

# GMP-Compliant Annular Groove Condenser NB/GMP Series

## Product Information (RN-9)

### GMP-Compliant Graphite Annular Groove Condenser

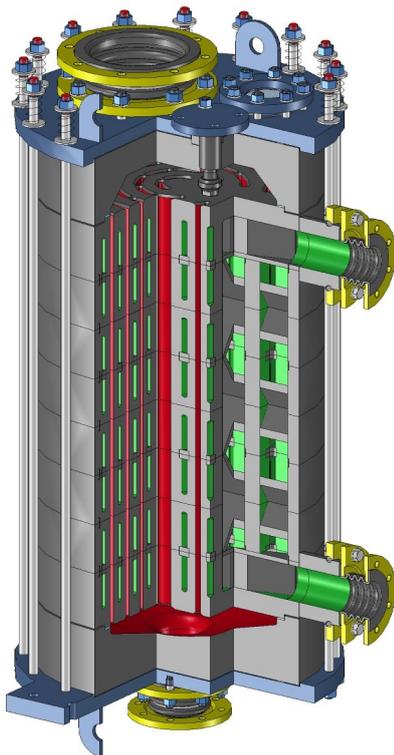
- Impregnated graphite heat exchanger for condensing duties in corrosive environments in GMP-compliant processes
- Design and materials used comply with relevant FDA regulations and recommendations
- Resistant against corrosion by virtually all leaches, acids, solvents, halogens and their alloys
- Resistant to corrosion on both product and service sides, i.e. applicable for heat recovery in corrosive processes
- For vertical installation
- Applicable in dephlegmation processes

### Features

- GMP compliance
- No black particles
- No cross or batch contamination risk
- CIP sprayball
- Sight glass
- Documentation according to FDA requirements
- Optimal resistance to corrosion
- No critical swelling or stress cracks caused by organic solvents
- Excellent heat transfer performance
- Self-cleaning
- No gaskets and therefore no risk of leakage
- Small overall height, compact design
- Low maintenance cost
- High plant availability

### Design

- Cylindrical graphite discs with straight channels for product condensation
- Completely drainable, no dead space, no crevices
- Gasket-free, completely fused annular groove discs
- No black particles due to special manufacturing procedure
- CIP spray ball, sight glass
- Detachable headers for cleaning
- Carbon fiber reinforcement of main body (optional)
- Gas / liquid separation (optional)
- Max. transfer area: 55 m<sup>2</sup> (592 ft<sup>2</sup>)
- Max. disc diameter: 900 mm (36")



GMP-compliant graphite annular groove condenser (cross section)

### Potential Applications

- Condensing of solvents in synthesis plants, especially multi-purpose plants in the pharmaceutical and speciality chemical industries
- Condensing duties during the production of APIs (active pharmaceutical ingredients)
- Use in the production of food and food ingredients (e.g. flavors and fragrances)

### Design parameters

- 1 bar to +6 (+10) bar max. allowable pressure
- Full vacuum to 90 psig (150 psig)
- 30 (-60)°C to +180 (+200)°C  
-22°F (-74°F) to 356°F (392°F)  
max. allowable temperature

# GMP-Compliant Annular Groove Condenser NB/GMP Series

## Materials Used and Material Options

Graphite	Phenolic formaldehyde resin-impregnated graphite GAB GPX1 / GPX1T resp. GAB GPX2 with low resin content (optional)
Reinforcement	Carbon fiber fabric (standard at 90/45 and 90/90 psi design pressure)
Gaskets	Flat gaskets Gylon blue at detachable headers All other components fused
Steel parts	Pressure plates and flanges: carbon steel (optional stainless steel) Rods, nuts, springs: stainless steel

All product side MOC include FDA conformity declaration

## Specifications and Price Quotes

For a detailed offer, please provide the following data:

- Quantity and physical properties of the process and service medium
- Required inlet and outlet temperatures
- Operational pressure and allowed pressure drops
- Further process details (optional)
- Please fill out our questionnaire: WS 1550

## Design and Inspection

- Annular groove heat exchangers are designed, manufactured and inspected according to AD 2000 Merkblatt (in compliance with the European Pressure Equipment Directive, PED)
- Other design and manufacturing standards upon request

GMP-compliant graphite annular groove condenser NB7-10/GMP (cross section)



## Additional Information

- Data sheet RN-9 includes information on terminology and dimensions
- Further precisions and complementary information (brochures, corrosion resistance charts, product information, data sheets,... ) are available for download at [www.gab-neumann.de](http://www.gab-neumann.de).

## Advantages

- Robust design
- Modular setup
- Easy assembly
- High operational safety
- Easy mechanical cleaning

## Technical Perfection

Application preferred in single-purpose and mono plants

Optimal thermal performance at compact dimensions

Long lifetime

## Economically Outstanding

Low-cost alternative to shell & tube exchangers for small and medium-sized transfer areas

Low maintenance and spare part cost

Competitive pricing

Short lead times