Protohaven

Class Notes

Welding 101: Basic Welding Skills

Clearances

MIG Welder
Plasma Cutter

Contents

Welcome **1**
Shop Rules 1
Tool Status Tags 1
Filing a Tool Report 2
Safety **3**
PPE 3
Introduction **4**
Learning Objectives 4
Terminology 4
Tools **5**
MIG Welder 5
Resources **6**

Welcome

Welcome to the Basic Welding Skills class at Protohaven!

Shop Rules

Be Safe

- Get safety clearances
- Wear protective equipment
- Watch and reset equipment after use
- Never use equipment that is red-tagged

Take Care of Each Other

- Be aware of your surroundings
- Don't use a tool if it poses a danger to someone else

Take Care of the Tools

- Get tool clearances
- Do not alter of use equipment beyond limits
- Notify staff when maintenance is needed

Keep the Shop Clean

- Clean up after yourself
- Return tools to their original locations

Tool Status Tags

Every tool at Protohaven has a status to let you know if the tool is safe to use.

If the tool status is *green*, the tool is safe to use. All features should be expected to work, and no extra care should need to be taken while using the tool.

If the tool status is *yellow*, the tool may still be used, but with extra caution. The information on the physical tag or in the online maintenance history will indicate what special care needs to be taken while using the tool. If the physical tag and the maintenance log disagree, alert a tech.

If the tool status is *red*: **DO NOT USE THE TOOL**. The tool is not safe to use. The information on the physical tag or in the online maintenance history will indicate what fixes are pending, and when a repair is expected.

Some tools in the shop are explicitly green tagged to let you know they are working. Other tools in the shop are not explicitly green tagged when they are working to reduce sign fatigue. If you are in doubt about the status of a tool with no visible tag, check the Protohaven website for the tool status page:

`https://www.protohaven.org/equipment/`

Filing a Tool Report

If you are using a tool, and the tool becomes unsafe, damaged, or is not working properly, you must notify a tech. The tech may instruct you to submit a tool report:

`https://airtable.com/appbIlORlmbIxNU1L/shrluff2WSzy8c3xd`

Notifying the tech will help us keep signage up to date, and make sure the users who come in after you have all the information they need to use the tool safely, even if they don't use discord.

Safety

PPE

Always wear proper protective gear when welding.

Gloves

Jacket

Mask

If you feel unsure of something, feel free to ask!

Introduction

Learning Objectives

- Clearance to use our MIG welder.
- The ability to safely operate the welder and weld different types of metals.
- Begin to understand how to adjust the machine to work best for the type of welding you are performing.

Terminology

Shielded Metal Arc Welding (Stick Welding)	Uses a metal electrode covered in flux to create weld. As the current goes from electrode to metal, it melts the metals and electrode, creating a weld pool. The flux coating turns into a gas that shields the weld and creates slag covering the weld. Stick welding can be messy and the slag is hammered off of the weld after cooling. Generally used for large structural metal construction where precision and cleanliness aren't primary concerns.

Tools

MIG Welder

(Overview paragraph(s))

Notes

Safety

Common Hazards

Care

Use

Consumables

Parts of the TOOL

Basic Operation

Setting Up

1. Power the MIG Welder on.
2. Turn gas tank valve knob 2-3 turns counter-clockwise.
   This will enable the flow of gas to the pressure valve.
3. Turn pressure valve a few turns clockwise until pressure is between 30-40.
4. Adjust wire feed speed and voltage according to chart recommendations for metal thickness.
5. Attach grounding cord to table or piece to be welded

Workholding

There are a variety of tools to hold the workpiece firmly to the welding table:

- Clamps
- Magnets

Making a Weld

Cleaning Up

1. Turn the gas tank knob clockwise until gas flow stops and the tank has a hand-tight seal.
2. Turn the pressure valve a few turns counter-clockwise to release pressure.
3. Turn both wire feed and voltage knobs to their lowest setting.
4. Depress trigger on welding wand to release gas pressure until gas pressure valve indicates pressure has dropped to less than 10.
5. Turn the MIG welder off.
6. Wind up cables for storage.
7. Stow the welding wand in the holder on the side of the NIG welder.

Resources

(add resources here)