



Strong magnetic fields have been linked with interference of cardiac pacemakers and the shifting of ferromagnetic metallic medical implants. Because of this, it is important for owners of these devices to understand the hazards associated with magnetic fields before they begin work with or around magnetic field producing equipment. There is also a risk of personal injury if the magnetic field is strong enough to create projectiles through the attraction between ferrous objects and the magnet. Additionally, there may also be potential for damage to magnetic media (ID cards, credits cards, cellular devices, hard disk drives, etc.) when in proximity to the magnetic field.

## Exposure Guidelines

Currently, there are no Tennessee Occupational Safety and Health standards for static magnetic field exposure. However, the ACGIH has published these Threshold Limit Values (TLVs):

### Exposure Guidelines

<b>ACGIH 2012 TLVs</b>	<b>Ceiling Value</b>
Whole Body (general workplace)	2 Tesla (T)
Whole Body (special worker training and controlled workplace environment)	8 T
Limbs	20 T
Medical device wearers	0.5 mT

0.5 mT = 5 Gauss

A TLV is a value set by the American Conference of Governmental Industrial Hygienists (ACGIH) and is the level to which a worker can be exposed day after day for a working lifetime without adverse effects. Routine occupational exposure to static magnetic fields should not exceed 2 Tesla (T) or 20,000 Gauss (G) in the general work area. Staff with special training who are operating in a controlled work environment (one in which forces exerted by magnetic field producing equipment do not exceed levels capable of creating potentially hazardous projectiles) may not exceed 8T (80,000G). Exposure to the limbs of workers in the general work area should not exceed 20T (200,000G). Staff or visitors who have ferromagnetic metallic alloy medical implants or electronic devices should not be exposed to static magnetic fields exceeding 0.5mT (5G).

## Supervisor Responsibilities

Supervisors of labs containing equipment that produces magnetic fields in excess of 0.5mT (5G) must do the following:

- Provide safety training for employees working in areas where magnetic fields exceed 0.5mT (5G).
- Identify individuals with pacemakers or ferromagnetic implants who will be excluded from exposure to magnetic fields  $\geq 0.5\text{mT}$  (5G).
- Supervise employee work practices to the degree necessary to avoid the hazards associated with magnetic fields in the lab.
- Post signage or another form of demarcation that identifies the area within which affected employees or visitors may be at risk.
- Contact the CorVel nurse triage line at 1-866-245-8588 to report any potentially harmful interaction or injury and to coordinate any medical care if needed.

## Training

Lab supervisors must incorporate safety training into their new employee onboarding training to communicate to their staff the hazards they will encounter in their specific job responsibilities before they begin work. Additional training in magnetic field safety should be included in their hazard communication training if they will be working in or around strong magnetic field producing equipment. This additional training should include:

- What are the hazards of strong magnetic fields?
- What work practices are best to avoid injury while working in or around strong magnetic fields?
- What signage or other forms of demarcation identify areas with strong magnetic fields?
- What does an employee do in the event of accidental exposure or injury?

## Warning Signs

Aside from lab personnel, Facilities staff, housekeeping, and visitors may come in proximity of your lab or magnetic equipment. Strong magnetism must be indicated on the list of hazard assessment placard posted on the door to the lab. Prominent warning signs identifying the need for special precautions must be located in applicable areas. Signage should be visible on all entrances of labs with magnetic field producing equipment that will alert staff and visitors to the hazards they may encounter. Click on the below images to print hazard signs to post on entranceways and on magnetic field producing equipment.



## General Safety

General safety precautions should be taken when working with or around the magnetic field producing equipment to prevent accident injury. Ferromagnetic (metal) objects can be accelerated with great force and speed towards large magnets causing personal injury. Staff and visitors should remove any magnetic materials from their person to prevent injuries from flying objects. This includes, but is not limited to, keys, pocket knives, cell phones, pagers, tools, badge holders, etc. They should also remove any magnetic media, such as ID cards, credits cards, cellular devices, hard disk drives, etc. to prevent damage to these objects.

## Additional Information

In case of accidental exposure or injury from strong magnetic field producing equipment, call CorVel at 1-866-245-8588. Or, for more information on magnet safety, contact your supervisor or the Office of Research Safety at (901)448-6114 or at [labsafety@uthsc.edu](mailto:labsafety@uthsc.edu).