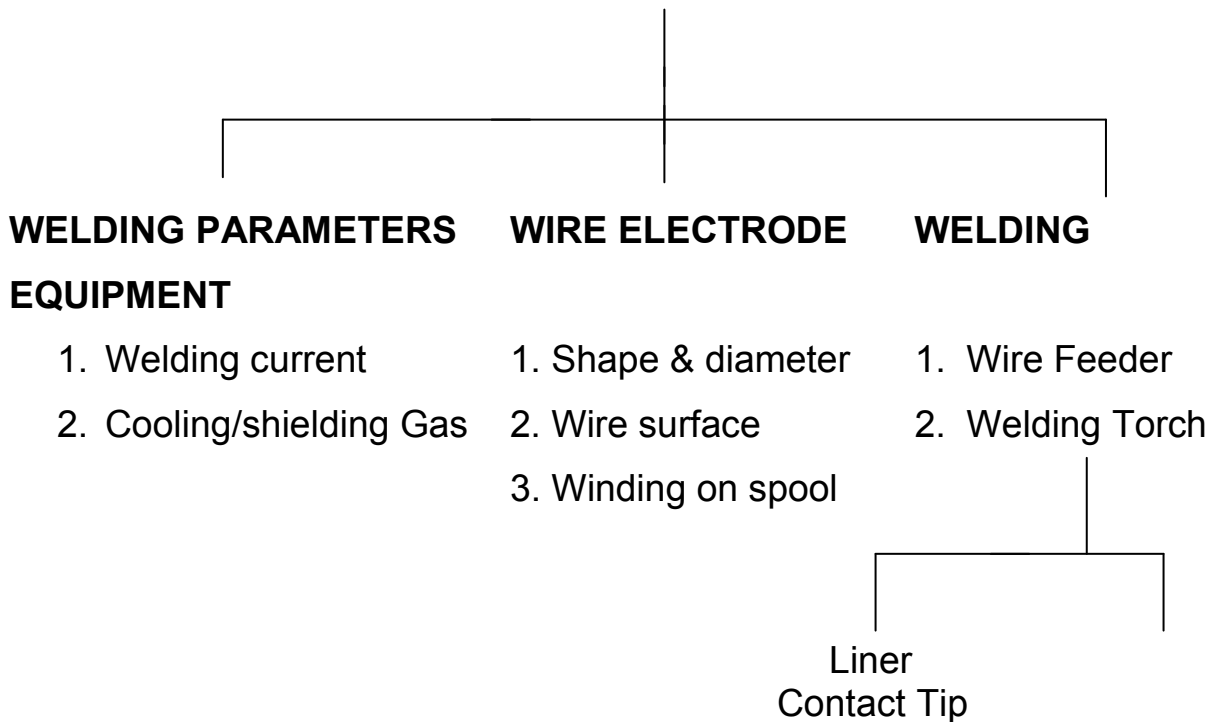


A GUIDE TO EFFECTIVE MIG / MAG WELDING

Binzel's motto of '**bringing welding to the point**' is dependent on the following important factors



NOTE : The quality and the productivity of the welding operation is influenced by each of the factors mentioned above. A good welding torch alone cannot guarantee excellent & trouble-free welding!

THE WELDING PARAMETERS

- The **welding parameters** are based entirely on the nature of the welding job. Use of the optimum current and the correct mixture of gases give a clean and porosity-free weld.

THE WIRE ELECTRODE

- The quality of the **Wire Electrode** plays a very important role in giving a smooth feeding of the wire to the point of welding resulting in uninterrupted welding cycles.
- The **Wire Electrode** must have –
 - A **smooth surface**. Rough surface increases friction with Liner. It also reduces transfer of current from Contact Tip to electrode. Rough surface is normally due to manufacture of wires from worn-out drawing dies.
 - Proper **coiling** of the wire on spool. Coiling should be **uniform**, otherwise it places excessive load on Wire Feeder during feeding of wire. **Larger spool diameter** is better as it ensures that the wire is straighter.
 - Proper **packing and storage** of the wire is important. Unprotected wire tends to get corroded / oxidized on the surface. This increases wire diameter and also reduces conductivity of the wire.
- **The Wire Electrode must have -**
 - A **clean surface**. Residue of oil or water on the wire reduces the conductivity of the wire and increases the thermal load on Contact Tip. This finally results in early failure of Contact Tip.
 - A **uniform diameter and shape** throughout the length. Variation in size / shape adversely affects wire feeding and current transmission.

- A **proper coating** for copper coated wires. Poor coating tends to peel-off. These copper particles then get transported to the Contact Tip where they melt and stick to the opening. This results in clogging of the tip.

THE WIRE FEEDER

The Wire Feeder performs the task of drawing Wire Electrode from the spool and feeding it through the Liner to the point of welding. The important factors to be monitored on a Wire Feeder are –

- Selection of the **right type** of feed rolls –
“**V**” **groove** for hard wires / “**U**” **groove** for Aluminium wires
- Selection of the **right diameter** of feed rolls –
Dia. 30 mm for low wire speed / **Dia. 40 mm** for 33% higher wire speed
- Selection of **optimum** feed roll **pressure** on wire –
Too less pressure may result in erratic feeding of wire.
Excessive pressure may lead to deformation of wire, which may then hamper smooth movement of wire through the Liner and Contact Tip.

THE WELDING TORCH

Whilst the entire design and construction of the welding torch is extremely critical, the **welder** needs to pay **special attention** to two elements of the torch – namely the **Liner** and the **Contact Tip**.

THE LINER

The Liner performs the important task of transporting the Wire Electrode to the point of welding. The Liner must be –

- Of the **right material** to suit the material of the wire (steel Liner for low alloy wire / plastic Liner for Aluminium wire / S.S. Liner for high alloy wire).
- Of the **right internal diameter** to suit the wire diameter.
- **Clean** from inside. Copper coating / oxidation layer / corrosion layer / grease and dust layer off the surface of the wire can clog the Liner.
- **Free of 'kinks'** along the entire length and **free of 'burrs'** at both ends of the Liner. These kinks/ burrs act as obstacles to free movement of the wire.
- Of the **correct length**. The length should be such that the Liner is automatically **pre-stressed** after assembly on torch.

Abicor Binzel produces high quality Liners which are made from high tensile strength steel all these factors determine the **friction** (or resistance to movement) between the **Liner** and the **Wire Electrode**. Excessive friction causes variation in feeding speed of the wire – leading to poor welding quality.

THE CONTACT TIP

This is probably the most critical component in the welding torch. The Contact Tip performs the most important task of **transferring the welding current** (originating from power source and traveling through cable) to the **Wire Electrode**.

For performing this task efficiently, the Contact Tip must –

- Be made of a **material** that has excellent **conductivity**, high **wear resistance** and high **thermal stability**. **Abicor Binzel** produces Contact Tips from **CuCrZr** – which meets all these requirements. **CuCrZr** is thermally stable up to 400 c whereas the more commonly used **E-Cu** loses its thermal stability at around 250 c only.
- Have an accurately machined **bore** with **excellent surface finish** on the **internal** surface of the bore. This ensures proper contact (over a large surface area) between the wire and the Contact Tip. This in turn ensures low heat generation at the Contact Tip and enhances the life of Contact Tip.
- Only Abicor Binzel possesses the technology to **drill** these bores with a high degree of precision. The process of ‘drawing’ of hollow tubes can never match the precision of our drilling process.

CONCLUSION

“Cheap” is not always **“inexpensive”**.

Cheap Products :

- Frequent failures
- High downtime
- Low productivity
- High cost!

It is the **‘attention to such small details’** that makes the **Binzel Torch** very **special**. As a company dedicated entirely to the design and manufacture of welding torches alone, **Abicor Binzel** needs to be, and always has been, in the **forefront of Welding Torch technology**.

This presentation covers only those factors that would help the **Welder** to get the best out of his Binzel torch. Our mission is to continuously improve the performance, reliability, affordability and **welder-friendliness** of our torches. In this, we would always welcome the suggestions and support of our valued Customers.

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