

Guardian Tubes

Guardian R50 sleeve range

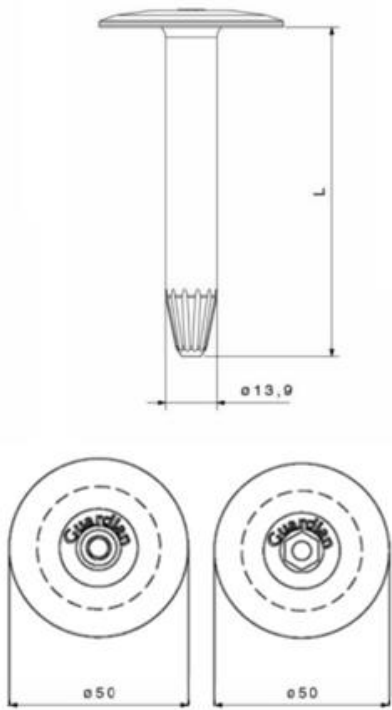


Fig. 1

Tube washer R-50

Tube washer ASTL-50 with hexagonal internal tube shape (used together with ACS 6.1)

Tube washer RPA-50 (Polyamide)

Guardian R48 sleeve range

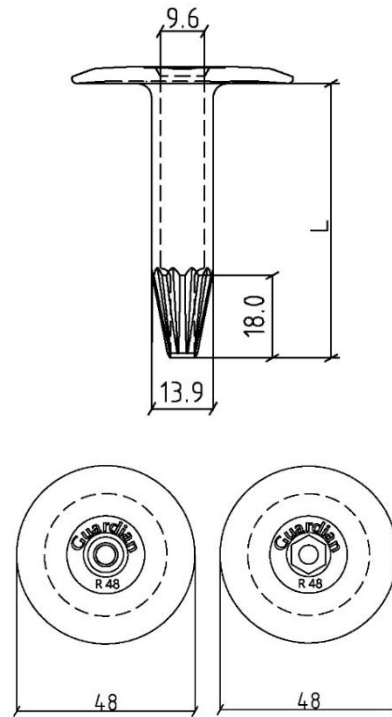


Fig. 2

Tube washer R-48 (Polypropylene)

Tube washer ASTL-48 / ASTL-50 with hexagonal internal tube shape (used together with ACS 6.1)

Tube washer RPA-48 (Polyamide)

Guardian RB48 sleeve range

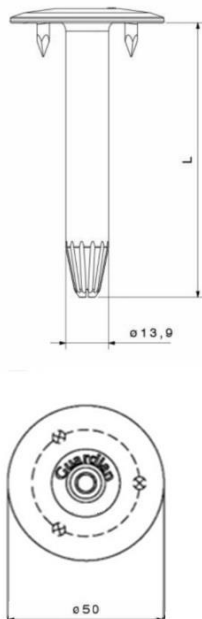


Fig. 3

Tube washer RB-48 with three barbs (Polypropylene)

Tube washer RBPA-48 with three barbs (Polyamide)

Guardian RBS50 sleeve range

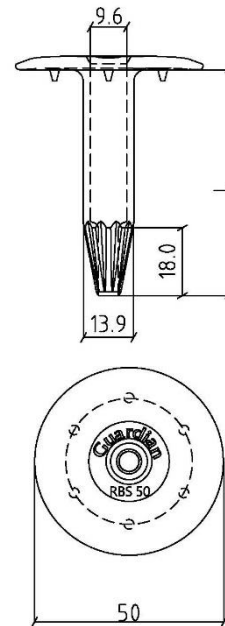


Fig. 4

Tube washer RBS-50 with six barbs

| Fastener | Substrate | R _k : Characteristic values of axial load resistance (kN) ⁵⁾ | Durability Resistance to unwinding EAD 030351-00-0402 cl. 5.3.7 D.2.3, D.3.1, D.3.2 and cl. 5.3.4 D.2.2 |
|----------------------|----------------------------------|--|---|
| GUARDIAN PS 4.8 | Steel sheet 0.70mm | 1.31 | Approved |
| GUARDIAN PS 4.8 | Steel sheet 0.75mm | 1.52 | Approved |
| GUARDIAN PS 4.8 | Steel sheet 1.00mm | 1.94 | Approved |
| GUARDIAN BS 4.8 | Steel sheet 0.70mm | 1.17 | Approved |
| GUARDIAN BS 4.8 | Steel sheet 0.70mm ⁴⁾ | 1.35 | Approved |
| GUARDIAN BS 4.8 | Steel sheet 0.75mm | 1.45 | Approved |
| GUARDIAN BS 4.8 | Steel sheet 0.80mm | 1.54 | Approved |
| GUARDIAN BSHD 4.8 | Steel sheet 1.00mm | 1.65 | Approved |
| GUARDIAN BSHD 4.8 | Steel sheet 1.25mm | 2.10 | Approved |
| GUARDIAN BSRF 4.8 | Steel sheet 0.75mm ⁴⁾ | 1.02 | Approved |
| GUARDIAN BS 5.5 | Steel sheet 0.72mm ⁴⁾ | 1.74 | Approved |
| GUARDIAN BS 6.1 | Steel sheet 0.60mm | 1.56 | Approved |
| GUARDIAN BS 6.1 | Steel sheet 0.70mm | 1.78 | Approved |
| GUARDIAN BS 6.1 | Steel sheet 0.75mm | 1.98 | Approved |
| GUARDIAN BS 6.1 | Steel sheet 1.00mm | 2.77 | Approved |
| GUARDIAN BS 6.8 | Steel sheet 0.50mm | 1.06 | Approved |
| GUARDIAN BS 6.8 | Steel sheet 0.60mm | 1.31 | Approved |
| GUARDIAN BS 6.8 | Steel sheet 0.70mm | 1.78 | Approved |
| GUARDIAN DBT 4.8-A | Steel sheet 0.70mm | 1.17 | Approved |
| GUARDIAN DBT 4.8-A | Steel sheet 0.75mm | 1.41 | Approved |
| GUARDIAN DBT 4.8-A | Steel sheet 0.80mm | 1.52 | Approved |
| GUARDIAN DBT-S-4.8-A | Steel sheet 0.75mm ⁴⁾ | 1.16 | Approved |
| GUARDIAN TPR 6.3 | Steel sheet 0.50mm | 1.19 | Approved |

³⁾ Steel sheets, galvanized, min S280 according to EN 10147

⁴⁾ Steel sheets, galvanized, yieldstrength 320 MPa

⁵⁾ Obtained value from the axial load test in steel sheets substrates, table 4, and the pullover test, table 6, of washers is compared and the lowest of the two gives the characteristic value for the fastener / sleeve, washer combination of the application.

Table 5: Wood substrate

| Fastener | Substrate | R _k : Characteristic values of axial load resistance (kN) |
|---------------------|---|--|
| GUARDIAN HD 6.1 | 18 mm OSB/3 ⁷⁾ | 1.36 |
| GUARDIAN HD 6.1 | 18 mm multilayer wood deck ¹²⁾ | 2.37 |
| GUARDIAN HD 6.1 | 18 mm wood deck underlayment ¹¹⁾ | 1.94 |
| GUARDIAN MTS 4.8 | 18 mm OSB/3 ⁷⁾ | 1.16 |
| GUARDIAN TS 5.2 | 17mm softwood ⁹⁾ | 1.28 |
| GUARDIAN TS 5.2 | 23mm softwood ⁹⁾ | 1.90 |
| GUARDIAN TS 5.2 | 18 mm OSB/3 ⁷⁾ | 1.35 |
| GUARDIAN TS 5.2 | 18 mm chipboard ¹⁰⁾ | 1.18 |
| GUARDIAN TS 5.2 | 18 mm multilayer wood deck ¹²⁾ | 1.89 |
| GUARDIAN TS 5.2 | 18 mm wood deck underlayment ¹¹⁾ | 1.94 |
| GUARDIAN LBS 6.0 | 18 mm OSB/3 ⁷⁾ | 1.40 |
| GUARDIAN LBS 6.0 | 23mm softwood ⁹⁾ | 2.00 |
| GUARDIAN LBS-S 6.0 | 18 mm OSB/3 ⁷⁾ | 1.44 |
| GUARDIAN LBS-S 6.0 | 18 mm Plywood ⁸⁾ | 2.92 |
| GUARDIAN BS 4.8 | 18 mm OSB/3 ⁷⁾ | 1.05 |
| GUARDIAN BS 4.8 | 18 mm Plywood ⁸⁾ | 1.80 |
| GUARDIAN BSRF 4.8 | 18 mm OSB/3 ⁷⁾ | 1.05 |
| GUARDIAN BSRF 4.8 | 18 mm Plywood ⁸⁾ | 1.54 |
| GUARDIAN DBT 4.8-A | 18 mm OSB/3 ⁷⁾ | 1.05 |
| GUARDIAN DBT- 4.8-A | 18 mm Plywood ⁸⁾ | 1.80 |

⁷⁾ OSB board type 3 according to EN 300

⁸⁾ Plywood according to EN 636-2, structural application

⁹⁾ Soft wood according to EN 338 C24

¹⁰⁾ Chipboard according to EN 312:2010 class P4 minimum

¹¹⁾ Multilayer wood deck Underlayment according to EN 636-2 Structural application

¹²⁾ Multilayer wood deck according to EN 636-2 Structural application

Table 6: Pullover test of washer

| Washer | Fastener ¹³⁾ Guardian | | | | | | | | | | | | | | R _k : Characteristic values of axial load resistance | Durability according to EAD 030351-00-0402 | |
|------------------------------|----------------------------------|--------|--------|--------|--------|----------|----------|-------------------|-------------|---------------|--------|---------------------|---------------------|--------|--|--|----------|
| | ACS 6.1 | BS 4.8 | BS 5.5 | BS 6.1 | BS 6.8 | BSHD 4.8 | BSRF 4.8 | CS 6.1 / CS S 6.1 | DBT 4.8(-A) | DBT-S-4.8(-A) | HD 6.1 | LBS 6.0 / LBS S 6.0 | LBS-8.0 / LBS S 8.0 | PS 4.8 | | | TS 5.2 |
| SP-40 – D/F/DD/FD | - | X | X | X | X | X | X | X | - | - | X | X | - | X | X | 3.88 | Approved |
| SP-40-LBS | - | | | | | | | | | | | | X | | | 4.29 | Approved |
| SP-50-D. F. S | - | X | X | X | X | X | X | X | - | - | X | X | X | X | X | 4.83 | Approved |
| SPB-50-S | - | X | X | X | X | X | X | X | - | - | X | X | - | X | X | 4.83 | Approved |
| SP-70-D. F. S | - | X | X | X | X | X | X | X | - | - | X | X | - | X | X | 2.88 | Approved |
| SP 8240-D/F/S | - | X | X | X | X | X | X | X | - | - | X | X | - | X | X | 5.30 | Approved |
| SPA 8240-D/F | - | - | - | - | - | - | - | - | X | X | - | - | - | - | - | 5.00 | Approved |
| STBS | - | X | X | X | X | X | X | X | - | - | X | X | - | X | X | 3.68 | Approved |
| Sleeve R23 – STBT | - | X | X | X | X | X | X | X | - | - | X | X | - | X | X | 1.78 | Approved |
| Sleeve R23 – STBS7T15 | - | X | X | X | X | X | X | X | - | - | X | X | - | X | X | 1.78 | Approved |
| Guardian screw-STBS7T15 | - | X | X | X | X | X | X | X | - | - | X | X | - | X | X | 3.68 | Approved |
| STBST | - | X | X | X | X | X | X | X | - | - | X | X | - | X | X | 3.68 | Approved |
| Sarnabar + R23 | X | X | X | X | X | X | X | X | - | - | X | X | - | X | X | 1.78 | Approved |
| Sarnabar + Guardian screw | - | X | X | X | X | X | X | X | X | X | X | X | - | X | X | 5.00 | Approved |
| GWSP (*)-80-F2E | - | - | X | X | X | - | - | X | - | - | - | X | - | - | X | 2.48 | Approved |
| Sleeve GWT + GWSP (*)-80-F4E | - | X | X | X | X | X | X | X | - | - | X | X | - | X | X | 3.17 | Approved |
| Sleeve R 50 | - | X | X | X | X | X | X | X | - | - | X | X | - | X | X | 1.58 | Approved |
| Sleeve R 48 | - | X | X | X | X | X | X | X | - | - | X | X | - | X | X | 1.58 | Approved |
| Sleeve RPA 48 | - | X | X | X | X | X | X | X | - | - | X | X | - | X | X | 3.00 | Approved |
| Sleeve RB 48 | - | X | X | X | X | X | X | X | - | - | X | X | - | X | X | 1.58 | Approved |
| Sleeve RBPA 48 | - | X | X | X | X | X | X | X | - | - | X | X | - | X | X | 3.00 | Approved |
| Sleeve RBS 50 | - | X | X | X | X | X | X | X | - | - | X | X | - | X | X | 1.58 | Approved |
| Sleeve R 75 | - | X | X | X | X | X | X | X | - | - | X | X | - | X | X | 1.58 | Approved |
| Sleeve TBPP 8040 | - | X | X | X | X | X | X | X | - | - | X | X | - | X | X | 1.58 | Approved |
| Sleeve TBPA 8040 | - | X | X | X | X | X | X | X | - | - | X | X | - | X | X | 2.52 | Approved |
| PP 45 | - | X | X | X | - | X | X | X | - | - | - | X | - | X | X | 2.50 | Approved |
| Sleeve ASTL-50 | X | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1.58 | Approved |
| Sleeve ASTL 48 / ASTL 50 | X | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1.58 | Approved |
| Sleeve ASTL 75 | X | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1.58 | Approved |
| Sleeve R50-LN | - | - | - | - | - | - | - | - | - | - | - | - | X | - | - | 1.58 | Approved |
| Sleeve R48-LN | - | - | - | - | - | - | - | - | - | - | - | - | X | - | - | 1.58 | Approved |
| Sleeve R75-LN | - | - | - | - | - | - | - | - | - | - | - | - | X | - | - | 1.58 | Approved |

¹³⁾Obtained values from the axial load test in different substrates (table 2 - 5) and the pullover test (table 6) of washers/sleeves are compared and the lowest of the two gives the characteristic value for the fastener / sleeve, washer combination of the application.