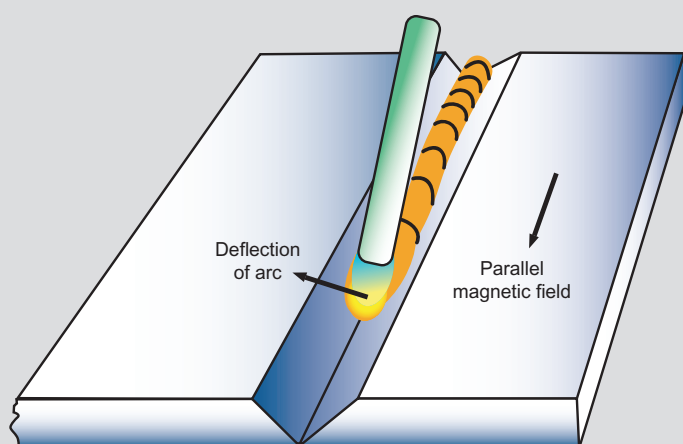


Magnetism in the Steel

When welding ferromagnetic steels as HARDOX and WELDOX, lack of fusion and other types of imperfections can be caused through uncontrolled deflection of the arc. This disturbance of the arc can be caused by magnetism in the plates.



Arc deflection can be caused by disturbance from the magnetic field



Residual magnetism can be measured by a gauss meter

When arc blow is encountered, it may not be possible to totally eliminate it, but steps can be taken to reduce its effect.

Measure the residual magnetism by for instance a gauss meter in the weld gap. When the magnetic field strength is greater than 50 gauss, arc blow may be experienced.

Magnetism can be present in ferromagnetic steels from different causes. One example is magnet in jacking equipment which can induce magnetism in the steel.

The use of magnets in handling of steel plates is applied by SSAB Oxelösund. Magnet handling of the plates can also occur during transport to the customer or by the customer himself.

The following methods can be used to prevent magnetic arc blow:

- Demagnetize the steel, by a demagnetizer. There are different types of demagnetizing equipments on the market. Choose a magnetizer that fulfils your production requirements.
- Demagnetize the weld area by wrapping an electric cable around the work piece. Connect the cable to the poles of a DC power source. The number of required coils will depend on the maximum recorded and current-carrying capacity of the cable and may require some trials. Gradually increase the current and monitor the magnetic field strength. If the strength increases, reverse the polarity of the current through the coil. Adjust the current so that a low magnetic field strength is achieved in the weld gap.

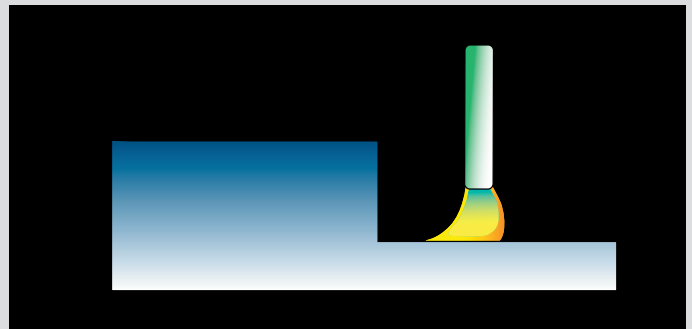
Magnetism in the Steel



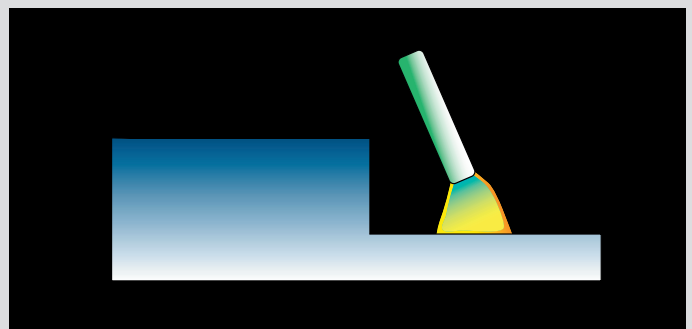
Demagnetize the plate by wrapping, The magnetism is measured by a gaussmeter

- Check along the weld preparation for magnetism, using a gauss meter or other device. Where it shows its lowest level, make the first tack weld. The magnetic field created during the tack welding will reduce or change the magnetic field.
- For MMA welding: Use alternating current (AC) for the root run if possible.
- Magnetic arc blow can be reduced by tilting the torch. Choose the angle of the torch so that the magnetism from the plate is minimized.

- If the plate thickness is unsymmetrical, (see figures below) tilting the torch can reduce the effect from differences in plate thickness.



before



after

- Magnetism might be reduced in the plates if the plates are exposed to heavy vibration.
- Positive effects can be achieved by using two or more earth connections.
- Don't connect earth connection(s) close to the welded joint. Changing place(s) of earth connection(s) might improve the situation with magnetism.



HARDOX wear plate only from SSAB Oxelösund.
HARDOX is a registered trademark of SSAB Oxelösund.

SSAB Oxelösund AB
SE-613 80 Oxelösund
Sweden

Phone +46 155 25 40 00
Fax +46 155 25 40 73
www.ssabox.com
www.hardox.com