

BEARINGS FOR THE SUGAR INDUSTRY



NSK high performance bearings help to maximise uptime and reduce maintenance costs for sugar manufacturers

The NSK Company

Partnership based on trust - and trust based on quality

As one of the world's leading manufacturers of rolling bearings, linear technology components and steering systems, we can be found on almost every continent – with production facilities, sales offices and technology centres – because our customers appreciate short decision-making channels, prompt deliveries and local service.



NSK commenced operations as the first Japanese manufacturer of rolling bearings back in 1916. Ever since, we have been continuously expanding and improving not only our product portfolio but also our range of services for various industrial sectors. In this context, we develop technologies in the fields of rolling bearings, linear systems, components for the automotive industry and mechatronic systems. Our research and production facilities in Europe, Americas and Asia are linked together in a global technology network. Here we concentrate not only

on the development of new technologies, but also on the continuous optimisation of quality – at every process stage.

Among other things, our research activities include product design, simulation applications using a variety of analytical systems and the development of different steels and lubricants for rolling bearings.

Total Quality by NSK: The synergies of our global network of NSK Technology Centres. Just one example of how we meet our requirements for high quality.

NSK is one of the leading companies with a long tradition in patent applications for machine parts. In our worldwide research centres, we not only concentrate on the development of new technologies, but also on the continual

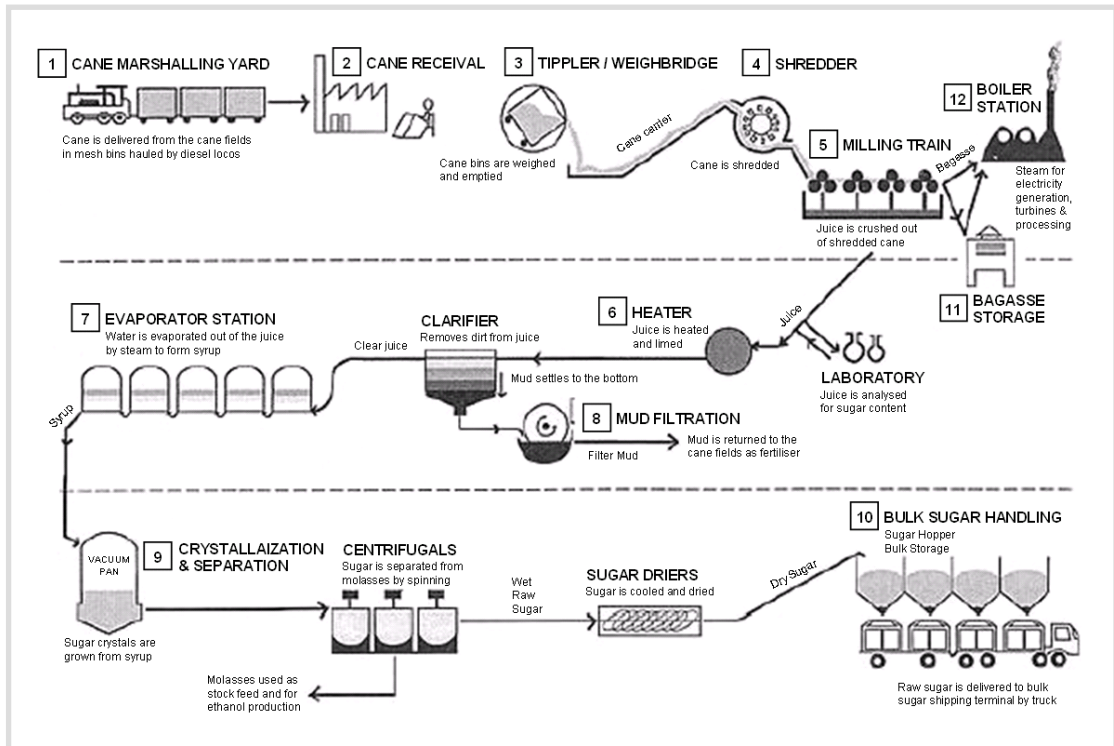
improvement of quality based on the integrated technology platform of tribology, material technology, analysis and mechatronics.



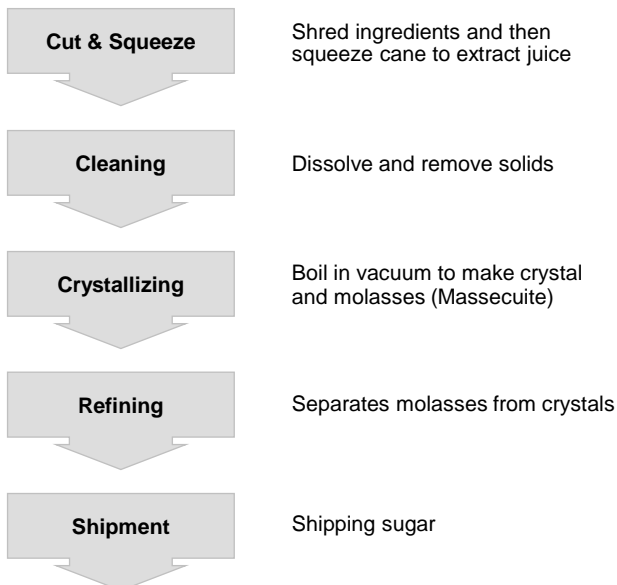
How Raw Sugar is Made

Overall Process from Cane to Bulk Sugar Handling

Production Process Flow Chart

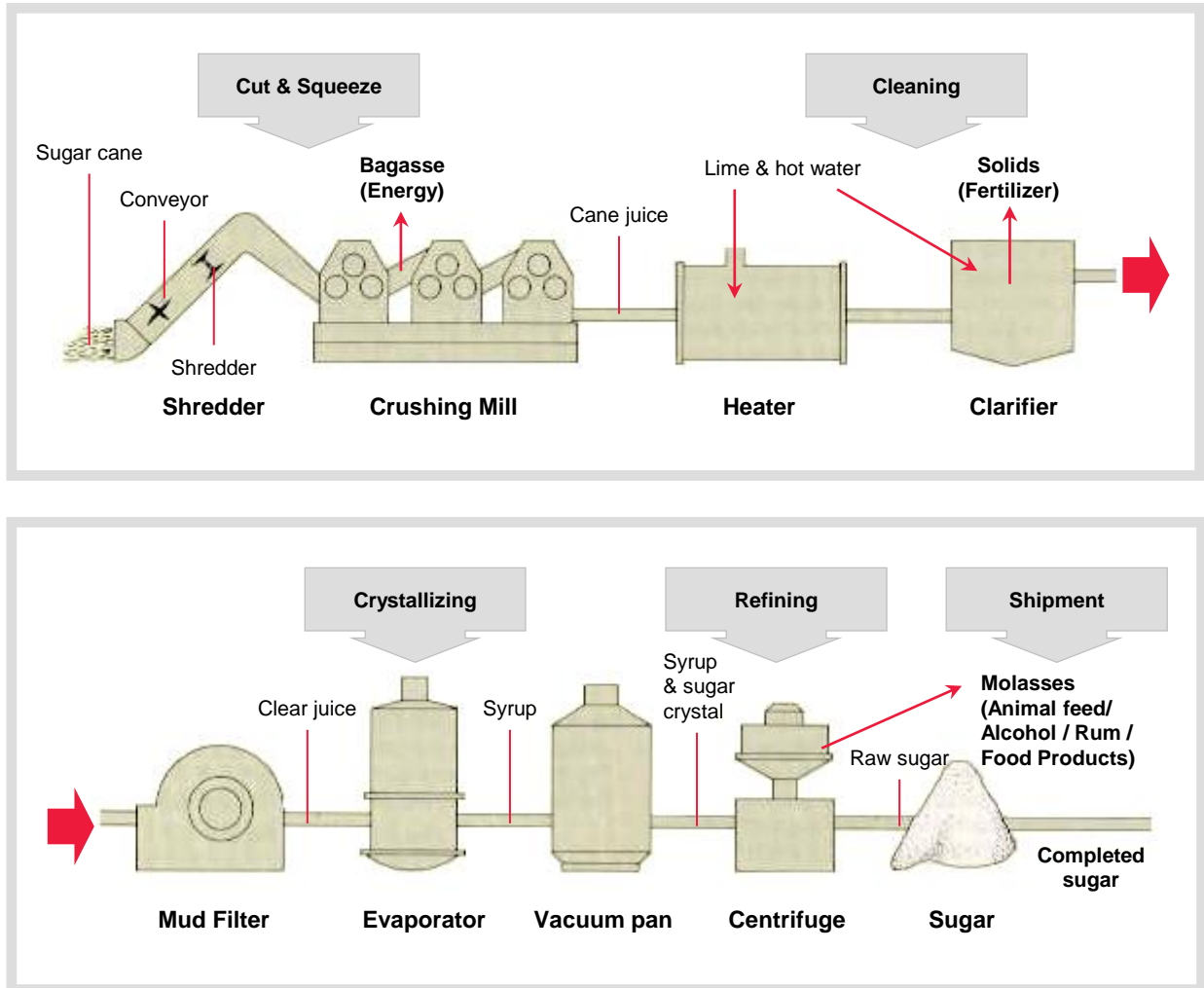


Production Process in a Mill



How Raw Sugar is Made

Mill Flow Chart



Cut and Squeeze Process

Cane Carrier (Conveyor)



Cobra Chain Conveyor



Belt Conveyor

NSK Suitable Products

High Reliability

High Capacity

High Strength



Deep Groove Ball Bearing

- NSK Ultra clean 'Z' steel
- Advanced lubrication technology
- High grade balls
- Specially honed raceways
- Patented seals and shields



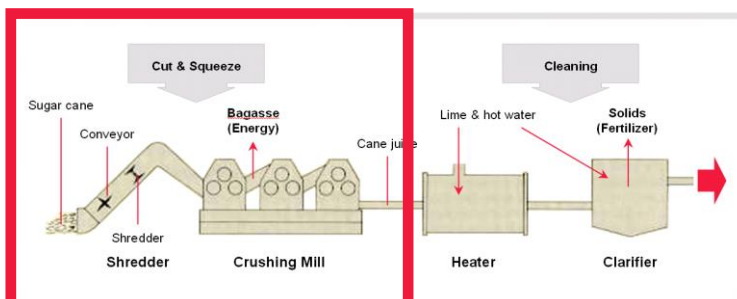
Spherical Roller Bearing – NSKHPS series

- Up to 2 times operating life of conventional bearing
- High limiting speed up to 20% higher than conventional bearing
- High strength cage (steel or brass)
- Low noise and vibration

Operating conditions

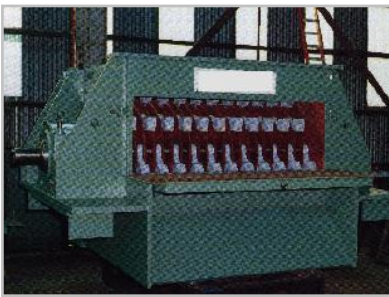
Heavy Contamination

Impact Load



Cut and Squeeze Process

Cane Shredder



NSK Suitable Products

High Reliability

High Capacity

High Strength

High Temperature



Spherical Roller Bearing – TL series

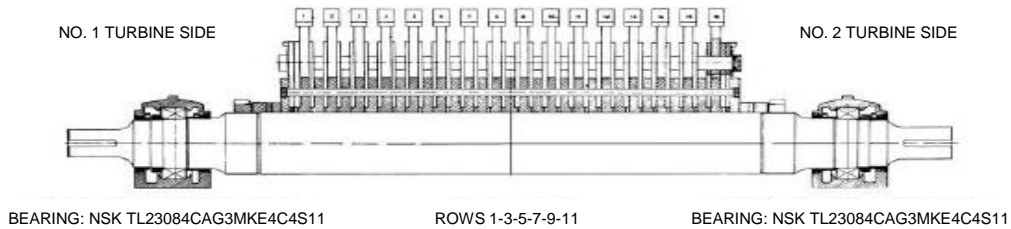
- Innovative chemical composition of steel
- Special heat treatment process
- High strength inner and outer rings
- High strength brass cage
- High resistance to cracks
- High resistance to vibration and impact

NSK Shredder bearing spec.



Spherical Roller Bearing – CA series

- Tough machined brass cage
- Self-aligning ability with floating ring guide
- Controlled roller skew
- High dynamic and static load rating
- High speed performance – low temperature rise
- High resistance to heavy and shock loading

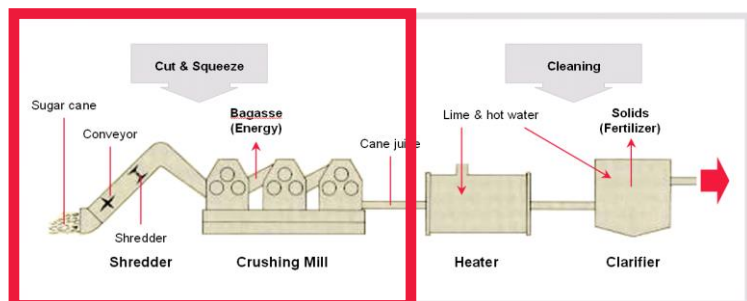


Operating conditions

Impact Load

High Speed

High Temperature



Cut and Squeeze Process

Cane Crushing (Squeezing) Mill



NSK Suitable Products

High Reliability

High Capacity

High Strength



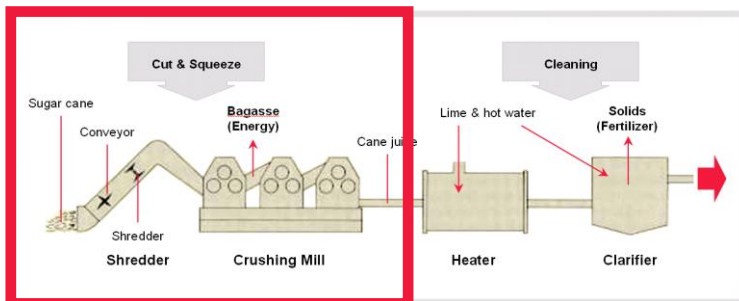
Spherical Roller Bearing – Giant size CA series

- Tough machined brass cage
- Self-aligning ability with floating ring guide
- Controlled roller skew
- High dynamic and static load rating
- High resistance to heavy and shock loading

Operating conditions

Heavy Load

Low Speed



Power Generation (Boilers)

Boiler Fans



NSK Suitable Products

High Reliability

High Speed

High Strength

High Temperature



Spherical Roller Bearing – NSKHPS series

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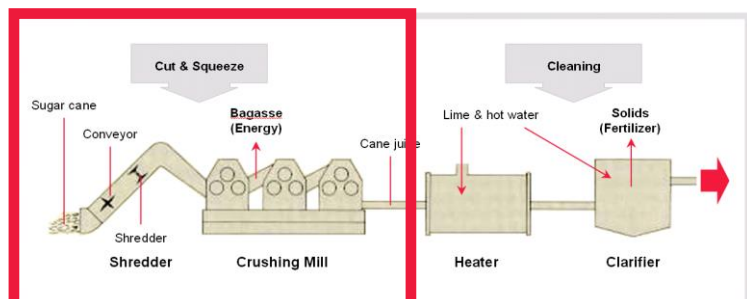
CORRECT SPHERICAL ROLLER BEARING INTERNAL RADIAL CLEARANCE IS A CRITICAL POINT TO NOTE

Operating conditions

Low Load

High Speed

High Temperature



Cleaning Process

Clarifier



NSK Suitable Products

High Reliability

High Capacity

High Strength

Low Noise



Deep Groove Ball Bearing

- NSK Ultra clean 'Z' steel
- Advanced lubrication technology
- High grade balls
- Specially honed raceways
- Patented seals and shields



Cylindrical Roller Bearing – EW and EM series

- Cage strength greater than competitors (pressed steel or one-piece brass)
- Up to 2 times operating life of conventional bearing
- Up to 25% higher limiting speed
- Up to 40% noise (3-7dB quieter) and vibration reduction



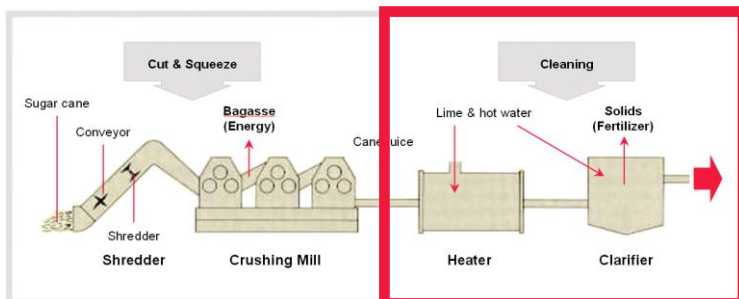
Spherical Roller Bearing – NSKHPS series

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Tapered Roller Bearing

- Inch and metric sizes
- Standard steel, carburised steel and HTF treatment available
- Custom made sets with spacers
- Outer diameters up to 2500mm



Cleaning Process

Rotary Mud Filter



NSK Suitable Products

High Reliability

High Capacity

High Strength



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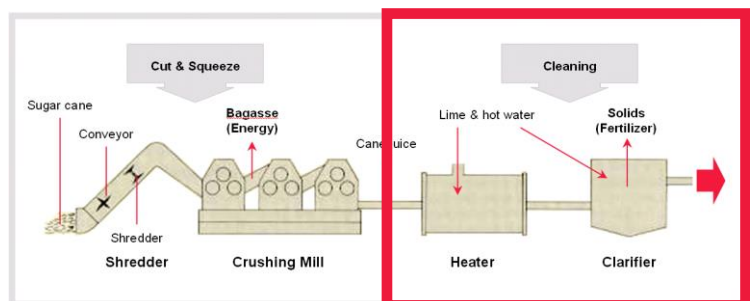
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Crystallizing Process

Evaporator



NSK Suitable Products

High Reliability

High Capacity

High Strength

Low Noise



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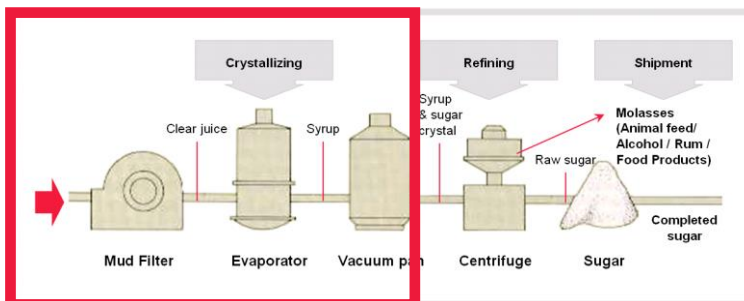
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Molded Oil Bearing

- Grease-free property with no oil refilling
- Operating life more than twice as long as grease lubrication in dust/water contaminated environment
- Extended maintenance-free performance



Crystallizing Process

Vacuum Pan



NSK Suitable Products

High Reliability

High Capacity

High Strength



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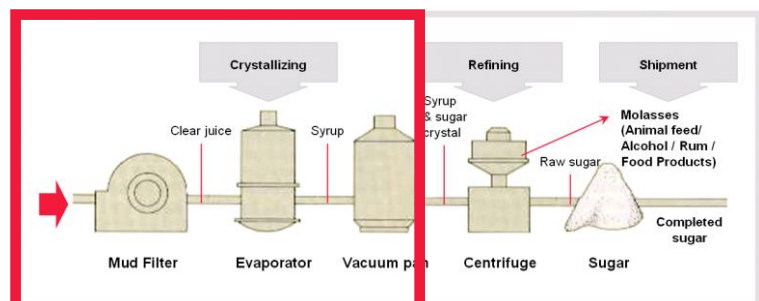
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Refining Process

Centrifuge (Fugals)



NSK recommends bearings with brass cages

NSK Suitable Products

High Reliability

High Capacity

High Strength



Deep Groove Ball Bearing

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- Advanced lubrication technology
- High grade balls
- Specially honed raceways
- Patented seals and shields



Angular Contact Ball Bearing

- Offered in 15, 25, 30 and 40 degree contact angle
- Available in a range of Polyamide, Steel and Brass cage assemblies
- Advanced lubrication technology
- High grade balls for quiet and smooth operation
- Super finished raceways to minimise noise and aid lubricant dispersion



Cylindrical Roller Bearing – EW and EM series

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Spherical Roller Bearing – NSKHPS series

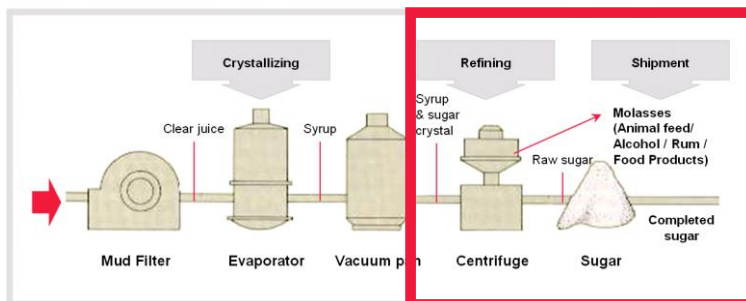
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Operating conditions

High Vibration

High Speed

High Temperature



Refining Process

Sugar Dryer



NSK Suitable Products

High Reliability

High Capacity

High Strength



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Spherical Roller Bearing – NSKHPS series

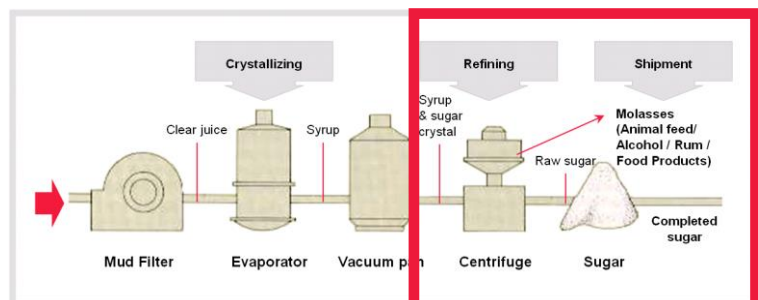
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Operating conditions

Low Speed

High Load

Heavy Contamination



Cane Harvesters



NSK Suitable Products

High Reliability



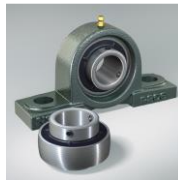
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Bearing Units

- Sealed single row ball bearing in a pillow block or flanged housing
- NSK units feature flingers to keep contaminants away
- Variety of shaft locking mechanisms
- Triple lip seal variations extending operating life



Hi-TF Bearing

- Special material outperforming standard bearing steel
- Innovative heat treatment technology
- Up to 10 times operating life under contaminated conditions and twice operating life under clean lubrication
- Up to 4 times the operating life at 160°C
- Less than one-third the rate of wear
- 40% improvement in seizure resistance

Operating conditions

High Vibration

High Load

Heavy Contamination

Cane Locos



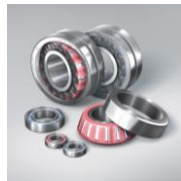
NSK Suitable Products

High Reliability



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Operating conditions

High Vibration

High Load

Heavy Contamination

ASEAN & OCEANIA SALES OFFICES

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USJ 1, 47600 SUBANG JAYA,
SELANGOR D.E., MALAYSIA
TEL: +60 3 5886 3388

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FAX: +65 6250 0247

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FAX: +66 2320 2626

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THANG LONG INDUSTRIAL PARK,
DONG ANH DISTRICT, HANOI,
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FAX: +84 4 3955 0158

Visit our website: www.nsk.com

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