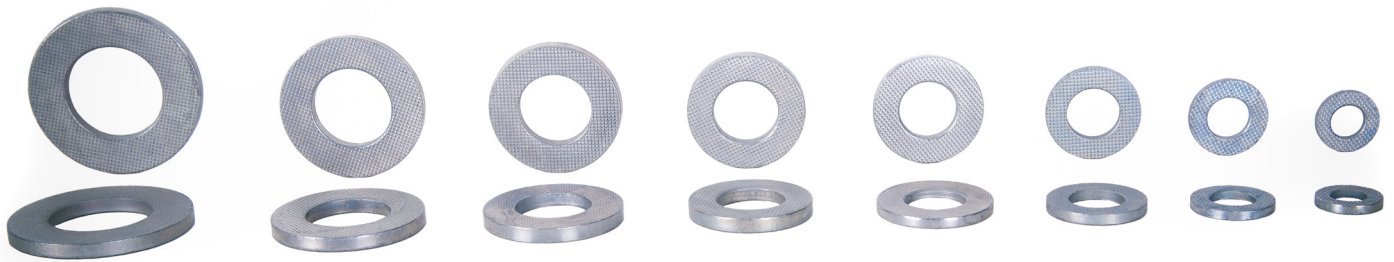


## LOCKTIX® – Washers to locking fastenings

Hardened steel, Zinc-Nickel plated, Cr(VI)-free



To cover the most diverse needs to locking of screwed fastenings REYHER has a rich portfolio, always able to provide the right solution. LOCKTIX® washers are ideal to cope with the needs that occur with dynamic loads. These positive locking washers hold dependably and ensure economic vibration-proof screwed fastenings with moderate to high preload forces. They have a doubleside embossed and particular large contact surface. Due to the electroplated Cr(VI)-free zinc-nickel coating the LOCKTIX® provides high corrosion protection. This makes them the optimal solution for, e.g. the automotive sector.

LOCKTIX® washers are readily available in the RIO – REYHER Internet Order Webshop in sizes M 8 to M 24.

### Technical Information

#### The LOCKTIX® locking effect

The locking system is vibration-proof in line with DIN 65151, Junker-Test.

Two questions are particularly relevant:

1. How big is the shift path?
2. How high is the assembly preload force?

Tests carried out show a shift path of  $\pm 0.3$  mm, at moderate (30% target preload force) to high (90% target preload force) a very good result. The tests illustrated in the diagram were carried out with hardness 200 HV and 300 HV of a support washer and show with hardness 200 HV of a support washer a providing reliable consistent locking. With a hardness above 300 HV of the bolted components a minimum preload force level of 50% of the preload force required should be applied.

### Advantages

- **Vibration-proof screwed fastenings**  
for moderate to high preload forces
- **High corrosion protection**  
Zinc-Nickel plated, Cr(VI)-free
- **Suitable for a wide range of applications**  
everywhere dynamic loads occur
- **Price advantages over comparable locking elements**
- **In stock ready for immediate delivery**

### Article Information

#### LOCKTIX® – Washers to locking fastenings

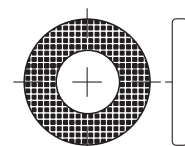
Hardened steel, Zinc-Nickel plated, Cr(VI)-free

#### Sizes:

M 8, M 10, M 12, M 14, M 16,  
M 18, M 20, M 24

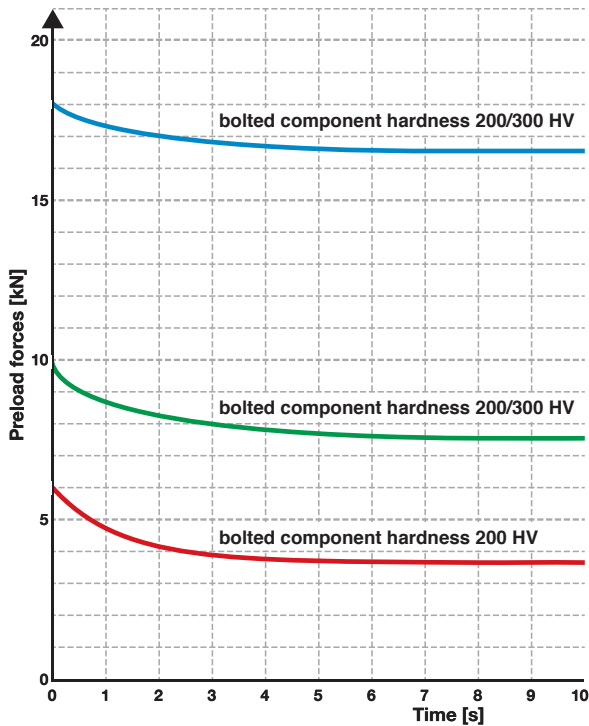
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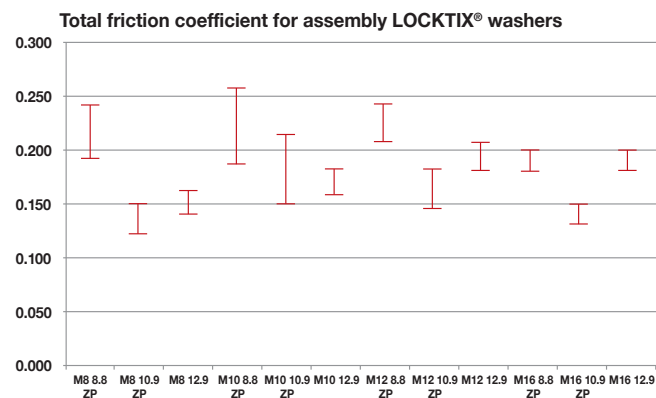


# Technical Information

## Vibration Testing M 8



30% (red), 50% (green), 90% (blue) nominal preload force



## Reliability through optimized assembly parameters

When assembly locking elements specific torque is generally applied. For optimal assembly and to achieve the highest reliability possible, tests in line with DIN EN ISO 16047 were carried out. The interlocking surface on both sides of the LOCKTIX® washer leads to altered friction on the contact surfaces, which is largely dependent on the hardness of the screw used. This means that a general consideration of all hardness classes is not applicable. For example, when you combine with 8.8, a higher friction occurs. In comparison to higher hardness classes here the hardness of the screw is the lowest and consequently the surface structure claws in extremely well.

In the table below the recommended tightening torque for hexagon head screws and hexagon socket head cap screws for general use is given (8.8 ZP, 10.9 ZP, 12.9). If maximum use is required for the screw or alternative coating are present we recommend carrying out test assembly to find the correct tightening torque in each individual case. We would be very pleased to help you.

Sizes	Pitch mm	Tension cross section $A_s$ (mm <sup>2</sup> )	Preload forces $F_v$ (kN) for property classes			Tightening torque $M_A$ (Nm) for property classes		
			8.8	10.9	12.9	8.8	10.9	12.9
M 8	1.25	36.6	16.9	26.3	30.8	31.5	39.4	46.1
M 10	1.5	58.0	26.9	41.9	49.1	62.4	77.9	91.1
M 12	1.75	84.3	39.2	61.1	71.5	108	135	157
M 14	2.0	115.0	53.9	83.9	98.2	172	214	250
M 16	2.0	157.0	74.0	115	135	268	332	389
M 18	2.5	193.0	92.9	140	164	383	462	540
M 20	2.5	245.0	119	180	211	542	652	762
M 24	3.0	353.0	172	259	303	934	1122	1314