Aichelin UNITHERM
industrial furnace solutions

ENDOGAS GENERATOR

Safety Always

Reliability at Work

Customised Solutions

ENDOGAS GENERATOR

PROTECTIVE GAS GENERATOR ENDOMAT

Gas carburizing processes and other heat treatments under protective gas, where the carbon exchange with the work piece surface plays a role, make high demands on the controllability of the atmosphere. The carrier gas procedure using endogas, proven since many years, offers the best conditions according process engineering for:

- Exact process control
- Best reproducibility of the final results
- High quality requirements.

The λ-probe control

The measuring gas is conducted through a temperature-constant -probe. At the same time a mV-signal is emitted by the λ-probe, which is used for measuring, control and regeneration of the Endogas-composition and is displayed in mV. (optionally in °C dew point.)

A very precise control of gas/air mixtures is required to produce constant quality of endogas.

Quantity Control

The Endogas generator capacity can be adjusted to the required capacity manually or by automatic quantity control. The unused protective gas is burned off in manually controlled Endo Gas Generator. In automatic controlled quality control system the amount of Endogas is generated automatically with minimum wastage at burn-off.

Through adapted design and using the modern L−probe, a quantity control of the protective gas in the range of 100 % up to 50 % of the nominal capacity is now possible

Applications in Heat Treatment Furnaces:

1. Carburizing:

   o Carburizing is a heat treatment process in which carbon is diffused into the surface of low-carbon steel at elevated temperatures. This increases the hardness and wear resistance of the steel, especially in parts like gears, shafts, and bearings.

   o The Endogas mixture provides the necessary carbon atmosphere for carburizing. In the carburizing furnace, the steel part is heated in an Endogas atmosphere, which allows the carbon to infiltrate the surface, thereby hardening it.

2. Hardening of Steel Components:

   o Hardening processes, where steel is rapidly cooled after heating, can be optimized by controlling the atmosphere around the components. Using Endogas ensures that the metal is subjected to the proper gas mix, maintaining the desired surface properties.

3. Atmosphere Control in Continuous Furnaces:
    - Incontinuousfurnacesusedforheattreatment,astable atmosphere with controlledcarbonlevelsisrequiredforthepropertreatment of metal parts over longproductionruns.TheEndogasgeneratorcancontinuously supply this controlled atmosphere, ensuring consistent results.

Advantages:

1. BetterControl Over Gas Mixture: An Endogas generator gives precise control over the gas composition, crucial for processes like carburizing and preventing oxidation.
2. Cost-Effective: On-site production of Endogas can be more cost-effective compared to purchasing bottled or pre-mixed gases or methanol fluid mixed with nitrogen gas especially for large-scale industrial applications.
3. Prevents Oxidation: The hydrogen component in the Endogas mixture helps reduce oxidation of the workpieces, maintaining high-quality surface finishes.
4. Consistency: Generators provide a consistent supply of the right gas mixture, ensuring uniform results in heat treatment processes.

Applications in Industry:

- Automotive Manufacturing: Used for carburizing gears, axles, and other high-wear parts.
- Aerospace Industry: For heat treating high-performance parts that require specific surface hardness.
- Tool Manufacturing: Producing durable and hard tool steels.
- Machine Parts and Bearings: For improving the surface properties of components that need to withstand heavy wear.

ACCESSORY EQUIPMENT'S FOR ATMOSPHERE CONTROL

1. Gas Flow control Panel
2. Electric process control Panel



1. Gas Flow control Panel
    - The panel controls the flow rates of different gases, such as Endogas, Natural gas, Nitrogen & dilution air
    - Itcan adjust the flow of gases entering the furnace, which is crucial for achieving the right carburizing results.
    -
2. Electricprocess control Panel
    - o The panel monitors and adjusts the ratio of gases in the mixture, ensuring that the furnace receives the right proportions of gases for the desired treatment.
    - o Oxygen probe and carbon potential controller are founded to measure O2 level and in term carbon potential in the atmosphere.
    - o PLC System is provided for automation
3. Temperature Monitoring:
    - o Temperature controllers are provided to monitor and control furnace temperature in various zone for uniform temperature distribution.

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