

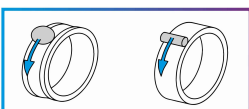
## Summary

- Point and line contact describes the type of contact between rolling elements and a raceway surface
- Point contact in ball bearings: Contact of the rolling elements with the raceway at one point
- Line contact in roller bearings: Contact of the rolling elements with the raceway in a line

## What is meant by "point and line contact"?

You may have already heard that rolling bearings can be split into **two types**. The classification depends on the shape of the **rolling elements** (balls or rollers/needles), so that a basic distinction is made between ball and roller bearings.

The main difference between the two designs lies in the contact between the rolling elements and the **raceway** surface. Imagine a **deep groove ball bearing** and a **cylindrical roller bearing**: In a the deep **groove** ball bearing, the contact between the balls and the raceway is point-shaped from a geometrical point of view. Whereas in the rolling elements of a cylindrical roller bearing contact the raceway in a linear manner.



## The advantages and disadvantages of point and line contact

*Graphic representation of point and line contact.*

Both types of contact have advantages and disadvantages. **Point contact** offers the advantage that ball bearings can be operated at a high **speed**. They are sometimes used in machine tools or electric

motors. However, ball bearings cannot support as much load as roller bearings. The rolling elements of roller bearings offer a larger contact area to the raceways than balls. As a result, bearings with line contact can generally support higher loads than ball bearings and have greater stiffness. On the other hand, the frictional [torque](#) is higher than with ball bearings. Due to the linear contact, roller bearings are therefore used in applications with comparatively low speeds – for example in gearboxes.

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