



Your Trusted Japanese Brand

NBK Special Screws

Solving Your Problems with a Vast Selection, Advanced Expertise,
and High-Quality Screws



Technical Challenges Solved by NBK Screws





CONTENTS

01	Select NBK Screws by Application	P.2
02	Case Studies	P.14
03	Product Lineup	P.30
04	Services	P.32
05	Company Information	P.34

Select NBK Screws by Application



Facing Machine Design or Manufacturing Challenges?
Discover NBK's Special Screws for 20 Different Applications

01 Vacuum	02 Low Outgassing	03 Cleanroom	04 Chemical Resistance	05 High Strength	06 High Specific Strength	07 Heat Resistance
08 Non-Magnetic	09 Captive	10 Increased Productivity	11 Electrical Insulation	12 Anti-Reflective	13 Compact and Space-Saving	14 Lightweight
15 Galling & Seizing Prevention	16 Prevention of Screw Drive Damage	17 Fixing and Positioning	18 Conveyance	19 Loosening Prevention	20 Sheet Metal Fastening	

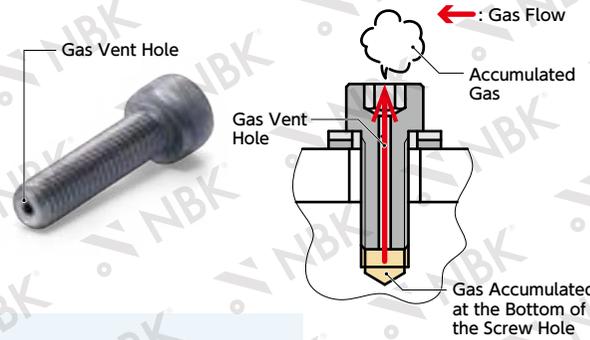
Select NBK Screws by Application

01

Vacuum

These screws are suitable for use in vacuum chambers.

They efficiently discharge gas accumulated in screw holes or drilled holes, achieving stability in vacuum levels and high vacuum. The gas vent holes in NBK's vacuum equipment screws are processed in a way that minimally affects the metal structure, reducing the risk of brittle fracture during use and the generation of outgassing in vacuum environments.



NBK's Recommendations

SVSQLG
Washer Integrated Hex Socket Head Cap Screws



SVSH-C22
Hexagon Socket Head Cap Screws HASTELLOY C-22 Equivalent*



SVFT
Titanium Cross-Recessed Flat Head Screws



SWAS-VF-PC
Washer with Gas Vent Grooves



Learn more here



*HASTELLOY is a registered trademark of Haynes International, Inc.

03

Cleanroom

These screws are ultrasonically cleaned or IPA cleaned in a cleanroom environment and then packaged.

They are ideal for parts used in FPD manufacturing equipment, semiconductor manufacturing equipment, medical devices, and food machinery, as well as parts used in cleanrooms. Can be used immediately upon arrival, saving you cleaning process time.



Learn more here



02

Low Outgassing

These are screws made of materials and surface treatments that emit low levels of outgassing.

Due to their minimal outgassing, these screws are ideal for vacuum environments such as vacuum chambers used in semiconductor manufacturing. There are also titanium screws with low outgassing that have undergone brightening treatment.



NBK's Recommendations

Low Outgassing Surface Treatment

SVS11S-PC
SUS304 Special Chemical Polishing Treatment



SVSHT
Titanium Brightening Treatment



Low Outgassing Material

SPD-H
Vespel*



SPE-C
PEEK



Learn more here

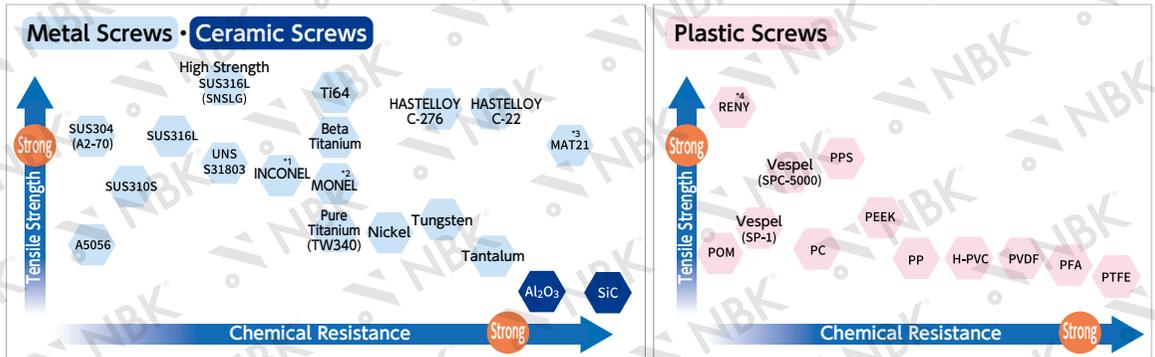


*Vespel is a registered trademark of DuPont.

04

Chemical Resistance

These screws are suitable for use in corrosive environments that use wafer cleaning solutions and process gases.



Special materials and coatings prevent chemical corrosion and dissolution. Preventing corrosion reduces maintenance and equipment damage.

Learn more here



*1: INCONEL is a registered trademark of Special Metals Corporation.

*3: MAT21 is a registered trademark of Proterial, Ltd.

*2: MONEL is a registered trademark of Special Metals Corporation.

*4: RENY is a trademark of GLOBAL POLYACETAL CO., LTD.

Problem-Solving Case Studies



Here are examples of how NBK screws have solved customers' issues.

By Industry

Introducing industry-specific problems and solutions by equipment and process!



Case Studies on Solving Semiconductor Manufacturing Equipment Issues

Solutions for special environments such as vacuum, high temperature, and chemical adhesion are explained by equipment and process!

» P.16



Case Studies on Solving Food Machinery Issues

Introducing ways to improve workability and hygiene required in the food and packaging industry.

» P.22



Case Studies on Solving Medical Device Issues

Providing tips on ensuring cleanliness and safety in biochemical analyzers, MRI machines, and more!

» P.24

By Problem

Introducing problems in equipment design and on-site work, along with solutions!

- 01 Preventing gaps between the sheet and screw when fastening thin sheets ... P.26
- 02 Removing damaged screws P.26
- 03 Improving workability for fixing and positioning P.27
- 04 Reinforcing places where bolts are frequently removed P.27
- 05 Implementing theft and tamper prevention measures P.28
- 06 Countermeasures against screw loosening P.28
- 07 Preventing foreign object contamination and complying with CE marking P.29
- 08 Maintaining high strength in screws even under high temperature ... P.29



Case Studies on Solving Semiconductor Manufacturing Equipment Issues

Solutions for special environments such as vacuum, high temperature, and chemical adhesion are explained by equipment and process!



1 Inside the Equipment

01

Tools that can be used even in narrow working spaces are required

Tools optimized for working in narrow spaces are available

Tools with reduced height dimensions are available. Required working space is decreased, so device/equipment structure can also be made more compact.

NBK's Solution Tools for Extremely Limited Access Spaces



02

Tools that can be used even in locations where magnetization must be avoided are required

Non-magnetic tools are available

Suitable for assembly and maintenance of equipment and devices in environments with strong magnetic fields. They can also be used on devices for which magnetization must be avoided.

NBK's Solution Non-magnetic Tools



03

Screws that will not affect communication are required

Solutions with plastic screws of various shapes and materials

Conventional metal screws may affect LoadPort and FOUP communication. The use of plastic screws prevents disruption of stable communications.

NBK's Solution Plastic Screws



04

Screws that can be used in limited spaces are required

Screws with extremely thin heads are available

Products made of highly corrosion-resistant SUS316L, pure titanium, and so on are also available.

NBK's Solution Low Profile Screws

Q **SSHS** **SSHL** **SSHT**



05

Equipment must be firmly connected

Washers which can correct an alignment mismatch between the bolt and seating surface, occurring frequently when connecting equipment, are available

When connecting two pieces of equipment, the use of spherical washers absorbs any bolt tilting, enabling reliable fastening.

NBK's Solution Spherical Washers

Q **SQWS**



3 Equipment Exterior

01

CE marking compliance is required

Screws which don't fall out when the cover is removed are available

Fixed guards must be secured with fasteners that can only be opened or removed using a tool. By using captive screws, the screws can be retained in the fixed guard when the fixed guard is removed, allowing compliance with CE marking.

NBK's Solution Captive Screws SSC



02

Only certain workers should be able to remove screws

Screws requiring dedicated tools for removal are available

Tampering can be prevented by using these screws where only certain workers should be able to remove screws.

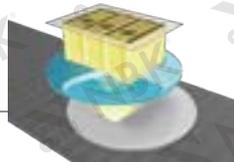
NBK's Solution Security Screws SRFXS-SET



4 Equipment by Manufacturing Process

Semiconductor Lithography Equipment

Photolithography process



► **Improved equipment accuracy is required**

Even the small screws used at joints enable exposure accuracy to be improved by suppressing the influence of reflection.

Required characteristic: **Anti-Reflective**

Low Temperature Black Chrome Treated Screws

Black Stainless Steel Screws

Anti-Reflective Screws

Product list here ►

Etching Equipment

Etching process



► **Resistance to high temperatures and chemicals is required**

For environments where various gases and solvents are used at high temperatures, screws with excellent heat resistance and chemical resistance are effective.

Required characteristic: **Heat Resistance**
Chemical Resistance

Ceramic Screws

Cover Caps (Ceramic)

MAT21 Screws

HASTELLOY Equivalent Screws

SUS316L Screws

Titanium Screws

Special Surface Hardened Screws

Heat Resistant Screws Chemical Resistant Screws

Product list here ►

Coating Equipment Sputtering Equipment

Film Formation Process



► **Resistance to high temperatures and chemicals is required**

For environments where various gases are used at high temperatures, screws with excellent heat resistance and chemical resistance are effective.

Required characteristics: **Heat Resistance**
Chemical Resistance

Ceramic Screws

SUS316L Screws

Molybdenum Screws

HASTELLOY Equivalent Screws

Nickel Screws

INCONEL Equivalent Screws

Titanium Screws

Heat Resistant Screws Chemical Resistant Screws

Product list here ►

Physical Inspection Equipment

Inspection/evaluation process



► **Improved degree of vacuum is required**

The degree of vacuum can be further improved by removing air trapped within the screw hole.

Required characteristic: **Vacuum**

Screws with Ventilation Hole

► **Increased inspection accuracy is required**

Required characteristic: **Non-Magnetic**

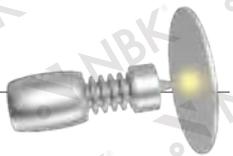
Plastic Screws: PPS

Titanium Screws

Phosphor Bronze Screws

Ion implantation Equipment

Ion implantation process



► **Improved degree of vacuum is required**

There are screws that prevent galling caused by heat cycles in environments of 1000°C or higher.

Required characteristics: **Heat Resistance**

Special Surface Hardened Screws

Tantalum Screws

Tungsten Screws

► **Improved equipment accuracy is required**

Non-magnetic components are effective as fasteners to prevent ions from deflecting due to the magnetic properties of the part.

Required characteristics: **Non-Magnetic**

Phosphor Bronze Screws

Titanium Screws

Tantalum Screws

Electrical Inspection Equipment

Inspection/evaluation process



► **More compact equipment is required**

We have small diameter screws of M2.6 and less, including S0.6 up and M1 up.

Required characteristics: **Space-saving**

Micro screws

Icon Legend: Heat Resistance | Chemical Resistance | Vacuum | Anti-Reflective

Non-Magnetic | High Strength | High Specific Strength | Lightweight | Galling & Seizing Prevention | Space-saving