Centre for Appropriate Technology

Steel products for home repairs and building

INTRODUCTION

This is the second Bush Tech in a short series to help people doing small jobs around the home. The first (BT #57 — May 2012) described useful tools. This Bush Tech discusses using steel, which is one of the most common materials for home use.

Strength, appearance, durability and resistance to pests, workability and the effect of climate are the main factors influencing choice of building materials. This means suitable material for the job in one place may not be suitable in another.

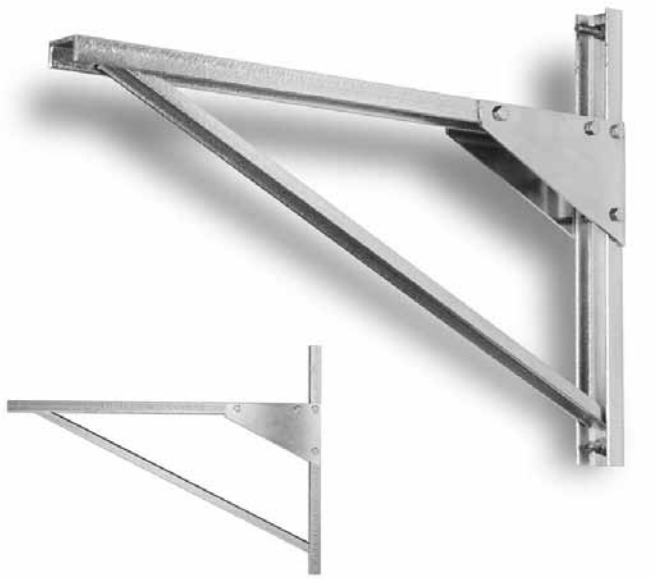
STEEL PRODUCTS & PROTECTIVE COATINGS

Steel is a relatively strong and cheap metal for general use. Its most common form is mild steel. Mild steel can be bent, cut and drilled relatively easily, but it rusts quickly if not coated. To avoid this, hardware items are normally pre-coated in one of the following ways during the production process:

- Hot-dip galvanising —the steel (usually in its finished form such as corrugated sheet, nuts, bolts, etc.) is coated with a thin layer of molten zinc, which turns solid when cooling down. Zinc quickly forms an oxide layer on its exposed surfaces, which greatly slows down further corrosion. Galvanised materials are generally intended for outdoor use or in locations where the metal is frequently exposed to moisture. Individual items can be galvanised after fabrication, but the cost is relatively high, so this is usually only done for architectural or professional construction work. Newly galvanised surfaces usually show a coarse crystalline pattern.

A hot-dip galvanised steel sheet.

- Zinc plating is another production coating process where a (much thinner) zinc layer is deposited electrically on the steel surface. Zinc plating is cheaper than galvanising, but it gives limited protection against rust. Nuts and bolts commonly sold in hardware stores are zinc plated, and many sizes are only available in this form. A new zinc plated item usually looks more even and glossy than the equivalent galvanised piece.



Zinc plated steel brackets.

Watch Out! Zinc plated hardware is suitable only for indoor use, and if used for external work will often have a very short life. Zinc plated products can not normally be painted effectively.

- Zincalume coating deposits a layer of zinc-aluminium alloy on the surface of sheet steel products such as corrugated sheet. Further specialised paint layers may be added to colour the final product — this is marketed as the Colorbond range of sheeting products. The rust resistance of Zincalume is comparable to galvanising.

Where uncoated steel materials are used, it is possible (and almost always necessary) to paint them after cutting, drilling, or filing has been completed. Any rust or residual oil should also be removed before the first coat (a suitable metal primer coat) is applied. Oil is best removed with a rag soaked in mineral turpentine.

Watch Out! Galvanised and Zincalume products may be painted, but seek advice from a paint shop as the surface needs special preparation.

STEEL SHEETS AND FITTINGS

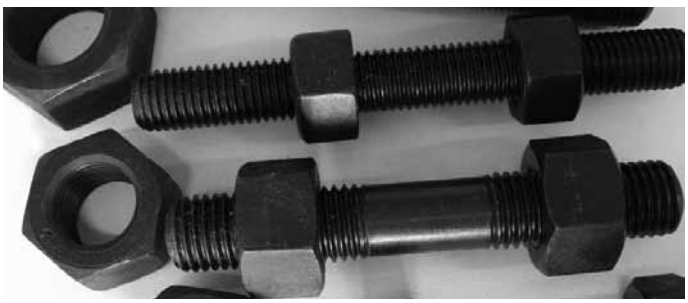
Sheet steel products are typically available in a range of thicknesses. Around 0.4 mm is common, but for light or heavy duty situations check whether other grades are available.

Other steel products may be made of stainless steel and high tensile steel.

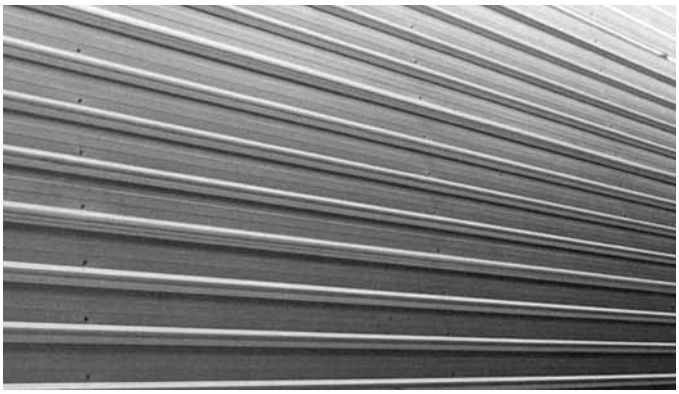
Stainless steels give superior rust protection to galvanising, but are more expensive again. They are typically used where even a small amount of rust would cause problems, such as in food preparation areas, sinks, wash troughs, washing machines and nuts and bolts that are used near salt water.

Watch Out! Stainless steel nuts and bolts may seize, particularly where they are under heavy load while being tightened — such as a turnbuckle being tensioned. To avoid this, first make sure the threads are very clean and free running, then coat the threads with a dry lubricant such as graphite grease — ask your hardware store for a suitable product.

High tensile steels are typically used in nuts and bolts which are under extreme tension. They are commonly used in certain locations in cars, and can usually only be identified by markings on the head of the bolt. To replace a damaged nut or bolt, take a sample with you to a car parts supplier.



High tensile steel rods and nuts.



A Zincalume coated steel clad wall.

Stainless steel kitchen sink.

Stainless steel laundry sink.