Air Pads

Air pads as installation tool and/or alternative for rail systems

Air Pads as transport system

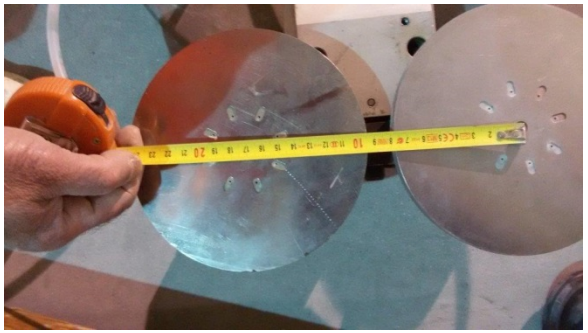
- Air pads in general
- Difference of precision and industrial air pads
- Performed tests
- Compressor

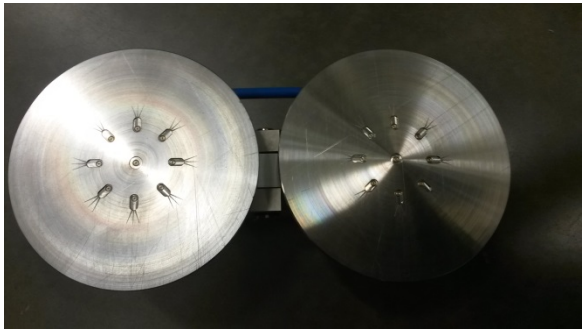
In General

- Smooth transport of heavy items
- The floor is an essential part of the system
  - No gaps
  - No pores
  - No sharp edges
- High air pressure and high air flow
  -> Dust will be spread every were!
  -> To be considered for clean environment

High precision air pads.

- Basic concept: flat metal surface with jet nozzle
- More air pressure less volume flow
- **Lifting 0,05mm -> a perfect flat floor is essential!**
- High-Quality floor at SCS and MID tested successfully 2015 (reports: “SCS_HQF_final” and “150421 SAT MID-HQFloor”)





Transport (industrial) air pads

- Rubber bulb like hovercraft
- Endless lifting capacity
- Less air pressure more volume flow (during test only 0,5bar needed)
- Lifting 20mm – 50mm
- Steps and unevenness can be handled

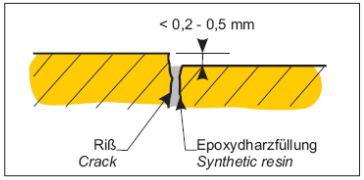


Abb. 5.1: Risse werden mit Epoxydharz luftdicht verschlossen. Höhendifferenz weniger als 0,2 - 0,5 mm (Betriebsdruckabhängig).
Fig. 5.1: *Airtight sealing of a crack with synthetic resin. Height difference less than 0.2 - 0.5 mm (depending on operating pressure).*

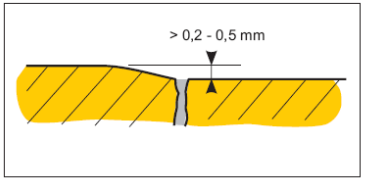


Abb. 5.2: Höhendifferenz zwischen beiden Seiten größer als 0,2 - 0,5 mm (Betriebsdruckabhängig), die eine Seite muß abgeschrägt werden.
Fig. 5.2: *Height difference more than 0.2 - 0.5 mm (depending on operating pressure), both sides have to be levelled out.*

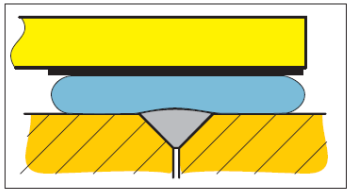


Abb. 6.1: Optimale Fugenform mit leichter Wölbung nach außen.
Fig. 6.1: *Correct gap form, with gentle convex curvature.*

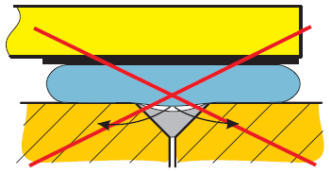


Abb. 6.2: Eine konkave Oberflächenwölbung ist nicht gestattet.
Fig. 6.2: *Wrong gap form.*

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Currently performed test

- In this round we tested **industrial air** pads
  - DESY MEA5 at SCS, MID and HED — DELU 4TLM-300-1
  - AEROFILM / LS Luftkissen at FXE — TS-4-B30N 01
- Test on the area at FXE -> pass
- General Movement over the concrete (“Estrich”) pass
  - Small damage in combination with Air bubble in the concrete was enhanced by the Air Pad in SCS
  - Investigation by civil construction: bigger area affected
  - Compensation done

Currently performed test

- Transition from the concrete to the HQF (at MID and SCS): very well –> pass
- Movement over tapped holes (“Gewindehülsen”) in the floor -> pass
- Movement over the door cut out in MID (crucial also for SCS, HED) with 2mm steel plate as support works fine -> pass

Air / Compressor

- Maximum requirement from the instruments
  - Industrial air pads: 3 Bar; 288m³/h
  - Precision air pads: 45Nm³/h (18m³/h at 6 bar)
  - Rental a compressor worked fine for the tests
    Atlas Copco GX11ff: 7.5 bar / 100 m³/h
- The instruments specify and hand over the demands to PSPO and TS to investigate the MKK pressurized air supply or to find a suitable compressor
- In general there will be different usage
  - **Industrial air pads:**
    - ► Between beam times (HED, FXE, SQS, SCS)
    - ► Once for installation, MID need at least 4800 l/min, at 3 Bar air pressure
    - ► Movement of spectrometer / detectors **during beam time**
    - ► FXE need high airflow (up to 2400 l/min per system, but only 2 Bar air pressure)
  - **Precision air pads:**
    - ► MID and SCS –> **parallel** operation is needed
    - ► MID and SCS need lower air flow, but up to 6 bar air pressure

Pressurized air will be needed very urgent (begin of April 2017)

Thanks

- Süleyman Arslan
- DESY - MEA5