



|                           |                                 |
|---------------------------|---------------------------------|
| Part Number               | <b>FE 412 Z</b>                 |
| Type                      | Freewheel Clutch Insert Element |
| Spring                    | Z (Tension)                     |
| With Hardened Steel Rings | No                              |

### Geometrical Data

|                |        |      |
|----------------|--------|------|
| Inner Diameter | d [mm] | 4    |
| Outer Diameter | D [mm] | 12   |
| Width          | W [mm] | 12   |
| Weight         | [kg]   | 0.00 |

### Shaft & Housing Tolerances

|                          |  |
|--------------------------|--|
| Shaft Tolerance          | h5   |
| Housing Tolerance        | H6   |
| Shaft & Housing Hardness | HRC 60 <sup>+4</sup> , Ehd <sup>1</sup> ≥ 1.3 mm |
| Shaft & Housing Surface  | R <sub>z</sub> ≤ 2.5 μm                          |
| Shaft & Housing Chamfer  | 1mm x 15°  |

### Ratings

|   |         |        |
|---|---------|--------|
| Nominal Torque                          | [Nm]    | 4      |
| Nominal Torque                          | [ft-lb] | 3.0    |
| Max. Indexing Frequency                 | [Hz]    | 10     |
| Max. Speed <sup>3</sup>                 | [rpm]   | 27,000 |
| Max. Operating Temperature <sup>4</sup> | [°C]    | 140    |

### Notes:

1. Effective hardness depth, equivalent to case hardness depth (CHD).
2. The stated speed and torque ratings are contingent on utilizing specified tolerances, correct installation techniques, and an operating temperature below the specified maximums. If specific applications differ, please consult GMN USA engineers.
3. The stated RPM value is for the maximum freewheel rotational speed for the sprags, not the shaft or housing. High freewheel rotational speeds can produce centrifugal forces that can cause the sprags to lift off from frictional contact, therefore creating an opportunity for improper engagement and potential slip. The sprag RPM must be below the listed value before engagement occurs. The actual sprag freewheel speed is difficult to determine because the sprags are driven by frictional forces from the race(s) and lubrication. Theoretically there is no maximum rotational speed in the driving direction; the inner race, sprags, and outer race rotate as one unit unaffected by centrifugal forces. Please consult GMN USA engineers with high RPM applications that approach or exceed the stated RPM rating.
4. The stated temperature rating is for an injection molded cage. The maximum temperature rating is 170°C for a steel cage.