SMAW : BEADS AND FILLET WELDS pdf

1: NCCER, Welding Level 1 Trainee Guide, Paperback | Pearson

View Notes - SMAW -beads and fillet weldsTerm: Definition: wire brush or grinder used to remove heavy mill scale or corrosion from coupons Term: Definition: tapping best method of striking an arc.

Identifies oxyfuel cutting equipment and setup requirements. Explains how to light, adjust, and shut down oxyfuel equipment. Trainees will perform cutting techniques that include straight line, piercing, bevels, washing, and gouging. Identifies correct amperage, gas pressures, and flow rates. Covers plasma-arc cutting methods for piercing, slotting, squaring, and beveling metals. Explains how to store equipment and clean the work area. Identifies the electrodes and safe operation of the equipment. Provides step-by-step instructions for performing air carbon arc washing and gouging activities. Identifies and explains joint design and base metal preparation for all welding tasks. Identifies and explains weld imperfections and causes. Describes non-destructive examination practices, visual inspection criteria, welder qualification tests, and the importance of quality workmanship SMAW-Equipment and Setup 5 Hours Describes SMAW welding and welding safety. Explains how to connect welding current and setup arc welding equipment. Identifies and explains using tools for cleaning welds. Explains proper storage and control of filler metals and identifies the use of codes. Explains how to detect and correct arc blow. Describes how to make stringer, weave, overlapping beads, and fillet welds. Describes use of fit-up gauges and measuring devices to check fit-up and alignment and use of plate and pipe fit-up and alignment tools to properly prepare joists. Explains how to check for joint misalignment and poor fit. Describes how to make groove welds with backing. Provides procedures for making fl at, horizontal, vertical, and overhead groove welds. Provides procedures for making fl at, horizontal, vertical, and overhead open v-groove welds. This textbook is also sold in the various packages listed below. Before purchasing one of these packages, speak with your professor about which one will help you be successful in your course.

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2: Welding Program < Northshore Technical Community College

SMAW Fillet Welds?!!! One thing I do that might help if the actual size of the fillet weld is important is mark out where the toes of the weld should come to with soapstone then just run a grinder or zip cut line just inside the soapstone mark so you know you just have to cover that grinder line and your good.

However, creating a good weld is not always easy, especially for a beginner. Following a few simple tips as well as learning the common weld defect and how to fix them will have you on your way to laying quality SMAW welds. Shielded metal arc welding SMAW is the most common form of arc welding. By following a few simple tips, even beginners can learn how to spot common weld defects and fix them to create a high-quality weld. Tips to Get Started 1. Using these steels will make the SMAW process easier because they can be welded at fast speeds with minimum cracking tendencies. If you are welding with low-alloy steels and carbon steels with chemistry compositions higher than this normal range, they will have a greater tendency to crack, particularly when welding on heavy plate and rigid structures. In addition, steels with high sulfur and phosphorus contents are not recommended for production welding. If they must be welded, use small-diameter, low-hydrogen electrodes. A slow travel speed will further keep the puddle molten, allowing gas bubbles time to boil out, creating a better finished weld. When welding on to gauge sheet steel, the fastest travel speeds are obtained with the work positioned at 45 to 75 degrees downhill. Last, it is best to weld high-carbon and low-alloy steel plate in the level position. Follow the Principles for Joint Geometry and Fit-up Joint dimensions are chosen with fast welding speed and good weld quality in mind. Proper joint geometry is based on a few simple principles. First, fit-up must be consistent for the entire joint. Since sheet metal and most fillet and lap joints are tightly clamped for their entire length, gaps or bevels must be controlled accurately over the entire joint. Any variations in a joint will force you to slow your welding speed to avoid burn-through and manipulate the electrode to adjust for the fit-up variation. Second, you need a bevel that will aid in good bead shape and penetration. An insufficient bevel prevents the electrode from getting into the joint. For example, a deep, narrow bead with an insufficient bevel may lack penetration, making it prone to cracking. Third, a root opening is needed for full penetration. The root opening must be consistent with the diameter of the electrode being used. An excessive root opening wastes weld metal and slows welding speed. And last, a root face or a backup strip is required for fast welding and good quality. Feather-edge preparations require a slow, costly seal bead. E at approximately amps direct current electrode positive DCEP. For low-hydrogen and seal beads, weld with an EXX18 electrode at approximately amps. Avoid Buildup and Overwelding Fillets should have equal legs, and the bead surface should be nearly flat. Extra buildup is costly in material and time, adds little to weld strength, and increases distortion. For example, doubling the size of a fillet requires four times as much weld metal. Clean the Joint Before You Weld To avoid porosity and attain the ideal weld travel speed, it is important to remove excessive scale, rust, moisture, paint, oil, and grease from the surface of joints. Slow the travel speed to allow time for gas bubbles to boil out of the molten weld before it freezes. Choose the Right Electrode Size Large electrodes are meant for welding at high currents for high deposition rates. Therefore, use the largest electrode that is practical for your application and consistent with good weld quality. Electrode size sometimes may be limited, especially on sheet metal and root passes where burn-through can occur. In addition, joint dimensions sometimes limit the electrode diameter that will fit into the joint. Troubleshooting Weld Defects Here are some of the most common stick welding problems and how to correct them. Although it does not affect weld strength, spatter does create poor appearance and increases cleaning costs. There are several ways to control excessive spatter. First, try lowering the current. Make sure it is within the range for the electrode type and size you are welding with and that the polarity is correct. Another way to control spatter is to try a shorter arc length. If the molten metal is running in front of the arc, change the electrode angle. Finally, look for arc blow conditions commonly referred to as a wandering arc , and be sure the electrode is not wet. While frequently just an appearance problem, undercutting can impair weld strength when the weld is loaded in tension or subjected to fatigue. To eliminate undercut, reduce the current and travel speed, or simply reduce the puddle size until you have a size you can handle. Then change the electrode angle

so the arc force holds the metal in the corners. Use a uniform travel speed and avoid excessive weaving. Try dry electrodes from a fresh container. If the problem recurs frequently, store open containers of electrodes in a heated cabinet. With DC welding, stray magnetic fields cause the arc to wander off course. This is a greater problem at high currents and in complex joints. To control a wandering arc, the best option is to change to AC welding. In addition, you can change the electrical path by shifting the work connection to the other end of the workpiece or by making connections in several locations. You also may do this by welding toward heavy tacks or finished welds, using run-out tabs, adding steel blocks to change the work current path, or tacking small plates across the seam at the weld ends. Most porosity is invisible. However, since severe porosity can weaken the weld, you should know when it tends to occur and how to combat it. Begin by removing scale, rust, paint, moisture, and dirt from the joint. Be sure to keep the puddle molten for a longer time to allow gases to boil out before it freezes. If the steel has a low carbon or manganese content, or a high sulfur free-machining steel or phosphorus content, it should be welded with a low-hydrogen electrode. Sometimes the sulfur content of free-machining steels can be high enough to prevent successful welding. Minimize the mixture of base metal into weld metal by using low current and fast travel speed for less penetration. Or, try using a shorter arc length. A light drag technique is recommended for low-hydrogen electrodes. For surface holes, use the same techniques that are used for porosity. Proper fusion means the weld physically bonds strongly to both walls of the joint and forms a solid bead across the joint. Lack of fusion is often visible and must be eliminated for a sound weld. To correct poor fusion, try a higher current and a stringer bead technique. Be sure the edges of the joint are clean, or use an AWS E or E electrode to dig through the dirt. If the gap is excessive, provide better fit-up or use a weave technique to fill the gap. Penetration refers to the depth the weld enters into the base metal, and usually is not visible. To achieve strong welds, full penetration to the bottom of the joint is key. To overcome shallow penetration, try using higher currents or decreasing your travel speed. Use small electrodes to reach down into deep, narrow grooves. Remember to allow some gap at the bottom of the joint. Cracking is a complex subject because there are many different types of cracks that occur in different locations throughout a weld. All cracks are potentially serious, as they can lead to complete failure of the weld. Most cracking is attributed to high carbon, alloy, or sulfur content in the base metal. Weld with low-hydrogen electrodes. Use a high preheat temperature for heavy plate and rigid joints. Reduce penetration by using low currents and small electrodes. This reduces the amount of alloy added to the weld from the melted base metal. Fill each crater before breaking the arc. On multiple-pass or fillet welds, be sure the first bead is of sufficient size and flat or convex enough to resist cracking until the later beads can be added for support. To increase bead size, use a slower travel speed and a short-arc technique, or weld 5 degrees uphill. Always continue welding while the plate is hot. If possible, weld toward the unrestrained end because rigid parts are more prone to cracking. Peen each bead while it is still hot to relieve stresses. You May Also Like.

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3: Welding â€“ Entry Level

SMAW BEADS & FILLET WELDS I. A. Demonstrate an Understanding of SMAW Beads and Fillet Welds. 1. 1 2 3Review the set up shielded metal arc welding (SMAW) equipment.

YouTube Stick Welding Stick welding is the most common form of arc welding, but creating a good weld may not be easy for the beginner. Unlike wire welding where you basically "point and shoot," stick welding has a higher skill level and requires mastery of certain techniques. This article will offer tips that you can follow to increase your chances of creating a high quality stick weld - right from the start. It will also discuss how to troubleshoot problems and correct them. Selecting these steels will make the stick welding process easier since they can be welded at fast speeds with minimum cracking tendencies. If you are welding with low-alloy steels and carbon steels with chemistry compositions above the "normal range", they will have a tendency to crack, particularly when welding on heavy plate and rigid structures. Because of this, you should use special precautions. In addition, steels with high sulphur and phosphorus contents are not recommended for production welding. If they must be welded, use small diameter, low hydrogen electrodes. Welding with a slow travel speed will further keep the puddle molten allowing gas bubbles time to boil out, creating a better-finished weld. Choose a Joint Position and Electrode that is Conducive to the Metal Joint position can have a great affect on finished weld quality. When welding on 10 to 18 gauge sheet steel, the fastest travel speeds are obtained with the work positioned at a 45 to 75 degrees downhill angle. Lastly, high carbon and low-alloy steel plate can best be welded with the work in the level position. Follow Simple Principles for Joint Geometry and Fitup Joint dimensions are chosen for fast welding speeds and good weld quality. Proper joint geometry is based upon some simple principles: Fitup must be consistent for the entire joint. Since sheet metal and most fillet and lap joints are tightly clamped for their entire length, gaps or bevels must accurately be controlled over the entire joint. Any variations in a given joint will force the operator to slow his or her welding speed to avoid burnthrough and manipulate the electrode to adjust for the fitup variation. Sufficient bevel is required for good bead shape and penetration; insufficient bevel prevents the electrode from getting into the joint. For example, a deep, narrow bead may lack penetration and has a strong tendency to crack. Sufficient root opening is needed for full penetration, while excessive root opening wastes weld metal and slows welding speed. It is important to note that the root opening must be consistent with the diameter of the electrode being used. A root face or a backup strip is required for fast welding and good quality. Feather edge preparations require a slow costly seal bead. Avoid Buildup and Overwelding Fillets should have equal legs and a nearly flat bead surface. Extra buildup is costly in material and time, adds little to weld strength and increases distortion. For example, doubling the size of a fillet requires four times as much weld metal. Clean the Joint Before Welding To avoid porosity and attain the ideal weld travel speeds, it is important to remove excessive scale, rust, moisture, paint, oil and grease from the surface of joints. Slow the travel speed to allow time for gas bubbles to boil out of the molten weld before it freezes. Choose the Right Electrode Size Large electrodes weld at high currents for high deposit rates. Therefore, use the largest electrode practical to be consistent with good weld quality. But, electrode size may be limited especially on sheet metal and root passes, where burnthrough can occur. In addition, joint dimensions sometimes limit the electrode diameter that will fit into the joint. Troubleshooting Weld Defects Here are some of the most common stick welding problems and how to correct them: Spatter Although spatter does not affect weld strength, it does create a poor appearance and increases cleaning costs. There are several ways to control excessive spatter. First, try lowering the current. Make sure it is within the range for the type and size electrode you are welding with and that the polarity is correct. Another way to control spatter is to try a shorter arc length. If the molten metal is running in front of the arc, change the electrode angle. Finally, look for arc blow conditions commonly referred to as a wandering arc , and be sure the electrode is not wet.

4: NCCER Bookstore: SMAW - Beads and Fillet Welds TG, 3rd Edition

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5: Stick Welding- Creating High Quality Stick Welds

This course is an introduction to the preparation and setup of arc welding equipment and the processes of striking an arc. It also covers how to make stringers, weave, overlapping beads, and fillet welds.

6: SMAW - Beads & Fillet Welds in Construction â€" CTIS

Table of Contents. SMAW - Beads and Fillet Welds (Hours). Describes the preparation and setup of arc welding equipment and the process of striking an arc.

7: Welding â€“ Eastern Oklahoma County Technology Center

SMAW Beads & Fillet Welds: Describes the preparation and setup of arc welding equipment and the process of striking an arc. Explains how to detect and correct arc blow. Explains how to detect and correct arc blow.

8: SMAW Fillet Welds?!!! - Miller Welding Discussion Forums

Instagram: captain_manny_14 2f fillet weld, six pass stringer beads on 1/4 plate,SMAW at 88amps, Part 2 video of learning with CAPTAIN manny series.

9: NCCER Bookstore: Welding Level 1 Trainee Guide, 5th Edition

The nomenclature of the weld, the zones affected by the welding heat when a butt weld is made by more than one pass or layer, and the nomenclature applying to the grooves used in butt welding are shown in figure

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