi Biotec provides premium technical support to meet the demands of even the busiest laboratories.

Our technical support team is composed of experienced scientists and highly trained service engineers. They can assist you in a wide range of situations: from providing advice on experimental design and sample preparation, to answering specific questions about instrument operation and service options.

Visit [www.miltenyibiotec.com/support](http://www.miltenyibiotec.com/support) to experience expert technical assistance:

- Online forum for technical and product discussions
- Comprehensive list of frequently asked questions
- Library of data sheets and special protocols

## A service contract to fit your needs

Choose from a range of service agreements designed to fit your lab.

- Reduce costs by avoiding instrument downtime or sample loss
- Ensure you produce highly reproducible results
- Assure that experienced technical support is only a phone call away

	Full Service	Full Service Premium	Planned Maintenance
<b>Maintenance</b>			
Planned maintenance	●	●	●
Replacement of worn parts	●	●	●
Software updates	●	●	●
Labor, shipment, and product maintenance logistics	●	●	●
Maintenance intervals (per year)	1	1	1
<b>Repairs service</b>			
Repair and replacement	●	●	
Labor and travel expenses	●	●	
Replacement parts	●	●	
Loaner equipment		●	

For labs with higher throughput that require more than one service visit per year, we offer additional planned maintenance visits and services that can be added to either Full Service Premium or Full Service plans.

## Ordering information

autoMACS Pro Separator – Starter Kit	Order no.
<ul style="list-style-type: none"> <li>• autoMACS Pro Separator</li> <li>• MiniSampler</li> <li>• MACS Reagent Rack 4</li> <li>• Chill 5, 15, 50 Rack Set</li> <li>• Software</li> <li>• Barcode reader</li> <li>• 5x2 autoMACS Columns</li> <li>• 2x2 column substitutes</li> <li>• autoMACS Pro Buffer Combination</li> <li>• User manual and short instructions</li> <li>• One-year warranty</li> </ul>	130-092-545

**Table 3:** The components of autoMACS Pro Separator – Starter Kit.

Accessory	Description	Order no.
Chill 5 Rack	Chill Rack for 5 mL tubes	130-092-951
Chill 5 Rack, Box of 3	Three Chill 5 Racks for 5 mL tubes	130-097-041
Chill 15 Rack	Chill Rack for 5 and 15 mL tubes	130-092-952
Chill 15 Rack, Box of 3	Three Chill 15 Racks for 5 and 15 mL tubes	130-097-036
Chill 50 Rack	Chill Rack for 5, 15 and 50 mL tubes	130-092-953
Chill 50 Rack, Box of 3	Three Chill 50 Racks for 5, 15 and 50 mL tubes	130-097-037
Chill 5, 15, 50 Rack Set	Set of three Chill Racks	130-097-038
MACS Reagent Rack 4	Accommodates 4 vials of MACS Reagents	130-094-574
Air-Filter Extension Set	Extension tube and hydrophobic air filter for the autoMACS Fluid Bottles	130-091-339
autoMACS Pro Laminar Hood Plate	Metal plate for operating the autoMACS Pro Separator in a laminar flow hood	130-093-246
autoMACS Pro Angle Connector Set	Space-saving angle adaptors for cables connecting to the autoMACS Pro Separator	130-093-245
autoMACS Pro Protection Cover	Protection foil for long-term storage of the autoMACS Pro Separator	130-093-532
autoMACS Columns	Columns specifically designed for use with the autoMACS Pro Separator	130-021-101

**Table 4:** Accessories available for the autoMACS Pro Separator.



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