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Safety distances on the machines: openings in fixed protections and distance between light curtains

The safety distance between an opening in a shelter and a dangerous point, or between a light curtain and a hazardous point, is often a matter of debate between manufacturers and user customers, as these aspects affect the machine's dimensions or may limit the operability by operators.

The practical implications related to the safety distance are therefore very important aspects, both in the case of the construction of new machines and in the case of evaluation and adaptation of old machines.

MTM Consulting can follow your company in managing this specific issue, through the use of assessment methods and solutions appropriate to your reality and regulatory requirements.

The UNI EN ISO 13857: 2008 standard "*Safety of machinery - Safety distances to prevent the achievement of dangerous areas with the lower and upper limbs" is the basis of reference for the sizing of the safety distance in many application cases, including in particular we can remember:*

- the meshes of a protection network;
- the openings of channels or slides used for loading/unloading of machined pieces;
- openings to allow sampling;
- the height from the ground of the perimeter guards.

For the dimensioning of these distances the standard provides a series of elevations that express the minimum safety distance to be respected between the beginning of the opening and the nearest dangerous point reachable, according to the dimensions of the opening (width and height) and of its shape.

The UNI EN ISO 13855: 2010 standard *"Positioning of protective means according to the approach speed of parts of the human body"* is instead suitable for calculating the distance that the barrier of photocells must have from the nearest internal hazardous point reachable. In fact, in case of positioning too close to the machine it could incur a non-effectiveness of the barrier, which once crossed would still allow the reaching of the moving parts before they are actually stopped. In the opposite case, however, an excessive distance increases the necessary space around the access point for its protection from intrusions, and therefore arrests, unwanted, and makes it more difficult to operate on the machine in case of frequent operations near the danger zone.

The minimum safety distance is defined by a formula that considers:

- the speed of crossing the barrier, depending on whether it is an arm or a whole body;
- the resolution of the barrier, or the distance between the single emitting beams;
- the speed of response of the barrier, a typical data provided by the manufacturer of the photocell barrier;
- the stopping speed of the dangerous member once the stop command has been given.

Sizing these safety distances according to the harmonized standards of the Machinery Directive, both for new and existing machines, provides presumption of conformity about these points and evades any doubt in the event of disputes, whether they come from a customer or an inspection body.