

Applicable Floor Surfaces for Air Bearing

The traveling performance, the air consumption, and the durability of the air bearing considerably depends on the floor surface. As the floor surface is smoother with fewer gaps or steps, it is more suitable for using an air bearing and the traveling performance becomes higher. Pay sufficient attentions to the floor surface construction and control.

1. Overview

The conditions required as the floor surface for the air bearing is smooth, hard with luster on the surface without inclination, cracks, steps, etc. If there are such obstacles on the floor, not only will the traveling resistance of the air bearing become larger, but damages to the air bearing may result by moving it forcibly.

The air bearing can be used on the following floor surfaces

- Steel plating
- Concrete with a resin-coated surface
- Temporary steel plating (Not suitable for permanent use)

2. Standard precision of floor area

As the gradient increases, cross current and necessary traction increase, and measures for excess cross current and drive force become necessary. Accordingly, we recommend a gradient of 3/1000 or less for practical bearing use.

- Entire inclination 3/1000 or less
- Entire surface waving ± 3mm or less per 1m

3. Construction and Maintenance Procedures

General maintenance of the floor is explained here. There is a wide variety of floor structural states, so consult a specialized floor construction company for the detailed correcting method.

3.1. In the case of steel plating

3.1.1. Cautions in construction

- Weld joining parts completely, and smoothen surfaces by a sander.
- Make sure to remove projections weld-spattered surfaces, etc., otherwise these may cause a puncture.
- Completely remove weld scattered spatter by welding work.
- Smoothen any burrs on the cut edge of iron sheets.
- If an iron sheet is not completely welded, smoothen the surface with a sander and cure by taping after pitch welding so as to eliminate steps.

3.1.2. In the case of crack

- There is no problem with a hair crack or short crack (length about 100mm) of width about 1 ~ 2 mm on the surface.
- After padding, finish with a sander to be flat on the surface. Smoothen the surface with fine sandpaper.

3.1.3. In the case of a flawed hole

- If the average diameter of the flawed hole is about 10 ~ 20 mm, it will not obstruct the traveling performance, unless the hole is a blowout.
- However, it is a problem, if there are holes in 2 positions or more on 1 air bearing surface. Finish with a sander after padding. And smoothen it with fine sandpaper.

3.1.4. In the case of step

- Basically, it is difficult to pass on a step.
- If it is a slight step, chamfer the corner part sufficiently with a sander to make it a smooth inclination. Or make a sufficient slope with putty, etc., and then coat the surface again.
- The traveling resistance is increased.

3.1.5. In the case of unevenness

- A large unevenness of which the inclination is 5° or less, and the height is 3 mm or less is not a problem. Flatten small unevenness with a sander.
- A sharp edge may scratch the air bearing, so smoothen it with a sander and sandpaper.

3.1.6. In the case of rusting

- If it is used frequently, normally problematic rust does not occur. However, if it is not used for a long period of time, rust affecting the performance of the air bearing may occur.
- If rust which is felt sandy by touching by hand occurs, smoothen it with sandpaper.
- In the case of long-term non-use, apply oil thinly on the floor surface to take measures for rust. Wipe off oil before use again. If a floor surface wet with oil is used, the oil and dust will adhere to the air bearing and this will affect the performance of the air bearing.

3.2. In the case of concrete with a resin-coated surface

3.2.1. In the case of crack

- After correcting with putty evenly, coat again.
- If it is shallow, putty is not necessary. It only has to be corrected by the film thickness of paint.
- If the width is narrow, it can be cured by taping. Thin poly tape with smooth surface is recommended (packing tape cannot be used).
- If the width is wide, place a thin (0.4 mm or less) galvanized plate on the surface and seal up the periphery with the above mentioned tape. Pay attention so that the end of the plate does not come off. (It may damage the air bearing.)

3.2.2. In the case of a flawed hole

- If the diameter of the flawed hole is 20 mm or less and a blowout, it will not obstruct the traveling performance.
- If there are 2 positions or more holes on 1 bearing surface, paste tape.

3.2.3. In the case of roughness of the entire floor surface

- Polish the base lightly with sandpaper, and coat it again. At this point, pay attention so that no litter or sand grains, etc., are included and coated together.

3.3. In the case of temporary steel plating

- Place iron sheets side by side contacting each other so as to eliminate gaps, and spot-weld at a pitch of 200 ~ 400 mm so that the iron sheets do not rattle due to traveling of objects being transported.
- Use a sander to carefully smoothen build-up of matter on welded joints. (Projections not allowed)
- Cure iron sheet joining parts by taping.
- Gaps between iron sheet joining parts should be 0, and construct floor surfaces so that the gaps are not more than 2 mm. If any gap of more than 2 mm is generated, caulk and cure the gap by taping.
- Steps between iron sheets should be 0. Construct floor surfaces so that the steps are not more than 1.5 mm. Chamfer and cure any edged steps by taping.
- Select iron sheets free from rust, flaws, or deformation such as warpage.
- Red rust is not allowed (care should be taken for rented iron sheets, in particular), and remove any incrustrated rust.
- If there is severe rust, enclose the rust with tape after curing it with galvanized plates with 0.5 mm or less.
- Make sure to touch the surface with hands after flooring to confirm its smoothness.

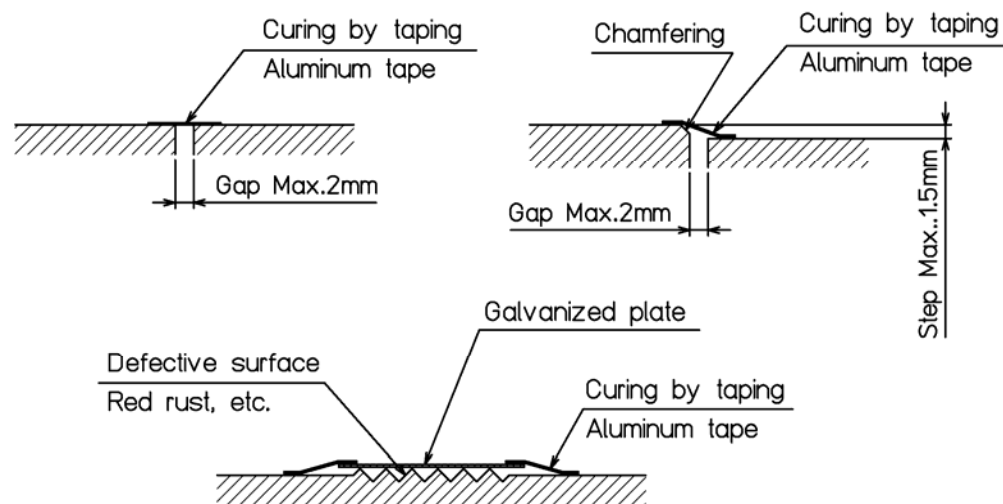


Fig.1 Curing of temporary iron sheet floor surface

4. Cautions

4.1. Curing by taping

- Make sure to cure joining parts and gaps by taping.
- Use only poly tape or aluminum tape. Never use packing tape.
- Remove dust or oil content on the area to be taped and firmly adhere tape so that it won't peel off.
- Periodically change the tape.

4.2. Daily control

- Keep the floor surface clean without foreign matter on a daily basis.
- Powder dust, cutting powder, may cause wearing of the air bearing at an early stage.
- Be careful not to drop tools, parts, etc., on the floor surface. A large object may scratch the floor surface, and small objects may be caught by the air bearing while traveling resulting in puncture.
- If there are cracks, flaws, or unevenness on the floor surface, correct them immediately.
- Especially if there is a sharp edge, or even minor protrusions, the air bearing may be scratched, so repair it immediately.
- This is not a problem, if nothing is felt by touching by hand.
- Control the floor surface so as not to generate rust. If there is a sharp edge, or even minor protrusions, the air bearing may be scratched, so repair it immediately.

4.3. Foreign matter, adhered objects

- Securely remove foreign matter on the floor surface, since this may cause puncture.
- Water and oil are not problems
- When welding work, etc., is carried out around the equipment, cure the diaphragm of the air bearing. Otherwise, the diaphragm will be perforated due to flying sparks, etc.

4.4. Items to check before transfer

- Always check the floor surface before transfer, and if there is a position where the tape of the joining part is likely to peel, attach it again.
- Clean litter or foreign matter on the floor surface.
- Remove protruding objects securely.
- Make it a habit to check and clean the floor surface before transfer.

Applicable Floor Surfaces for Air Porter

The traveling performance, the air consumption, and the durability of the air porter considerably depends on the floor surface. As the floor surface is smoother with fewer gaps or steps, it is more suitable for using an air porter and the traveling performance becomes higher. Pay sufficient attentions to the floor surface construction and control.

1. Outline

Necessary conditions of the floor surface for air porters are being smooth, free from inclinations, large cracks, or steps. If such obstacles exist on the floor, not only will the traveling resistance of the air porter become larger, but damage to the air porter may result by moving it forcibly.

The air porter can be used on the following floor surfaces.

- Steel plating
- Concrete with a resin-coated surface
- Floorings
- Tiles
- Composite panelings

2. Standard floor surface precision

The fewer the number of gap/steps there are, the better the traveling performance.

- Gap within 10 mm (in the case of no step)
- Step within 5 mm (in the case of no gap)

3. Construction and Maintenance Procedures

General maintenance of the floor is explained here. There is a wide variety of floor structural states, so consult a specialized floor construction company for the detailed correcting method.

3.1. In the case of steel plating

3.1.1. Cautions in construction

- Smoothen the surface of iron sheets with a sander after welding so as to eliminate steps.
- Make sure to remove projections weld-spattered surfaces, etc., otherwise these may cause a puncture.
- Completely remove weld scattered spatter by welding work.
- Smoothen any burrs on the cut edge of iron sheets.

3.1.2. In the case of cracks

- For cracks of more than 5 mm, after cladding by welding finish with a sander so as to make the surface flat. Smoothen the surface with fine sandpaper.

3.1.3. In the case of a flawed hole

- Finish with a sander after padding. And smoothen it with fine sandpaper.

3.1.4. In the case of step

- Chamfer the corner part sufficiently with a sander to make it a smooth inclination. Or make a sufficient slope with putty, etc., and then coat the surface again.
- The traveling resistance is increased.

3.1.5. In the case of unevenness

- A sharp edge may scratch the air porter, so smoothen it with a sander and sandpaper.

3.1.6. In the case of rusting

- If it is used frequently, normally problematic rust does not occur. However, if it is not used for a long period of time, rust affecting the performance of the air porter may occur.
- If rust which is felt sandy by touching by hand occurs, smoothen it with sandpaper.
- In the case of long-term non-use, apply oil thinly on the floor surface to take measures for rust. Wipe off oil before use again. If a floor surface wet with oil is used, the oil and dust will adhere to the air porter and this will affect the performance of the air porter.

3.2. In the case of concrete with a resin-coated surface

3.2.1. In the case of crack

- After correcting with putty evenly, coat again.
- If it is shallow, putty is not necessary. It only has to be corrected by the film thickness of paint.

3.2.2. In the case of a flawed hole

- For large flawed holes, adhere tape.

3.2.3. In the case of roughness of the entire floor surface

- Polish the base lightly with sandpaper, and coat it again. At this point, pay attention so that no litter or sand grains, etc., are included and coated together.

3.3. In the case of flooring

3.3.1. Cautions during construction

- Do not use floor materials with a large groove width
- Do not use floor materials with a narrow groove gap
- For places such as openings (trap doors) where there is a gap, pay sufficient attention during construction.

4. Cautions

4.1. Curing by taping

- Make sure to cure joining parts and gaps by taping.
- Use only poly tape or aluminum tape. Never use packing tape.
- Remove dust or oil content on the area to be taped and firmly adhere tape so that it won't peel off.
- Periodically change the tape.

4.2. Daily control

- Keep the floor surface clean without foreign matter on a daily basis.
- Powder dust, cutting powder, may cause wearing of the air porter at an early stage.
- Be careful not to drop tools, parts, etc., on the floor surface. A large object may scratch the floor surface, and small objects may be caught by the air porter while traveling resulting in puncture.
- If there are cracks, flaws, or unevenness on the floor surface, correct them immediately.
- Especially if there is a sharp edge, or even minor protrusions, the air porter may be scratched, so repair it immediately.
- This is not a problem, if nothing is felt by touching by hand.
- Control the floor surface so as not to generate rust. If there is a sharp edge, or even minor protrusions, the air porter may be scratched, so repair it immediately.

4.3. Foreign matter, adhered objects

- Securely remove foreign matter on the floor surface, since this may cause puncture.
- Water and oil are not problems
- When welding work, etc., is carried out around the equipment, cure the rubber of the air porter. Otherwise, the rubber will be perforated due to flying sparks, etc.

4.4. Items to check before transfer

- Always check the floor surface before transfer, and if there is a position where the tape of the joining part is likely to peel, attach it again.
- Clean litter or foreign matter on the floor surface.
- Remove protruding objects securely.
- Make it a habit to check and clean the floor surface before transfer.