

# THE LAB CYCLE

ESCO SCIENTIFIC | QUARTERLY NEWSLETTER | ISSUE 7 | OCT - DEC 2021

## SCIENCE SPEAKS

### Listening to Your Body: The Science of Ergonomics

A day's work in the laboratory requires dedication and focus from every lab professional to warrant reliable results. Routinary activities in the laboratory may cause physical stress and strains that can lead to significant injuries. Hence, every lab staff needs to be reminded of the most important tool they are working with—their body. *Continue at page 2.*

## IN THE BLUELIGHT

### The Hazards in an Art Conservator's Life

Art conservation enables generations to witness and relish an artist's lifework. The advent of scientific breakthroughs has enabled the application of principles and practices of technical examination, documentation, and treatment for objects of material culture. Art conservation intends to improve an artifact's condition by stabilizing its physical condition and dealing with deterioration and/or damage.

*Continue at page 6.*

## UP AND ABOUT

### Latest Innovations from Esco Lifesciences

Known to provide enabling technologies that help make human lives safer and easier, Esco Lifesciences continues to innovate and address the needs of the customers. It adapts to new technologies and demands by product innovation and improving existing product lines.

Get to know the latest advancements from Esco Lifesciences! *Continue at page 7.*



## WHAT'S INSIDE?

### SCIENCE SPEAKS

- Listening to Your Body:  
The Science of Ergonomics.....2
- Proper Chemical Storage in the Laboratory.....4

### IN THE BLUELIGHT

- The Hazards in an Art Conservator's Life.....6

### UP AND ABOUT

Latest Innovations from Esco Lifesciences:

- The New and Improved TÜV NORD Bioseal  
-Certified Rotors of Esco Versati™ Centrifuge.....7
- The Solution to Your Chemical Storage Needs.....8

### EINESCO'S ZONE

- Test Your Safety Knowledge!.....9



# Listening to Your Body: The Science of Ergonomics

A day's work in the laboratory requires dedication and focus from every lab professional to warrant reliable results. Routine activities in the laboratory may cause physical stress and strains that can lead to significant injuries. Hence, every lab staff needs to be reminded of the most important tool they are working with—their body.




## Work-related musculoskeletal disorders

Ergonomics is all about "fitting the job to the worker." The term originates from the Greek words *nomos* which means "rule" and *ergon* which means "labor." It is the practice of modifying the work environment, such as equipment, furnishings, work pace, and so on, to meet employees' physical needs and limitations.

The five components of ergonomics are safety, comfort, ease of use, productivity/performance, and aesthetics, and all-important in preventing occupational injury, no matter what work you have. According to the National Institute for Occupational Safety and Health (NIOSH), the main purpose of ergonomics is to avoid injury or illness such as musculoskeletal disorders (MSDs). MSDs are triggered by continuous exposure to repetitive movements, vibrations, and awkward posture. Some examples of MSDs include low back pain, DeQuervain's disease, tendinitis, rotator cuff injuries (affects the shoulder), epicondylitis (affects the elbow), trigger finger, muscle strains, and carpal tunnel syndrome.

Musculoskeletal disorders caused by workplace or working conditions are known as work-related musculoskeletal disorders.

## Work-related Musculoskeletal Disorders (WMSDs) can cause the following symptoms:

<p>Pain</p> 	<p>Skin discoloration or redness</p> 	<p>Weakness</p> 	<p>Numbness</p> 
<p>A tingling sensation or a dull ache</p> 	<p>Cramping</p> 	<p>Joints with a limited range of motion</p> 	<p>The joints swell or stiffen</p> 

Lab personnel spends remarkable periods working in a constrained sitting or standing position. Some routine work also demands a constant repetitive arm and wrist movement or prolonged fixed postures that may lead to hand injuries. This may result in decreased productivity, time off work, and temporary or permanent injuries. However, it can be avoided by using ergonomic solutions for a healthier work setting.

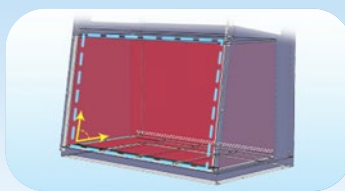
## Integration of ergonomics in engineering controls

Since laboratory professionals are at such a high risk for WMSDs, it is vital to take precautions. That is why Esco Lifesciences Encourages **S**afe and **C**omfortable **O**peration in the laboratory. We design equipment with the safety and comfort of our customers in mind. Apart from being validated under international standards, our products are also ergonomically constructed to fit the working conditions of the laboratory workers.

## Esco Biological Safety Cabinet



Angled-down display helps maintain proper posture and control pad that is ADA-compliant.



Ergonomically-angled front improves reach and comfort, reduces glare with frameless shatterproof sash that is easier to clean, and offers a larger unobstructed viewing area.



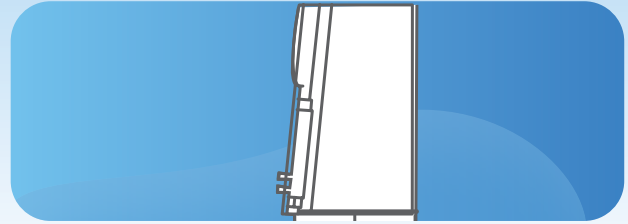
Raised armrest that is ergonomic for a comfortable working position.



## Esco Fume Hood



Double-hinged sash with arm ports that provide good working flexibility.



5° Face Pitch ergonomically allows users to work further into the hood without strain.

## Esco Laminar Flow Cabinet



Sliding sash with ergonomic handle



Centered and angled down controller for easy reach and viewing. Comfortable low noise at 52 dBA which reduces fatigue and improve work concentration.

## Esco Cold Storage Equipment



Ergonomic door handle



## Esco General Equipment



Orbital shaker and centrifuge with minimized vibrations

***The integration of ergonomic features to our laboratory equipment aims to promote good musculoskeletal health among lab professionals. We at Esco, care.***

### References:

- [1] AlNekhlan, A. F., AlTamimi, A. M., AlAqeel, B. Y., AlHawery, A. A., AlFadhel, S. F., & Masuadi, E. M. (2020, January 23). Work-related musculoskeletal disorders among clinical laboratory workers. PubMed Central (PMC). <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7014994/>
- [2] Ergonomics and Musculoskeletal Disorders | NIOSH | CDC. (n.d.). Centers for Disease Control and Prevention. Retrieved October 27, 2021, from <https://www.cdc.gov/niosh/topics/ergonomics/>
- [3] Laboratory Ergonomics. (n.d.). University of North Carolina at Chapel Hill. <https://ehs.unc.edu/workplace-safety/ergonomics/lab/>
- [4] Laboratory Safety Ergonomics for the Prevention of Musculoskeletal Disorders. (n.d.). Occupational Safety and Health Administration. Retrieved October 27, 2021, from <https://www.osha.gov/sites/default/files/publications/OSHAfactsheet-laboratory-safety-ergonomics.pdf>
- [5] Roth, C. (2011, February 1). The Importance of Ergonomics for the Safety Professional. EHS Today. <https://www.ehstoday.com/archive/article/21912602/the-importance-of-ergonomics-for-the-safety-professional>
- [6] The Advantages of Ergonomics. (n.d.). Oregon Occupational Safety and Health (Oregon OSHA). <https://osha.oregon.gov/OSHApubs/ergo/ergoadvantages.pdf>

# Proper Chemical Storage in the Laboratory

Chemicals are widely used in laboratories. Regardless of whether it is a research lab, testing lab, or other kinds of laboratory, it is crucial to handle and store chemicals properly to avoid accidents. More importantly, extra precautions shall be practiced especially for hazardous chemicals due to their high reactivity.

Before using hazardous chemicals, it is a must to read the Material Safety Data Sheet (MSDS) of the substance as it provides vital information about its physical, health, and environmental hazards; protective measures; and safety precautions for handling, storing, and transporting. Knowing the potential hazard of the substance in use will significantly help avoid laboratory mishaps.



Here are some guidelines on how to properly store chemicals:

1 

Properly label all chemical containers.

2 

Keep all containers properly sealed when not in use.

3 

Store chemicals according to their compatibility and hazard classes.

4 


Do not leave or store chemicals in the fume hood.

5 

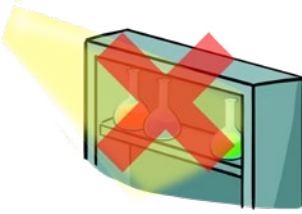
Store large and heavy containers on lower-level shelves.

6 

Do not overcrowd shelves.

7 

Avoid storing chemicals in high places or above shoulder level.

8 

Avoid storing chemicals under direct sunlight or beside heat sources.

9 

Properly dispose of all expired and degraded chemicals.

10 

Store volatile chemicals in ventilated cabinets.

11 

Store flammable substances in approved flammable storage cabinets.

12 

Store corrosive substances in the appropriate secondary containers.

## Types of Storage Cabinets

There are different types of storage cabinets specially designed for specific substances. Using the correct type of cabinet is necessary for safe storage.



**General Storage Cabinets** are typically constructed with chemical-resistant or inert materials for storing non-reactive and low hazard chemicals.



**Flammable Storage Cabinets** are fire-resistant and sometimes explosion-proof cabinets that have vents with flame arresters and doors that latch automatically when a fusible link melts at 74°C (165°F) under fire conditions. These cabinets are tested and approved by the National Fire Protection Association (NFPA) or the Occupational Safety and Health Administration (OSHA).



**Corrosive Storage Cabinets** are made from non-corrosive materials or finished with a powder coating that can resist strong acids, bases, and solvent.



**Hazardous Storage Cabinets** are similar to flammable and corrosive cabinets since they can store acids, bases, and oxidizers but are better used to store highly reactive materials. In this type of cabinet, incompatible chemical groups are strictly segregated to avoid unnecessary reactions.



**Filtered Storage Cabinets** designed to keep inventory safe and prevent corrosion. They are equipped with activated carbon and HEPA filters that capture toxic fumes and particles.

ASC

Continue on page 8 to learn more about Filtered Storage Cabinets.

### References:

- [1] Chemical Storage Guidelines | FACULTY OF ENGINEERING AND NATURAL SCIENCES. (n.d.). Sabanci University. <https://fens.sabanciuniv.edu/en/laboratory-safety/general-laboratory-safety/chemical-storage-guidelines>
- [2] General Storage Guidelines | Environment, Health and Safety. (n.d.). Environment, Health and Safety. <https://ehs.cornell.edu/research-safety/chemical-safety/laboratory-safety-manual/chapter-7-safe-chemical-use/79-0>
- [3] Hazard Communication Standard: Safety Data Sheets. (n.d.) Occupational Safety and Health Administration. <https://www.osha.gov/sites/default/files/publications/OSHA3514.pdf>
- [4] How to Store Chemicals Safely. (n.d.). Justrite. <https://www.justrite.com/news/how-to-store-chemicals-safely-by-using-chemical-storage-cabinets/>
- [5] McLeod, V. C. (2021, September 2). Handling and Storing Chemicals. Lab Manager. <https://www.labmanager.com/lab-health-and-safety/handling-and-storing-chemicals-2944>
- [6] Safety Cabinets and Storage. (n.d.). Justrite. <https://www.justrite.com/storage-and-safety-cabinets>

# The Hazards in an Art Conservator's Life

**"Art is too important not to share." -Romero Britto**

Art conservation enables generations to witness and relish an artist's lifework. The advent of scientific breakthroughs has enabled the application of principles and practices of technical examination, documentation, and treatment for objects of material culture. Art conservation intends to improve an artifact's condition by stabilizing its physical condition and dealing with deterioration and/or damage.

The intricate work of art conservation is carried out by art conservators. They carefully study every piece to determine its chemical and physical characteristics and subsequently decide on which methods and materials they would use. Conservators intend to keep each piece to its original form.

## CHEMISTRY AND HAZARDS IN ART CONSERVATION

Chemistry is a key player in bringing life back to an aged painting. Due to chemical reactions, the colors fade, and the pieces deteriorate making it dull and shy away from the original look. Chemistry comes in the picture when art conservators use various substances along with other advanced technologies to preserve and conserve artwork. They are at risk of exposure to various strong acids, bases, solvents, heavy metal-containing pigments, pesticides, and fungicides. Despite the risk, these professionals are left with limited choice as the hazards cannot be eliminated and substituted.

## EMPLOYMENT OF ENGINEERING CONTROL

Since hazard substitution and elimination are out of the options, this leaves the conservators with engineering control as the most effective way to protect themselves from occupational hazards. The use of filter-based fume extractors is recommended to effectively reduce the accumulation of vapors. Esco Scientific offers **Ascent™ Max - E series ductless fume hood**—a green solution to modern chemistry. It protects users from toxic chemicals, fumes, odors, and particles by means of a directional airflow (away from the user) passing through carbon and/or HEPA filter/s.

### FILTRATION SYSTEM

- Main Filter: Nanocarb™ Activated carbon, available in 8 types
- Secondary filter: HEPA Filter
- Efficient perimeter clamping ensures no leakage as well as allows easy filter change procedure.

### WORKTOP OPTIONS

- Standard stainless steel worktop can be upgraded to phenolic resin or epoxy for better chemical resistance.

### ISOCIDE™ ANTIMICROBIAL POWDER COATING

- Eliminates 99.9% of surface bacteria within 24 hours of exposure.

While conservators work to preserve and conserve irreplaceable pieces of history, Esco Scientific works to preserve and conserve the health of these professionals. And it doesn't stop there, we will continue to innovate solutions and achieve a safe working environment for everyone. We call it—**the art of safety.**



ADC\_E\_

#### References:

- [1] Barbara, S. (2019, July 25). Top 3 Differences Between Art Conservation and Art Restoration. Stella Art Conservation. <https://stellaartconservation.com/differences-art-conservation-restoration/>
- [2] Bradley, K. (n.d.). The Chemistry of Art Preservation. [www.chemistryislife.com](http://www.chemistryislife.com). <https://www.chemistryislife.com/the-chemistry-of-artpreservation>
- [3] Makos, K. A., & Skimina, M. (n.d.). Health and Safety in Museums and Art Galleries. The Synergist. <https://synergist.aiha.org/201605-healthand-safety-in-museums>
- [4] Materials Information and Technical Resource for Artists. (n.d.). Art Conservation. [https://www.artcons.udel.edu/mitra/Documents/MITRA\\_Health\\_and\\_Safety.pdf](https://www.artcons.udel.edu/mitra/Documents/MITRA_Health_and_Safety.pdf)
- [5] What is art conservation? (n.d.). Art Conservators Alliance. [https://www.artconservatorsalliance.com/what\\_is.html](https://www.artconservatorsalliance.com/what_is.html)



# Latest Innovations from Esco Lifesciences

Known to provide enabling technologies that help make human lives safer and easier, Esco Lifesciences continues to innovate and address the needs of the customers. It adapts to new technologies and demands by product innovation and improving existing product lines.

Get to know the latest advancements from Esco Lifesciences!

## THE NEW AND IMPROVED TÜV NORD BIOSEAL-CERTIFIED ROTORS OF ESCO VERSATI™ CENTRIFUGE

Introducing the new TÜV NORD Bioseal-certified microtube rotors for micro and medium capacity tabletop centrifuges. These fixed-angle rotors are hermetically sealable and can spin 1.5/2.0 ml microtubes and 0.2 to 0.5 ml PCR tubes via adapters. The new design and technology have a more durable O-ring and only require a quarter turn to close the lid. These new rotors are also autoclavable at 121°C at 15 psi for 20 minutes to ensure sterility and avoid crosscontamination.



Technical Specifications		
Rotor Code	VST-ROT-101	VST-ROT-102
Number of Tubes and Tube Capacity	24 x 1.5 / 2.0 ml	
Tube Type (without adapter)	Conical / Dome	
Angle	45°	
Maximum Radius	85 mm (3.4")	
Maximum RCF	21380 x g	21382 x g (TCV) 24320 x g (TCR)
Maximum Speed	15000 rpm	15000 rpm (TCV) 16000 rpm (TCR)
Temperature at Maximum Speed	6 °C	3 °C

The certification guarantees that the two new rotors of Esco Versati™ Centrifuge have passed the dynamic microbiological tests for BIOSEALS in accordance with the Annex AA of DIN EN 61010-2-020: 12-2017 international standards.



SCAN HERE

**CLICK [HERE](#) FOR MORE PRODUCT INFORMATION OR SCAN THE QR CODE.**



## THE SOLUTION TO YOUR CHEMICAL STORAGE NEEDS

Fumes from chemical containers often result in the storage cabinet's corrosion and contaminated air in the laboratory. **Ascent™ Storage Cabinet (ASC)** is ideal in providing a safe and convenient storage solution for any laboratories as it effectively adsorbs chemical fumes to provide operator and environmental protection. ASC is available in 5 models with varying filter configuration to suit the customer's chemical listing.



### Models and Filter Configuration

Models	ASC-A	ASC-B	ASC-C	ASC-D	ASC-E
<b>Main Filter</b>	Nanocarb™	Nanocarb™	Nanocarb™	HEPA	HEPA
<b>Second Filter</b>	Not Applicable	HEPA	Nanocarb™	Not Applicable	Nanocarb™

### Parts of ASC:

- VOC sensor**  
– detects filter saturation
- Sentinel™ Microprocessor control system**  
– supervises all cabinet's functions
- Polypropylene trays**  
– chemical resistant and can carry up to 40 kg load
- Acrylic door**  
– allows easy viewing of the chemicals
- Door lock with alarm**  
– restricts access to keep inventory safe



SCAN HERE

**WATCH THE LATEST VIDEO OF  
ASCENT™ FILTERED STORAGE CABINET**

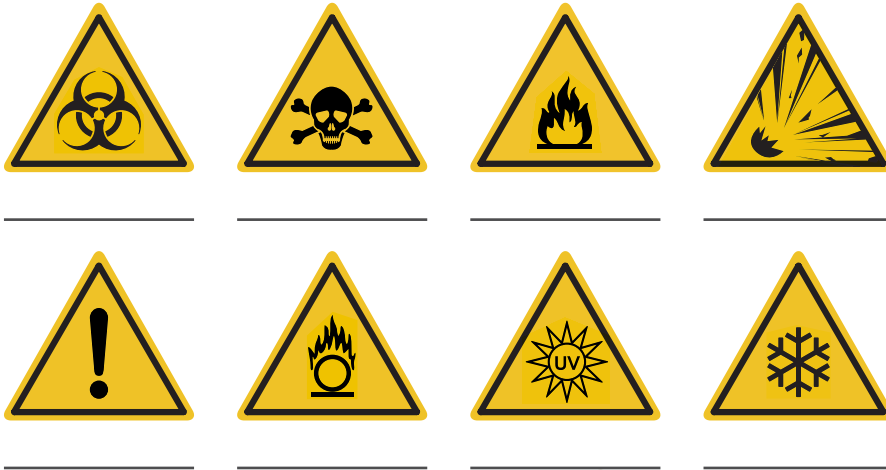




# Test Your Safety Knowledge!

A laboratory can be filled with hazards such as flammable substances, chemicals, biological specimens, sharp materials, and delicate instruments that must be handled with extreme caution. Thus, those working inside the laboratory must be well-knowledgeable of proper safety precautions to avoid possible accidents. The following are the laboratory safety symbols that warn and protect personnel from potential hazards.

## CAN YOU IDENTIFY THESE LAB SAFETY SYMBOLS?



Answers will be revealed on the next issue.



### Box of Choices

Get your answer here!

- Electrical Hazard
- Entrapment Hazard
- Flammable Material
- General Warning
- UV Light
- Hazard Irritant
- Explosive Materials
- Non-Ionizing Radiation
- Laser Beam Hazard
- Biohazard
- Optical Radiation Hazard
- Low Temperature
- Toxic Material
- Oxidizing Material

## Here is the solution to last issue's Match the Greek Alphabets Designated to Each Variant

