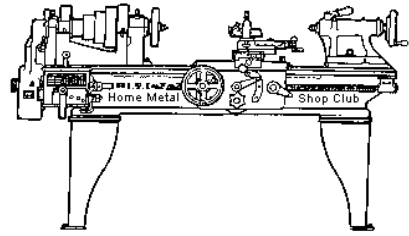




May 2024
Newsletter

Volume 29 - Number 05



<http://www.homemetalshopclub.org/>

The Home Metal Shop Club has brought together metal workers from all over the Southeast Texas area since its founding by John Korman in 1996.

Our members' interests include Model Engineering, Casting, Blacksmithing, Gunsmithing, Sheet Metal Fabrication, Robotics, CNC, Welding, Metal Art, and others. Members enjoy getting together and talking about their craft and shops. Shops range from full machine shops to those limited to a bench vise and hacksaw.

If you like to make things, run metal working machines, or just talk about tools, this is your place. Meetings generally consist of **general announcements**, an **extended presentation** with Q&A, a **safety moment, show and tell** where attendees share their work and experiences, and **problems and solutions** where attendees can get answers to their questions or describe how they approached a problem. The meeting ends with **free discussion** and a **novice group** activity, where metal working techniques are demonstrated on a small lathe, grinders, and other metal shop equipment.

President <i>Vacant</i>	Vice President <i>Ray Thompson</i>	Secretary <i>Joe Sybille</i>	Treasurer <i>Joe Sybille</i>	Librarian <i>Ray Thompson</i>
Webmaster/Editor <i>Dick Kostelnicek</i>	Photographer <i>Vacant</i>	CNC SIG <i>Martin Kennedy</i>	Casting SIG <i>Vacant</i>	Novice SIG <i>John Cooper</i>

About the Upcoming 08 June 2024 Meeting

The next general meeting will be held 08 June 2024 at 12:00 P.M. (Noon) at TxRxLabs, 6501 Navigation Blvd., Houston, Texas 77011 and on-line at Zoom.us. Log-in credentials are as follows: Meeting ID = 822 7007 1441 Passcode = 776714.

General Announcements

The HMSC has a large library of metal shop related books and videos available for members to check out at each meeting. These books can be quite costly and are not usually available at local public

libraries. Access to the library is one of the many benefits of club membership. The club has funds to purchase new books for the library. If you have suggestions, contact the [Librarian Ray Thompson](#).

We need more articles for the monthly newsletter! If you would like to write an article, or would like to discuss writing an article, please contact the [Webmaster Dick Kostelnicek](#). Think about your last project. Was it a success, with perhaps a few 'uh ohs' along the way? If so, others would like to read about it. And, as a reward for providing an article, you'll receive a free year's membership the next renewal cycle!

Ideas for programs at our monthly meeting are always welcomed. If you have an idea for a meeting topic, or if you know someone that could make a presentation, please contact [Secretary Joe Sybille](#).

Members are requested to submit to the club secretary the name, address, telephone number, and website address, if any, of any metal or other material stock supplier with whom the member has had any favorable dealings. A listing of the suppliers will appear on the homepage of the club website. Suppliers will be added from time to time as appropriate.

The club is looking for a member to serve as webmaster. After over ten years of service, our current webmaster would like to pass the webmaster torch to a successor. Also, the club is looking for a volunteer to serve as president.

Recap of the 11 May 2024 General Meeting

By Dick Kostelnicek



Mark Heidorn set up the live streamed session on ZOOM *très vite*. The meeting started at 12 :00 P.M. There were 5 club members present at TxRxLabs (left photo) and two participants online at ZOOM. Ray Thompson chaired the meeting (right photo).



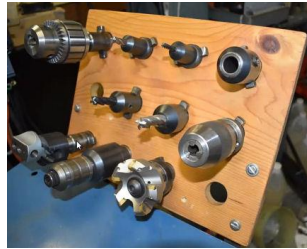
Presentation

Dick Kostelnicek gave a brief presentation of his recent vacation cruise to the Canary Islands and Morocco. He recounted his visit to the bowels of the ship that was run entirely as diesel electric and was commanded engineering wise via a touch screen computer. Gone are the days of mechanical ship controls.

Show & Tell

John Cooper showed his Quick Switch Tooling for his mill. He also made a wood tray holder to display the mill's tooling. John explained how he made a tapered drill bit to make the holes that supported the quill tooling (see photos at right).

Dean Eicher recounted his visit to the engine room on a steam ship that he sailed on in the past.



Article

WELDING CAST IRON

by *Gary Toll*

During a safety session on welding, the subject of welding cast iron arose. It has been widely reported that welding cast iron can't be done. This is far from the truth. The following is what I have learned from several books on welding published by Lincoln Electric Co. They are "Arc Welding" and "New Lessons in Arc Welding."

First, we need to understand what we are welding. Actually, cast iron comes in four different forms, grey iron, malleable iron, ductile (nodular) and white or (chilled) iron. Of the four types grey, malleable and ductile iron are difficult to weld. Proper procedures are necessary to successfully weld these types of cast iron.

It is necessary to establish which type of cast iron you wish to weld. Grey is the most common and is produced with normal sand mold and when broken has a grey cast to the surface when recently broken. White iron is manufactured by pouring molten metal against a cooling surface such as metal or graphite. This causes the molten metal to cool rapidly causing the carbon to remain in solution rather than precipitate out as graphite. The result is a harder and more brittle type of cast iron than grey iron, though it has almost the same chemical analysis. White iron usually has less silicone than grey iron. White iron has a white appearance upon fracturing and a finer grain structure. White iron is usually the first step in the manufacture of malleable iron.

Malleable iron, usually white cast iron and then heat treated for several days in an annealing process that changes the combined carbon into iron carbide and other types of iron carbon compounds. The heat treatment both increases the strength and ductility of the iron. Welding destroys these benefits and necessitates additional heat treatment after the welding process. Unless you have these facilities it is best left to a professional shop when repairs are necessary.

Ductile iron is similar to grey iron but with the addition of magnesium and cerium which in ductile iron form fine particles which causes the graphite become into spheroids .

Types of Electrodes:

The American Welding Society lists five different basic types of electrodes for welding cast iron.

RC1 Group: Intended for use in oxyacetylene welding.

EC1 Group: A covered electrode with cast iron core wire.

ESt Group: A covered electrode with steel core wire. The weld deposit is not machinable.

ENi Group: A covered electrode with nickel base core wire. Welds are machinable.

Copper Base Group: Intended for braze welding and surfacing cast iron.

Problems when welding cast iron.

- Cast iron is brittle
- Strength - good compressive strength but low in tensile and torsional.
- Pockets of carbon graphite
- Cracks can grow when welding has stopped
- Parts need to be preheated to reduce the chance of additional cracking or just spot welded to keep the casting cool.
- After welding the part need to gradually cool to prevent cracking
- Finding the extent of the cracks before starting for proper preparation.

Finding cracks is easy using a kerosene and chalk. Wipe the part with kerosene so it soaks into the crack and then coat with chalk and the kerosene will make a black line down the crack.. It is recommended to either stop drill at the ends of the crack or v groove beyond the ends to eliminate stresses.

Preheat the casting to a red heat before welding. Weld as necessary and keep the part hot for up to 24 hours.

A review of You Tube videos shows that for some parts the part can be preheated with a torch or a gas grill. To keep the part warm after welding the parts can be places in sand box or packed is finer glass insulation.

For additional information consult major welding suppliers such as Lincoln, Miller or any welding equipment manufacturer.

In summary welding procedures are basically the same for all types of rods that are suitable for welding cast iron. The part must be clean and free from all oil, grease, rust and other contaminants. The weld area must be vee-grooved and stop drilled to prevent the crack from continuing. In most cases the part needs to be preheated before welding and cooled slowly after the weld is finished.