

## **MECHANICAL BRANCH REQUIREMENTS**

1. The design, production, materials, marking, manuals, test and certification of workmanship and testing should be compliant with Appendix no. 10 to TS and harmonised standards. We allow using the ASME design code. The works should be performed pursuant to the Technical Standards adopted at Anwil S.A.
2. The Contractor's duty is to prepare the basic, detailed and as-built mechanical designs (pressure and non-pressure devices) agreed with the Office of Technical Inspection / Plant Technical Inspection / Maintenance Services or Notified Body (depending on to which one the devices are subject), covering the supplied equipment, the piping of the newly designed unit and the modernised piping of the existing installations and networks (with connection points).
3. The technical design must be prepared on the basis of a physical inventory of the existing installation by the Contractor. The technical documentation and the selected suppliers must be accepted by the Ordering Party, but this does not exempt the Contractor from its responsibility for execution and errors in this regard. The detailed documentation requirements are included in Appendix no. 8 to TS.
4. The Contractor will specify the list and cost of spare parts for a period of 2 years of operation, including but not limited to: gaskets, filter elements, catalytic converters, mechanical seals of pumps and other fast-wearing components suggested by the supplier.
5. Such materials as may be used for pressure devices (apparatus, piping, etc.) should meet the requirements according to Annex I (4.3) of the PED Directive 2014/68/EU or come with an acceptance certificate 3.1 pursuant to EN10204.
6. The components to be selected should be materially unified with the existing installation.
7. It is required that materials be sourced from manufacturers in the EU, USA, Canada, Japan or South Korea. The supply of materials and other sources may only be effected with the approval of Anwil SA.
8. The aboveground pipelines of the designed installation will be constructed according to the ASTM and ANSI/ASME standards, and for GRP pipelines –according to the DIN/EN standards (compatible with ASME/ANSI fittings). On all the aboveground pipelines, use flanges according to ANSI/ASME B16.5. with a type RF rebate. The underground pipelines are designed according to the European standards, using fittings in pursuant to the EN standards.
9. ANSI/ASME flanged connections are to be made for tanks, apparatus and columns. An indication of the respective classes and type of rebates is required at the basic design stage.
10. Requirements for safety discs (if present):
  - such discs are selected to suit the pressure composition and temperature of the carrier,
  - in order to accept particular solutions, the Ordering Party requires the following parameters to be specified: nominal diameter, rupture pressure, material, technological number and manufacturer,

- discs used should have fault signalling; the signal must be transmitted to the control room,
11. Requirements for blocks (holders of safety discs):
    - made of duplex steel,
    - modules and categories will be selected pursuant to Directive 2014/68/EU.
  12. Requirements for manual shut-off valves:
    - flanged valve connections acc. to ANSI. B16.5.
    - valve mounting acc. to ANSI B16.10 – short pattern,
    - valve drive – up to 3" (DN80) – lever, above 3" (DN80) – gearbox,
    - Hand levers made of metal materials without aluminium and its alloys,
    - Corrosion protection of the body in accordance with corrosivity category C5, paint thickness at least 320 microns,
    - mushroom valves with non-return function, with the option to use a flexible poppet to enhance tightness,
    - screwed valve seat (for mushroom valves),
    - certified sealed "live loaded" and TA Luft spindles,
    - where required, valves are made in a fire-resistant and antistatic version,
    - required dimensional inspections, conformity of workmanship with the documentation, hydraulic test, leakage test, certificates of materials used for the main components subject to pressure and in contact with the carrier, certification of fireproof and anti-electrostatic execution,
  13. Safety valve requirements:
    - screw-in valve seat
    - certified sealed "live loaded" and TA Luft spindles,
    - "fire safe" safety features – BS6755, API607, API6FA,
    - required dimensional inspections, conformity of workmanship with the documentation, hydraulic test, leakage test, certificates of materials used for the main components subject to pressure and in contact with the carrier, certification of fireproof and anti-electrostatic execution,
    - as part of the specification, the provision of diagrams or tables showing the relationship between operating pressure and temperature.
  14. All non-return valves should be supplied as flanged ones (due to the installation of caps).
  15. The design of heat exchangers should be oversized by at least 20% in relation to the design value (if possible).
  16. Requirements for pumps and blowers:
    - All the vortex devices must be installed as double ones (2x100%).
    - The process pumps will be compliant with API 610. The application of pumps according to DIN/ISO is only permissible with the consent from the Ordering Party.
    - As for the process pumps, double mechanical seals should be used according to API 682.

- The blowers used must comply with API 673, with double dry gas sealing (nitrogen purge).
  - The vortex devices should be compliant with Anwil S.A. Technical Standards no. ZODS\_01\_2021-Zał.1.1÷1.8.
17. All the mechanical components must come with a set of acceptance documents, including the certification of all acceptance tests and declared performance and workmanship in accordance with the EU directives.