

# Safety considerations: HiDES Laboratory IIIT-Bangalore

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## General

In case of accident notify instructor, or the lab in charge or any faculty or staff in the institute.

## For personal safety

1. REMOVE ALL METAL items such as jewelry, rings, wrist watches or bands, necklaces, etc. These items make excellent electrodes with the power sources. This may lead to electric shock in contact with electric power sources.
2. DO NOT MAKE CIRCUIT CHANGES without first turning off the power.
3. NEVER WORK ALONE in the laboratory. Make sure that there are at least three people in the laboratory; one to aid the victim and one to obtain additional help.
4. Turn off the power and ground high-voltage points before touching wiring.
5. Move slowly with feet firm to maintain balance. Never lunge for falling objects.
6. Avoid standing on metal surfaces or wet concrete. Keep your shoes dry.
7. Never handle electrical equipment with wet skin.
8. Hot soldering irons should be rested in an approved holder. Never leave a hot iron unattended.

## To protect equipment and minimize maintenance

### Do

1. SET MULTIMETERS to highest range before connecting to an unknown source.
2. INFORM your instructor about the faulty equipment so that it can be sent promptly to the shop for repair.

### Do Not

1. Do not eat, drink, or smoke in the lab; please step out into the halls for this purpose.
2. Do not use an MULTIMETERS to measure resistance (ohms) in a circuit to which power is connected.
3. Do not move equipment around the room without instructor's permission.

## Comments about electric shock

Offhand it would seem that a shock of 10,000 V would be more deadly than one of 100 V. This is not true! The real measure of a shock's intensity is the amount of current forced through the body. Although any amount of current over 10 mA is capable of producing painful-to-severe shock, currents between 100 and 200 mA are lethal. In this current range, ventricular fibrillation of the heart occurs. Above 200 mA, the resulting muscular contractions are so severe that the heart is forcibly clamped during the shock and ventricular fibrillation is prevented. Although severe burns, unconsciousness, and stoppage of breathing may occur with the higher body currents, they may not be fatal if the victim is given immediate resuscitation or artificial respiration. The magnitude of body current depends on the voltage, body resistance, points of contact, and condition of the skin. The total resistance may be as low as 500  $\Omega$  for wet skin and as high as 500 k $\Omega$  for dry skin. Death by electrocution has been recorded from a voltage as low as 42 V dc, implying a resistance as low as 400  $\Omega$ . Thus, the only conclusion with respect to voltage is that 50 V can be just as deadly as 500 or 5000 V.

## Aiding a shock victim

If a disabling electric shock occurs, cut the power and/or remove the victim as quickly as possible without endangering yourself. If the power switch is not readily accessible, use a length of dry wood, rope, clothing, belt, or other insulating material to pull or pry the victim loose. The resistance of the victim's contact decreases with time so that the fatal 100 to 200 mA current may be reached if action is delayed. Examine the victim to determine if he is breathing. Keep the victim lying down, keep warm and inform the faculty/lab-in charge or the registrar very soon.