



## forAM® 625 15-45 VG

Advanced nickel based alloy for additive manufacturing

**forAM 625 VG** is a vacuum induction melted, argon gas atomized, and spherical powder for additive manufacturing. The powder is a low Carbon Nickel-Chromium based superalloy. Its exceptional corrosion resistance, high strength over a wide temperature range, and its excellent processability make the alloy first choice for the chemical processing field, aerospace, and off-shore applications

Some typical applications are, chemical process equipment, turbine engine components, marine industries, fuel and exhaust systems, natural gas industry, nuclear reactors, pollution control.

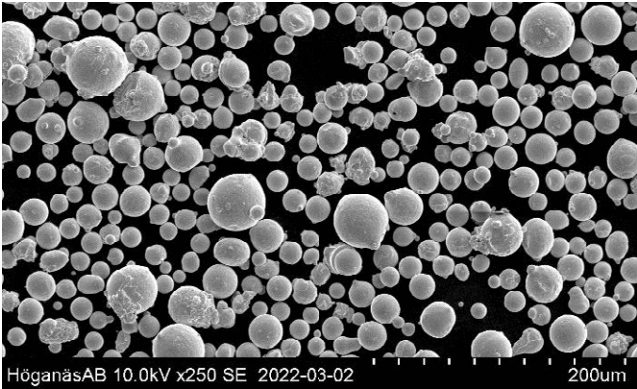
### Equivalent materials:

- » 2.4856
- » UNS N06625
- » NC22DNb
- » AMS7001 (chemical composition)

**For more information on forAM product line and other of Höganäs products, please contact your local sales representative.**

Powder properties

| Chemical composition, (typical values) |            |
|--|------------|
| Element                                | Content, % |
| Cr                                     | 21         |
| Nb                                     | 4          |
| Mo                                     | 8.5        |
| C                                      | < 0.010    |
| Ni                                     | Balance    |



| Typical powder properties |                                       |                              |
|---------------------------|---------------------------------------|------------------------------|
| Nominal particle range    | 15-45 µm (max 5% over and under size) | MPIF05, ASTM B214, ISO4497   |
| Hall flow                 | 15 s/50 g                             | MPIF03, ASTM B213, ISO4490   |
| Apparent density          | 4.4 g/cm³                             | MPIF04, ASTM B212, ISO3923/1 |

Mechanical properties at 40 µm layer thickness

| Surface condition is machined            |                           |                   |                         |
|--|---------------------------|-------------------|-------------------------|
| Heat treatment                           | As printed <sup>(1)</sup> | SR <sup>(2)</sup> | HIP <sup>(3)</sup> URC® |
| Printed in Z-direction – Build direction |                           |                   |                         |
| UTS (MPa)                                | 860                       | 880               | 860                     |
| YS (MPa)                                 | 620                       | 650               | 380                     |
| Elongation (%)                           | 48                        | 50                | 58                      |
| IE Notch in Y direction (J)              | 190                       | 200               |                         |

| Heat treatment                           | As printed <sup>(1)</sup> | SR <sup>(2)</sup> | HIP <sup>(3)</sup> URC® |
|--|---------------------------|-------------------|-------------------------|
| Printed in X/Y-direction – Perpendicular |                           |                   |                         |
| UTS (MPa)                                | 970                       | 1,010             | 860                     |
| YS (MPa)                                 | 705                       | 680               | 385                     |
| Elongation (%)                           | 36                        | 38                | 56                      |
| IE Notch in Z direction (J)              | 160                       | 200               |                         |
| Hardness (HV10)                          | 310                       | 300               |                         |

(1) No heat treatment  
(2) Stress relieved at 870 °C for 1h in Ar followed by rapid cooling in Ar  
(3) HIP 1,190 °C/100 MPa for 4h cooled using URC® unit



As polished (40 µm)



As printed - Build direction (40 µm)



Stress relived - Build direction (40 µm)

## Mechanical properties at 80 µm layer thickness

| Surface condition is machined            |                   |                   |                   |
|--|-------------------|-------------------|-------------------|
| Heat treatment                           | SR <sup>(1)</sup> | SR <sup>(2)</sup> | SA <sup>(3)</sup> |
| Printed in Z-direction – Build direction |                   |                   |                   |
| UTS (MPa)                                | 970               | 880               | 870               |
| YS (MPa)                                 | 640               | 420               | 405               |
| Elongation (%)                           | 46                | 57                | 57                |
| IE Notch in Y direction (J)              | 135               | 185               | 190               |

| Heat treatment                           | SR <sup>(1)</sup> | SR <sup>(2)</sup> | SA <sup>(3)</sup> |
|--|-------------------|-------------------|-------------------|
| Printed in X/Y-direction – Perpendicular |                   |                   |                   |
| UTS (MPa)                                | 1,045             | 900               | 885               |
| YS (MPa)                                 | 710               | 435               | 415               |
| Elongation (%)                           | 38                | 53                | 55                |
| IE Notch in Z direction (J)              | 125               | 180               | 190               |
| Hardness (HV10)                          | 410               | 355               | 330               |

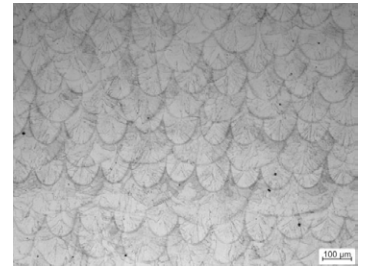
(1) Stress relieved at 870 °C for 1h in Ar followed by rapid cooling in Ar

(2) Stress relieved at 1,038 °C for 2h in Ar followed by rapid cooling in Ar

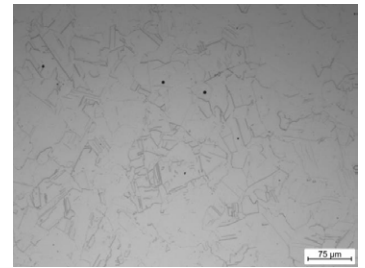
(3) Solution annealed at 1,190 °C for 1h in Ar followed by rapid cooling in Ar



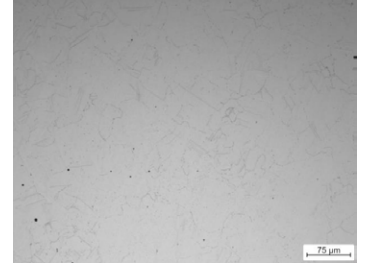
As polished (80 µm)



Stress relieved (1) - Build direction (80 µm)



Stress relieved (2) - Build direction (80 µm)



Heat treated (3) - Build direction (80 µm)

## Standard packaging:

30 kg (6x5 kg, 2.5 L PE bottles packed in cardboard box)

200 kg / 500 kg Flexbag

(Other tailored particle sizes and packaging are available under conditions)