
Metal industry

Bronx Engineering

SKF Explorer sealed spherical roller bearings

Engineering consultancy



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SKF bearings keep steel levelling machines rolling

A specially developed range of bearing units, developed and manufactured by SKF, are playing a vital role in maintaining the accuracy and reliability of steel strip and sheet levelling machines, produced by Midlands based Bronx Engineering. In particular, the SKF bearing units help both to ensure that the work rolls used to apply force to the steel materials are supported and aligned correctly, thus extending the operating life of the roll assemblies to between five and ten years, depending on application.

Bronx Engineering has been designing and producing specialised machine systems and complete production lines for the steel industry for over 70 years. Particularly, the company has established itself as the leading supplier of steel coil processing machinery, including slitting, cut-to-length, tension levelling and inspection systems.

Levelling systems are used to remove shape imperfections that are a natural result of the unique properties generated in each batch of steel when it is rolled, cooled, and coiled at the mill. These imperfections can include coil set cross bow, edge wave and centre buckle. In each case, if the imperfections are not sufficiently removed then cut sheets of steel will be difficult to handle and may be impossible to use in subsequent manufacturing operations using plasma

cutting, coating or punching and bending presses.

Levelling of the steel is achieved by passing the material through sets of nested work rolls, which alternately flex the material up and down to stretch the outside and compress the inside of each bend radius as the material travels over the rolls. Additionally, the work rolls can be shaped along their length to increase the travel distance through selected parts of the machine.

This stretches the short fibres of the material to match those that were elongated during manufacture, gradually realigning and straightening the grain structure of the metal; in essence, the process effectively eliminates shape defects.



Kevin Homer, Operations Director for Bronx Engineering, explains, *"The work rolls are key to the successful operation of each of our levelling machines and have to be correctly aligned at all times to ensure precision strip levelling and to prevent the introduction of further imperfections as a result of errors within the roll assembly. Machines can have up to 23 work rolls, typically up to 2 m in width and between 35 and 100 mm in diameter. They all require substantial support, which is where the specially designed SKF Backup rollers come into play."*

A series of Backup rollers run along the length of each work roll, providing support and precise alignment, with up to 189 Backup rollers being used in a standard machine. The Backup rollers are based on specially modified energy efficient SKF Explorer sealed spherical roller bearings, which have a Vibro polished solid steel outer shell, plus a chamfered and radiused profile. *"The accuracy and quality of finish is crucial"*, points out Kevin Homer, *"to ensure that damage in the form of stress peaks or tram lines is not transferred via the high precision work rolls to the steel strip. Similarly, it is crucial that the Backup rollers are completely free from vibration and with virtually zero friction to ensure that they spin freely to eliminate the risk of flat spots being formed on the work rolls."*

In addition the SKF Backup rollers incorporate rugged hydrodynamic seals that reduce operating temperature by up to 35% and frictional torque by over 20%. This helps them last up to three times longer than traditional lip seals, while preventing contaminants entering the bearing, even under the harshest of operating conditions.

Kevin Homer adds, *"We've been using the SKF backup roller bearings for many years and in more recent times the energy efficient SKF series. Such is the level of performance and reliability that they typically operate within tolerance for extended periods – often between five and ten years, depending on the application. Just as importantly, we've always worked closely with SKF to improve the operation of our machine components, and have always received an excellent level of technical and sales support."*



Specially modified SKF Explorer sealed spherical roller bearing

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