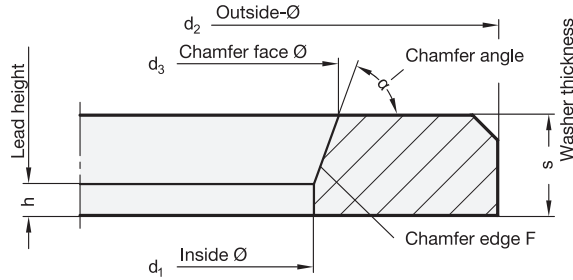


## Technical information



### Outside diameter $d_2$

The outside diameter  $d_2$  of the lower type refers to washers DIN 125 / ISO 7089, and the higher type to washers DIN 7349.

### Chamfer face diameter $d_3$

This dimension is, together with the chamfer angle  $\alpha$   $70^\circ$  and the inside diameter  $d_1$ , the most important dimension of these heavy duty washers. Diameter  $d_3$  is actually, even in the lower tolerance range, larger than the max. contact under head diameter on a bolt.

This will ensure that the chamfer of  $d_3$  of the hardened washer will not be pressed into the underhead radius causing an indentation on the bolt which would damage the bolt.

### Inside diameter $d_1$

The inside diameter  $d_1$  is kept as small as possible ensuring that the bolt is inserted centrally into the washer. The choice of a matching pair of bolt and washer with least radial clearance is important in order to avoid a mismatch between chamfer diameter  $d_3$  and the max. contact area diameter of the bolt head.

### Chamfer angle $\alpha = 70^\circ \pm 2^\circ$

This relatively large angle is necessary when using hexagon headed bolts to avoid interference with the chamfer face diameter  $d_3$  of the washer.

### Chamfer edge F

The extended chamfer edge F, as seen from  $d_3$  and  $d_1$  create an edge that provides the smallest radial clearance towards the transition from bolt shank to head. Even with the minimum chamfer angle of  $\alpha = 68^\circ$  and the smallest dimensions for  $d_1$  and  $d_3$ , this radial clearance is sufficient for all bolts according to DIN EN.

### Lead height h

This is the height of the cylindrical part of the internal diameter  $d_1$ ,  $h$  should be as high as possible in relation to the pitch of the thread of the bolt.

### Washer thickness s

Washers GN 6339 are higher when compared with DIN washers (exception: DIN 7439 which is equal to the high type).

A larger thickness leads to a stronger washer. As a result, bearing in mind the chamfer  $d_3$ , a minimum height is established which ensures that the bolt thread will not be damaged when the bolt is tightened.