MOTION & CONTROL™
NSK

THE RISKS OF BUYING COUNTERFEIT BEARINGS AND HOW TO AVOID THEM

All the items shown on this page are counterfeit.

Counterfeit bearings are a global issue, with all markets being highly susceptible to the risks of buying these low-quality products.

As a leading manufacturer of premium-quality bearings, NSK is focused on eradicating this issue – an issue that ultimately leads to users experiencing higher costs, higher risk and reduced machine reliability as a result of more frequent bearing failures.

In this white paper, we will look at the origins of counterfeits, the different types, the risks attached in buying them, and how to safeguard your organisation against buying and receiving counterfeit bearings. We will also explain what NSK is actively doing to stop manufacturers of these extremely dangerous products.

Commercial pressures

The relentless drive to remain competitive and profitable forces too many companies into making purchasing decisions based on unit price, rather than considering total cost and performance.

They must manage urgent and conflicting pressures to improve output, whilst at the same time reducing both unplanned down-time and maintenance expenditure costs. Purchasing and engineering teams often find the appeal of lower-priced bearing suppliers irresistible – unaware, through no fault of their own, of the risks and dangers involved in this low-price purchasing strategy.

The end result is that they inadvertently purchase and receive a counterfeit bearing that may well be much cheaper than the 'real thing'; however, in reality, they have actually paid considerably more for the product than it is truly worth.

Buying low-price counterfeit bearings will lead to a costly plant and is a high-risk strategy. These poor-quality products fail more often when put into service, increasing the associated maintenance and purchasing costs – and these increased costs are invariably much higher than the amount saved on the unit price of the bearing when it was purchased.

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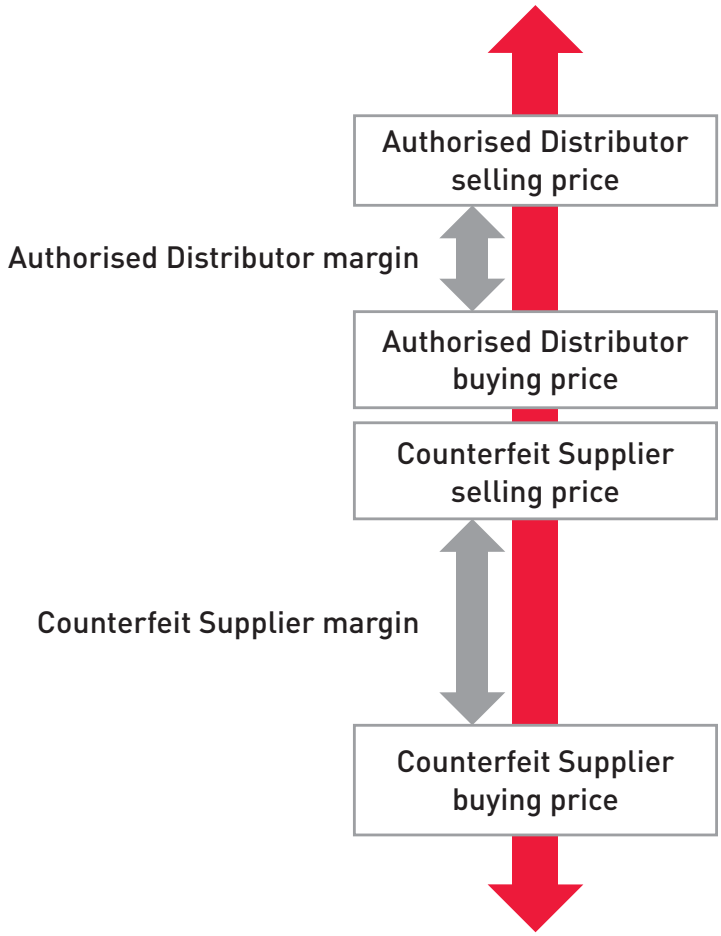
This type of scenario is not just frustrating for users when they discover what has happened. It's also infuriating for authorised distributors who have invested in stocking genuine, premium-quality bearings locally; who, while offering off-the-shelf availability, were deemed 'too expensive' when the purchasing decision was made.

A major cause of this frustration is due to the fact that these distributors know that counterfeit suppliers have likely made much more profit on the transactions than they would have done supplying the genuine article (as shown below in the schematic below).



Note:
Counterfeit Supplier selling price may not be much cheaper than the genuine product price!

Where do counterfeits come from?

Counterfeit bearings tend to originate from suppliers in countries where the cost of manufacturing is low. They use lower-grade materials that are often processed on ageing machines operated by minimum-wage operatives – not a great combination when users are expecting a quality product. They then package these counterfeit bearings in boxes designed to resemble original manufacturer packaging – completely disguising the inauthenticity of the product, cheating purchasers and users.

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What are the features of counterfeit bearings?

› Inconsistent quality

This can lead to unexpected, premature failures in service. Products that pass pre-production trials may then fail in production, resulting in uncertainty over the performance of the product to which the bearing is fitted.

› Products from uncontrolled sources

Low-price counterfeits tend to be imported from a variety of manufacturers in countries where costs are low. Users may receive different-quality products from shipment to shipment. Another risk is the variable quality control in manufacturing, handling and storage of the counterfeit products, depending on the source and brand purchased. Bearing damage caused as a result of these can be very difficult to detect on installation, but will lead to premature failures during operation.

› No local technical back-up

In the event that users need technical support or advice, typically there are no local Application Engineers available to help with, for example, bearing selection advice or failure analysis. Low-price manufacturers do not have modern, well-equipped technology centres to provide test data, product defect and failure analysis, and new product development.

› No materials development

Counterfeit brands use inferior-quality raw materials, as opposed to the extra-clean, high-quality materials used by premium manufacturers. Steel quality is the major factor in bearing operating life and reliability – a life difference of up to 20 times is not uncommon. In addition, premium manufacturers also invest in the development of new, special materials unique to them, capable of giving up to 10 times life in contaminated environments.

› Material purity

The fatigue life of alloyed bearing steels such as 100 Cr6 (or SUJ2 in the Japanese standard), for instance, depends principally on the inclusion content. Oxide or non-metallic inclusions, in particular, promote negative effects under the raceway surface. As an example, it is known that aluminium oxide inclusions, which are formed by the process of oxidisation during the melt, can lead to a major reduction in bearing fatigue life. This effect is created because aluminium oxide inclusions are relatively hard and can break up when the steel is being processed, such as during forging. When break-up occurs, the inclusions shrink and weaken the microstructure. Working with a leading steel manufacturer, NSK has developed materials like Z Steel, EP Steel and BNEQARTET to prevent this negative effect, also using special melting processes that reduce non-metallic content and prolong fatigue life.

› No heat treatment development

Heat treatment is another parameter, which affects the specific characteristics of steels and, consequently, affects bearings. This is why materials such as NSK's SHX steel are subjected to a specific heat treatment that is particularly resistant to wear at high operating temperatures. Bearings of this type are required not just where heat is present as an inherent part of the process, but in applications such as machine tools, where fast spindle speeds generate high temperatures in the drive components. During development, the characteristics of SHX steel were proven by means of comprehensive wear resistance tests, including four-ball and roller tests, as well as material and surface fatigue life tests. Counterfeit manufacturers do not offer this kind of product development and analysis.

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How to avoid buying counterfeit bearings

Most users that receive counterfeit bearings believe that they have purchased genuine products and, not being bearings 'experts', will find it almost impossible to tell the difference between real and counterfeit products at the point of delivery.

This means that they completely rely on their supply chain to have the necessary quality control procedures in place to avoid the risk of counterfeits entering their plants.

When purchasing premium bearings from an authorised distributor, users can be sure that these procedures are in place, as this is one of the many stringent control processes that distributors must adhere to in order to be authorised by the manufacturers.

The benefits of authorised distributors

Carefully chosen and meticulously monitored, NSK Authorised Distributors are professional, knowledgeable and service orientated.

With extensive stocks of NSK and RHP products and unlimited access across the range, they deliver genuine orders quickly and reliably – as well as everything from stock management to product and application knowledge, through to engineering advice and support based on a total-cost approach.

Every NSK Authorised Distributor is part of a tripartite relationship delivering the peace of mind that comes as part of a fully committed global and local alliance.

Another potential source of vulnerability to receiving counterfeits is when subcontractors are used for rotating equipment repairs on assets such as electric motors, pumps, gearboxes and fans. Unless vetted to ensure they are aware of the risk and have the appropriate controls in place to avoid it, they may inadvertently purchase and install counterfeit bearings during the repair or refurbishment.

To minimise the risk of receiving counterfeits, it is recommended that users follow this process:

1. Specify the premium brand of bearing you require – for example NSK.
2. Check that the distributor you plan to buy from is authorised by NSK.
3. Ask for a copy of their latest authorised distributor certificate.
4. If they cannot produce one, visit the NSK website, where you can find a full list of authorised distributors, or alternatively call NSK for confirmation of their status.

This process gives you the best chance of getting what you are paying for:
factory-fresh, genuine, premium NSK bearings that will provide the optimum level of performance during operation.

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How to identify authentic NSK bearings

What to look For

- Are markings similar to standard manufacturer markings?
- Are they any markings at all?
- Inspect the rolling elements and raceways.
  Look for rough finishes and abnormal roller appearance.
- Are there markings on different areas of the bearing than normal?
- Is the product wrapped in appropriate shipping material?
- Was it purchased through an authorized channel?

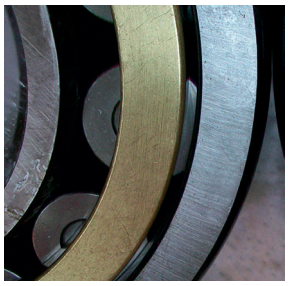
Both images are counterfeit. Incorrect wrapping and no markings.

A. Authentic NSK product

B. Counterfeit

Although they look similar in general appearance, you can see several areas in which they are different including indentation on the rollers.

Is it counterfeit? Yes. Things to look for: no lifting holes, comer radius should not be polished, no indent in rollers.



A. Authentic NSK product

B. Counterfeit

NSK single piece machine brass cage with broached pocket. Counterfeit two piece cage with rivets. Difference in cage could cause bearing failure.

Examine the bearings carton:

Is the packaging similar to other packaging?
Are the crates indeed quality shipping crates?
Do they have proper markings?
Are the logo markings genuine?

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Examine the outer shipping cartons:

Look at the pallet configuration and container load.
Compare manufacturer country with shipment country.

What is NSK doing to fight the counterfeit issue?

Following the recent seizure of 23,000 counterfeit NSK packages and labels in Hebei Province, China, a follow-up raid discovered more fake merchandise at another factory owned by the same offender.
Over 90,000 counterfeit bearing boxes and 10 imitation printing plates covering four major bearing companies (including NSK) were found. The entire batch of boxes was confiscated and taken to the warehouse of the Market Supervisory Board (MSB), the local trademark infringement office.
The range of machinery and equipment found within the factory indicates the level of capability many counterfeiters have at their disposal. Several machines for printing, laminating, die-cutting, creasing and cutting were discovered. Aside from the fake boxes, officials also found several stacks of uncut packages, most of which were NSK.

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NSK's statement for dealing with counterfeits

Save our customers
- Protect human life, property and reliance
- Promote authorised dealer network
- Exclude illegal players and products from the market

Terminate counterfeits
- Eliminate the counterfeit syndicates
- Suspend counterfeit manufacturers' operations and distribution channels
- Conduct legal action against counterfeit manufacturing sources

Promote the value of the NSK brand
- Recognition of real value
- Conduct brand protection activities
- Provide educational programmes for dealers/colleagues

Cooperation with entities in China
- Support resources to our activities
- Protect out-flow of counterfeits by Customs and Border Control by:
  - Major trading countries
  - Raid activities by central and local government organisations

Seizures of counterfeits at Chinese Customs

Year	Cases	Pieces seized
2010-14	103	813,684
2015	22	3,500
2016	9	2,468
2017	15	10,917
2018	33	11,516
2019	32	8,015

These figures show the effectiveness of China's Customs seizures in eliminating counterfeit products. While the number of pieces decreases, the value is constant due to the size of the products.

NSK's fight against counterfeiting continues with a new app

NSK works closely with the WBA (World Bearing Association), JBIA (Japan Bearing Industry Association) and authorities around the world to enforce the law on counterfeiters, and eliminate fake bearings – including through app development.

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Counterfeit NSK packaging recently seized by police.

Established for over 100 years, NSK is recognised around the globe for manufacturing high-quality, reliable bearing products that are used in many different industries, including automotive.

For this reason, NSK is a prime target for counterfeiters. Traders dealing in fake bearings not only put their own businesses at risk – by sourcing and selling inferior bearings – but those of end users, who unwittingly believe they are getting 'the real thing' at a reduced price. Such bearings have the potential to fail prematurely, even catastrophically, presenting an inherent safety risk.

In light of these risks, NSK engages in multifaceted efforts to combat fake bearings. Recent efforts include a new app, 'NSK Verify', that allows customers to assess the authenticity of machine tool bearings by scanning a special barcode found on the box.

As the next step in eliminating fake bearings, NSK has collaborated with major bearing companies to extend this thinking into another new app, WBA Bearing Authenticator: **'WBACheck'**.

This app assesses the bearing authenticity of WBA member companies by scanning a compatible 2D barcode.
This makes it easier for customers who use bearings from multiple companies. Furthermore, if an unregistered bearing is detected, the app automatically notifies NSK.

WBACheck can be downloaded from the official WBA website: **www.stopfakebearings.com/#buysafely**

Combatting the efforts of counterfeiters is a time-intensive, high-cost exercise. However, NSK continues undeterred in its relentless pursuit of these fake bearing operations to ensure that customers worldwide can continue to use genuine NSK products with confidence.

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About NSK

NSK started manufacturing the first bearings in Japan in 1916. After setting its sights beyond in the 1960s, it has grown to operate in 30 countries, researching, designing and manufacturing Motion & Control™ solutions supporting essential mobility and industry applications worldwide.

NSK is the top supplier of bearings in Japan, and the third largest in the world by market share – as well as a world leader in electric power steering and ball screw manufacturing and technology.

Its responsive products and technologies, including a diverse range of solutions for precision machining, are used to enhance automotive performance and industrial productivity while reducing energy consumption to unprecedentedly low levels.

About WBA

The World Bearing Association (WBA) is a non-profit and unincorporated industrial association founded in 2006 by three major, regional bearing associations. WBA promotes the common, lawful interests of the world bearing industry, such as open economic engagement, sustainable development and the protection of legal rights of companies. NSK is an active member of WBA.

The WBA and its participating companies assist local law enforcement with information and identification of counterfeits, to help find and prosecute counterfeiters. We are frequently involved in raids and investigations of suspected counterfeit operations. This helps buyers, distributors and end users.

WBA contributes to the development of the global bearing industry and focusses on issues of common interest including recent initiatives including anti-counterfeiting **(www.stopfakebearings.com)** and environmental protection.