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# General

## Scope and objectives

This specification covers the minimum requirements characteristics and performance requirements of raised access floors for used in electrical, instrumentation and process control rooms. It is applicable to modular, factory made flooring elements, comprising panels and pedestals.

The general design of the raised access floor shall provide:

* Safety for personnel and equipment
* Easy to maintain and to operate
* Suitable for harsh industrial environment
* All materials shall be suitable for continuous operation for at least 25 years

## General Rules

The general rules defined in the Cargill standard "General Specifications" are also part of this specification. The supplier has to inform himself about the content of this specification.

## Normative references

The design, material and performance shall conform to the latest applicable IEC recommendations as well as relevant local/national standards, regulations and codes.

National

All national standards and legal requirements shall apply.

International

Among others especially the following normative documents shall apply:

EN 1081 Resilient floor coverings - Determination of electrical resistance.

EN ISO 140-12 Acoustics – Measurement of sound insulation in buildings and of building elements – Part 12: Laboratory measurement of room to room airborne and impact sound insulation of an access floor (ISO 140-12:2000).

EN 1815 Resilient and textile floor coverings – Assessment of static electrical propensity.

prEN 12524 Building materials and products - Energy related properties - Tabulated design values.

EN 12664 Thermal performance of building materials and products – Determination of thermal resistance by means of guarded hot plate and heat flow meter methods – Dry and moist products of medium and low thermal resistance.

EN 12667 Thermal performance of building materials and products – Determination of thermal resistance by means of guarded hot plate and heat flow meter methods – Products of high and medium thermal resistance.

prEN 13501-1 Fire classification of construction products and building elements – Part 1: Classification using data from fire reaction tests.

prEN 13501-2 Fire classification of construction products and building elements – Part 2: Classification using data from fire resistance tests (excluding products for use in ventilation systems).

ENV 61024-1 Protection of structures against lightning – Part 1: General principles (IEC 61024-1:1990, modified).

HD 384.4.41 Electrical installations of buildings – Part 4: Protection for safety; Chapter 41: Protection against electrical shock.

This standard is based on International Systems of Units (SI) except where otherwise specified.

# Definitions

**Mechanical fixings** Nail fixings or similar used to provide additional fixing security of the pedestal base plate to the sub floor.

Panel Load bearing horizontal component of the access floor. It is supported by the under structure (e.g. pedestals and stringers)

Pedestal Vertical component or part of the element, which transmits the loading to the subfloor

**Pedestal adhesive** this is normally a 2 or 3 part epoxy resin based adhesive with good adhesion to concrete and steel. This adhesive will be of a thick consistency in order to cater for local undulations in the concrete sub floor.

Plenum Available space between the underside of the panels of the access floor and the sub-floor

Plenum height Distance between the highest point of the sub floor and the lowest point of the underside of the access floor

Raised access floor Factory made flooring system comprising panels supported on understructure of pedestals, and/or stringers or other components as applicable providing a load bearing structure for the fitting out of a building. Raised access floor systems are also identify as false floors or computer floor.

**Rolling loads** these loads are imposed by items of equipment fitted with wheels or castors that are frequently moved around.

Safety factor the factor by which the ultimate load is divided to establish the working load

Ultimate load Maximum load at the time of failure of the element during the specified ultimate load test procedure

Stringer Horizontal component connecting pedestals that may support panels (beams)

System Assembly of elements forming a complete installed raised access floor

Working load Load given by dividing the ultimate load by the safety factor (ultimate load is sometimes called failure load and working load is sometimes called design load as well as nominal load)

# Design

## Floor Panels

The minimum requirements for floor panels are:

**Safety in case of Fire**

The panels shall be non-combustible, thus this raised floor could be used for escape routes adding an additional important protection for people inside the building

**Dimensional Accuracy and Accessibility**

The panels shall be laid on pedestal, without screwing, thus high accessibility. : This will give high interchangeability of panels and a low operation costs. The dimensional accuracy shall ensure no moving of panels and any groaning and squeaking. The deviations on the panel dimensions shall be class 1 (table 3) according to EN 12825.

**Air leakage**

* For Air Leakage (no loss of air when floor is used as air channel) and preventing dust and dirt falling to the ground floor a good tightness of joints is needed.
* A floor panel at a wall or cabinet shall a “wall foam tape” to prevent air leakage.

**The floor panel must be protected by edge trim.**

**Surface**

* The surface covering shall be High Pressure Laminate (HPL). HPL must be ease to maintenance and to dissipate static electricity. HPL thicknesses shall be > 3mm.
* The material must withstand movement of heavy equipment on casters (wheels) and must resist the build-up of static electricity.
* No special detergent shall be required for cleaning the floor plates.

**Alignment**

* The height different between two floor panels shall be less than 0,5 mm
* The floor alignment < 0,5 mm over length of 20 meters

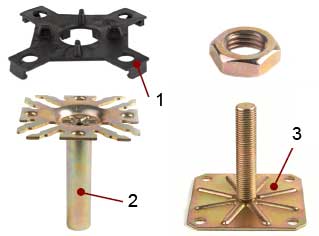
**Lifetime**

* Panels must be designed for more than 25 years

## Pedestal

Pedestals are an all-metal construction comprising of the following components:

* Base plate manufactured from pressed steel at a minimum size of 100mm x 100mm. At least 4 holes are included in the base plate to allow for mechanical fixings. Larger size base plates shall be used at higher floor heights (>1000mm).



1. Gasket for the pedestal
2. The upper part of the pedestal
3. The pedestal base

* The pedestal tubes are welded to the pedestal base plates.
* The pedestal shall be of zinc coated materials and shall have a good protection against corrosion.
* Pedestal heads are produced from zinc plated pressed steel or high-pressure die cast aluminium.
* The design of the pedestals allows for at least of a total of 40mm of adjustment to cater for sub floor variations. Once adjusted at the correct height the locking device prevents any change in adjustment due to vibration.
* The pedestal tubes shall incorporate a locking device to ensure that the pedestals remain locked at their correct height.
* The pedestal heads are designed to readily accept both snap on and bolt on stringers. The stringers shall be bolt to increase the structural performance of a raised floor system.
* The pedestal heads are fitted on site with a snap on plastic cap that provides location for the floor panels.
* The pedestals are attached to the sub floor by the use of an epoxy resin-based adhesive. Additional security is needed through the use of mechanical fixings.

## Stringers

The stringers shall be bolt on the pedestal. These are screwed into the pedestal head and are designed as structural components and as such increase the structural performance of the raised floor system. They will also provide increased lateral stability.

## ****Bridging beams****

Bridging beams are used to bridge across services or obstacles in the floor void in situations when a pedestal cannot be sited in its required location. The bridging beam is supported at either end by a pedestal to which it must be firmly fixed. Whenever possible standard bridging shall be used although if required bridging can be designed to overcome special circumstances.  
The actual section used varies with the span between the support pedestals, the grade of floor in which it is to be installed and the project specification

## Substructure

The raised access floor shall be:

* All metal parts shall be galvanized steel to prevent corrosion.
* Screwed to the floor with at least 2 screws, only adhesive is not allowed.
* Suitable for a height form 400 to 1200mm, with a mechanical lock to prevent the height getting out of adjustment as result of vibration caused by the floor system being used. Later readjustments must be possible at any time.
* Between the pedestal and floor plate shall be a sound dampening gasket, which shall be locked to the pedestal (screw).
* The grid shall be bolted to create a much safer environment. Bolting the stringers to the pedestal creates a grid that remains rigid even when floor tiles are removed.
* Under structure must be designed to last 25 years.
* Supporting frame for a cabinet of an electrical panel:
  + Electrical cabinets, like LV/HV boards, MCC etc shall be placed on a separate special design-supporting frame to carry the high weight and to give enough stability to the cabinets.
  + The support frame can be:
    - * Pedestals and stringers with a higher load design
      * Welded special frame

## Protection against corrosion

The element shall comply with European standards, if existing, in respect of protection of metallic materials against corrosion if existing. In the absence of such standards, elements shall comply with requirements valid in the place of implementation

## Loading capacity

The raised access floor shall at least have (if no information on datasheet):

* Load capacity class 3, which means a design load of >= 4000 N
* Destructive force ≥ 8000 N
* Safety index of 2 according
* Deflection Class A maximum defection 2,5 mm

## Electrostatics / Static Electricity

The floor systems shall comply with EN 1081, EN 1815 and HD 384.6.61.

The floor systems have to meet the following requirements:

* antistatic according to EN 54 345 2 kV as its voltage charge
* resistance to earth R2<= 1 x 109 Ohms or voltage
* The metallic structure of the raised floor must be electrically bonded to the ground to minimize static build-up.
* The bolted-stringer raised floor is considered to be electrically bonded to itself. This type of raised floor need only be interconnected to the building steel, electrical safety ground, and any other metallic structure that penetrates the perimeter of the floor to meet the required specifications
* The grid structure (Pedestal and stringers) shall be connected to the earthing system in each corner point with an earthing wire with a diameter of 25 mm2. The structure electrical resistance shall be 1 Ohm or less. The connection to the earthing system shall be done by the electrical contractor.
* Compliance shall be verified by visual inspection and measurement by the supplier

## Fireproofing Performance characteristics

The raised access floor shall be classified for its resistance to fire according to EN 13501-2.   
In general, the following performance characteristics are possible: REI 30, which means satisfying the performance criteria of integrity, insulation and load bearing for a minimum tome period of 30 minutes.

Resistance to fire according to EN 13501, part 1, Raised access floor systems shall be B, non-flammable

# Documentation

A proper set of documentation shall be delivered together with the raised access floor. The general requirements for documentation are mentioned in the ‘General Specification’. The documentation shall be divided into chapters as detailed below:

* Drawings
* Technical Data
* Calculations
* Certificates, declarations, test reports
* Manuals

## Drawings

The supplier shall provide a set of drawings as detailed below:

* Sample test report
* Special test report according to standards mention in 1.3 normative references

# Warranty

All products provided under this specification shall be warranted for 24 months from date of delivery or 20 months from date placed in operation, whichever comes first. Upon receiving a warranty claim from CARGILL, the supplier shall at its own cost and expense and without reimbursement by CARGILL promptly correct, repair or replace the items which are not in conformance with this specification. The supplier’s warranty shall cover all costs (including, without limitation, those costs associated with parts, labour, technical support, travel, transportation, and shipping and handling).