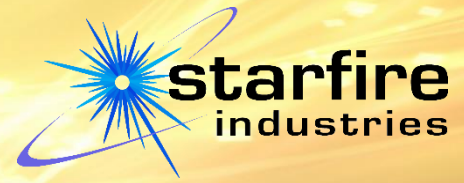


nGen™-310 FOR PORTABLE CW NEUTRONS

Powered by Starfire Industries nGen™ technology



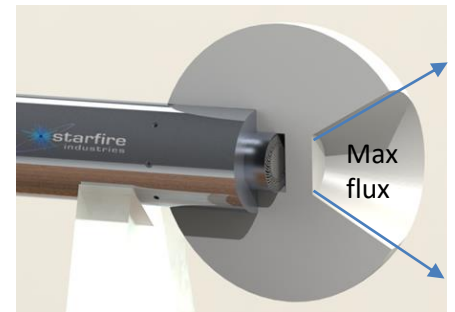
PORTABLE NEUTRONS FOR BASIC INTERROGATION

The nGen™-310 is a lightweight, easy-to-deploy high-output sealed fusion neutron generator suitable for a range of uses. The ultra-compact form factor contains the entire generator and supporting hardware including all high-voltage and controller components. Simply plug the AC-DC converter into a standard wall outlet and connect to a remote computer and off you go! The nGen™-310 leverages key features of the Starfire's nGen-300 human-portable generator for active interrogation and nGen-100 small-diameter well logging system. The Tritium version (DT), available in 2019, will have 50x the neutron output.

DO MORE WITH LESS USING GROUNDED TARGET

Using Starfire's patented biased-plasma source and grounded-target technology, the nGen™-310 generates copious neutrons a few mm from the device edge on a small-diameter extendable snout permitting:

- close coupling with moderator/collimator assemblies to minimize their size and weight
- greater than 2π solid angle access to the high-flux neutron emission zone
- higher neutron utilization leveraging forward-directed DD anisotropy



Superior Neutron Utilization

TAKE ADVANTAGE OF LOWER ENERGY DD NEUTRONS

The nGen™-310-DD avoids radioactive materials by utilizing the DD fusion reaction to generate neutrons. Resulting ~2.5 MeV DD neutrons are lower energy than DT ~14 MeV neutrons, making DD a more suitable option for radionuclide source replacement. The lower energy neutrons allow for advanced threshold neutron detection, fewer interfering secondary reactions, faster thermalization time for pulsed applications, more compact moderator for thermal applications and lighter personnel shielding requirements.



THE nGen™-310 ADVANTAGE

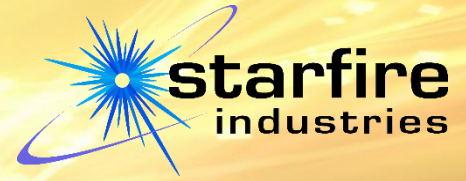
- Cost-effective
- Sealed, compact form for human portable applications
- Designed for AC wall plug and remote computer control
- Neutrons generated at tube end for higher available neutron flux
- Multiple configuration options available for portability and use
- 1cm spot size for radiography, 3mm from end

FEATURES

- DD version: avoids radioactive materials; not "dual-use"/export restricted
- Simple x-ray license for use
- Air-cooled
- Integrated HV supply
- Electrically grounded neutron region on small snout
- Close moderator coupling to minimize active interrogation mass
- USB to ethernet connection
- Simple software interface
- Safety feature: the generator shuts down when data link is lost

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APPLICATIONS



- On-site Inspection
- PGNAA/Materials Analysis
- Active Interrogation
- Security/Inspection
- Quality Control
- Neutron radiography
- Laboratory research
- Mineral Analysis



nGen™-310 PC software screenshot

SPECIFICATIONS

Neutron Output

Time-averaged Yield	10^7 DD n/s max; 5×10^8 DT n/s max
DD Neutron Energy	~2.5MeV (DT 14MeV option by special request)
Ion Source Type	Electrodeless RF
Pulse Options	Continuous, >50% duty factor optional
Max Neutron Flux	~ 1×10^6 n/cm ² *s

Power and Operation

Operating Voltage	up to 140kV
Power Requirements	Up to 100W

System Information

Neutron Source Dimensions	3" OD x 18" L (7.6 cm OD x 46 cm L)
Neutron Source Weight	10 lbs (4.5 kg)
Supporting Hardware Dimensions	4" W x 6" H x 9" L (10 cm W x 15 cm H x 22 cm L)
Supporting Hardware Weight	4.0 lbs (1.8 kg)
Integrated cooling w/ Cowling Dimensions	3.5" OD, 22.5" length with fan
Warranty	500 operating hours, or 12 months

nGen™ technology makes the nGen™-310 possible

Starfire Industries' nGen™ Technology has 5-10x greater neutron output over existing generators of the same size. Patented biased RF ion source, ultra compact HV and grounded target technologies enable higher voltages in a small form factor, higher power operation >100W and detector placement near the neutron source plane. (Patents: 9607720, 9008256, and others)



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