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Aluminium and copper are the most available material in the earth, but the copper conductor carries 40% extra current than the aluminium conductor.But the cost to sqmm points of view, i.e the cost of 3 core 35sqmm aluminium cable has Rs 1.6per sq. meter and copper conductor has Rs 3.0 per sqmm. However, the aluminium cables are much cheaper than the copper cable.However, in this article, we are going to see how to get cable capacity using Aluminium and Copper Current Carrying Capacity Calculation chart.Also see: Note: Here, sqmm indicates the cross-sectional area of the cable.Also, the current-carrying capacity of the cables are depending on the following factors such asAmbient temperature,Number of core,Voltage level,Method of cable laying i.e If you put the cable underground, you can increase the current by 5% more than the current going in the open trays. Since the ambient temperature of the underground cable is lower compared to the open cable.Type of insulation.Conductor class.Manufacturer Standards.Learn More: Difference Between Multi meter Megger andSeriesTest LampAlso see:How to Repair Electrical Wire Insulation FailureCopper Current Capacity chart:Below chart recommends single core copper cable as for class 5 conductors (flexible), 2 core and 3 core cable as class 2 conductor. Refer to the below-mentioned cable,Note that, the first column indicates the size of the cable, according to that, you can get the current-carrying capacity of the cable with respect to its size in sqmm along with the different core.Copper cable Current Carrying Capacity (XLPE insulated)Cable Size in (Sq. mm)Single CoreTwo CoreThree/Four Core11713.591.52217.515.52.530242144032286514136106957501691766825119101893514612511050175151134702211921719526523120112030526923915033430026118538434129624045940034630053245839 4 Aluminium Current-Carrying Calculation chart:Aluminium cable Current Carrying Capacity (XLPE insulated)Cable Size in (Sq. mm)Single CoreTwo CoreThree/Four Core4161311620161410252219163531282543413635655952508071637091807195120115100120153133118150188161140185230203176240270254220300340314270 Note that in the above current-carrying calculation is done based on the XLPE insulation. In PVC insulation the same capacity will be reduced by 5%.Also see: Motor cable Size calculatorHow to calculate aluminium bus bar current carrying Capacity?Aluminium current-carrying is equal to 0.8 times of the total volume of the aluminium (length*breath*thickness).Lets have a simple example of 4 sqmm bus bar. Apply our equation,Current carry capacity of 35 sqmm bar= 0.8* 35 = 28 Amps.How to calculate Copper bus bar current carrying Capacity?Copper current-carrying is equal to 1.2 times the total volume of the copper (lenth*breath*thickness). Lets us have a simple example of 35 sqmm bus bar. Apply our equation,Current carry capacity of 35sqmm bar = 1.2* 35 = 42 Amps. Brand:PolycabProduct Category:Copper Power CableSize:10 sq mmCore:4 CoreConductor Material:CopperColour:BlackOverall Diameter (Strip/Wire):21.8mmCurrent Rating (A):73 AmpThickness of PVC Insulation:0.7mmMin.thickness of pvc inner sheath:0.3mmNominal Jimensions of Armoui (Strip / Wire):1.4mmMin. Thickness Of PVC Outer Sheath (Strip / Wire):1.40mmMax DC Resistance ohm:1.83 OhmMax. AC Resistance ohm:2.34 OhmApprox. Reactance at 50Hz Ohms/Km:0.0837Capacitance mFd/Krr:0.31 March 24, 2025August 21, 2024 Categories Uncategorized Post navigation Galvanized Steel vs Stainless Steel You cannot use the same cable sizes for every appliance in your home. Manufacturers make conductors in different sizes because they have to accommodate the varied electrical needs of the equipment in your house. You are probably familiar with 1mm, 1.5mm, and 2.5mm because people use these sizes in lighting circuits and sockets. But what about 10mm wiring? What purpose does it serve? Better yet, what kind of load can it carry? 10mm cables can tolerate anywhere between 32 and 64 amps depending on various factors including location, the length of the cable and ambient temperature. Situation(10mm)AmpsWire enclosed in an insulated wall44AEnclosed in conduit52AClipped64AThermal insulation in contact with the ceiling < 100mm45AThermal insulation in contact with the ceiling > 100mm36AThermal Insulation cable touching the wall47AThermal Insulation cable not touching the wall32A The amperage of an electrical cable refers to its current carrying capacity. This is the definition most electricians repeat. However, that definition doesnt mention the heat, which is vital to the amperage. 10mm cables can carry far more than 70 amps of current. But electricians are not necessarily concerned about the maximum amount of electricity a conductor can take. Rather, they want to identify the volume of current a wire will safely transmit. This is because every conductor generates heat when it transports electricity from one point to another. The electricity produces heat when it encounters the resistance in a conductor. Yes, 10mm cables can carry more than 70 amps of current. But eventually, if you force enough electricity through a conductor, the copper or aluminum will melt. If the heat is not strong enough to melt the conductor, it can still start a fire by igniting papers, curtains, sheets, and any other combustible components in the vicinity. The purpose of determining a wires amperage is to find the amount of electricity it can handle without raising the heat to dangerous levels. However, heat is not the only factor that matters. You must also consider the following: If the goal is to limit the amount of heat a current generates when it passes through a conductor, you must pay attention to the ambient temperature. Conductors in settings with higher ambient temperatures are more likely to overheat. Therefore, you have to lower the current passing through the wire if the ambient temperature is too high. The ambient temperature and temperature rating go hand in hand. Many manufacturers design cables with higher temperature ratings. These conductors work in settings with higher ambient temperatures, which is why their amp ratings are equally high. They can tolerate problematic ambient temperatures without overheating. Wires with lower temperature ratings are the opposite. They have lower amp ratings. If you look at the tables your contractors and engineers use, you will notice that they reveal the amp ratings of different wire sizes depending on their temperature ratings. The temperature rating a contractor selects will depend largely on the ambient temperature of the setting. Where do you intend to install the 10mm cables? Will you run them through conduits and ducts? Do you want to bury the conductors underground? Or will they remain free in the air? The setting affects the ventilation. You should install wires with higher temperature ratings in places with poor ventilation. Some people use cooling systems to counteract the overheating that may occur. This goes without saying. The size of the conductor affects the current carrying capacity. Think of a water pipe. The wider the pipe, the more water it can carry. Conductors are the same. The largest loads require the thickest conductors. This is why electricians prioritize the thickest cables for every application they encounter. But you cant just use the thickest wiring for every task. After all, thick conductors are more expensive than their thin counterparts. Additionally, they are less flexible and more challenging to manipulate. You need the correct wire size for each application. Dont ignore the number of conductors because this factor affects heat dissipation. The more insulated conductors you bundle together, the worse the heat dissipation. Related Post: How Many Amps Can 6mm Cable Carry?How many Amps Can 16mm2 Cable Take? Buy a clamp meter. You can measure the current running through a 10mm cable without cutting it open. If you dont have a clamp meter, you can cut the line open and use an ammeter. But this method is useless. It will show you the amount of electricity running through the cable, not the volume of current it can tolerate without overheating. Fortunately, you dont have to calculate a cables amperage. A table is more convenient. Many tables reveal the different cable sizes and their corresponding amperage. But what if your tables show the wire size in AWG instead of MM? While the US prefers AWG, many international markets measure the wire size in MM. The AWG standard has been around since the 1800s. Therefore, it is more widespread than you realize. Electrical world has a formula for converting the wire size. But you can ignore it. The formula isnt necessary because the website has published a table you can use to find a cables size. It shows the AWG and its corresponding diameter in MM. They want you to remember that a smaller number in AWG refers to thicker conductors. An example is 8AWG, which is a smaller figure than 10AWG. But 8AWG can carry more electricity than 10AWG. MM is the opposite. 10MM is thicker than 1.25MM. You should also realize that converting MM to AWG doesnt produce exact numbers. But you can eliminate the decimal points by rounding up or down. Nicab has also provided a table that shows wire sizes in AWG and MM2. From this table, you can see that 10MM is 8AWG. You can find the amperage of 8AWG in one of a million tables on the internet. This will give you the amp rating of 10MM wiring. But you dont have to convert MM to AWG. It is much easier to check the cable physically. Look at the insulation. More than likely, the wire size in AWG is printed on the jacket. 10MM cables are typically used for grounding purposes. The conductors are compatible with heavy-duty household appliances. The distance matters. Conductors have resistance. Electricity has to flow against that resistance when it moves through a conductor. This produces heat. The resistance increases with the distance. As a result, elevating the distance will also increase the heat generated. A long wire is more likely to overheat than a short wire. More importantly, the voltage drop will become a problem. The voltage drop shouldnt exceed 3 percent. Considering 10mm cable equals 8awg with a voltage drop of 3% using single-phase line with respective voltage 120, 240 & 480 volts can carry maximum distance up to 62, 124, 248 feet Voltage DropVoltagePhaseMaximum Distance3%120Single Phase62 feet3%240Single Phase124 feet3%480Single Phase248 feet Considering 10mm cable equals 8awg with a voltage drop of 3% using 3-phase line with respective voltage 120, 240 & 480 volts can carry maximum distance up to 71, 143, 287 feet Voltage DropVoltagePhaseMaximum Distance3%1203 Phase71 feet3%2403 Phase143 feet3%4803 Phase287 feet The best way to control the voltage drop is to increase the size with the length. Get a thicker conductor if you need a longer cable that covers a greater distance. Because smaller gauges have more resistance, you can reduce the resistance and voltage drop despite the significant distance by getting a thicker cable. 10MM is quite thick, especially in a domestic setting. But it isnt the thickest. Dont be afraid to exceed 10MM if you want the conductors to cross large distances. 10mm cable can tolerate a maximum current of 64 amps while the minimum current of 32 amps You have to limit the current running through cables that dont have proper ventilation. They cannot dissipate the heat they generate. But if the wires are clipped directly, they can carry as much as 65 or 70 amps. Cable SizeAmpsVoltWatt10mm40A1204800W10mm40A2409600W10mm40A48019200W To get the wattage, you have to multiply the voltage and amperage. For instance, you can calculate the wattage of a 10MM 40A cable in a 120V service if you multiply 120V by 40 amps. This gives you 4,800 watts. You cannot determine the watts unless you know the voltage and amperage. 10MM armored cables can accommodate 75 amps. Armored cable has a higher amp rating. It has a protective layer that allows the wires to survive in harsher settings whose conditions would typically corrode ordinary wires. You can run 10MM armored cables underground without worrying that insects and rodents will ruin them. They are a perfect addition to construction sites, factories, and subways. Copper cable is a popular choice for wiring in many electrical applications. Copper cable current rating, electrical conductivity and durability make it an ideal choice for carrying current. But how much current can copper cable actually handle? In this blog post, well take a look at the copper cable current carrying capacity. 4 mm Copper Cable Current Carrying Capacity:4 sq mm cable current capacity10 sq mm Copper Cable Current Carrying Capacity:This type of 10 sqmm copper cable current rating has a maximum recommended continuous current rating of 32 amps. It should be noted that 10 sq mm wire current capacity rating applies only to installations in ambient temperatures up to 30C and with a voltage drop not exceeding 3%.10 sq mm 3 core copper cable current capacityThe current capacity of a 10 sq mm 3 core copper cable can range from 32 to 73 Amps, depending on the specific cable and application.35 sq mm Copper Cable Current Carrying Capacity:35 sq mm cable current capacity has a maximum recommended continuous current rating of 92 amps. Again, this rating applies only to installations in ambient temperatures up to 30C and with a voltage drop not exceeding 3%.25 sq mm Copper Cable Current Carrying Capacity:25 sq mm cable current capacity has a maximum recommended continuous current rating of 63 amps. Once more, 25mm cable amp rating applies only to installations in ambient temperatures up to 30C and with a voltage drop not exceeding 3%.50 sq mm Copper Cable Current Carrying Capacity:50 sq mm copper cable has a maximum recommended continuous current rating of 111 amps. As before, this rating applies only to installations in ambient temperatures up to 30C and with a voltage drop not exceeding 3%.16 sq mm Copper Cable Current Carrying Capacity:16 sq mm copper cable has a maximum recommended continuous current rating of 41 amps. This too applies only to installations in ambient temperatures up to 30C and with a voltage drop not exceeding 3%.4sqmm Copper Cable Current Carrying Capacity:4sqmm copper cable has a maximum recommended continuous current rating of 13amps. Here again, this rating applies only to installations in ambient temperatures up to 30C and with a voltage drop not exceeding 3%.70sqmm Copper Cable Current Carring Capacity:70 sq mm cable current capacity has a maximum recommended continuous current rating of 156amps. As usual, this rating applies only to installations in ambient temperatures up to 30C and with a voltage drop not exceeding 3%.95sqmm Copper Cable Current Carring Capacity :95sqmm copper cable hasa maximum recommended continous current rating of 208amps . Yet again this rating applies only to installations in ambient temperatures up to 30C and with a voltage drop not exceeding 3%.4 core 16 sq mm copper cable current carrying capacityThe current carrying capacity (ampacity) of 4 core 16 sq mm copper cable is approximately 61.2 Amps. Its important to note that this value depends on multiple factors such as surrounding temperature, load duration, and installation conditions.240 sq mm Copper Cable Current Carring Capacity :The current carrying capacity of a 240 sq mm copper cable depends on various factors such as the installation method, ambient temperature, and insulation type. Generally, a 240 sq mm copper cable can carry a cable rating from approximately 600 to 800 amperes, depending on these factors. It is important to consult relevant standards and regulations for accurate specificationHow to calculate Current carrying capacity of Copper Cable?Determine the Cross-Sectional Area of the CableThe first step in calculating the current carrying capacity of a copper cable is to determine its cross-sectional area. This is done by measuring the diameter of the cable and then multiplying it by pi (3.14). The result is the area of the cable in square millimeters. For example, if a cable has a diameter of 8mm, its cross-sectional area would be 25.12 mm2.Calculate Resistance per Unit LengthThe next step is to calculate the resistance per unit length of the cable. This can be done by using Ohms Law, which states that resistance equals voltage divided by current (R = V/I). The resistance per unit length is calculated by dividing the voltage (V) by the current (I), multiplied by 1000 to convert it into ohms per kilometer (/km). For example, if a cable has a voltage rating of 300V and an amperage rating of 10A, its resistance per unit length would be 30 /km.Calculate Current Carrying CapacityOnce you have determined both the cross-sectional area and resistance per unit length of your copper cable, you can calculate its current carrying capacity using Joules Law. Joules Law states that power equals current squared times resistance (P = I2R). To calculate current carrying capacity, multiply your calculated resistance per unit length with your cross-sectional area in square millimeters and divide it by two (I = 2P/(A x R)). For example, if you have a cable with a cross-sectional area of 25mm2 and a resistance per unit length of 30 /km, its current carrying capacity would be 500A.Consider Temperature RatingWhen calculating current carrying capacity for copper cables, it is important to consider their temperature rating as well. Copper cables are rated according to their maximum operating temperature; higher temperatures require higher ratings for safe operation. Therefore, when selecting a copper cable for your application, make sure that you choose one with an appropriate temperature rating for your environment or application requirements.Consider Voltage DropFinally, when calculating current carrying capacity for copper cables, it is also important to consider voltage drop over distance due to line losses caused by electrical resistivity in cables . Voltage drop occurs when electricity flows through wires; as electricity passes through wires with greater resistivity , more energy is lost as heat resulting in lower voltages at longer distances from source . Therefore , when selecting a copper cable for your application , make sure that you choose one with an appropriate voltage drop rating based on your distance requirements .How many amps can 2.5 mm cable take?The current carrying capacity of a 2.5 mm copper cable can vary depending on factors such as installation method, insulation type, and ambient temperature. However, as a general guideline, a 2.5 mm copper cable is typically rated for carrying currents up to 20-25 amps in domestic or residential installations. It is advisable to consult relevant standards and manufacturer specifications for accurate information specific to your application.Copper Cable Current Carrying Capacity ChartCopper cable Current Carrying CapacityCable Size in (Sq. mm)Single CoreTwo CoreThree/Four Core11713.591.52217.515.52.530242144032286514136106957501691766825119101893514612511050175151134702211921719526523120112030526923915033430026118538434129624045940034630053245839 Conclusion:The amount of amperes (amps) that your cu cable current carrying capacity depends on its size (gauge). By taking into account the size (in square millimeters) of the wire you can determine its ability to safely handle electrical currents. When considering any kind of installation involving electricity, it is important that you consult an experienced electrician who can advise you on the best materials for your specific application as well as provide you with accurate calculations regarding wattage capacity, copper cable current capacity etc., which will help ensure your safety when dealing with electricity! Intended Audience: Electricians or DIYers interested in understanding the capabilities of different sizes/gauges/shapes/types of electric cables used for wiring projects.A passionate metal industry expert and blogger. With over 5 years of experience in the field, Palak brings a wealth of knowledge and insight to her writing. Whether discussing the latest trends in the metal industry or sharing tips, she is dedicated to helping others succeed in the metal industry.

6 sq mm copper armoured cable current carrying capacity. 4 sq mm copper armoured cable current carrying capacity. 2.5 sq mm copper armoured cable current carrying capacity. 10 sq mm 4 core copper armoured cable current carrying capacity. 16 sq mm copper armoured cable current carrying capacity. 4 core 16 sq mm copper cable current carrying capacity. 10 sq mm copper cable current capacity.