

## Materials we use

### Steel:

#### Mild Steel

Mild steel is a type of carbon steel with a low amount of carbon – it is also known as “low carbon steel.” Less carbon means that mild steel is typically more ductile, machinable, and weldable than high carbon and other steels. The low carbon content means it has very little carbon and other alloying elements generally resulting in less tensile strength than high carbon and alloy steels. Mild steel also has a high amount of iron and ferrite, making it magnetic. The lack of alloying elements such as those found in stainless steel means that the iron in mild steel is subject to oxidation (rust) if not properly coated. But the negligible number of alloying elements also helps mild steel to be relatively affordable when compared with other steels. It is the affordability, weldability, and machinability that make it such a popular choice of steel for consumers

Reference: <https://www.metalsupermarkets.com/what-is-mild-steel/>

#### Stainless Steel

Stainless steel is not rust-free; it is as described stainless. The two main types of stainless steel that we use are grades 304 and 316. The main differences between the two grades are the composition of the stainless in manufacture. Grade 304 contains 18% chromium and 8% nickel, whereas grade 316 contains 16% chromium and 10 % nickel with the addition of 2% molybdenum. It is the molybdenum in grade 316 that helps to resist corrosion from salt in seawater and winter gritting. Grade 316 is usually referred to as Marine grade as it is better suited to coastal areas than 304.

#### Aluminium

Aluminium is the world’s most abundant metal and is the third most common element comprising 8% of the earth’s crust. The versatility of aluminium makes it the most widely used metal after steel.

Pure aluminium is soft, ductile, corrosion resistant and has a high electrical conductivity. It is widely used for foil and conductor cables, but alloying with other elements is necessary to provide the higher strengths needed for other applications. Aluminium is one of the lightest engineering metals, having a strength-to-weight ratio superior to steel.

Aluminium has a density of around one-third that of steel or copper making it one of the lightest commercially available metals.

By utilising various combinations of its advantageous properties such as strength, lightness, corrosion resistance, recyclability and formability, aluminium is being employed in an ever-increasing number of applications.

Reference: <https://www.azom.com/article.aspx?ArticleID=2863>

### **Galvanized steel:**

Galvanized steel is a type of steel that has been galvanized by the application of a zinc coating throughout its body so that it can be protected from corroding or rusting. Galvanized steel has a longer life and durability compared to non-galvanized steel. The application process of zinc on a steel structure is called "galvanization."

Galvanized steel is among the most popular steel types because of its extended durability, the strength and formability of steel plus the corrosion protection of the zinc-iron coating. The zinc protects the base metal by acting as a barrier to corrosive elements, and the sacrificial nature of the coating results in a long-lasting and high-quality steel product.

Reference: <https://www.nationalmaterial.com/galvanized-steel-types-uses-benefits/#:~:text=What%20is%20Galvanizing%3F,is%20called%20hot%2Ddip%20galvanizing.>

<https://www.corrosionpedia.com/definition/2153/galvanized-steel>

### **Corten Steel :**

Corten steel is often referred to as Cor-Ten and broken down into two key elements. **Cor** refers to the corrosion resistance and **Ten** is for the Tensile strength. This is also known as "Atmospheric Corrosion Resistant" enabling the surface to "rust" whilst maintaining its structural integrity. The surface rust (known as oxidation) can take up to six months to appear, however applying a vinegar-based solution can accelerate the oxidation to hours rather than months. The rust that forms offers a protective barrier and prevents further rusting while giving a natural aged effect to any product it is used in (seating, Sculpture etc). Consideration needs to be taken where to locate the finished product as over a long period of time, weathering can make the colour run.

### **Wood:**

#### **Iroko:**

**Iroko is a medium-heavy, medium-hard exotic wood with a yellow-brown to dark brown colour.**

**It is a very durable wood, hardly impregnable,** which does not require any preservative treatment.

These characteristics make iroko a tropical wood suitable for:

- exterior joinery and outdoor furniture
- shipbuilding
- construction of bridges, frameworks and railway sleepers

The timber dries well and fairly rapidly, with only a slight tendency to distortion and splitting.

Iroko has excellent strength properties, comparing well with teak, though weaker in bending and in compression along the grain.

It is a very durable wood; iroko does not require regular treatment with oil or varnish when used outdoors, although it is very difficult to work with tools as it tends to splinter easily, and blunts tools very quickly.

Reference: <https://en.wikipedia.org/wiki/Iroko>

<https://www.trada.co.uk/wood-species/iroko/>

### **Red Meranti:**

Meranti is a durable hardwood with soft to medium density and light or dark golden reddish color, which depends on the origin of the wood. It is primarily used in internal applications and projects such as home/office interior, flooring, furniture, window, moulding, etc. In terms of workability, Meranti cuts, nails, glues, screws and sands easily. The wood is easily available and moderately priced. Here's everything you need to know about Meranti timber, its properties, uses and availability.

Reference: <https://cameroontimberexport.com/meranti-wood-properties-characteristics-uses/>

**Coconut Palm Wood:** Please refer to the attached PDF.

### **Why Coconut wood?**

*Because it is "the most eco-friendly natural wood" that has zero impact on forests.*

Every 100 to 120 years, the coconut palm's ability to yield fruit declines. Since the fruit is more valuable than the wood, the owner removes the tree and replaces it with fresh saplings.

Coconut wood was long used as firewood because it is too difficult to cut. New tungsten and diamond cutting tool technology allowed for the cutting and processing of this wood.

We now use this extremely hard wood, which is "eco-friendly natural wood," to make durable, long-lasting street furniture.

### **Bamboo wood**

Bamboo is a relatively new type of wood. From a botanical point of view, bamboo is a collective name for a group of grass species.

Bamboo is neither a hardwood nor a softwood, but a wood made from a grass species

Bamboo wood is known as a very sustainable material as the bamboo stems grow quickly in places where other crops have difficulty growing, they also store a lot of CO2 during growth and, after production, have a long life time, similar to wood. Sustainability when looking at bamboo wood means that it is both environmentally friendly and has a long lifespan. This is why bamboo is seen as the ideal building material of the future.

- More stable: because it is always laminated or compressed, there is less deformation

- More fire resistant: because compressed bamboo wood has a higher density than most wood types, it is more fire resistant.
- More consistent quality: because each bamboo product is machine-produced, the quality of the material is consistent and reliable, provided that reliable brands are selected.

## **WPC**

wood plastic composite (WPC) is a material created from a unique blend of natural wood and plastic fibers. Sawdust, pulp, bamboo, peanut hulls and unused woodworking materials, like bark, from a variety of projects, are combined with plastic powder to form WPC.

The greatest advantage of WPC is its environmentally friendly approach of using waste wood and recycled plastic material. Wood composite plastics have low maintenance cost as compared to that of solid wood. One of the main reasons responsible for the fast growth of WPC is its low-life cycle cost.

Reference: <https://extension.okstate.edu/fact-sheets/what-is-wood-plastic-composite.html>

<https://www.generalkinematics.com/blog/wood-plastic-composite-uses-benefits/#:~:text=What%20is%20Wood%20Plastic%20Composite,plastic%20powder%20to%20form%20WPC.>

## **HPL**

**HPL or High Pressure Laminate:** HPL is about the most durable laminate available. It is made of several sheets of paper that get bonded together using high pressure presses. It is used in many horizontal applications such as counter tops and higher quality table tops. On vertical surfaces, it is commonly used for doors and drawer fronts of cabinets. HPL has higher impact resistance than most other laminates.

High pressure laminate is considered one of the most durable decorative surface materials. It performs well in both horizontal and vertical applications, appearing in furniture, cabinetry, flooring and wall treatments.

HPL is durable and therefore well-suited for surfaces in high-traffic areas in the home, as well as retail, corporate and hospitality settings. It is often utilized on both vertical and horizontal surfaces in hospitals and clinics.

It is considered to be one of the most durable decorative surface materials and is available with special performance properties including chemical, fire and wear resistance.

Reference: <https://www.compositepanel.org/products/decorative-surfaces/high-pressure-laminates/>

## **Stone**

### **Granite:**

one of the most durable and attractive of all natural stones. It consists of quartz, feldspar and mica; during formation it cooled very slowly which results in it being second only to diamonds in its hardness. Due to its resistance to flaking, scratching and scorching, granite is the number one choice in natural stone for contemporary street furniture. It is the key choice for creating furniture which

can be placed in any street scene, with minimal maintenance. The beauty of granite or stone products is that over a long period of time, it does not lose its charm appeal and elegance. It will not fade or look dated, its rustic appeal will lend an enigmatic touch to the whole project ambiance.

Granite is available in various colours and tones and you can pick a variety of colours that will complement the project you are working on. Depending on your preference, you can select a colour that will blend within its surroundings or stand apart due to its contrasting appearance. If you are looking for natural beauty then choosing granite street furniture for your project is a key decision.

Available in a wide range of surface finishes to suit the project brief, granite will add elegance to any Project.

Polished finish: High gloss, smooth finish.

Honed finish: Satin sheen, smooth finish

Hammered finish: The surface of the stone is hammered resulting in an even, medium textured finish.

Reference: <https://bollardstreet.com/materials-we-use/>

**GRP:** Please refer to the attached PDF

The Glass Reinforced Plastic (GRP) used in our furniture is strong, light and versatile. Products moulded out of Polypol-1003, which is medium viscosity, medium reactivity, general-purpose, Thixotropic, pre-accelerated unsaturated polyester resin, are designed to give the fastest wetout of fibreglass reinforcements, higher glass-to-resin ration leading to better coverage, rapid cures and rapid moulding cycles. Our GRP comes in three types of finishes: metal-infused, Metal Matched Paints (MMP) and solid colour resin. Our care kits for general maintenance and repair include a can of acrylic enamel paint and catalyst for standard finishes or a can of resin and a small bottle of catalyst for metallic finishes. For longer warranty elements we propose a Jotun Guaranteed Coating Methodology with Polyurethane paint system.