Spark testing chart

When you choose a metal to use in manufacturing, to perform mechanical repairs, or even to determine if the metal is welded, you should be able to identify its main type. Some field metal identification tests can be used to identify a piece of metal. You need to know the composition of the metal to produce satisfactory welding. Metal workers and welders should be able to identify different metal products so that proper working methods can be applied. Drawings (MWOs) must be available for the equipment. They should be considered to determine the metal to be used, and any thermal treatment if necessary. After some practice, a welder or metal worker learns that some parts of the equipment or machine are forging, others cast iron, others and so on. There are seven tests commonly used to identify metals. Each of them is below. Use the tests along with information about the mechanical and physical properties of each metal. These tests are as follows: the appearance of the surface of the spark test chip test magnet test chemical test solidity test When conducting a test for metal identification, we suggest to perform tests in the order outlined in these metal identification charts, starting with the easiest to perform: Metal Identification Test Sequence for Non-Magnetic Metals Metal Identification Test Series for Slightly Magnetic Metal Identification Sequence for Magnetic Metal Identification to quickly identify methods that can be used to identify scrap metal identification techniques or other metal identification requirements. (wpsm_comparison_table id'6 class Sometimes you can identify the metal simply by its surface appearance. The shape includes things like cast engine blocks, car bumpers, strengthening rods, corner irons or I-rays, pipe fittings. Consider the form and how the part is made. Castings will have signs of parting lines of mold, cold rolled or extruded surfaces or hot rolled wrought-iron material. An example is a piece of cast pipe, it can be cast iron or wrought iron, which usually consist of steel. A strong clue in metal identification is color. It can distinguish precious metals, magnesium, aluminum, brass and copper. If there are signs of oxidation, remove it through a scrape to reveal the color of the unoxed surface. Scraping helps in the identification of copper, magnesium and lead. Rust or oxidation is a sign that can be used to differentiate corrosion resistance steel from simple carbon steel. Broken surfaces or submitted metal surfaces can also give clues. Working with metal sometimes leaves decals that can help with identification. Pable iron and cast iron can have sand mould High-carbon steel shows rolling or forging low-carbon steel signs showing forging signs of the role of surface feel and examination of the surface feel can provide additional signs of metal type. For example, stainless steel is rough when not finished, and metals such as Monel, nickel, bronze, brass, copper and wrought iron are smooth. Lead has a velvet look and is sleek. The limitation of surface research is that you often do not have the information necessary to classify metal. Metals such as plyed iron and cast iron often show evidence of sand mold. Surface color compared to other tests When the metal surface does not provide enough information for identification, other tests can be used. Tests that are easy to conduct in any store include: magnetic tests spark tests of chip magnetic tests (wpsm_comparison_table id'4 class wpsm_comparison_table wpsm_comparison_table wpsm_comparison_table Spark tests use sparks by pointing out when holding metal against a grinding wheel as a way of classifying iron and steel. What is a spark test? The test involves carrying a sample slightly against a grindstone or an abrasive wheel. Taking note and visually examining the color of the spark, shape and length, the metallurgist can accurately identify metals. Although the test is fast and extremely convenient, it does not replace metal chemical analysis. This is a quick method of sorting metals, where the characteristics of sparks are known, for example, when sorting mixed steel. When the metal is held lightly against the grinding wheel, different types of steel and iron produce sparks that vary in color, shape and length. Carrier Line Definition This test is especially useful in determining cast iron or cast iron scrap metal. These metals create sucked out small metal particles that are quickly ripped off, becoming red-hot. When they shoot abrasive wheel, they follow the so-called carrier line or trajectory. When you study the carrier line, look at the length of the spark, the flow, and the color. One of the advantages of a spark test is that it can be used with all types and stages of metals, including finished parts, forged forgings and bar stocks in racks. Restrictions When using a spark test on steel, some steels have the same carbon content, but different alloy elements such as the difference between unalloyed and low-alloy steel. Steel has different types of alloys that can affect the characteristics of bursts in the spark pattern, bursts of itself and carrier lines. Alloys can accelerate or slow down the carbon spark or make the media lines darker or lighter. For example, a metal Molybdenum looks like an orange color, separated by a spear at the end of the carrier line. When working with nickel, he suppress the effect of a carbon surge. However, nickel sparks can be identified by shiny white light in tiny blocks. The carbon surge contained even more than nickel. Silicon causes the media line to suddenly end with a white flash of light. The spark test is not useful for detecting non-ferrous metals such as nickel-base alloys, aluminum and copper. These metals do not show a significant flow of sparks. However, this method can be used to differentiate between colored and non-ferrous metals. How to conduct the Spark test you can use either a portable or stationary grinder to test the spark. In any case, the speed on the outer rim of the wheel should not be less than 5.00 feet per minute (1525 m) to get a good flow of sparks. The abrasive wheel must be very difficult and clean to produce a true spark rather than a coarse spark. Use grinding wheels that have hardness to last for some time, but soft enough to maintain a loose cutting edge. Testing the spark in a small light to make it easier to see the color of the spark. As a recommendation, use standard metal samples when comparing sparks with test models. When holding a metal piece, unswind it so that a stream of sparks moves through your line of vision. Steady to keep the metal park still, then touch the high-speed metal wheel grinding machine with enough pressure to create a flow of sparks that is horizontal and about 12 inches (30.48 cm) long. The flow of the spark should be at right angles to your line of vision. Be careful not to have too much pressure the wheel pressing on the metal, as the increased pressure increases the temperature of the sparks flow. The increased pressure also makes it appear as if the metal has a higher percentage of carbon content. All aspects of the spark flow (near the wheel, mid-flow, incandescent particles at the end of the stream, marked as part of the identification process. Looking at the flow of the spark, watch 1/3 of the path from the tail. See how sparks cross your line of view. Carrier lines are straight lines of sparks. are usually continuous and sold. They can be divided into three short forks or lines at the end of the carrier line. What types of sparks streams? A twig is a flow of a spark that is divided into several lines at the end of the stream. They are found in different places on the carrier line. These twigs are called either queues or stars. At times, the media line increases slightly by a short length, continues, and then increases for a short period. When you see heavier heavier at the end of the carrier line they are called kidneys or spear points. If there is a high level of sulfur, this leads to thicker areas in the carrier lines. These thick areas are called copy tips. Cast-iron metal has extremely short streams Most steel alloys and low-carbon steel have relatively long streams. Steel is usually white to yellow to spark cast-iron reddish straw yellow sparks in long stripes that tend to break into the Sparkler effect visible with 0.0.15 percent carbon steel. The carbon tool steel exhibits a pronounced 1.00% carbon steel gap showing minute and shiny sparklers or explosions. As the carbon content increases, the intensity of the gap increases. If you are interested in becoming experienced as a spark tester from non-ferrous metals, collect several types of metals to practice. Prepare the metals so that they are the same shape and size so that this in itself does not indicate identity. Place a unique number on each sample. Then create a list of names with the appropriate numbers. Then check each sample by writing down the name after you do the test. Repeat until you get good enough to identify each sample. (wpsm_comparison_table id'2 class Abrasive safety wheels using a grinding wheel dress to test metal Spark Never use an abrasive wheel that is out of balance or cracked because vibration can cause the wheel to break or break down. Make sure any new wheel-size sanders are correct. As the wheel's radius increases, the rim speed increases despite the face being the same engine. that collapses, place the guards on the grinding machines as protection. DO NOT use a meat grinder when the guards are missing. Stand to one side when the meat grinder is activated. Stay away from the wheel line to protect yourself from the wheel that bursts. Never press sideways on an abrasive wheel or overload a meat grinder if it is not built to withstand such use. Always wear a shield or goggles when using a meat grinder. Make sure that the rest of the tools (a device that helps the operator to keep working) are set up to a minimum clearance for the wheel. Move work on the face of the wheel to extend the life of the wheel. Moving work minimizes grout and any bandage on When working with a grinding wheel, keep your fingers away from the wheel. Also, watch out for any loose clothes or rags that can get tangled in the wheel. Do not wear gloves when using an abrasive wheel. Never hold metal with tongs while grinding. Never grind non-ferrous metals on a wheel designed for non-ferrous metals because such abuse clogs abrasive material. This accumulation of metal can cause it to fly apart after it becomes unbalanced. The grinding wheels of Care Recovery often keep the grinding wheels in good condition. The process of cleaning the periphery of the wheel is called a bandage. The refueling process involves tearing up any boring abrasive grains to create a smooth wheel surface. The wheeled dresser is used to change the grinding wheels on the bench and pedestal grinder. Magnetic test magnets are often used to identify metal. Iron-based alloys are magnetic, while non-magnetic metal is non-magnetic. Using a small pocket magnet test can be performed where with experience, you can distinguish between a material that is slightly magnetic with one that has a strong magnetic pull. Non-magnetic materials are easily recognized. Magnetic metal identification tests are not 100 percent because some stainless steel is non-magnetic. In this case, there is no substitute for experience. There are three main stainless steel groups: Martensitic: contain between 11.5% and 18% chromium and up to 1.2% carbon, sometimes some Ferritic nickel: contain between 10.5% and 27% chromium and nickel-free austenitic: contain between 16% and 26% chromium and up to 35% nickel - high resistance to corrosion. These steels have good welding (not heated before welding.) The most common type of autonetic steel is 304 class or 18/8 (18% chromium and 8% nickel.) used in the food, dairy and aviation industries. If the metal clings to the magnet, it means that it is ferrit. It is stainless steel, low-alloy or unalloyed steel or normal steel. Note that stainless steel has poor welding while low alloy or unalloyed steel has a high weldability. Ferrit steels are found in architectural and automatic finishing applications. It has fewer anti-corrosion applications and does not harden during heat treatment. Strongly magnetic materials include: Types of low-alloy steel steel types of low-alloy steel Martensitic stainless steel Pure Nickel Iron Alloy Slightly magnetic reactions from metals that include: Monel high nickel alloys stainless steel 18 chrome 8 nickel type when cold worked, for example, in a seamless tube. The magnet clinging to the metal indicates Ferretic Metal Non-magnetic materials include: Copper base alloys aluminum-based zinc alloy base alloys Annealized 18 chrome and 8 nickel stainless magnesium Precious metals austenitic stainless steel non-magnetic steel is austenitic Several metals can be identified by studying chips produced with a hammer or chisel. The only necessary tools are a cold chisel and a banner. Use a cold chisel to score on the edge or corner of the material. Once chiseled, the surface will show a baseline metal without oxidation. This applies to magnesium, lead and copper. In some cases, the sign of the structure is the roughness or roughness of the broken surface. The ease or complexity of chipping the metal part is also air duct level. If the metal piece bends easily without breaking it is one of the most ducted metals. It is one of the fragile metals if it breaks quickly with little or no bend. A simple test used to identify an unknown piece of metal is a chip test. The chip test is done by removing a small amount of material from the test part with a sharp, cold chime. The unalloyed or Cast Steel Chisel Test Material is removed ranging from continuous streaks to small, broken fragments. The chip can have smooth, sharp edges; It can be coarse-grained or fine-grained, or it may have saw like an edge. Cast Iron Chisel Test Chip size is a critical contribution to metal identification. The ease with which chipping occurs is considered as it indicates the hardness of the metal. The chip will break if it is a fragile material and for a continuous chip, it means that the metal is a duct. Metals with continuous chips (easy chipping and chips usually don't disintegrate) Aluminum Soft Steel Pliable Iron Fragile Chips: Small broken chip fragments are hard to obtain: due to the hardness of the metal, but can be continuous information in the table below can help in the identification of metal using this dough. (wpsm_comparison_table id'5 Class Aluminum and Magnesium Test To check for aluminium and magnesium, follow the following steps: wash with clean water and wait 5 minutes. If you see the following colors, it indicates the presence of these metals: Drip on a clean area of one to two drops of 20% caustic soda (NaOH) solution. Clean the metal area. Black: Al-Ku (copper), Ni (nickel) or yn (zinc) Grey/Brown: AL and Si (silicon, more than 2%) White: Pure Aluminum Without Color Change: Magnesium (Mg) Using an oxyacetylene torch, the welder can identify different metals by studying how a puddle of slag and molten metal looks and how quickly the metal melts during heating. When the sharp angle of the white metal part is heated, the melting speed can be a sign of its identity. (wpsm_comparison_table id'9 class Hardness Tests Hardness is complex and requires a review of the physical qualities of metal. The word hardness is sometimes used to refer to the temperament or stiffness of wrought-iron products because the strength of the tensing is associated with metal hardness. from the corner edge of the file. The hardness indicated is indicated Bite. This is the oldest and one of the simplest methods of hardness testing; this will yield results ranging from fairly soft to glass hardness. The main objection to using a file test is that the exact record of the results cannot be stored as numerical data. The table below summarizes the reaction to Brinell's relative hardness, and the possible type of steel. (wpsm_comparison_table the id'7 class Rockwell Hardness Test The Rockwell Hardness Test uses as a machine to test Rockwell's hardness to measure the depth of the impression when using a known load to do on a hard test point. Soft metals will lead to a deeper impression and low hardness of numbers. The dial indicates the hardness number. In this test, 1/16 steel ball for softer metals or 120 diamond cone for solid metals presses against the surface of dead acts through several levels. Gage points to hardness using rockwell B and C. The higher the Rockwell number will be the higher the harder the piece. You will see a reading from 63 to 65 for a tempered speed cutter. Scale C and diamond dot are necessary when performing solid steel tests. When testing a non-cone-free metal, use scale B and steel ball. Brinell Hardness Test Brynella is similar to the Rockwell test. The difference between Rockwell and Brinell is that the Brynella test looks at the area of impression. The test is carried out by forcing a tempered ball with a diameter of 10 mm to the surface of the metal being tested. For soft materials such as brass and copper, the ball has an applied pressure of 500 kilograms. The pressure varies to 3,000 kilograms for materials such as steel and iron. A small microscope is used to measure the diameter of the impression when applied. The metal hardness number is determined by dividing the load, which has been applied by the impression area. This is then compared to the split leading to a hardness conversion table. The table shows the metal number. The Scleroscope Test Using this hardness process is measured by the height of the diamond hammer bounce after it has been dropped through the guide glass tubes on the test piece and the rebound is checked on a scale. The more complex the material used, the greater the hammer rebound, because the rebound is directly proportional to the stability or elasticity of the test piece. The height of the rebound is recorded on the geig. Since the scleroscope is portable, it can be moved to work, allowing testing on a large section of metal too heavy to be seen on the work bench. The indentations made by this test are very insignificant. Vickers Hardness Test Brinella hardness method similar to testing method Vickers. The penetrator used in Brinelle Brinell It is a round steel ball while the Vickers machine rests on a diamond pyramid. The impression made by this penetrator is a dark square against a light background. This type of experience is easier to measure than a circular experience. One of the key advantages if the diamond point is not deformed is as when using a steel ball. Chemical analysis Some metals can be identified by a chemical test. These tests can be performed directly in the metal shop. Chemical analysis is used to identify metals using a system developed by the Society of Automotive Engineers (SAE.) Monel vs. Iconel Identification Inconel can be distinguished from monel with one drop of nitric acid applied to the surface. It will turn blue-green on Monel, but will show no reaction to Inconel. Identification of stainless steel A few drops of 45% phosphoric acid will bubble on a low-key stainless steel. Magnesium vs. Aluminum Identification Aluminum can be differentiated from magnesium by using silver nitrate, which will leave the black deposit on magnesium, but not on aluminum. Numerical Index System One of the most widely known steel opening systems for steel specifications and compositions is a system created by the Society of Automotive Engineers (SAE), known as the SAE designation. The specifications were originally intended for use in the automotive industry; however, their use has spread to all industries where steel and alloys are used. As the name suggests, this is a numerical system used to determine the compositions of SAE steel. With a few exceptions, simple steel and steel alloys are identified by a four-digit measurement system. Through this procedure, store drawings use numbers and drawings to partially describe the composition of the materials mentioned in the drawings. The rooms use 4 or 5 digital codes for non-ferrous metals. First digit: Type of alloy (e.g. 1 steel) Second and third digits indicate the main alloy in as many percentages. The last two or three numbers are the carbon content of the hundredths of 1 percent. To better understand the SAE system, let's assume that the store's drawing indicates the use of 2340 steel. The main element of alloy or type of steel is the first digit to which it belongs; In this case, the nickel alloy. In simple alloy steels, the second digit indicates an approximate percentage of the prevailing alloy element (3 per cent nickel). The last two figures always indicate carbon content at points, or hundredths of 1 percent (i.e. 0.40 hundredths of 1 percent carbon). This explanation shows that the designation 2340 indicates nickel steel, about 3 per cent of nickel and 0.40 hundredths of a cent of carbon. Steel Bar Color Coding Color Code, established by the U.S. Department of Commerce Standards Bureau for the manufacture of steel bars. The markings are applied by painting the ends of the metal Work on this color code was originally carried out at the request of the National purchasing agents. Solid Colors: Usually means Carbon Steel Twin Colors: Assign Alloy and Free Cutting Metal Identification Color Codes Metal Identification Test Sequence: Free PDF with recommended testing sequence for magnetic, slightly magnetic and non-magnetic metals. Smithy Links: Identification of Metal Metal Trials: How to Identify Metals for Welding. N.p., n.d. Web. February 18, 2017 SPARK TEST - tpub.com. I N.p., n.d. Web. February 18, 2017 Metal characteristics, plasma welding, welding positions ... N.p., n.d. Web. 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