

ΧΥΤΟΣΙΔΗΡΟΣ – CAST IRON

https://en.wikipedia.org/wiki/Cast_iron

Cast iron is a group of iron-carbon alloys with carbon (C) content greater than 2%.

Carbon (C) ranging from 1.8 to 4 wt%, and Silicon (Si) 1–3 wt%, are the main alloying elements of cast iron. Iron alloys with lower carbon content are known as steel.

Cast iron tends to be brittle, except for malleable cast irons. With its relatively low melting point, good fluidity, castability, excellent machinability, resistance to deformation and wear resistance, cast irons have become an engineering material with a wide range of applications and are used in pipes, machines and automotive industry parts, such as cylinder heads, cylinder blocks, gearbox cases and urban equipment & playgrounds.

It is resistant to damage by oxidation.



Non-Wood materials used in outdoor structures

ΑΝΟΞΕΙΔΩΤΟΣ ΧΑΛΥΒΑΣ – STAINLESS STEEL

https://en.wikipedia.org/wiki/Stainless_steel

In metallurgy, stainless steel, also known as **inox steel** or **inox** from French *inoxydable* (inoxidizable), is a steel alloy, with a minimum of 11% chromium content by mass, and a maximum of 1.2% carbon by mass.

Stainless steels are notable for their high corrosion resistance, which increases with increasing chromium (Cr) content.



Non-Wood materials used in outdoor structures

ΓΑΛΒΑΝΙΣΜΕΝΟΣ ΧΑΛΥΒΑΣ / ΣΙΔΗΡΟΣ – GALVANISED STEEL / IRON

<https://en.wikipedia.org/wiki/Galvanization>

επιψευδαργύρωση

Galvanization or galvanizing is the process of applying a protective zinc coating to steel or iron, to prevent rusting. Zinc (Zn) is attached in the surface.

The most common method is **hot-dip galvanizing**, in which the parts are submerged in a bath of molten zinc.



Non-Wood materials used in outdoor structures

ΧΑΛΥΒΑΣ ΜΕ ΠΟΥΔΡΑ ΗΛΕΚΤΡΟΣΤΑΤΙΚΗΣ ΒΑΦΗΣ – POWDER COATED STEEL

https://en.wikipedia.org/wiki/Powder_coating

Powder coating is a type of coating that is applied as a free-flowing, dry powder (PET, PU, Epoxy, PET-Epoxy), without using any solvent.

The powder coating is typically applied electrostatically and then cured under heat (>200°C).



Non-Wood materials used in outdoor structures

ΚΡΑΜΑΤΑ ΑΛΟΥΜΙΝΙΟΥ – ALUMINIUM ALLOYS

https://en.wikipedia.org/wiki/Aluminium_alloy

Aluminium alloys are alloys in which aluminium (Al) is the predominant metal. The typical alloying elements are copper, magnesium, manganese, silicon, tin and zinc.

There are two principal classifications, namely casting alloys and wrought alloys.

The most important cast aluminium alloy system is **Al-Si** where the high levels of silicon (4-13%) contribute to give good casting characteristics.

Aluminium alloys are widely used in engineering structures and components where light weight or corrosion resistance is required.

Much less flammable alloys contain high percentage of magnesium (Mg).



Non-Wood materials used in outdoor structures

ΣΧΟΙΝΙΑ – STEEL ROPES with POLYAMIDE YARN

<https://www.richter-spielgeraete.de/ropes.html>

These special ropes consist of galvanized steel-wire strands.

*Each individual strand has a **polyamide yarn** tightly wrapped around it. Edge ropes are additionally reinforced by a steel-wire core.*

Ropes are tempered, which means the polyamide yarn is inductively fused around each steel-wire cable.

A hard polyamide coating remains to protect each strand. Such ropes feel pleasant to the touch, ideally suited to be gripped by children's hands.



Non-Wood materials used in outdoor structures

ΠΟΛΥΕΣΤΕΡΑΣ – POLYESTER

<https://en.wikipedia.org/wiki/Polyester>

*Polyester is a category of polymers that contain the ester functional group in their main chain. As a specific material, it most commonly refers to a type called **polyethylene terephthalate (PET)**.*

*In playgrounds, some elements of polyester include also **fiber glass**.*



Non-Wood materials used in outdoor structures

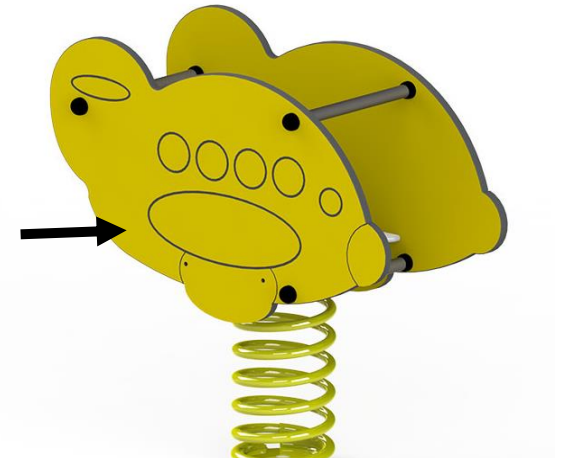
BAKELITEΣ (HPL) – High Pressure Laminates (HPL)

https://en.wikipedia.org/wiki/Decorative_laminate

HPL is molded and cured at pressures not lower than 70 bar. It is made of resin impregnated **cellulose** layers, which are consolidated under heat and high pressure.

The various layers are described below: Overlay paper, which serves to improve the abrasion, scratch and heat-resistance, Decorative paper, which defines the design and is composed of colored or printed paper, and Kraft paper, which is used as core material and control product thickness. Their density is greater than 1.35 g/cm^3 .

HPL consists of more than 60 to 70% paper, with the remaining 30 to 40% a combination of a **PF** for the core layers and **MF resin** for the surface.



Non-Wood materials used in outdoor structures

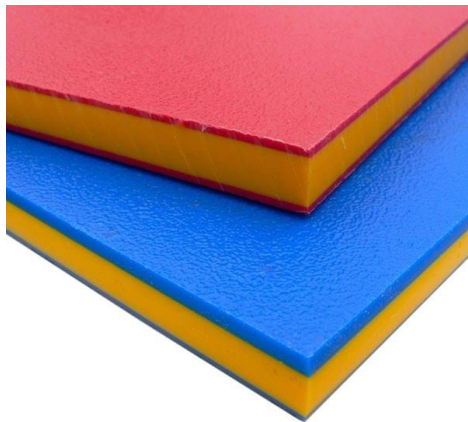
ΠΟΛΥΑΙΘΥΛΕΝΙΚΑ ΠΑΝΕΛ (ΠΛΑΣΤΙΚΑ) – HDPE Plastic Sheets

https://en.wikipedia.org/wiki/High-density_polyethylene

High-density polyethylene (HDPE) is a thermoplastic polymer produced from the monomer **ethylene**. HDPE is commonly recycled.

HDPE is known for its high strength-to-density ratio. The density of HDPE can range from 0.93 to 0.97 g/cm³. Although the density of HDPE is only marginally higher than that of low-density polyethylene, HDPE has little branching, giving it stronger intermolecular forces and tensile strength than LDPE.

Lots of parts in modern playgrounds are made of coloured HDPE.



Non-Wood materials used in outdoor structures

ΧΥΤΕΥΜΕΝΑ ΠΛΑΣΤΙΚΑ – MOLDED PLASTICS

https://en.wikipedia.org/wiki/Decorative_laminate

How is molded plastic?

Injection molding is the process of making custom plastic parts by injecting molten plastic material (PE, PP, PVC, etc) at high pressure into a metal mold.

Just like other forms of plastic molding, after the molten plastic is injected into the mold, the mold is cooled and opened to reveal a solid plastic part.



Non-Wood materials used in outdoor structures

ΕΠΙΦΑΝΕΙΕΣ ΚΑΟΥΤΣΟΥΚ – EPDM Rubber | Playground surfacing

https://en.wikipedia.org/wiki/Playground_surfacing

https://en.wikipedia.org/wiki/EPDM_rubber

A playground surface is the material that lies under and around swings, slides, other playground equipment, and kinder gardens. The surfaces are usually made of rubber and designed specifically for aesthetics, child safety, and/or wheelchair accessibility.

Playground safety surfacing often involves the use of recycled rubber tire products such as poured rubber, rubber tiles or loose rubber mulch.

***EPDM** (ethylene propylene diene monomer) rubber regardless of the binders used (aromatic/aliphatic) will still breakdown with UV radiation. The colors will fade or change after some weathering.*

