



# Support in tunnelling projects

## How GL can contribute to your success

### A challenge to your business

Your business is tunnelling machines, one of the most challenging fields of engineering. Nobody needs to tell you it is also a business where safety and reliability are two of the most important factors – or that maintaining high standards of safety and reliability is vital to your company's success. The fact is that your business requires expertise in various areas of state-of-the-art technology where Germanischer Lloyd (GL) has an outstanding reputation as a globally operating certification and consultancy company. That's why our support can contribute to your success.



Tunnelling machines: technically challenging due to longer, deeper tunnels, geological conditions, etc.

### The solution you need

**GL offers you a wide range of certification and consulting services in fields of relevance to tunnelling machines:**

- Test and certification of airlocks according to current standards, e.g. EN 12110, ASME PVHO-1 as well as national standards and regulations
- Concepts for working under compressed air above 3.6 bar
- PED/TPED certification – all modules (pressure vessels, piping, assemblies)
- Training courses (e.g. EN 12110, PED)
- Welding (under hyperbaric conditions, build-up welding, welder tests, WPS approval)
- FEM calculations (pressure vessel design, flow simulation, etc.)
- Approval of vibration and sound analyses as well as measures to reduce vibration and noise for air locks
- Certification of containerised supply systems and tunnelling equipment
- Approval of safe transport: stowage, storage and tie-down measures
- Risk assessments (FMEA, evacuation plans, fire protection, rescue, etc.)
- Feasibility studies for new projects
- Type examination and production quality assurance for air locks

From certification and consulting to a master agreement or order contract, please do not hesitate to ask for a quotation that fits your needs.



Safer and more reliable operations with a tunnelling machine thanks to GL's expertise

## GL – your best partner

You can rely on GL for support in your tunnelling business. At GL we can point to unparalleled expertise and experience in pressure equipment going back to 1867, the year our society was founded. Moreover, the GL specialists in this field have been recognised as authorised experts by the leading German State Authority for Mining, Energy and Geology. Last but not least, our global network of engineers, surveyors and office staff will provide you with first-class local support.



New dimensions in tunnelling: more complex machines require more sophisticated support

## Benefits that make all the difference

- Long time experience in certification of air locks
- Worldwide availability of experienced engineers and surveyors from GL's global network
- One contact – comprehensive overview
- Always up-to-date thanks to GL's membership of the technical and standardisation groups ISO and EN
- In-house expertise, GL Rules and Guidelines on Certification and Construction of Pressure Vessels for Human Occupancy

### One-stop shopping at GL

By combining **approval processes for air locks, hydraulics, controls, pneumatics, piping and pressure vessels** in a single step at GL, you can save yourself time and money.! We also offer material certification and a wide range of welding services as listed below.

#### Workshop approvals according to:

GL Rules, EN ISO 3834-2 to -4, DIN 2303, DIN 18800-7, EN 1090, EN 15085-2, EN 17660, DIN EN 4113 or EU Pressure Equipment Directive (PED), AD 2000 HP 0

#### Welders and operators qualification according to:

DIN EN 287, EN ISO 9606, EN 1418, ISO 14732, AWS D1.1, AWS D3.6M, AD 2000 HP 3, EN 14555, ISO 15618-1, ASME sec. IX, EN 13133 (brazers)

#### Welding procedure tests according to:

GL Rules for Welding, EN ISO 15614-1 to -13, EN ISO 14555 (stud welding), EN 13134 (brazing), AD 2000 HP 2/1



#### Approval of NDT workshops

Please take an information tour on our homepage [www.gl-group.com/supplyindustry](http://www.gl-group.com/supplyindustry) for more one-stop shopping opportunities.

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