Scope of supply

- Atomization gas supply and distribution
- Atomization gas cooler
- Cyclon Filter incl. automatic cleaning system
- Fine Filter
- Storage and buffer vessels
- Oil-free compressor
- Shut-off and control valves
- Piping and fittings, flanges, bolts and gaskets, compensators.
- Instrumentation and control system
- Process design
- Plant and component lay-out
- Engineering services
- Erection and start-up on site

Application of SGI-Ar/N2-Purification systems

- Powder metallurgical plants
- Diffusion furnaces for conductor production
- Annealing and drawing furnaces of all types
- Metallurgical plant
- Electrical engineering
- Welding techniques
- Chemistry
- Research establishments
- Test laboratories

Application of SGI-Ar/N2-Recycling systems

- Metal atomization process for powder production:
  - Spray deposition
  - Products: Powder for further HIP-processing, tubulars, rounds, flats
  - Materials: High-alloy steels, tool steels, aluminum alloys, copper alloys
by recirculation and as well the amount of purge gas can be reduced when the equipment is evacuated instead of purged. The necessary gas pressure and the required gas quantity for the atomization are the key figures for the design of such a system. A pay-back time between appr. 1 to 3 years is realistic.

Instrumentation and Control
The process control is carried out with computer controlled equipment and process visualization. Emergency supply units guarantee to keep up an emergency operation in case of power failure.

Important process parameters:
- No contamination of the gas during recirculation
- Recirculation efficiency: 98.5%
- Gas pressure: Acc. required process parameter
- Recycled gas quantity: Acc. required process parameter
- Gas pressure after atomization: -100 mbar to 200 mbar

SGI-Argon and Nitrogen purification systems

Before start of an atomization process the gas within the atomization tower may have residual impurities due to insufficient purging processes or after plant maintenance.

The use of SGI-Argon and nitrogen purification systems

The principle idea of a gas recycling system is to reduce the cost for the consumed gas used for the atomization. It is possible to minimize the atomization gas consumption by recirculation and as well the amount of purge gas can be reduced when the equipment is evacuated instead of purged. The necessary gas pressure and the required gas quantity for the atomization are the key figures for the design of such a system. A pay-back time between appr. 1 to 3 years is realistic.

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SGI-Argon and nitrogen purification systems

Although the molten metal getters all these impurities at the start of the process SGI can deliver gas purification systems to clean the gases within the system which allows to considerably reduce the costs of operating such plants.

The most frequently-used protective gases are the inert gases argon/helium and nitrogen. Quality or the protective effect of a gas are decisively influenced by the degree of undesirable substances like \(O_2\), \(H_2O\), \(CO_2\) in the vapour or gas phase that attack the material, for example, through oxidation or corrosion, or form undesirable deposits on the material.

On the basis of experiences in the fields of metallurgy, SGI is able to design and build such gas purification systems which are connected to the atomization plant and are an integral part of the recycling systems.

Purification process
By means of special catalysts as well as adsorption materials the gases can be purified to a certain extend which allows the re-use of these gases in closed loops.

Typical residual impurities before and after purification:
- Oxygen: 1000 vpm - 1 vpm
- Carbon monoxide: 100 vpm - 2 vpm
- Carbon dioxide: 100 vpm - 2 vpm
- Water: 1000 vpm - 2.5 vpm