ASPREX Fact Sheet

Handrail

Continuous rail fixed to a sidewall to allow the person firmly grabbing and thus provide lateral support while walking or climbing stairs; it can accommodate for any length of the walking path and follow any wall conformation by straight, rounded and angled sections. The materials used in the framework may include metal, plastic, wood or other materials.

- Product Classification
  - APL (WHO Assistive Product Priority List): 16 (Handrails/grab bars)
  - ISO 9999:2022: 181803 (Handrails and support rails)
- Possible configuration variants
  - Coating (which may be textured or made of metal, plastic, epoxy or other materials).
  - Reflective or high-contrast surfaces (to increase identifiability for people with low vision).
- Possible accessories or optional components

  None specified.
- Product goals

  Activities or functions the product is mainly intended to support, according to WHO ICF Classification:
  - Walking [d450].
  - Maintaining body position [d415].
- Indicated impairments

  Difficulties the product is mainly intended to address, according to the WHO ICF Classification:
  - Walking [d450].
  - Seeing [b210] (difficulty in orientation while walking).
  - Muscle power functions [b730].
  - Stability of joint functions [b715].
- Contraindicated impairments

  Difficulties for which the product may be inappropriate:
  - Severe difficulty in grasping/gripping. *Unless used with variants: Coating*
  - Ability to use only one leg.
  - Severe arms weakness.
- Indicated environments

  Specific environments in which the product should be used:
  - Wall-bordered paths.
  - Stairs.
- Contraindicated environments

  Environments in which the product may be inappropriate:
  - Weak walls.
  - Walls lacking points where the rail can be safely fixed to bear the person's weight.
- Other indicated factors

  Other factors or situations the product is intended to address:
  None specified.
- Other contraindicated factors

  Other factors or situations in which the product may be inappropriate:
  - Having a wounded foot or being at risk of developing wounded feet (due for instance to diabetes; in which case one should never hop on the wounded foot).
- Points to be considered in product selection

- The handrail must be safe, which means stable, irremovable, not deformable, supporting the person's weight when walking or resting, and able to bear the user's pushing/pulling force when clinging or falling.
- An unsafe handrail is a potential source of accidents rather than a facilitator.
- The handrail safety depends on three factors: the technical quality of the selected product item, the characteristic of the walls where the handrail is going to be installed, and the expertise of the person who is going to install it.
- When selecting the product item, always check the product documentation to find out the technical quality data and the installation instruction.
- Good quality traditional masonry and bricks should cause no problems if the recommended fixtures and procedures are followed.
- A plasterboard or tiled surface should not affect the fixing, although ensure that the whole depth of the fixing is supported by the masonry.
- Most dense concrete blocks are strong enough to support rails; however, care should be taken as their composition may make it difficult to drill a straight hole through them.
- If the wall is made of lightweight, aerated and hollow brickwork, even the most appropriate fixings may not be able to withstand the loads that can be suddenly applied to the rails.
- The insides of the hollow blocks are often filled with a polystyrene type insulating material, which will not provide enough support for fixtures screwed into it.
- Aerated concrete blocks, which are often used in bathrooms and toilets as the waste pipes are carried through their cavities, are made of a very lightweight substance, which limits their fixing support qualities; supporting fixtures should be attached to this type of wall using specific wall mounted support products or battens.
- Even if a partition or stud wall is physically strong and stable and has a suitable flat surface to take a handrail, the addition of a pattress or backboard on the wall is advised when fixing a grab rail to it; this should be a flat, unknotted piece of wood, which is screwed into the vertical joining pieces of the partitions.
- Particular care should be taken when attaching rails to domestic sandwich partitions, e.g. plasterboard with a hardboard facing.
- Fixing to UPVC plastic door frames should be avoided, as the frames are unlikely to have the necessary internal materials in the required area to support a grab rail's fixings.
- When rails are installed outside or in a bathroom and are likely to become wet, consider using brass or chromium-plated screws to avoid the formation of unsightly rust stains.
- Make sure to have a person who will be able to carry out the installation in a perfect manner.
- If you are unsure of the construction of your home, you should seek the advice of a builder; they may also be able to advise you, and fit rails if suitable.
- The installer should ensure there is no possibility that any metal part that may be touched by you, including fixing screws, will come into contact with electric cabling.
- Choose the handrail coating based on your gripping ability, comfort perception, heat / cold sensitivity and aesthetics; especially if the handrail is placed in outdoor spaces or exposed to high or low temperature, a plastic or epoxy coating may be necessary.
- Once all points above have been addressed, the physical shape and the path of the handrail should be designed: this will allow calculation of the exact number of components, spare parts and consumables that is needed for installation.

Points to be considered in product fitting

- The handrail height should be between 900-1000 mm above ground, or above the pitch line of the stairs, which is the same height as normal banisters.
- A different height may be chosen depending on specific user's needs; however, as a handrail - once installed - tends to be used by more people (family members, visitors etc.), for safety reasons it is recommended to install it at a standard height and provide a second parallel handrail at custom height (e.g. 750 mm above the ground, which is suitable to children or people using wheelchairs).
- The handrail should have a fixing at least every 1000 mm and no more than 150 mm from each end; it may require mounting on a pattress or backboard to ensure stable and safe support.
- When used on stairs, it is recommended that the handrail is run continuously from the bottom to the top of your flight of stairs, including going around the edge of any intervening landings and across window openings; the handrail should be allowed to continue past the top and bottom steps at least by 300mm.

- Points to be considered in product use
    - If the user happens to experience losses in the hand's strength, or pain in the hands or wrist or elbows or shoulder, his or her gripping ability may be temporarily hindered; additional support by another person may be advisable.
- Points to be considered in product maintenance / follow-up
    - Regularly clean and sanitize the handrail.
    - Regularly inspect the handrail stability and safety: if any component shows deformation, breaks, unscrewing or detachment, repair should be carried out immediately.
- Examples of products available on the market
    - Live product search in the EASTIN website https://www.eastin.eu/en/searches/products/list?iso=181803

Source

This Fact Sheet was compiled in 2021 by an international team of experts, to provide the initial knowledge base for a project ("An online system to assist the selection of assistive product") supported by the World Health Organization in 2020-2021 within the GATE Initiative (Global collaboration on Assistive Product). Fact Sheets were compiled for each of the 50 types of products included in the WHO APL (Assistive Product Priority List).

The team was composed of Renzo Andrich (Italy, group leader), Natasha Layton (Australia), Stefan von Prondzinski (Italy), Jerry Weisman (USA), Silvana Contepomi (Argentina) and Hasan Minto (Pakistan).

The project led to a prototype online tool called ASPREX (ASsistive PRoduct EXplorer). At the end of the project, it was transferred to a WHO collaborating center (the Global Disability Hub in the UK), in view of possible future developments.