

## II - The EN Standards

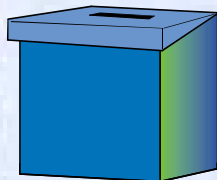
The EU Council Resolution on a new approach to technical harmonization and standards was published on June 4, 1985. The "new approach" was to streamline technical harmonization and the development of standards in that Directives are limited to essential safety or other performance requirements in the general public interest, while the technical details are left to European Standards organizations such as CEN, CENELEC and ETSI. **European Standards (EN)** are therefore tools to help manufacturers and users comply with the Directives by providing practical guidance on meeting their requirements. Standards are not mandatory, but give details on recommended solutions that follow the Directives, particularly in relation to establishing a technical construction file. They are therefore a methodical toolkit, and in addition they offer stronger evidence of compliance.

European standards are more comprehensive than those of other countries. Many countries adapt the European standards for their own use (USA, Japan), or merely adopt them in their totality (e.g. Australia, Poland).

### Approval of European Safety Standards

"The approval of European safety standards follows a clearly defined process. Firstly a working group is organised to discuss the possible changes. Secondly, the working group drafts a standard. The draft standard is issued with a "pr" prefix (for project), indicating that the standard exists but has not been generally adopted by all countries. Thirdly, the draft standard is put to a vote between the different European countries to confirm the text and adopt the standard".

#### Vote between the different European countries



A vote occurs between European countries in order to agree on the text of the standard. Each European country has a fixed number of votes: for instance France, Germany and Italy have 10 votes each and Belgium has 5 votes. The text of a standard is confirmed when the majority of the countries accept the text and when the proportion of favorable votes is more than or equal to 71%.

When the countries have voted and if the numbering is approved, a definitive code number is assigned to the standard. Usually, this number is the same as the old one, but without the "pr" prefix.

Finally, the code number becomes official when each country includes it in its Official Journal.

## The Architecture of European Standards

Standards are inseparable from risk assessment and the selection of the type of safety devices for machinery. Not only do they facilitate the understanding of the importance of the steps in selecting safety devices, they direct this selection through a series of specific recommendations such as safety distance etc. **It is strongly recommended that you read the principal Standards carefully to understand in what precise framework they are applicable.**

EN 292 explains the architecture of the standards that apply to Safety. To facilitate their use, the technical committees of the European Standards organisations (CEN, CENELEC, etc.) have divided them into three broad categories:

- **Type A standards** define fundamental concepts and general design principles that apply to all types of machinery.
- **Type B standards** are concerned with a particular aspect of safety (Type B1 standards) or a type of device or component affecting safety (Type B2 standards), and are applicable to most machinery. Normally a stand-alone safety device (such as a light curtain) will be marked with its corresponding Type B risk level coverage.
- **Type C standards** give minimum safety instructions for a specific group of machinery. In the absence of Type C standards, designers of machinery will have to use Type A and B standards to establish the technical construction file.

(See diagram II.1 on next page)



Diagram II.1

## Type A standards

- EN 292: Safety of machinery: Basic concepts, general principles for design /  
ISO/IEC 12100-1/2
- EN 414: Rules for elaboration and presentation of safety standards  
Part 1: Basic terminology methodology  
Part 2: Technical principles and specifications
- EN 1050: Risk assessment /  
ISO/IEC 14121

## Type B1 standards

- EN 294: Safety distances to prevent danger zones from being reached by upper limbs /  
ISO/IEC 13852
- EN 349: Minimum gaps to avoid crushing of parts of the human body /  
ISO/IEC 854
- EN 811: Safety distances to prevent danger zones from being reached by lower limbs /  
ISO/IEC 13853
- EN 954: Safety related parts of control systems  
Part 1: General principles for design /  
ISO/IEC 13849-1  
Part 2: Validation testing, fault list /  
ISO/IEC 13849-2
- EN 982: Safety requirements for fluid power systems and their components - Hydraulics /  
ISO/IEC 4413
- EN 983: Safety requirements for fluid power systems and their components - Pneumatics /  
ISO/IEC 4414
- EN 999: Hand/arm speed - approach speeds of parts of the human body for positioning protective equipment /  
ISO/IEC 13855

## Type B2 standards

- EN/IEC 60204: Electric equipment of machines
- EN 418: Emergency stop equipment /  
ISO/IEC 13850
- EN 574: Two-hand control devices /  
ISO/IEC 13851
- EN 953: General requirements for the design and construction of guards /  
ISO/IEC 14120
- EN 1037: Prevention of unexpected start-up /  
ISO/IEC 14118
- EN 1088: Interlocking devices with and without guard locking /  
ISO/IEC 14119
- EN 1760: Pressure-sensitive protective devices (mats, floors, edges, bars)[4 parts] /  
ISO/IEC 13856
- IEC/EN 60947-5-1: Electromechanical control circuit devices
- IEC/EN 61496: Electrosensitive protective equipment - general requirements [3 parts]

Diagram II.1 continued

## Type C standards

### *Machines for cold working of metals*

- EN 692: Mechanical presses
- pr EN 693: Hydraulic presses, press-brakes, pneumatic presses
- pr EN 12622: Hydraulic press-brakes
- pr EN 13736: Pneumatic presses

### *Rubber and plastics machines*

- EN 201: Injection moulding machines
- EN 289: Compression and transfer moulding presses
- EN 422: Blow moulding machines intended for the production of hollow articles
- EN 1114: Extruders and extrusion lines
  - Part 1: Extruders
  - Part 2: Die- face pelletisers
- EN 1417: Two-roll mills
- EN 1612-1: Reaction moulding machines

### *Continuous handling equipment and systems*

- pr EN 617: Storage of bulk materials in silos, bunkers, bins and hoppers
- pr EN 618: Mechanical handling of bulk materials except fixed belt conveyors
- pr EN 619: Mechanical handling of unit loads
- pr EN 620: Fixed belt conveyors for bulk materials
- pr EN 741: Pneumatic handling of bulk materials

### *Packaging machines*

- pr EN 415-1: Common requirements
- EN 415-2: Machines for pre-formed rigid packaging
- EN 415-3: Form, fill and seal machines
- EN 415-4: Palletisers and depalletisers

### *Graphic and paper machines*

- pr EN 1034: Paper machines

### *Food processing machinery*

- EN 1678: Vegetable cutting machines
- EN 1974: Slicing machines

### *Wood working machines*

- pr EN 691: Common requirements
- EN 848: One side moulding machines with rotating tool
  - Part 1: Single spindle vertical moulding machines
  - Part 2: Single spindle hand fed/integrated fed routing machines
- EN 859: Hand fed surface planing machines
- EN 860: One-side thickness planing machines
- EN 861: Surface planing and thicknessing machines
- EN 940: Combined wood working machines
- pr EN 1218: Tenoning machines
- pr EN 1807: Bandsaws

### *Tannery machines*

- EN 972: Reciprocating roller machine
- EN 930: Roughing, scouring, polishing and trimming machines
- EN 931: Footwear manufacturing machines
  - Lasting machines
- pr EN 1035: Machines with mobile tables
- EN 1845: Footwear moulding machines

### *Miscellaneous*

- EN 775: Manipulating industrial robots
- EN 1525: Industrial trucks - driverless trucks and their systems
- EN 10472: Industrial laundry machinery [6 parts]
- EN 11111: Textile machinery
- pr EN 11553: Safety of laser machines for treatment of materials
- EN 12626: Laser processing machines [6 parts]