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Workshop Control of Welding.

Werkstattprüfung der Schweißung.

Le contrôle des soudures à l'atelier.

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Fundamentally, if the electrodes used have the essential characteristics, the control of the quality of welding depends on control of welders.

Procedures must be established for all welding conditions, and when those are tested and proved satisfactory the methods of making the weld should thereafter be a drill which the welder learns by heart.

It may be of interest to state that it is found that such a method not only obtains consistent welding but speeds up the actual operation. The reason is fairly apparent. When the welder knows exactly what to do he wastes no time in thinking out how it should be done.

The principal part of every procedure is the first run, whether the weld be a fillet weld or a butt weld. It takes a higher degree of skill to make the first run in any weld in any position (horizontal, vertical or overhead) than is necessary for subsequent runs. The usual faults in first runs are lack of penetration and cracking. Even cracking may be controlled to some extent by the skill of the welder.

It is usually found desirable to concentrate training of the welder on the elimination of slag pockets and lack-of-fusion lines. Procedures are chosen to suit.

The best methods of observing the degree of skill obtained is by taking a Radiograph of a butt weld or etching a number of sections from any kind of weld. Those are shown to the welder.

The value of those methods of showing a welder the faults in his work is much greater than that of all others, because they both give him a comprehensible picture. Sets of figures of mechanical tests are meaningless to the operator, at least at this stage. The only other picture of the inside of a weld which can be offered is obtained by breaking a weld and offering the break to the welder with the necessary explanations. The explanations usually confuse the simple facts and quite frequently the slag pockets are not revealed even to the trained observer. X-ray photographs and etching of sections are the most convincing methods of showing a welder his faults.

Given a close training in standard drills or procedures — by gradual steps from the horizontal to the overhead, and finally by composite drills for welding a butt weld and a fillet weld an a pipe of small diameter in a fixed position —

the mechanical results of welders tests is found to be invariably quite good. The only failures met with in a large concern using 130 welders have been with men who to be finally dispensed with as no suitable for employment as welders.

The principal deficiency in men who are incapable of being welders appears to be that they cannot see the weld they are making, or cannot see it intelligently perhaps a species of colour blindness in some cases and merely lack of intelligence in others.

Mechanical results in vertical and overhead position welds invariably passed the specifications for the class of work in which the electrodes and welders concerned were employed. Also, the only variation in the test results appear to depend entirely on the class of electrode used.

While the methods described are used to train men in making welds in vessels and pipes operating at pressures of upwards of 1000 lbs/sq. in. it is found that the degree of excellence acquired through time enables us to get good quality and fast welding on all kinds of work with the welders who have gone through the whole training.