

### Spring rings for ball transfer units

- **Material**  
Stainless steel.

#### Applications

GN 509.3 spring rings allow an easy and quick assembly and removal of ball transfer units type GN 509 (see page 646) and GN 509.1 (see page 647).

Ball transfer units consist of a metal body inside which a ball, supported by smaller balls, helps in conveying loads applied on a plane surface in every direction (for example conveyor belts).

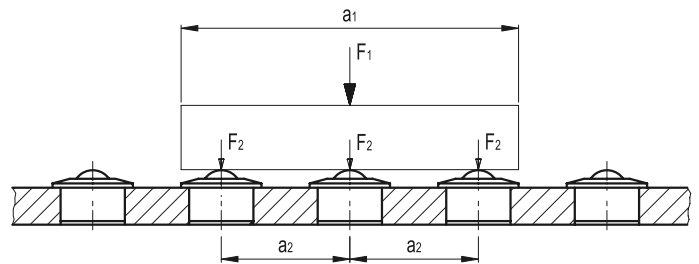
#### Choice of the ball transfer unit

To choose the proper ball transfer unit for a conveyor track, both weight and dimension of the load to be carried must be taken into consideration.

The max distance "a<sub>2</sub>" between the ball transfer units (on a plane surface) is obtained by dividing the smaller load dimension to be conveyed (a<sub>1</sub>) by 2.5. This calculation (based on an elementary geometry principle) guarantees that a load is always supported by at least 3 ball transfer units, thus preventing it from tipping over.

As far as the weight is concerned, as the load is supported by at least three different ball transfer units, each of them would bear a third of the total weight (the total weight divided by three).

It may be equal or lower than the max load capacity values showed in the table for every unit.



a<sub>1</sub> = smaller dimension of the load to be conveyed

a<sub>2</sub> = max distance between ball transfer units

$$a_2 = \frac{a_1}{2.5}$$

F<sub>1</sub> = load weight

F<sub>2</sub> = load supported by each ball transfer unit

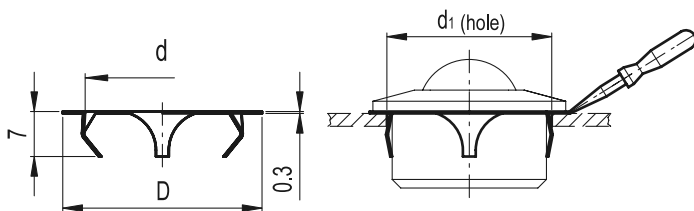
$$F_2 = \frac{F_1}{3} \leq \text{max load capacity of each ball transfer unit}$$

#### Speed and friction

The permissible conveying speed is 2 m/sec. With speeds higher than 1 m/sec., according to the dimensions of the ball transfer units, a rise in temperature, in proportion to the dimensions of them, could occur owing to the increase of the rotation speed of the support balls.

The friction value of the ball transfer units, at a speed of 1 m/sec., is 0.005 μ. This value depends, however, on the application and it could be subject to several variables.

Ball transfer units in turned and black-oxide steel (GN 509.1) offer a higher rigidity in comparison with the zinc-plated drawn sheet steel ones (GN 509). Lubrication of the balls is recommended to prevent corrosion, even though some applications may not require it.



Standard Elements	Main dimensions			For ball transfer units GN 509 GN 509.1 with d=	△△ g
	d	D	d <sub>1</sub>		
GN 509.3-24	24	31	25 -0.2	15.8	1
GN 509.3-36	36	44	37.3 -0.3	22.2	1
GN 509.3-45	45	55	46.7 -0.3	30.1	1