

Architectural Brass

CDA Publication No 89, 1991

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Copper Development Association

Copper Development Association is a non-trading organisation sponsored by the copper producers and fabricators to encourage the use of copper and copper alloys and to promote their correct and efficient application. Its services, which include the provision of technical advice and information, are available to those interested in the utilisation of copper in all its aspects. The Association also provides a link between research and user industries and maintains close contact with other copper development associations throughout the world.

Website: www.cda.org.uk

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Introduction



Decorative brass cladding to columns, safety screen and lift facade at Merry Hill centre, Dudley.

For architects and interior designers, the copper alloys known collectively as brass are among the most interesting metals available for the realisation of imaginative ideas, and have been so ever since brass was first manufactured. Brass has done more to stimulate the designer in the creation of exciting architectural detailing than almost any other material.

Gleaming balustrades, handrails and fine door furniture in polished or patinated brass and architectural bronze are in the mind of every architect and designer who has ever seen the beauty of these superb metals and their potential for enriching architectural ornamentation.

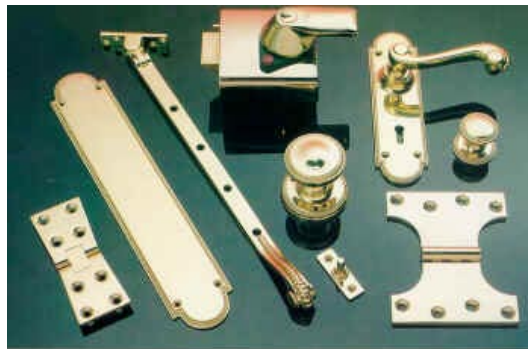
From Ghiberti's bronze doors on the Baptistry in Florence to the manganese bronze facade on Mies van der Rohe's Seagram building in New York, there is no other metal with such exciting visual possibilities when imaginatively handled. Also, brass is probably the only common metal that possesses virtually every positive attribute from corrosion resistance to aesthetic beauty. Above all, it is probably the extraordinary richness of colour and texture that endears it to the heart of every designer.

Advantages

There are many advantages associated with brass as an architectural material, some of which are as follows:

- Superb colour and texture
- Will accept a mirror-like polish
- Will not corrode
- Can be manufactured as rod, profile, tube, plate, sheet, foil and wire
- Good strength and ductility
- Easily processed by casting, extruding, rolling, drawing and hot stamping
- Excellent machining qualities
- No degradation in sunlight
- Will not soften in high temperatures (up to 200°C)
- Will not embrittle in sub-zero temperatures (down to -100 °C)

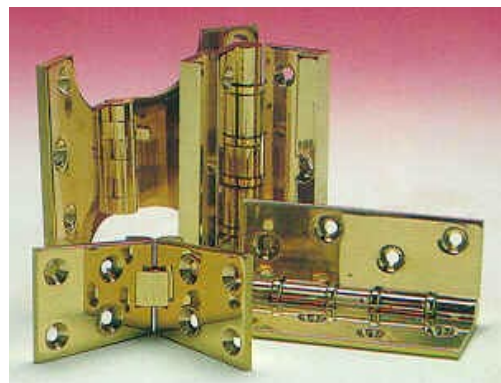
Brass is also the perfect material for use in clinical environments such as hospitals, where the biocidal action of the copper will inhibit the growth of most micro – organisms.



Door and Window Furniture (Brassart Limited)



*Mortice lever lock
ABT Gibbons, Josiah Parks & Sons Ltd,
Yale Security Products Ltd*



*Brass hinges
Hinges & Things Ltd*

Types of brass

The traditional properties of all brasses are strength, good electrical conductivity, corrosion resistance, machinability and richness of natural colour. There are over thirty-five different standard brasses, each one of which has unique properties that makes it particularly suited to a specific application.

The metallurgical structure of the brasses make some more easily machined, others more suitable for extrusion or hot stamping and others better suited to engraving. The ability of brass to reproduce extremely fine detail is one of the many advantages it has over most other metals and makes it particularly suited to the manufacture of highly decorative products using casting, piercing and embossing techniques.

The specialised uses of brass are of significant value to the architect and designer in the reproduction of period architectural hardware and feature work in the restoration of listed buildings, in particular, and in many of the highly prestigious buildings of all types currently on the drawing board and under construction.

Architectural bronze or manganese brass is especially resistant to atmospheric corrosion and has an unlimited life span. It develops a durable and tenacious oxide film, which is an attractive chocolate brown colour, and has the added advantage of self-healing over superficial scratches making it very competitive against some of the more expensive colour coating systems used on other metals. Brass is a material extensively specified by architects and designers who require a durable and aesthetically pleasing metal for use, particularly in prestigious buildings, both new and old.



*Brass handrails on a spiral staircase in a residential accommodation
(County Forge Limited)*



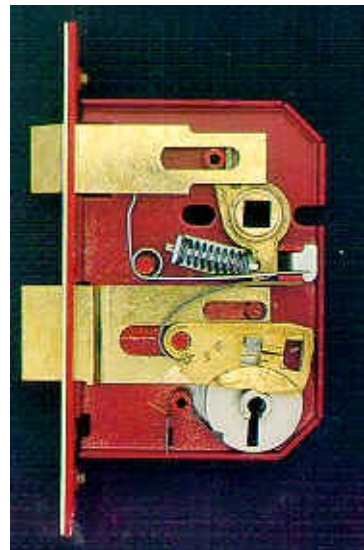
*Brass Rods, profiles and wire
(Delta Extruded Metals Company Limited)*



*Arena handrails at Merry Hill Centre, Dudley
(President Manufacturing Limited)*

Security hardware and ironmongery

The advantages of brass are particularly relevant to the design and manufacture of a wide range of security hardware products used in many new buildings such as offices, banks and hotels. Brass offers freedom from corrosion, fine tolerances in machining, smooth operation of moving parts and a general requirement for a long, trouble free life without maintenance or replacement. It is a metal ideally suited to the production of almost every item of architectural hardware including mortice locks, lever handle and ball handle sets, finger plates, escutcheon plates, window furniture and many other products.



*Open view showing brass components in a typical mortice lever lock mechanism
Security Lock Products - Josiah Parkes & Sons Limited, Yale security Products limited*

Economics

The real cost of products manufactured from brass is often considerably lower than the cost of the same component made from many other common metals, as the metal content is only a fraction of the total product cost. All brasses are easily machined and have lower production costs together with associated savings in tooling costs. In addition all brasses use a large percentage of recycled offcuts and swarf, which lowers the base cost of the metal. And finally the principal advantage is one of longer service life and freedom from corrosion, which leads to lower or non-existent maintenance and replacement costs.

Ornamental door furniture

Die-casting is a process particularly suited to brass and is used extensively in the manufacture of intricate functional and ornamental products. The casting process with its capability of reproducing the finest detail, previously reserved for the engraver's skills, is ideally suited to 'period' architectural hardware. Finger plates, escutcheon plates, lever handle and ball handle door sets, are typical of the many items which can be manufactured in architectural brass, using a variety of different processes.



Meadow Hall Shopping Mall, Sheffield (Viking Engineering (Architectural Metalwork))



Window frames and infill panels at Betty's tea rooms York (Rileys (Metal Workers) Ltd)



Door handles, window furniture and escutcheon plates (Brassart Ltd)

Handrails and balustrades

The ease with which brass can be extruded to almost any profile makes it the ideal metal for handrails, whereas intricate balustrade designs can be cast, formed or fabricated using brazing and soft soldering techniques.

Electrical components

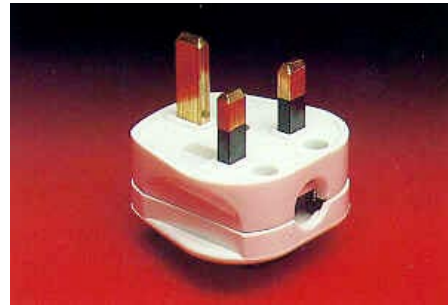
Brass is well suited to the manufacture of the numerous components in plugs, switches and industrial fuse gear, where good electrical conductivity is essential. It can also be used decoratively in the manufacture of domestic light switches, socket outlet plates and light fittings. Because brass performs well in all environments, its resistance to corrosion means that it will not build up insulating oxides which create higher contact resistances and the risk to electrical components from overheating.



Escalator Safety Balustrades at Merry Hill Centre, Dudley President Manufacturing Limited



Decorative domestic switches and 13 amp plug MEM Limited



Fabrication

Brass can easily be joined to itself and all other copper alloys, by soft soldering and brazing. This makes the fabrication of intricate brasswork much easier than with some other metals and also contributes to cleaner lines due to the omission of rivets, straps and brackets.

Decorative and protective finishes

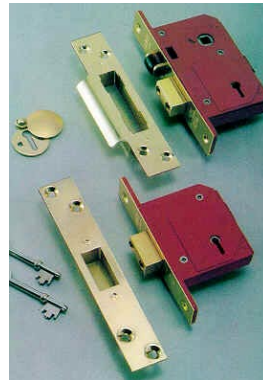
Modern decorative techniques are available for toning brass to almost any desired colour from a gold-like yellow, through dull yellows and amber browns, to chocolate brown and black. All these colours have an extremely long life even in working environments. Other decorative treatments, such as enameling and plating using chromium, nickel, silver or gold can further extend the creative possibilities for brass.

Brass is one of the few metals that can be successfully polished to either a high gloss or mirror finish. Although all polishing will ultimately tarnish, due to the effects of the atmosphere, the time taken will vary considerably according to the local environment conditions. To prevent tarnishing and to retain a polished finish, the use of protective lacquers and coatings is recommended. (for further details of protective lacquers and coatings see CDA publication TN41)

For more information on the compositions, properties and forms in which brass is commonly available please contact the Information Department at CDA.



*Range of Brass Profiles
(Delta Extruded Metals Limited)*



*Mortice Lever Lock Products
(Josiah Parkes & Sons Ltd)*

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