Controlling and regulating the nitriding potential under low pressure

- The $K_N$ provides information on the quantity of nitriding potential available in the furnace atmosphere at all times. This increasing need for a reliable monitoring of the $K_N$ comes from the requirements of the aerospace sector. In addition to its historic ALLNIT® process, BMI completed its offer with a monitoring and regulating probe.

- Used in various applications

  - Aeronautics
  - Aerospace
  - Automotive
  - Tooling
  - Heat treatment workshops

- **Working principle**
  - The $K_N$ is calculated by measuring the hydrogen level present in the furnace, formed by the ammonia cracking reaction.
  - This $K_N$ value is the quotient of the partial pressures of the ammonia and of the hydrogen.
    \[ K_N = \frac{p(NH_3)}{p(H_2)} \]
  - The higher the $K_N$ value, the higher is the nitriding power.
  - The higher the nitriding potential, the more likely the atmosphere will release nitrogen elements, allowing the nitriding to be done on the parts.
B.M.I. offers standard and custom-made solutions, adapted to each customer’s needs and complying to their industry’s standards.

Benefits of using the $K_N$ probe under low pressure (300 mbar to atm.)

- Working under low pressure facilitates the increase of $K_N$ values at the beginning of the cycle, compared to an atmosphere nitriding process
- Optimized gas consumption
- Cycle parameters can be defined regardless of the quantity of parts loaded into the furnace
- Reproducibility of results
- Continuous traceability of the furnace atmosphere
- Control of the white layers’ growth

The B5_RN range

- Standard sizes or specific chamber design
- Working temperature under nitriding: from 450°C to 650°C
- $K_N$ probe available as an option on our range of B5_RN furnaces
- Fast and monitored cooling at 1200 mbar
- Working under low pressure from 300 mbar to the atmospheric pressure
- Retrofit available on low pressure nitriding furnaces, type B5_RN

<table>
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Other technical specifications on request.

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