**USE OF FLAT CARBON STEEL FOR INDUSTRY**

A steel grade should fulfil two major demands : provide the end products its functionality

and agree with the processing at the customer. The choice of the steel grade and its

further specifications should meet these demands. Steels are widely used in all main

manufacturing sectors. These are the transport industry, the building industry, the

packaging sector, the domestic appliances industry and general engineering. Typical

applications in these areas are :

• Automotive and transport: cars, vans, trucks, railroad transport and shipbuilding

• Building : industrial buildings and home building

• Packaging : cans, tins, drums, containers

» Domestic appliances : refrigerators, washing machines, stoves and microwave ovens

« Engineering : process equipment for the chemical and oil industry, tubes and parts

**Mechanical construction and engineering**

Due to its mechanical properties, steel has virtually always ruled the field of mechanical

engineering. It satisfies a wide range of requirements. Its uniquely rich metallurgy, and

the skill with which the steel makers and many of their customers take advantage of it,

make it possible to obtain an extremely large diversity of functional characteristics.

Properties such as yield and tensile strengths, ductility, fatigue strength, abrasion

resistance, weldability, formability, etc., can be varied in apparently infinite

combinations.

Mobile cranes, for example, offer an illustration of the interest of

high strength steels. For a given lifting capacity, thinner sections

mean less metal and lower costs. However, here again, total

weight is an essential factor. The same reasoning applies to truck

trailers. A lighter structure means a higher payload. Furthermore,

a trailer must be easy to repair, and the weldability of steel is an

essential feature. Another example among the many applicationsof high strength steels is their use in pipelines, in order to reduce the wall thickness.

For the same pumping pressure and bursting strength, the weight savings significantly

decrease capital expenditure.

Corrosion can also be a constraint in mechanical engineering. Steel components, even

with thick sections for supporting heavy loads, must be protected against attack by the

natural environment or by chemical substances with which their function brings them

into contact. The traditional solution used to be galvanisation, followed by painting of

the finished part. Nowadays, wide hot-rolled steel strip several millimetres thick is

galvanised directly in the steel mills. Under certain conditions, corrosion of uncoated

edges and welds is prevented by "cathodic protection", so that in the majority of cases

subsequent coating with zinc is not necessary. Liquified natural gas tanks is one of the

applications that have gained from progress in corrosion protection.

Automotive

The steel itself shapes the automobile, inspiring its forms and encasing its mechanisms, while protecting its passengers from the weather, noise, and most importantly, from the danger of accidents.

The history of the motor vehicle is inseparable from that of steel, and has led to today's close

partnership between the automobile manufacturer and the steel maker. Continuous progress in vehicle performance has required parallel improvements in materials. The development of new grades is dictated mainly by the demands of this industry for materials that will make the production of lightweight, fuel-efficient cars, possible in a cost-effective manner.

Automobile design principles in fact reflect the properties of the material. They provide the toughness, strength and structural integrity necessary for passenger safety, while at the same time complying with increasing demands for aesthetic appearance and durability.

The proportion of steel used in housing (±2%) is quite different from that employed in

industrial buildings (±50%). However, whenever functional arguments prevail over

emotional reasoning, the mechanical qualities of steel win the day. Thus, the

possibility of very wide spans is extensively exploited in factories, warehouses,

agricultural buildings, sports facilities and shopping centres. Steel is not only the

rational choice, but is also synonymous with bold design. It enables a lighter, more airy

style. Less restricted by weight, and with the possibility of tensile loading, architects

can make full use of cantilever designs and non-vertical contours.

aggressive chemicals, as in washing machines, enamel-coated or stainless steels meet

the challenge. New steel grades now greatly facilitate the enamelling process,

simplifying surface preparation and reducing the number of layers and baking

treatments required.

When low cost is essential, paint finishes are employed. In this case, the sheet can be

coilcoated in the plant after galvanising, and then cut to shape, formed and assembled.

Modern galvanised and painted products offer remarkable flexibility and attractive

appearance, combined with resistance to all types of foodstuffs and cleaning agents,

e.g. detergents, disinfectants, vinegar, wine, ... Their resistance to ageing and high

temperatures has become excellent.

In cooking appliances, numerous structural components are subjected to very high

temperatures, exceeding 500°C in pyrolytic self-cleaning ovens. Only enamelled

products can withstand these conditions, and are universally employed in gas-burning

or electrically heated hobs.

points“

Steels are widely used in all main manufacturing sectors:

* General engineering (Due to its mechanical properties)
* Transport industry (The steel itself shapes the automobile)
* Building industry (The high mechanical strength makes it possible to obtain lighter and stiffer structures, with longer spans)
* Packaging sector (Easy and cheap to recycle)
* Domestic appliances industry (Cheaper, flexible, universal)