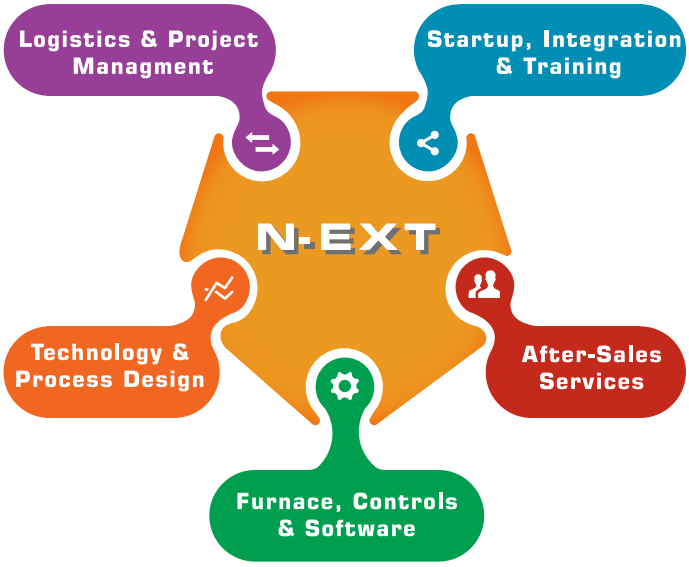
WHAT IS N-EXT™?

The N-EXT™ solution package for aluminum extrusion plants is much more than a standard nitriding / nitrocarburizing furnace with controls. It's a comprehensive solution that starts with a client and application assessment, equipment proposal and design, manufacturing, process testing and recipe proofing, continuing to logistics, onsite installation, training and commissioning to plant integration, and after-sales value-added services. This turnkey approach means an integrated nitriding / nitrocarburizing system complete with **Phase-Controlled NITREG®** technology that delivers superior quality and reliability year after year while optimizing the performance of dies and cost efficiency of extrusion operations.



N-EXT™ = Die Nitriding Made Simple

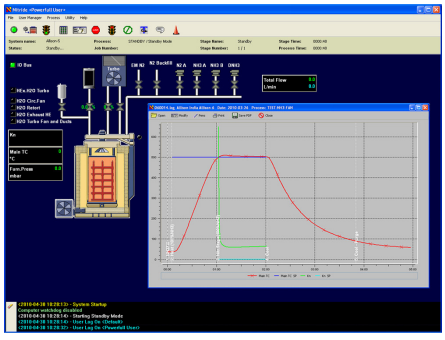
N-EXT™ consists of a self-contained, skid-mounted nitriding / nitrocarburizing system that facilitates a fast and simplified setup. Available in five sizes, each system is delivered complete with a furnace, control system, racking and emission control equipment. N-EXT™ is mounted on a platform for secure transport by forklift. Every system is fully assembled, factory tested and calibrated, making installation and on-site startup quick and effortless, and ready for production.

Model N-EXT™ 412 shown. Its compact construction makes efficient use of restricted floor space in a plant or shop.

N-EXT™ Advantage

- Phase-controlled NITREG®
- Preconfigured & factory-tested
- Pre-tested for metallurgical results
- Plug and Play
- Short startup period
- No cooling water required

Intuitive control interface contains all information on the furnace, process, and running job.



Easily moved into the heat treat facility with the help of a forklift.

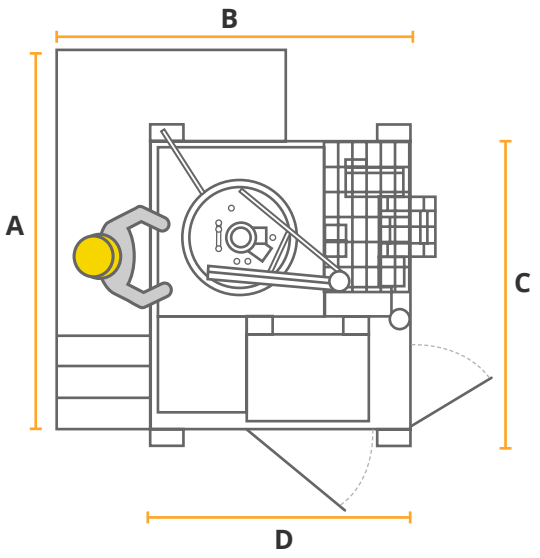
Standard sizes

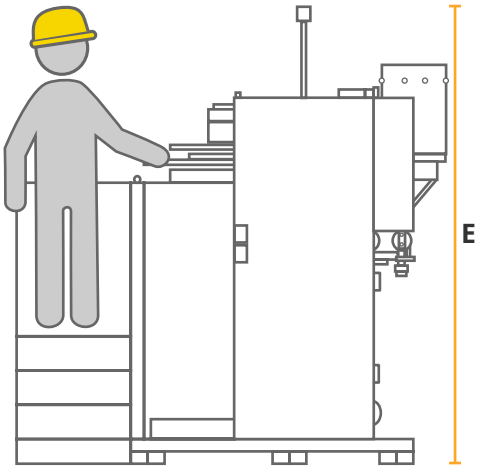
Green Solutions

Nitrex solutions minimize emissions and energy usage and limit harmful waste products.

CHARACTERISTICS		NXK-409	NXK-412	NXK-609	NXK-612	NXK-812
Working space		Ø 400 x 900 mm H Ø 15¾" x 35½" H	Ø 400 x 1200 mm H Ø 15¾" x 47¼" H	Ø 600 x 900 mm H Ø 23½" x 35½" H	Ø 600 x 1200mm H Ø 23½" x 47¼" H	Ø 800 x 1200mm H Ø 31½" x 47¼" H
Load capacity (max.)		300 kg / 660 lbs	400 kg / 880 lb	600 kg / 1300 lb	800 kg / 1700 lb	1000 kg / 2200 lb
Max. temperature		650°C / 1200°F	650°C / 1200°F	650°C / 1200°F	650°C / 1200°F	650°C / 1200°F
Dimensions (footprint)	A	2460 mm / 97"	2460 mm / 97"	2660 mm / 105"	2660 mm / 105"	2860 mm / 113"
	B	2325 mm / 92"	2325 mm / 92"	2525 mm / 99"	2525 mm / 99"	2725 mm / 107"
	C	1880 mm / 74"	1880 mm / 74"	2080 mm / 82"	2080 mm / 82"	2280 mm / 90"
	D	1700 mm / 67"	1700 mm / 67"	1900 mm / 75"	1900 mm / 75"	2100 mm / 83"
	E	2300 mm / 91"	2600 mm / 102"	2300 mm / 91"	2600 mm / 102"	2600 mm / 102"
Min. high clearance (floor to crane hook)		3200 mm / 126"	3800 mm / 150"	3200 mm / 126"	3800 mm / 150"	3800 mm / 150"

NOTE: Nitrex Metal reserves the right to make changes without notice.





SAVINGS

- Minimal space requirements
- Short startup period
- Low operating costs for processing low volume quantities
- No cooling water required

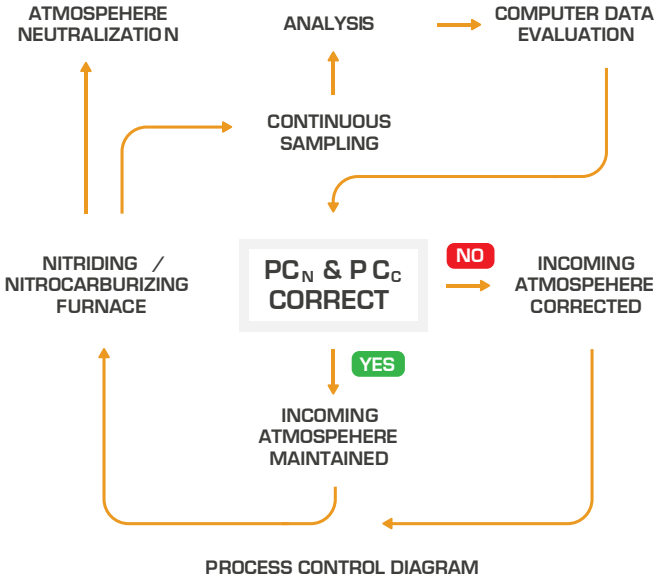
OPTIONS

- Custom loading fixture
- Mezzanine

MAIN FEATURES

- Fast heat-up rates and uniform temperature throughout the load
- Separate heating zones for accurate temperature control
- Light ceramic fiber insulation for fast and efficient heating as well as cooling
- Kanthal heating elements
- Retort made of refractory alloy
- Silicone cover/door seal for gas tight retort
- Automatic process control system

The N-EXT™ control system is programmable and logic based and is integrated with Phase-Controlled NITREG® or NITREG®-C technologies, which consists of an individually customized recipe for die types with optimum results.



PROCESS CONTROL DIAGRAM

The uniqueness of this system lies in its ability to control the Phase-Controlled Nitriding (PC_N) and Phase-Controlled Nitrocarburizing (PC_C) parameters of the atmosphere in a continuous fashion. Such true process control means an automatic correction of flows and ratios of the process gases, ensuring that the desired atmosphere is maintained. This type of control takes into account the thermodynamic state changes throughout the process cycle to yield an optimum surface treatment for your dies.

The process control system operates via user friendly, menu-driven software, which assists and helps the operator in the selection of process recipes, equipment calibration, and troubleshooting. The desired cycle is selected from a library of recipes designed and pre-tested by Nitrex. Once the recipe is selected, the computer takes over further operations until parts are ready for unloading.

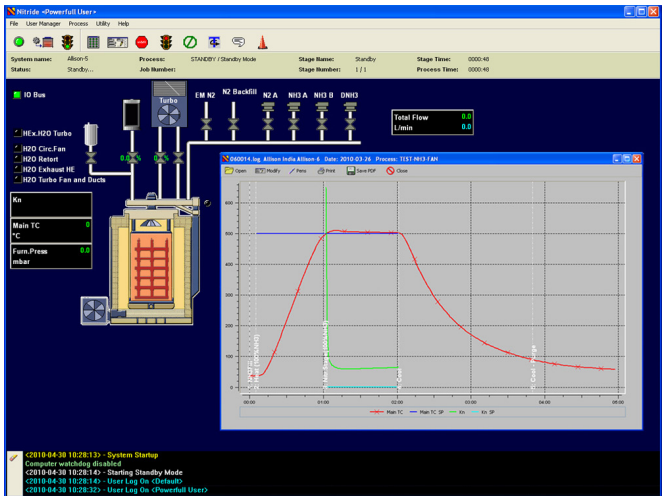
The Nitrex process controller GUI contains all relevant information on the furnace, and running process. It graphically displays process variables such as temperature, flows, power output, PC_N and PC_C parameters, as well as the actual status of the nitriding process, equipment and alarms. This allows the operator to easily monitor and interact with the system.

The N-EXT™ process control system is optimized to monitor and regulate all furnace functions, nitriding/ nitrocarburizing cycles, alarms, and maintenance conditions. The system consists of 3 distinct sections:

- a Nitrex process controller with integrated I/O's,
- a gas panel with atmosphere analysis based on the H_2Smart™, pressure measuring transducers, and mass flow controllers, and
- an electrical panel with a SCR/SSR controller for each heating zone.

What's an H_2Smart™?

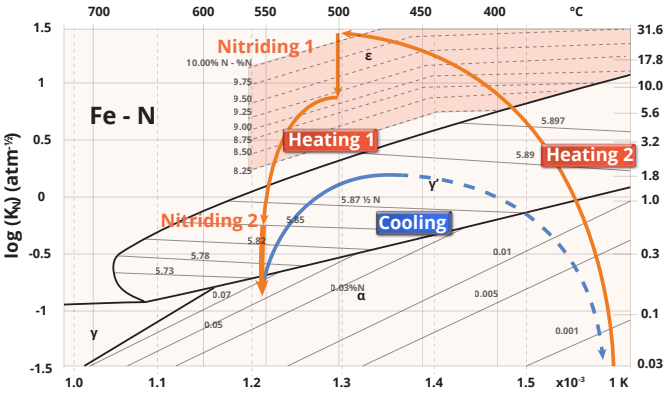
H_2Smart™ is at the heart of the Nitrex process control. It ensures accurate measurement of hydrogen in nitriding and nitrocarburizing atmospheres. Its unique design with a variable output integral pump allows the set sampling flow rate to be automatically maintained. A flow control circuit complete with pump saturation warning and flow alarm insure reliable sampling and accurate readings.



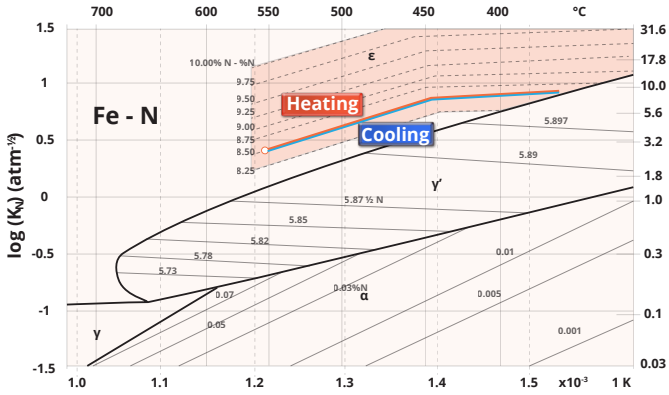
N-EXT TECHNOLOGY

PHASE-CONTROLLED NITREG® / NITREG®-C

Phase-Controlled NITREG® / NITREG®-C is a completely new approach to gaseous nitriding / nitrocarburizing. This proprietary technology allows us to control the nitrogen, or nitrogen & carbon, content in the white layer during the entire nitriding or nitrocarburizing cycle. With an improved distribution of nitrogen / carbon throughout the entire case we can achieve optimum properties for aluminum extrusion dies.



The blue and red lines show the changes of the nitriding potential (K_N) vs Temperature during a conventional nitriding process. Nitrogen concentration is not controlled, neither during heating nor cooling, causing the white layer to change structure, thus its properties.



With Phase-Controlled NITREG®, the same nitrogen concentration is maintained during the whole process including heating and cooling, resulting in a uniform, ideal white layer and case - therefore longer lasting dies!

HOW CAN PHASE-CONTROLLED NITREG® / NITREG®-C IMPROVE YOUR EXTRUSION OPERATIONS?

1 ENHANCES DIE LIFE

Improved friction characteristics and sub-surface strength mean longer extrusion cycles between each re-nitriding operation. With phase-controlled NITREG® -C, decarburization in the near surface region is prevented and better white layer properties with the added carbon emerge.

2 INCREASES NUMBER OF RENITRIDES

Thanks to an optimized nitrogen distribution throughout the case, renitriding characteristics can be improved and defects such as nitride networks and the corner effect, which may otherwise appear during renitriding treatments, can be avoided. Moreover, by applying phase-controlled NITREG®-C, decarburization is suppressed and die life may be prolonged.

3 IMPROVES HIGH-TEMP STRENGTH / THERMAL STABILITY

Phase-controlled NITREG®-C treated dies with added carbon in the white layer show better stability of white layer phases. Consequently, treated dies could better withstand the stresses of extrusion temperatures.

4 RESISTS FLAKING BETTER

An optimum nitrogen and carbon distribution resulting from phase-controlled NITREG® or NITREG®-C can significantly reduce the probability of brittleness and flaking.

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