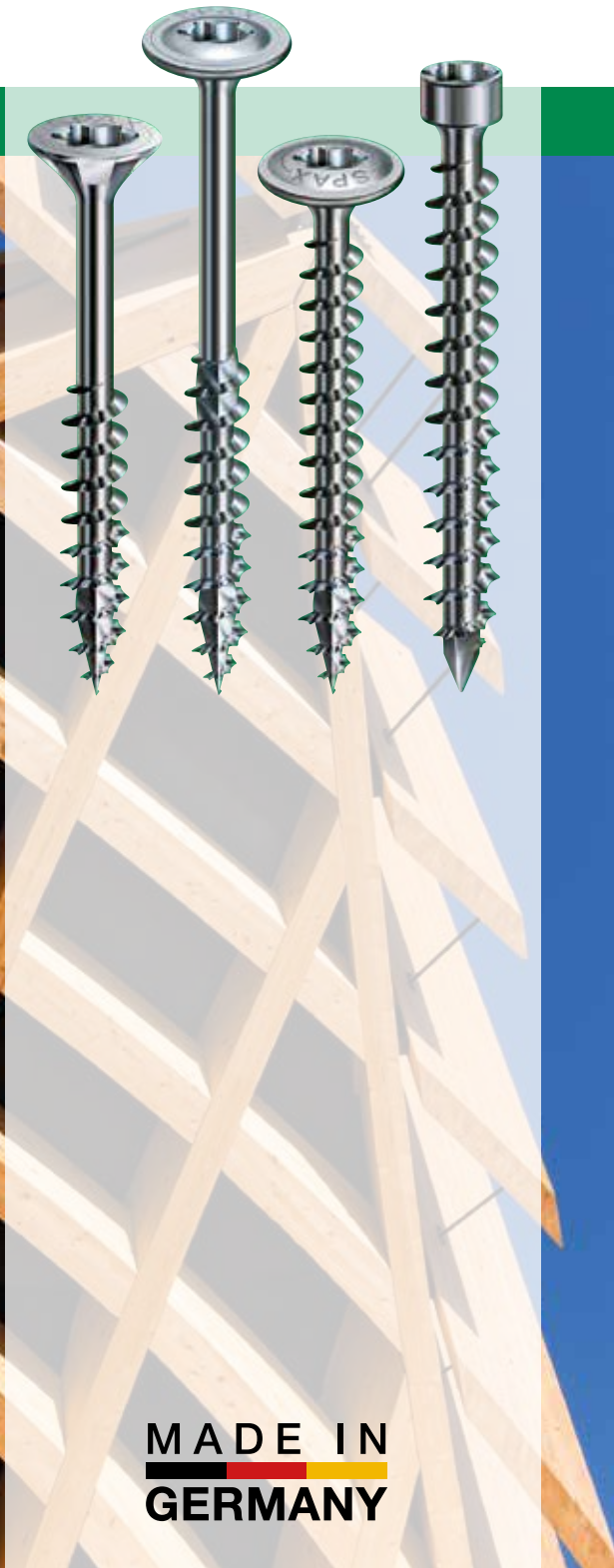
# SPAX
# CONSTRUCTION
## BROCHURE

SPAX – for wood construction



MADE IN GERMANY

# Content

## Information




## WIROX

WIROX A9J

## Blue zinc plated

A2J




## Stainless steel

EDELSTAHL® Rostfrei INOX STAINLESS STEEL · A2 1.4567 AISI 304 · A4 1.4578 AISI 316




## Service




# CE marking and declaration of performance (DoP) – Quality made in Germany


2



3

## CE marking and declaration of performance (DoP)
in accordance with the EU Construction Products Regulation

The commitment of SPAX International

The new Construction Products Regulation (CPR) No. 305/2011, which replaces the previous Construction Products Directive (CPD) 89/106/EEC, has been in effect since 1 July 2013.

Issuing a declaration of performance (DoP) is a fundamental change for manufacturers of construction projects.

Products will continue to be labelled with the CE marking, but the marking now also includes the number of the declaration of performance.

SPAX International provides the utmost transparency for its customers by including all items in the declaration of performance. The European Technical Assessment ETA-12/0114 dated 15.10.2024 is now the applicable basis for the assessment and CE marking of our products in accordance with the EU Construction Products Regulation (Regulation (EU) No. 305/2011).

In this way, the declaration of performance is unambiguously associated with the product and vice versa.

SPAX download portal

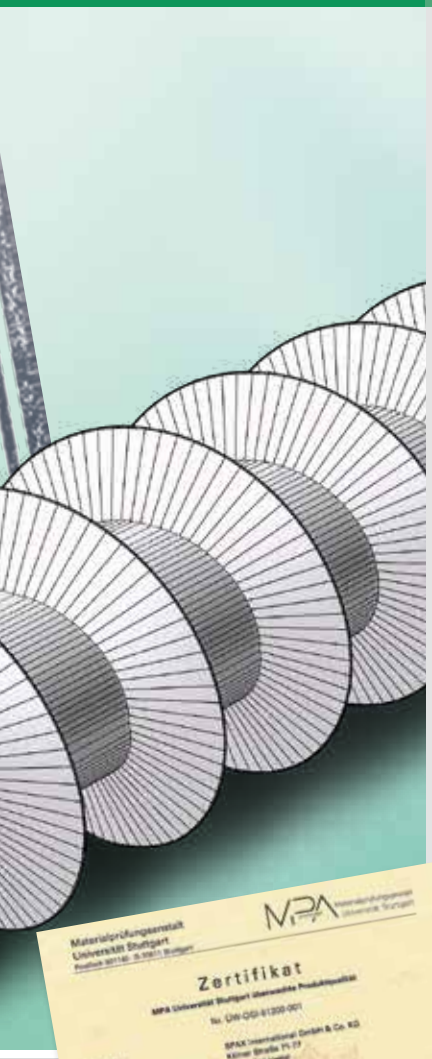
1 **European Technical Approval ETA**

2 **Declaration of Performance (DoP)**

3 **CE marking**


SPAX - Voluntary technical monitoring.

**Safety**
right to the top.




1

## Voluntary technical monitoring
for your safety

A resolution of the EU Commission moderated the system for the assessment and verification of constancy of performance (AVCP system), which also applies for SPAX products, and downgraded the requirement level from 2+ to 3. This affects all of the SPAX products governed by European Technical Approval ETA and, therefore, labelled with a CE marking. Level 3 means that external monitoring by an independent materials testing institute as a recognised certification body is no longer required. For this reason, only in-house production control is necessary in the future.

From the SPAX perspective, this downgrade in level represents a departure from the proven principle of dual control, which can result in a loss of trust by users in the long run. In the end, customers can no longer trust the products in the same way as before.

To counteract these circumstances, **SPAX is subjecting its products to voluntary technical monitoring by the Materials Testing Institute at the University of Stuttgart (MPA Stuttgart).** Therefore, our products will be clearly labelled with the MPA Stuttgart testing seal on the product packaging. This means that our SPAX products will continue to be tested and inspected externally on an ongoing basis.

2

MATERIALPRÜFUNGSANSTALT UNIVERSITÄT STUTTGART
ÜBERWACHUNG
MPA STUTTGART
Otto-Graf-Institut (FMPA)

1 Certification

2 MPA logo

For this reason, our customers can continue to place their full and complete trust in SPAX quality, which is tested by an independent body. Because it's safety first at SPAX! This is why we do our best at SPAX to guarantee the safety of our products and, hence, our customers' safety.

### Expiration of the general construction approvals for SPAX since 1 Aug. 2017

The general construction approvals (Allgemeine bauaufsichtliche Zulassungen (abZ)) for SPAX screws have been expired since 1 Aug. 2017 and will no longer be renewed. After the expiration date of the abZ, only the European Technical Assessments (ETA) can be consulted, which result in products labelled with the CE marking.

SPAX Downloads

From left to right: v.l.n.r. Andreas Großhardt (team leader), Moritz Klemm, Jakob Schäf, Florian Dorer, Linus Großhardt, Maximilian Kunert, Jakob Spreer, Michael Rieger (coach), Alexander Bruns (team leader)
Not in the photo: Roland Bernardi (team leader), Sascha Brück (coach),



SPAX – Strong partnership

# **Holzbau Deutschland –** An influential partner.

© Ronaldo Laube

## SPAX is a strong partner

Working together to create a larger market for wood construction

The partners of Holzbau Deutschland (Association of German Carpenters) consist of a group of manufacturers of construction materials, elements and machinery together with Holzbau Deutschland in the Zentralverband des Deutschen Baugewerbes (central association of the German construction industry) and its state associations. The common goal is to support carpentry and wood construction businesses with coordinated, effective measures in marketing and education. It's about creating a larger market for the German wood construction industry. The partnership was initiated in 2000. Now there are more than 20 partners in the group.

**The following projects, among others, are being implemented together:**

- **Support for the German National Carpentry Team**
  There are no better ambassadors for the wood construction industry than the ambitious and successful German national team. Since 2008, the partners of Holzbau Deutschland have supported the extremely successful team made up of the best, up and coming talent in the field of carpentry. At the 2015 World Championships, the team won the gold medal, and in 2016 they were European champions in the individual and team classifications for the third time in a row. The German national team is a significant and popular symbol for the entire profession and provides considerable support for recruiting the next generation of carpenters.

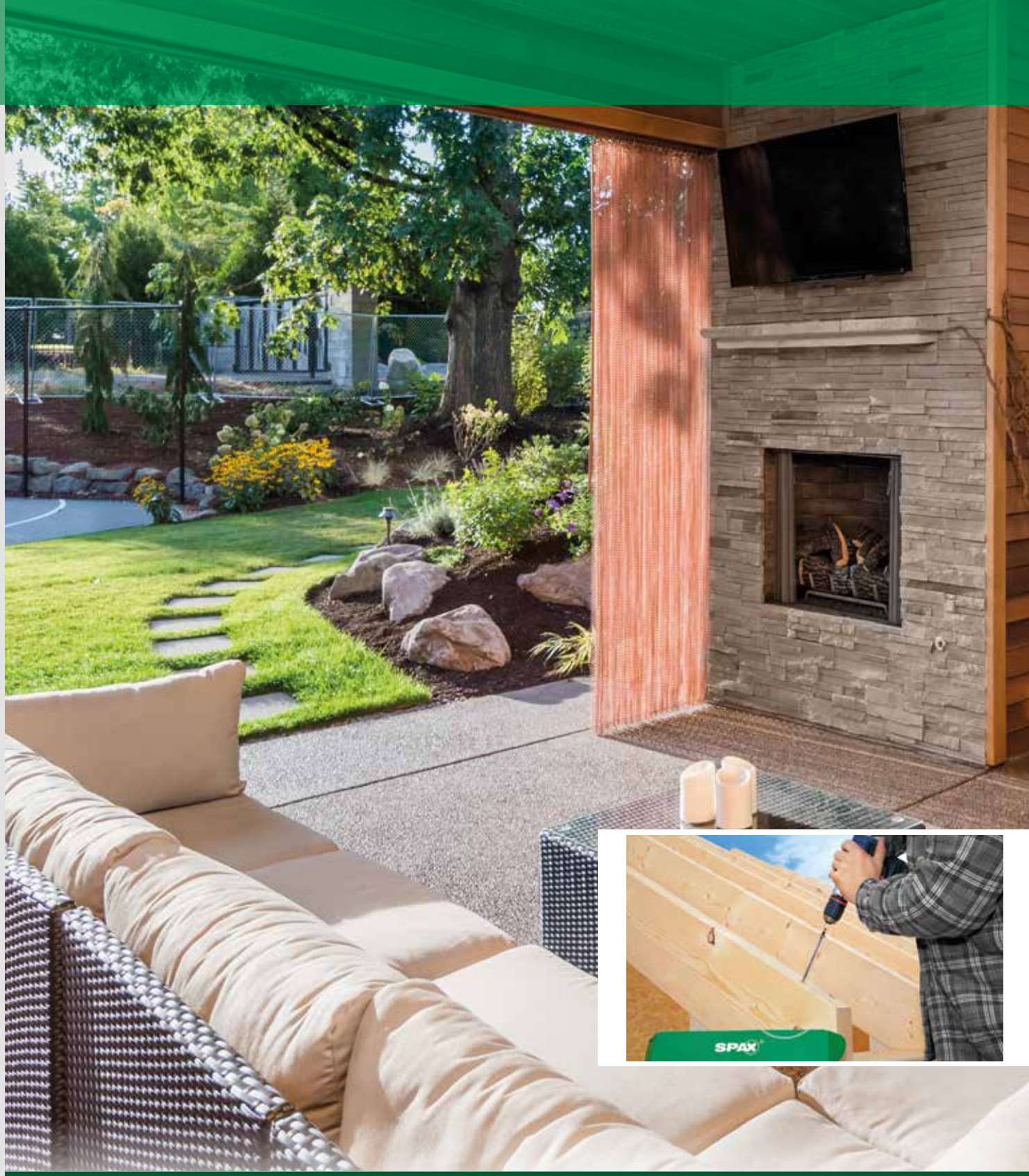
- **The "HOLZ KANN!" information portal**
  The goal of the "Holz kann" ("Do it with wood") campaign website is to help builder-owners and clients understand the advantages of wood in construction and renovation. The website primarily addressed builder-owners in the private sector and presents construction with wood in a neutral, comprehensive and competent manner.
  In this way, the partners hope to strengthen the demand for wood construction and demonstrate everything wood can do: a lot!

- **German Wood Construction Award**
  The Deutsche Holzbaupreis (German Wood Construction Award) honours buildings and building components consisting mainly of wood and wood materials as well as other renewable raw materials and which demonstrate the spectrum of applications for wood in an exemplary manner. The German Wood Construction Award has been presented biannually since 2003 and is now considered the most important award for building with wood in Germany. The partners supported this prize for the first time in 2017.

- **University Award for Wood Construction**
  The Hochschulpreis Holzbau (University Award for Wood Construction) honours students in architecture and construction engineering in order to support exemplary and creative work with wood materials in construction and development. Prizes are awarded for designs of buildings consisting mainly of wood and wood materials as well as other renewable raw materials. The award is given in connection with the prestigious Deutscher Holzbaupreis (German Wood Construction Award). The University Award for Wood Construction for 2017 was presented in May 2017 at the LIGNA trade fair in Hannover.

- **Zimmermeister-Suche.de**
  The Zimmermeister-Suche.de website is the largest search machine for carpentry businesses in Germany. All industry enterprises in Holzbau Deutschland (Association of German Carpenters) are automatically listed here, at no cost, of course. A geo-data search displays the location of the business for users. Businesses can add the services they provide and a link to their own websites.

- **Education projects**
  Together with its partners, Holzbau Deutschland (Association of German Carpenters) carries out various education projects. Information about technical development and standards as well as workplace safety in wood construction is provided to master training institutes and education facilities.




SPAX – Construction

# **The optimised WIROX surface -** for weatherproof outdoor applications too.

## The WIROX surface with **high corrosion protection.**

The new SPAX finish offers **higher corrosion protection** than bright zinc plating and has a considerably **higher surface hardness**. This makes it ideal for use in outdoor applications in structures such as carports or pergolas without direct exposure to weather. It also provides a significantly greater surface hardness than conventional yellow zinc plating or zinc flake coating, so it has **better resistance** properties in response to mechanical stress.

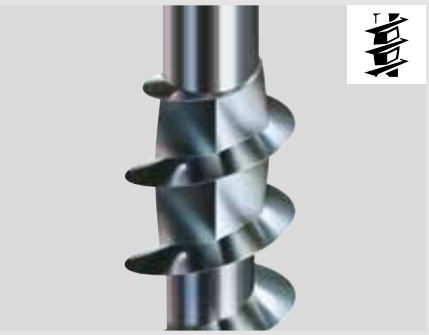
**The advantages and properties at a glance:**

- Is particularly suited to service class 2 in accordance with Eurocode 5 for open constructions without direct exposure to weather, such as car ports or pergolas
- Is free of chrome(VI) and far more **environmentally-friendly** than conventional surfaces, both during manufacturing and usage
- Is mechanically resistant
- **Despite the high corrosion resistance of WIROX®, stainless steel cannot be replaced.**

SPAX Designsoftware

# Product characteristics

## SPAX technology and application: **Thread and point**



### *4CUT* at the thread

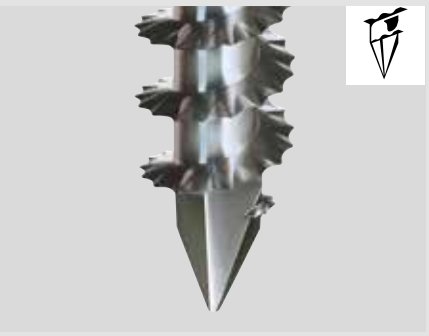
Starting at screw lengths of 160 mm, the special moulding at the thread of partial thread screws significantly reduces the screwing-in torque.

### *4CUT* in the screw point and Ground serrations

*4CUT*: No pre-drilling (wood-dependent), its point effectively reduces the splitting effect. The square end pushes aside the fibre of the wood and reduces the screwing-in torque.

Ground serrations: For a quick and secure fastening.

**Your advantage: Lower minimum clearances and lower minimum wood thicknesses in accordance with ETA.**



### *CUT* point and SPAX typical ground serrations

*CUT-point:* Precision placement allows screwing in without pre-drilling (wood-dependent). Effectively reduces splitting of the wood.

SPAX typical ground serrations: For a quick and secure fastening.

**Your advantage: Lower minimum clearances and lower minimum wood thicknesses in accordance with ETA.**

## SPAX technology and application: **Various head shapes**

### *MULTI* Head

Flush countersinking. Mills in wood and stops on metal. Length and manufacturer marking on the head.

### Flat countersunk head T-STAR *plus* with milled ribs

Flush countersinking. Countersinks the screw head flush into the wood.

### Washer head

Better tightening of connections also of warped boards. Easy bolting of steel parts and sheet metal to wood without prior counter boring of the bore hole.Guarantees higher beam supporting forces and allows savings with regard to piece numbers and working time.

**Particularly suited for rafter connections.**

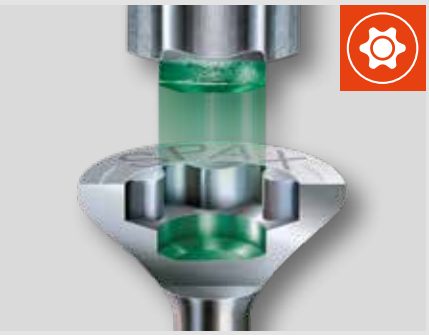
### Cylindrical head

Low splitting effect when sinking the head. Can be easily countersunk in wood.

**Barely visible due to small head diameter.**

# Product characteristics

## **T-STAR *plus*** – The innovative recess



### T-STAR *plus*

The SPAX T-STAR *plus* recess offers all the advantages of the T-STAR recess (no cam-out effect, minimises contact pressure force, accepts higher torques). In addition, this recess has a small depression in the screw head below the driving surface, into which the appropriate T-STAR *plus* bit with guide cone can be inserted precisely. This T-STAR *plus* connection ensures optimal force transmission, a long service life for the T-STAR *plus* bits, and a perfect fit. SPAX can even be used overhead because the screw is easier to guide and can no longer fall off the bit.

## **T-STAR *plus*** – Positive and secure fit of the bit and better driving


### SPAX-bit-programme

SPAX-bits are specifically designed for hand held screw drivers, electric mains powered and battery screw drivers and even industrial pneumatic machines. SPAX-bits give perfect fit as well as optimum hardness to ensure long life.

The SPAX-BITBOX T-STAR *plus* offers a simple colour coding system, which makes it easy to find the right size at the right time. A glance and a grab and you're set.

Application note: Do not use SPAX bits in lengths of 50 mm and 35 mm in the bit holder; instead, these must be inserted directly into the chuck of the cordless screw-driver or drill.

# SPAX-bit-programme

## **T-STAR *plus*** – Programme overview

| SPAX bits T-STAR *plus* **Length 25 mm** | Holding fixture ⬣ 1/4“ hexagon | | | | | |
|---|---|---|---|---|---|---|
| |  |  |  |  |  |  |
| Bit size | **T 10** | **T 15** | **T 20** | **T 25** | **T 30** | **T 40** |
| For SPAX thread Ø [mm] | 3.0 | 3.5 | 3.5<br>4.0<br>4.5<br>5.0 | Decking<br>5.0 for A2<br>6.0 for A4 | 6.0 | 8.0 |
| **SPAX number** | 5000009192109 | 5000009192159 | 5000009192209 | 5000009192259 | 5000009192309 | 5000009192409 |
| **EAN number** | 4003530239632 | 4003530239649 | 4003530239656 | 4003530239663 | 4003530239670 | 4003530239687 |

| SPAX bits T-STAR *plus* **Length 50 mm** | Holding fixture ⬣ 1/4“ hexagon | | | | | |
|---|---|---|---|---|---|---|
| |  |  |  |  |  |  |
| Bit size | **T 10** | **T 15** | **T 20** | **T 25** | **T 30** | **T 40** |
| For SPAX thread Ø [mm] | 3.0 | 3.5 | 3.5<br>4.0<br>4.5<br>5.0 | Decking<br>5.0 for A2<br>6.0 for A4 | 6.0 | 8.0 |
| **SPAX number** | 5000009193109 | 5000009193159 | 5000009193209 | 5000009193259 | 5000009193309 | 5000009193409 |
| **EAN number** | 4003530192852 | 4003530192869 | 4003530192876 | 4003530192883 | 4003530192890 | 4003530192906 |

| SPAX bits T-STAR *plus* **Length 35 mm** | Holding fixture ⬣ 1/4“ hexagon |
|---|---|
| |  |
| Bit size | **T 50** |
| For SPAX thread Ø [mm] | [10.0 – 12.0] |
| **SPAX number** | 5000007899501 |
| **EAN number** | 4003530241918 |

# Brief overview

## Flat countersunk head, full thread, T-STAR *plus*

| | WIROX A9J | | | A2 1.4567 AISI 304 | A4 1.4578 AISI 316 | | |
|---|---|---|---|---|---|---|---|
| Length [mm] | Ø $d_1$, [mm] 8.0 | 10.0 | 12.0 | 8.0 | 8.0 | 10.0 | 12.0 |
| | Ø $d_k$. [mm] 15.1 | 18.6 | 18.6 | 15.1 | 15.1 | 18.6 | 18.6 |
| 80 | ■ | | | | | | |
| 100 | ■ | ■ | | ■ | ■ | | |
| 120 | ■ | ■ | | ■ | ■ | | |
| 140 | ■ | ■ | | ■ | ■ | | |
| 160 | ■ | ■ | | ■ | ■ | ■ | |
| 180 | ■ | ■ | | ■ | ■ | | |
| 200 | ■ | ■ | ■ | ■ | ■ | ■ | |
| 220 | ■ | ■ | | ■ | ■ | ■ | |
| 240 | ■ | ■ | ■ | ■ | ■ | ■ | |
| 260 | ■ | ■ | | ■ | ■ | ■ | |
| 280 | ■ | ■ | ■ | ■ | ■ | ■ | |
| 300 | ■ | ■ | ■ | ■ | ■ | ■ | |
| 325 | ■ | ■ | | ■ | ■ | | |
| 350 | ■ | ■ | ■ | ■ | ■ | ■ | |
| 375 | ■ | ■ | | ■ | ■ | | |
| 400 | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| 425 | ■ | ■ | | | | | |
| 450 | ■ | ■ | ■ | | | | ■ |
| 475 | ■ | | | | | | |
| 500 | ■ | ■ | ■ | | | | ■ |
| 550 | ■ | ■ | ■ | | | | ■ |
| 600 | ■ | ■ | ■ | | | | |
| 650 | | ■ | | | | | |
| 700 | | ■ | | | | | |
| 750 | | ■ | | | | | |
| 800 | | ■ | | | | | |

■ T-STAR *plus,* full thread

## Flat countersunk head, partial thread, T-STAR *plus*

| Length [mm] | WIROX A9J | | | | A2 1.4567 AISI 304 | |
|---|---|---|---|---|---|---|
| | Ø $d_1$, [mm] | | | | | |
| | 6.0 | 6.0 | 8.0 | 10.0 | 6.0 | 8.0 |
| | T30 | T40 | Ø $d_k$, [mm] | | | |
| | 11.6 | 11.6 | 15.1 | 18.6 | 11.6 | 15.1 |
| 60 | | ❑ | | | | |
| 70 | | ❑ | | | | |
| 80 | | ❑ | ❑ | ❑ | | ❑ |
| 90 | | ❑ | | | | |
| 100 | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |
| 110 | ❑ | ❑ | | | | |
| 120 | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |
| 130 | ❑ | ❑ | | | | |
| 140 | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |
| 150 | ❑ | ❑ | | | | |
| 160 | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |
| 180 | ❑ | ❑ | ❑ | ❑ | | ❑ |
| 200 | ❑ | ❑ | ❑ | ❑ | | ❑ |
| 220 | ❑ | ❑ | ❑ | ❑ | | ❑ |
| 240 | ❑ | ❑ | ❑ | ❑ | | ❑ |
| 260 | ❑ | | ❑ | ❑ | | ❑ |
| 280 | ❑ | | ❑ | ❑ | | ❑ |
| 300 | ❑ | | ❑ | ❑ | | ❑ |
| 320 | | | ❑ | ❑ | | |
| 340 | | | ❑ | ❑ | | |
| 360 | | | ❑ | ❑ | | |
| 380 | | | ❑ | ❑ | | |
| 400 | | | ❑ | ❑ | | |
| 450 | | | ❑ | ❑ | | |

## Flat countersunk head, full thread, T-STAR *plus*

| Length [mm] | WIROX A9J | |
|---|---|---|
| | Ø $d_1$. [mm] 6.0 T30 | Ø $d_1$, [mm] 6.0 T40 |
| | Ø $d_k$, [mm] 11.6 | Ø $d_k$, [mm] 11.6 |
| 60 | | ■ |
| 70 | | ■ |
| 80 | | ■ |
| 100 | ■ | ■ |
| 120 | ■ | ■ |
| 140 | ■ | ■ |
| 160 | ■ | ■ |
| 200 | ■ | ■ |

■ T-STAR *plus*, full thread
❑ T-STAR *plus*, partial thread

## Washer head, T-STAR *plus*

| | WIROX A9J | | | A2 1.4567 AISI 304 | |
|---|---|---|---|---|---|
| Length [mm] | Ø $d_1$, [mm] | | | | |
| | 6.0 | 8.0 | 10.0 | 6.0 | 8.0 |
| | Ø $d_k$, [mm] | | | | |
| | 13.6 | 20.0 | 25.0 | 13.6 | 20.0 |
| 40 | ■ | | | | |
| 50 | | ■ | | | ■ |
| 60 | ■ | | | ■ | ■ |
| 80 | ■ | ■ | ■ | ■ | ■ |
| 100 | ❑ | ■ | ■ | ❑ | ■ |
| 120 | ❑ | ■ | ■ | ❑ | ■ |
| 140 | ❑ | ❑ | ❑ | ❑ | ❑ |
| 160 | ❑ | ❑ | ❑ | | ❑ |
| 180 | ❑ | ❑ | ❑ | | ❑ |
| 200 | ❑ | ❑ | ❑ | | ❑ |
| 220 | ❑ | ❑ | ❑ | | ❑ |
| 240 | | ❑ | ❑ | | ❑ |
| 250 | ❑ | ❑ | ❑ | | |
| 260 | | ❑ | ❑ | | ❑ |
| 280 | ❑ | ❑ | ❑ | | ❑ |
| 300 | ❑ | ❑ | ❑ | | ❑ |
| 320 | | ❑ | ❑ | | |
| 340 | | ❑ | ❑ | | |
| 360 | | ❑ | ❑ | | |
| 380 | | ❑ | ❑ | | |
| 400 | | ❑ | ❑ | | |
| 425 | | | ❑ | | |
| 450 | | ❑ | ❑ | | |
| 475 | | | ❑ | | |
| 500 | | ❑ | ❑ | | |
| 550 | | ❑ | | | |

■ T-STAR *plus,* full thread
❑ T-STAR *plus,* partial thread

## Cylindrical head, T-STAR *plus*

| WIROX A9J | | |
|---|---|---|
| Ø $d_1$, [mm] **6.0** | | |
| Ø $d_k$, [mm]8.4 | | |
| **Length [mm]** | 80 | ■ |
| | 100 | ■ |
| | 120 | ■ |
| | 140 | ■ |
| | 160 | ■ |
| | 180 | ■ |
| | 200 | ■ |

## Cylindrical head, T-STAR *plus*

| WIROX A9J | | |
|---|---|---|
| **Length [mm]** | Ø $d_1$. [mm] | |
| | **8.0** | **10.0** |
| | Ø $d_k$. [mm] | |
| | 10.0 | 12.3 |
| 120 | ■ | ■ |
| 140 | ■ | ■ |
| 160 | ■ | ■ |
| 180 | ■ | ■ |
| 200 | ■ | ■ |
| 220 | ■ | ■ |
| 240 | ■ | ■ |
| 260 | ■ | ■ |
| 280 | ■ | ■ |
| 300 | ■ | ■ |
| 325 | ■ | ■ |
| 350 | ■ | ■ |
| 375 | ■ | ■ |
| 400 | ■ | ■ |
| 425 | ■ | ■ |
| 450 | ■ | ■ |
| 475 | ■ | |
| 500 | ■ | ■ |
| 550 | ■ | ■ |
| 600 | ■ | ■ |
| 650 | | ■ |
| 700 | | ■ |
| 750 | | ■ |
| 800 | | ■ |

■ T-STAR *plus*, full thread

SPAX – Construction

# The wood construction range
with optimised WIROX surface

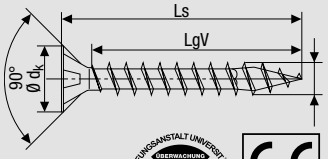
Altdorf town hall ©
Volker Winkler

SPAX Schraubenfinder

## Our wood construction range

Our optimised finish protects the environment. It does not contain chrome(VI), so it is considerably more environmentally friendly than conventional surfaces in terms of both manufacturing and use. Both users and the environment benefit from this innovation.

| **Technical directive** | |
|---|---|
| RoHS – EC Directive 2002/95/EC “Restriction of the use of certain hazardous substances” | **Complies with RoHS** |
| REACH – Regulation (EC) No. 1907/2006 “Registration, Evaluation, Authorisation and Restriction of Chemicals” | **Complies with REACH** |




# Flat countersunk head, Full thread, T-STAR *plus*

*MULTI* Head, 4*CUT*-point, case hardened, slide-coated

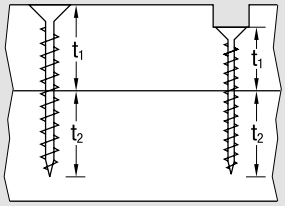
WIROX A9J

| Dimensions [mm] | | | | Packaging units | | | SPAX-No. | EAN code |
|---|---|---|---|---|---|---|---|---|
| Thread Ø d1 | Length total Ls | Length full thread LgV | BIT size T | SPAX BOX [pieces] | Master carton [pieces] | Pallet qty | | |
| **6.0** Ø $d_K$ = 11.6 mm **T30** | 100 | 85* | 30 | 100 | 1,000 | 32,000 | 1191010601005 | 4003530269714 |
| | 120 | 105* | 30 | 100 | 1,000 | 28,000 | 1191010601205 | 4003530269721 |
| | 140 | 125* | 30 | 100 | 1,000 | 28,000 | 1191010601405 | 4003530269738 |
| | 160 | 145* | 30 | 100 | 1,000 | 28,000 | 1191010601605 | 4003530269745 |
| | 200 | 185* | 30 | 100 | 1,000 | 24,000 | 1191010602005 | 4003530269752 |
| **6.0** Ø $d_K$ = 11.6 mm **T40** | 60 | 53 | 40 | 200 | 2,000 | 56,000 | 26010106006015 | 4003530295317 |
| | 70 | 61* | 40 | 200 | 2,000 | 56,000 | 26010106007015 | 4003530295324 |
| | 80 | 61* | 40 | 200 | 2,000 | 56,000 | 26010106008015 | 4003530295331 |
| | 100 | 85* | 40 | 100 | 1,000 | 32,000 | 26010106010015 | 4003530295348 |
| | 120 | 105* | 40 | 100 | 1,000 | 28,000 | 26010106012015 | 4003530295355 |
| | 140 | 125* | 40 | 100 | 1,000 | 28,000 | 26010106014015 | 4003530295362 |
| | 160 | 145* | 40 | 100 | 1,000 | 28,000 | 26010106016015 | 4003530295379 |
| | 200 | 185* | 40 | 100 | 1,000 | 24,000 | 26010106020015 | 4003530295386 |

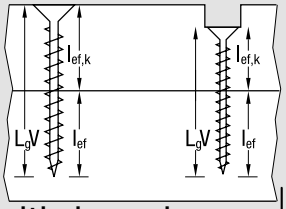
NEW

*Alternative Design. Thread does not extend completely up to the head.

Shear




Withdraw



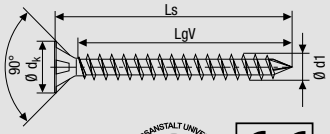

## Load-carrying capacity values $F_{v,Rk}$ for shear and $F_{ax,\alpha,Rk}$ for withdrawal

| Product | | | Wood-Wood (C24), $\alpha = 90°$ | | | | | | Sheet steel-Wood (C24), $\alpha = 90°$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dimensions [mm] | | | Shear | | | Withdrawal | | | Shear | | | Withdrawal | | |
| Thread Ø d1 | Length total Ls | Length full thread LgV | $t_1$ [mm] | $t_2$ [mm] | **$F_{v,Rk}$ [N]** | $t_1$ [mm] | $l_{ef}$ [mm] | **$f_{ax,d1,k}$ [N/mm]** | $t_1$ [mm] | $t_2$ [mm] | **$F_{v,Rk}$ [N]** | $t_1$ [mm] | $l_{ef}$ [mm] | **$f_{ax,d1,k}$ [N/mm]** |
| **6.0** Ø $d_K$ = 11.6 mm **T30** | 100 | 85* | 50 | 50 | **2,489** | 50 | 50 | **72,0** | 10 | 90 | **3,868** | 10 | 90 | **72,0** |
| | 120 | 105* | 60 | 60 | **2,669** | 60 | 60 | **N/mm** | 10 | 110 | **4,228** | 10 | 110 | **N/mm** |
| | 140 | 125* | 70 | 70 | **2,849** | 70 | 70 | **Max.** | 10 | 130 | **4,363** | 10 | 130 | **Max.** |
| | 160 | 145* | 80 | 80 | **3,029** | 80 | 80 | **$f_{tens,d}$** | 10 | 150 | **4,363** | 10 | 150 | **$f_{tens,d}$** |
| | 200 | 185* | 100 | 100 | **3,389** | 100 | 100 | **=8,5 kN** | 10 | 190 | **4,363** | 10 | 190 | **=8,5 kN** |
| **6.0** Ø $d_K$ = 11.6 mm **T40** | 60 | 53 | 24 | 36 | **2,237** | 24 | 36 | **2,592** | 6 | 54 | **3,200** | 6 | 54 | **3,888** |
| | 70 | 61* | 30 | 40 | **2,263** | 29 | 41 | **2,694** | 6 | 64 | **3,350** | 6 | 64 | **4,392** |
| | 80 | 61* | 35 | 45 | **2,263** | 34 | 46 | **2,694** | 6 | 74 | **3,350** | 6 | 74 | **4,392** |
| | 100 | 85* | 50 | 50 | **2,489** | 50 | 50 | **72,0** | 10 | 90 | **3,868** | 10 | 90 | **72,0** |
| | 120 | 105* | 60 | 60 | **2,669** | 60 | 60 | **N/mm** | 10 | 110 | **4,228** | 10 | 110 | **N/mm** |
| | 140 | 125* | 70 | 70 | **2,849** | 70 | 70 | **Max.** | 10 | 130 | **4,363** | 10 | 130 | **Max.** |
| | 160 | 145* | 80 | 80 | **3,029** | 80 | 80 | **$f_{tens,d}$** | 10 | 150 | **4363** | 10 | 150 | **$f_{tens,d}$** |
| | 200 | 185* | 100 | 100 | **3,389** | 100 | 100 | **=8,5 kN** | 10 | 190 | **4,363** | 10 | 190 | **=8,5 kN** |

*Alternative Design. Thread does not extend completely up to the head.

Multiply the value $f_{axw,d1,k}$ with the effective thread length ($l_{ef}$, $l_{ef,k}$) in the respective wood component. Lower as appropriate for angle $\alpha < 90°$.
The design value for thread load-carrying capacity must not exceed the design value for steel load-carrying capacity $f_{tens,d}$.

**For more information regarding measurement and design, see the SPAX design information at https://oxomi.com/p/3002034**




# Flat countersunk head, Full thread, T-STAR *plus*

*MULTI* Head, *CUT* point, case hardened, slide-coated

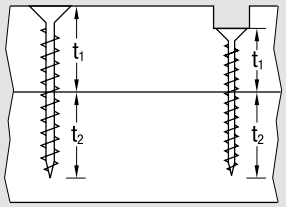
WIROX A9J

| Dimensions [mm] | | | | Packaging units | | | SPAX-No. | EAN code |
|---|---|---|---|---|---|---|---|---|
| Thread Ø d1 | Length total Ls | Length full thread LgV | BIT size T | SPAX BOX [pieces] | Master carton [pieces] | Pallet qty | | |
| **8.0** Ø $d_K$ = 15.1 mm | 80 | | 40 | 50 | 500 | 14,000 | 1201010800805 | 4003530294853 |
| | 100 | | 40 | 50 | 500 | 14,000 | 1201010801005 | 4003530294860 |
| | 120 | | 40 | 50 | 500 | 14,000 | 1201010801205 | 4003530257278 |
| | 140 | | 40 | 50 | 500 | 14,000 | 1201010801405 | 4003530257285 |
| | 160 | | 40 | 50 | 500 | 14,000 | 1201010801605 | 4003530245992 |
| | 180 | | 40 | 50 | 500 | 14,000 | 1201010801805 | 4003530246005 |
| | 200 | Thread | 40 | 50 | 500 | 12,000 | 1201010802005 | 4003530246012 |
| | 220 | close | 40 | 50 | 500 | 12,000 | 1201010802205 | 4003530246029 |
| | 240 | to | 40 | 50 | – | 4,800 | 1201010802405 | 4003530246036 |
| | 260 | head | 40 | 50 | – | 4,800 | 1201010802605 | 4003530246043 |
| | 280 | | 40 | 50 | – | 4,800 | 1201010802805 | 4003530246050 |
| | 300 | | 40 | 50 | – | 4,800 | 1201010803005 | 4003530246067 |
| | 325 | | 40 | 50 | – | 3,600 | 1201010803255 | 4003530292262 |
| | 350 | | 40 | 50 | – | 3,600 | 1201010803505 | 4003530246074 |
| | 375 | | 40 | 50 | – | 3,600 | 1201010803755 | 4003530292279 |
| | 400 | | 40 | 50 | – | 3,600 | 1201010804005 | 4003530246081 |
| | 425 | | 40 | 50 | – | 3,000 | 1201010804255 | 4003530292286 |
| | 450 | | 40 | 50 | – | 3,000 | 1201010804505 | 4003530246098 |
| | 475 | | 40 | 25 | – | 1,500 | 1201010804755 | 4003530294877 |
| | 500 | | 40 | 25 | – | 1,200 | 1201010805005 | 4003530246104 |
| | 550 | | 40 | 25 | – | 1,200 | 1201010805505 | 4003530246111 |
| | 600 | | 40 | 25 | – | 1,200 | 1201010806005 | 4003530246128 |

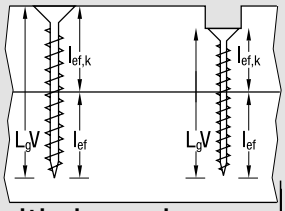
NEW

Flat countersunk head 10/12 mm also in stainless steel, see page 60

Shear




Withdrawal

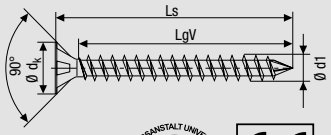



## Load-carrying capacity values $F_{v,Rk}$ for shear and $F_{ax,\alpha,Rk}$ for withdrawal

| Product | | | Wood-Wood (C24), $\alpha = 90°$ | | | | | | Sheet steel-Wood (C24), $\alpha = 90°$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dimensions [mm] | | | Shear | | | Withdrawal | | | Shear | | | Withdrawal | | |
| Thread Ø d1 | Length total Ls | Length full thread LgV | $t_1$ [mm] | $t_2$ [mm] | $F_{v,Rk}$ [N] | $t_1$ [mm] | $l_{ef}$ [mm] | $f_{ax,d1,k}$ [N/mm] | $t_1$ [mm] | $t_2$ [mm] | $F_{v,Rk}$ [N] | $t_1$ [mm] | $l_{ef}$ [mm] | $f_{ax,d1,k}$ [N/mm] |
| **8.0** Ø $d_K$ = 15.1 mm | 80 | | 40 | 40 | **3,515** | 40 | 40 | | 10 | 70 | **5,293** | 10 | 70 | |
| | 100 | | 50 | 50 | **3,755** | 50 | 50 | | 10 | 90 | **5,773** | 10 | 90 | |
| | 120 | | 60 | 60 | **3,995** | 60 | 60 | | 10 | 110 | **6,253** | 10 | 120 | |
| | 140 | | 70 | 70 | **4,235** | 70 | 70 | | 10 | 130 | **6,733** | 10 | 130 | |
| | 160 | | 80 | 80 | **4,475** | 80 | 80 | | 10 | 150 | **7,213** | 10 | 150 | |
| | 180 | | 90 | 90 | **4,715** | 90 | 90 | | 10 | 170 | **7,227** | 10 | 170 | |
| | 200 | Thread | 100 | 100 | **4,955** | 100 | 100 | | 10 | 190 | **7,227** | 10 | 190 | |
| | 220 | close | 110 | 110 | **5,110** | 110 | 110 | | 10 | 210 | **7,227** | 10 | 210 | |
| | 240 | to | 120 | 120 | **5,110** | 120 | 120 | **96.0** | 10 | 230 | **7,227** | 10 | 230 | **96.0** |
| | 260 | head | 130 | 130 | **5,110** | 130 | 130 | **N/mm** | 10 | 250 | **7,227** | 10 | 250 | **N/mm** |
| | 280 | | 140 | 140 | **5,110** | 140 | 140 | | 10 | 270 | **7,227** | 10 | 270 | |
| | 300 | | 150 | 150 | **5,110** | 150 | 150 | **Max.** | 10 | 290 | **7,227** | 10 | 290 | **Max.** |
| | 325 | | 162 | 162 | **5,110** | 162 | 162 | | 10 | 315 | **7,227** | 10 | 315 | |
| | 350 | | 175 | 175 | **5,110** | 175 | 175 | $f_{ax.d1.k}$ | 10 | 340 | **7,227** | 10 | 340 | $f_{ax.d1.k}$ |
| | 375 | | 187 | 187 | **5,110** | 187 | 187 | | 10 | 365 | **7,227** | 10 | 365 | |
| | 400 | | 200 | 200 | **5,110** | 200 | 200 | **=13.1kN** | 10 | 390 | **7,227** | 10 | 390 | **=13.1kN** |
| | 425 | | 212 | 212 | **5,110** | 212 | 212 | | 10 | 415 | **7,227** | 10 | 415 | |
| | 450 | | 225 | 225 | **5,110** | 225 | 225 | | 10 | 440 | **7,227** | 10 | 440 | |
| | 475 | | 237 | 237 | **5,110** | 237 | 237 | | 10 | 465 | **7,227** | 10 | 465 | |
| | 500 | | 250 | 250 | **5,110** | 250 | 250 | | 10 | 490 | **7,227** | 10 | 490 | |
| | 550 | | 275 | 275 | **5,110** | 275 | 275 | | 10 | 540 | **7,227** | 10 | 540 | |
| | 600 | | 300 | 300 | **5,110** | 300 | 300 | | 10 | 590 | **7,227** | 10 | 590 | |

Multiply the value $f_{axw,d1,k}$ with the effective thread length ($l_{ef}$, $l_{ef,k}$) in the respective wood component. Lower as appropriate for angle $\alpha < 90°$.
The design value for thread load-carrying capacity must not exceed the design value for steel load-carrying capacity $f_{tens,d}$.

**For more information regarding measurement and design, see the SPAX design information at https://oxomi.com/p/3002034**




# Flat countersunk head, Full thread, T-STAR *plus*

*MULTI* Head, *CUT* point, case hardened, slide-coated

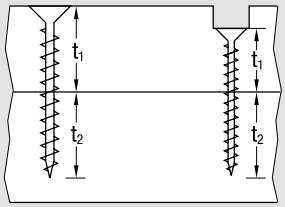
WIROX A9J

| Dimensions [mm] | | | | Packaging units | | | SPAX-No. | EAN code |
|---|---|---|---|---|---|---|---|---|
| Thread Ø d1 | Length total Ls | Length full thread LgV | BIT size T | SPAX BOX [pieces] | Master carton [pieces] | Pallet qty | | |
| **10.0** Ø $d_K$ = 18.6 mm | 100 | | 50 | 50 | 500 | 12,000 | 1201011001005 | 4003530294884 |
| | 120 | | 50 | 50 | 500 | 12,000 | 1201011001205 | 4003530257469 |
| | 140 | | 50 | 50 | 500 | 12,000 | 1201011001405 | 4003530292293 |
| | 160 | | 50 | 50 | 500 | 12,000 | 1201011001605 | 4003530252273 |
| | 180 | | 50 | 50 | 500 | 12,000 | 1201011001805 | 4003530292309 |
| | 200 | | 50 | 50 | 500 | 12,000 | 1201011002005 | 4003530246135 |
| | 220 | | 50 | 50 | 500 | 12,000 | 1201011002205 | 4003530246142 |
| | 240 | | 50 | 50 | – | 4,800 | 1201011002405 | 4003530246159 |
| | 260 | Thread | 50 | 50 | – | 4,800 | 1201011002605 | 4003530246166 |
| | 280 | close | 50 | 50 | – | 4,800 | 1201011002805 | 4003530246173 |
| | 300 | to | 50 | 50 | – | 4,800 | 1201011003005 | 4003530246180 |
| | 325 | head | 50 | 50 | – | 3,600 | 1201011003255 | 4003530292316 |
| | 350 | | 50 | 50 | – | 3,600 | 1201011003505 | 4003530246197 |
| | 375 | | 50 | 50 | – | 3,600 | 1201011003755 | 4003530292323 |
| | 400 | | 50 | 50 | – | 3,600 | 1201011004005 | 4003530246203 |
| | 425 | | 50 | 50 | – | 3,000 | 1201011004255 | 4003530292330 |
| | 450 | | 50 | 50 | – | 3,000 | 1201011004505 | 4003530246210 |
| | 500 | | 50 | 25 | – | 1,200 | 1201011005005 | 4003530246227 |
| | 550 | | 50 | 25 | – | 1,200 | 1201011005505 | 4003530246234 |
| | 600 | | 50 | 25 | – | 1,200 | 1201011006005 | 4003530246241 |
| | 650 | | 50 | 25 | – | 800 | 1201011006505 | 4003530292347 |
| | 700 | | 50 | 25 | – | 800 | 1201011007005 | 4003530257476 |
| | 750 | | 50 | 25 | – | 800 | 1201011007505 | 4003530292354 |
| | 800 | | 50 | 25 | – | 800 | 1201011008005 | 4003530246258 |

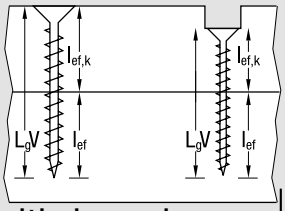
NEW

Flat countersunk head 10/12 mm also in stainless steel, see page 60

Shear




Withdrawal

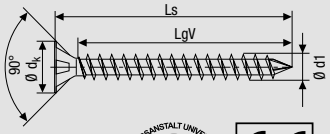



## Load-carrying capacity values $F_{v,Rk}$ for shear and $F_{ax,\alpha,Rk}$ for withdrawal

| Product | | | Wood-Wood (C24), $\alpha = 90°$ | | | | | | Sheet steel-Wood (C24), $\alpha = 90°$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dimensions [mm] | | | Shear | | | Withdrawal | | | Shear | | | Withdrawal | | |
| Thread Ø d1 | Length total Ls | Length full thread LgV | $t_1$ [mm] | $t_2$ [mm] | **$F_{v,Rk}$ [N]** | $t_1$ [mm] | $l_{ef}$ [mm] | **$f_{ax,d1,k}$ [N/mm]** | $t_1$ [mm] | $t_2$ [mm] | **$F_{v,Rk}$ [N]** | $t_1$ [mm] | $l_{ef}$ [mm] | **$f_{ax,d1,k}$ [N/mm]** |
| **10.0** Ø $d_K$ = 18.6 mm | 100 | | 50 | 50 | **5,130** | 50 | 50 | | 10 | 90 | **7,921** | 10 | 90 | |
| | 120 | | 60 | 60 | **5,300** | 60 | 60 | | 10 | 110 | **8,384** | 10 | 110 | |
| | 140 | | 70 | 70 | **5,705** | 70 | 70 | | 10 | 130 | **8,959** | 10 | 130 | |
| | 160 | | 80 | 80 | **5,992** | 80 | 80 | | 10 | 150 | **9,534** | 10 | 150 | |
| | 180 | | 90 | 90 | **6,280** | 90 | 90 | | 10 | 170 | **10,109** | 10 | 170 | |
| | 200 | | 100 | 100 | **6,567** | 100 | 100 | | 10 | 190 | **10,443** | 10 | 190 | |
| | 220 | | 110 | 110 | **6,855** | 110 | 110 | | 10 | 210 | **10,443** | 10 | 210 | |
| | 240 | | 120 | 120 | **7,142** | 120 | 120 | | 10 | 230 | **10,443** | 10 | 230 | |
| | 260 | Thread | 130 | 130 | **7,384** | 130 | 130 | **115.0** | 10 | 250 | **10,443** | 10 | 250 | **115.0** |
| | 280 | close | 140 | 140 | **7,384** | 140 | 140 | **N/mm** | 10 | 270 | **10,443** | 10 | 270 | **N/mm** |
| | 300 | to | 150 | 150 | **7,384** | 150 | 150 | | 10 | 290 | **10,443** | 10 | 290 | |
| | 325 | head | 162 | 162 | **7,384** | 162 | 162 | | 10 | 315 | **10,443** | 10 | 315 | |
| | 350 | | 175 | 175 | **7,384** | 175 | 175 | **Max.** | 10 | 340 | **10,443** | 10 | 340 | **Max.** |
| | 375 | | 187 | 187 | **7,384** | 187 | 187 | | 10 | 365 | **10,443** | 10 | 365 | |
| | 400 | | 200 | 200 | **7,384** | 200 | 200 | **$f_{ax,d1,k}$** | 10 | 390 | **10,443** | 10 | 390 | **$f_{ax,d1,k}$** |
| | 425 | | 210 | 210 | **7,384** | 210 | 210 | | 10 | 415 | **10,443** | 10 | 415 | |
| | 450 | | 225 | 225 | **7,384** | 225 | 225 | **=21.5kN** | 10 | 440 | **10,443** | 10 | 440 | **=21.5kN** |
| | 500 | | 250 | 250 | **7,384** | 250 | 250 | | 10 | 490 | **10,443** | 10 | 490 | |
| | 550 | | 275 | 275 | **7,384** | 275 | 275 | | 10 | 540 | **10,443** | 10 | 540 | |
| | 600 | | 300 | 300 | **7,384** | 300 | 300 | | 10 | 590 | **10,443** | 10 | 590 | |
| | 650 | | 325 | 325 | **7,384** | 325 | 325 | | 10 | 640 | **10,443** | 10 | 640 | |
| | 700 | | 350 | 350 | **7,384** | 350 | 350 | | 10 | 690 | **10,443** | 10 | 690 | |
| | 750 | | 375 | 375 | **7,384** | 375 | 375 | | 10 | 740 | **10,443** | 10 | 740 | |
| | 800 | | 400 | 400 | **7,384** | 400 | 400 | | 10 | 790 | **10,443** | 10 | 790 | |

Multiply the value $f_{axw,d1,k}$ with the effective thread length ($l_{ef}$, $l_{ef,k}$) in the respective wood component. Lower as appropriate for angle $\alpha < 90°$.
The design value for thread load-carrying capacity must not exceed the design value for steel load-carrying capacity $f_{tens,d}$.

**For more information regarding measurement and design, see the SPAX design information at https://oxomi.com/p/3002034**




# Flat countersunk head, Full thread, T-STAR *plus*

*MULTI* Head, *CUT* point, case hardened, slide-coated

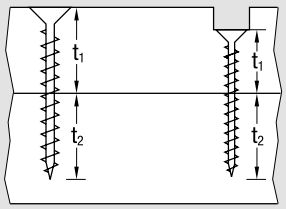
WIROX A9J

| Dimensions [mm] | | | | Packaging units | | | SPAX-No. | EAN code |
|---|---|---|---|---|---|---|---|---|
| Thread Ø d1 | Length total Ls | Length full thread LgV | BIT size T | SPAX BOX [pieces] | Master carton [pieces] | Pallet qty | | |
| **12.0** Ø $d_k$ = 18.6 mm | 200 | | 50 | 25 | 250 | 6,000 | 1201011202005 | 4003530246265 |
| | 220 | | 50 | 25 | 250 | 6,000 | 1201011202205 | 4003530249617 |
| | 240 | | 50 | 25 | – | 2,400 | 1201011202405 | 4003530246272 |
| | 280 | | 50 | 25 | – | 2,400 | 1201011202805 | 4003530246289 |
| | 300 | | 50 | 25 | – | 2,400 | 1201011203005 | 4003530246296 |
| | 350 | | 50 | 25 | – | 1,800 | 1201011203505 | 4003530246302 |
| | 400 | | 50 | 25 | – | 1,800 | 1201011204005 | 4003530246319 |
| | 450 | | 50 | 25 | – | 1,500 | 1201011204505 | 4003530246326 |
| | 500 | | 50 | 25 | – | 1,500 | 1201011205005 | 4003530246333 |
| | 550 | | 50 | 20 | – | 960 | 1201011205505 | 4003530246340 |
| | 600 | | 50 | 20 | – | 960 | 1201011206005 | 4003530246357 |

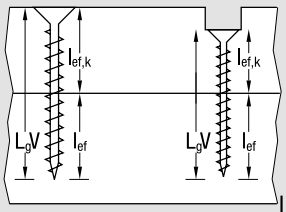
Article discontinued

Flat countersunk head 10/12 mm also in stainless steel, see page 60

Shear




Withdrawal



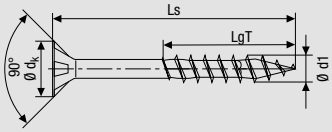

## Load-carrying capacity values $F_{v,Rk}$ for shear and $F_{ax,\alpha,Rk}$ for withdrawal

| Product | | | Wood-Wood (C24), $\alpha = 90°$ | | | | | | Sheet steel-Wood (C24), $\alpha = 90°$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dimensions [mm] | | | Shear | | | Withdrawal | | | Shear | | | Withdrawal | | |
| Thread Ø d1 | Length total Ls | Length full thread LgV | $t_1$ [mm] | $t_2$ [mm] | **$F_{v,Rk}$ [N]** | $t_1$ [mm] | $l_{ef}$ [mm] | **$f_{ax,d1,k}$ [N/mm]** | $t_1$ [mm] | $t_2$ [mm] | **$F_{v,Rk}$ [N]** | $t_1$ [mm] | $l_{ef}$ [mm] | **$f_{ax,d1,k}$ [N/mm]** |
| **12.0** Ø $d_K$ = 18.6 mm | 200 | | 100 | 100 | **8,288** | 100 | 100 | | 12 | 188 | **13,258** | 10 | 190 | |
| | 220 | | 110 | | **8,618** | 110 | 110 | | 12 | 208 | **13,918** | 10 | 210 | |
| | 240 | | 120 | 120 | **8,948** | 120 | 120 | | 12 | 228 | **14,108** | 10 | 230 | |
| | 280 | | 140 | 140 | **9,608** | 140 | 140 | **132.0** | 12 | 268 | **14,108** | 12 | 268 | **132.0** |
| | 300 | | 150 | 150 | **9,938** | 150 | 150 | **N/mm** | 12 | 288 | **14,108** | 12 | 288 | **N/mm** |
| | 350 | | 175 | 175 | **9,976** | 175 | 175 | | 12 | 338 | **14,108** | 12 | 338 | |
| | 400 | | 200 | 200 | **9,976** | 200 | 200 | **Max.** | 12 | 388 | **14,108** | 12 | 388 | **Max.** |
| | 450 | | 225 | 225 | **9,976** | 225 | 225 | **$f_{ax,d1,k}$** | 12 | 438 | **14,108** | 12 | 438 | **$f_{ax,d1,k}$** |
| | 500 | | 250 | 250 | **9,976** | 250 | 250 | **=29.2kN** | 12 | 488 | **14,108** | 12 | 488 | **=29.2kN** |
| | 550 | | 275 | 275 | **9,976** | 275 | 275 | | 12 | 538 | **14,108** | 12 | 538 | |
| | 600 | | 300 | 300 | **9,976** | 300 | 300 | | 12 | 588 | **14,108** | 12 | 588 | |

Article discontinued

Multiply the value $f_{axw,d1,k}$ with the effective thread length ($l_{ef}$, $l_{ef,k}$) in the respective wood component. Lower as appropriate for angle $\alpha < 90°$.
The design value for thread load-carrying capacity must not exceed the design value for steel load-carrying capacity $f_{tens,d}$.

**For more information regarding measurement and design, see the SPAX design information at https://oxomi.com/p/3002034**




# Flat countersunk head. Partial thread. T-STAR *plus*

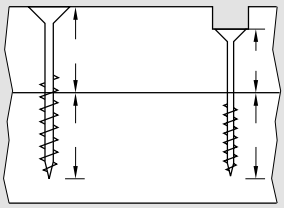
*4CUT. MULTI* Head. case hardened. slide-coated

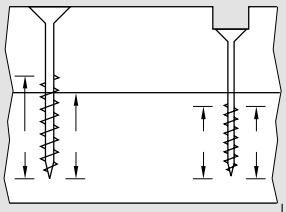
WIROX A9J

| Dimensions [mm] | | | | Packaging units | | | SPAX-No. | EAN code |
|---|---|---|---|---|---|---|---|---|
| Thread Ø d1 | Length total Ls | Length partial th-read LgT | BIT size T | SPAX BOX [pieces] | Master carton [pieces] | Pallet qty | | |
| **6.0** Ø $d_k$ = 11.6mm **T30** | 100 | 61 | 30 | 100 | 1,000 | 32,000 | 0191010601005 | 4003530155307 |
| | 110 | 68 | 30 | 100 | 1,000 | 32,000 | 0191010601105 | 4003530157677 |
| | 120 | 68 | 30 | 100 | 1,000 | 28,000 | 0191010601205 | 4003530155321 |
| | 130 | 68 | 30 | 100 | 1,000 | 28,000 | 0191010601305 | 4003530157622 |
| | 140 | 68 | 30 | 100 | 1,000 | 28,000 | 0191010601405 | 4003530155314 |
| | 150 | 68 | 30 | 100 | 1,000 | 28,000 | 0191010601505 | 4003530157646 |
| | 160 | 65 | 30 | 100 | 1,000 | 28,000 | 0191010601605 | 4003530155819 |
| | 180 | 65 | 30 | 100 | 1,000 | 28,000 | 0191010601805 | 4003530156205 |
| | 200 | 65 | 30 | 100 | 1,000 | 24,000 | 0191010602005 | 4003530156090 |
| | 220 | 65 | 30 | 100 | 1,000 | 24,000 | 0191010602205 | 4003530098666 |
| | 240 | 65 | 30 | 100 | 1,000 | 24,000 | 0191010602405 | 4003530098673 |
| | 260 | 65 | 30 | 100 | – | 9,600 | 0191010602605 | 4003530098680 |
| | 280 | 65 | 30 | 100 | – | 9,600 | 0191010602805 | 4003530098697 |
| | 300 | 65 | 30 | 100 | – | 9,600 | 0191010603005 | 4003530098703 |
| **6.0** Ø $d_k$ = 11.6mm **T40** | 60 | 37 | 40 | 200 | 2,000 | 56,000 | 26410106006015 | 4003530295164 |
| | 70 | 41 | 40 | 200 | 2,000 | 56,000 | 26410106007015 | 4003530295171 |
| | 80 | 46 | 40 | 200 | 2,000 | 56,000 | 26410106008015 | 4003530295188 |
| | 90 | 61 | 40 | 200 | 1,000 | 56,000 | 26410106009015 | 4003530295195 |
| | 100 | 61 | 40 | 100 | 1,000 | 32,000 | 26410106010015 | 4003530295201 |
| | 110 | 68 | 40 | 100 | 1,000 | 32,000 | 26410106011015 | 4003530295218 |
| | 120 | 68 | 40 | 100 | 1,000 | 28,000 | 26410106012015 | 4003530295225 |
| | 130 | 68 | 40 | 100 | 1,000 | 28,000 | 26410106013015 | 4003530295232 |
| | 140 | 68 | 40 | 100 | 1,000 | 28,000 | 26410106014015 | 4003530295249 |
| | 150 | 68 | 40 | 100 | 1,000 | 28,000 | 26410106015015 | 4003530295256 |
| | 160 | 65 | 40 | 100 | 1,000 | 28,000 | 26410106016015 | 4003530295263 |
| | 180 | 65 | 40 | 100 | 1,000 | 28,000 | 26410106018015 | 4003530295270 |
| | 200 | 65 | 40 | 100 | 1,000 | 24,000 | 26410106020015 | 4003530295287 |
| | 220 | 65 | 40 | 100 | 1,000 | 24,000 | 26410106022015 | 4003530295294 |
| | 240 | 65 | 40 | 100 | 1,000 | 24,000 | 26410106024015 | 4003530295300 |

NEW

Practical positioning guide for rooftop insulation flat countersunk head 8 mm with partial thread, see page 57

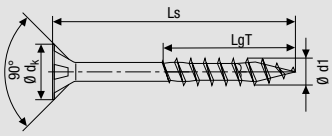
Shear 

Withdrawal 

## **Load-carrying capacity values** $F_{v.Rk}$ for shear and $F_{ax.\alpha.Rk}$ for withdrawal

| Product | | | Wood-Wood (C24). $\alpha = 90°$ | | | | | | Sheet steel-Wood (C24). $\alpha = 90°$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dimensions [mm] | | | Shear | | | Withdrawal | | | Shear | | | Withdrawal | | |
| Thread Ø d1 | Length total Ls | Length partial thread LgT | $t_1$ [mm] | $t_2$ [mm] | $F_{v.Rk}$ [N] | $t_1$ [mm] | $l_{ef}$ [mm] | $F_{ax.\alpha.Rk}$ [N] | $t_1$ [mm] | $t_2$ [mm] | $F_{v.Rk}$ [N] | $t_1$ [mm] | $l_{ef}$ [mm] | $F_{ax.\alpha.Rk}$ [N] |
| **6.0** Ø $d_K$ = 11.6mm **T30** | 100 | 61 | 40 | 60 | **2,260** | 39 | 61 | **2,694** | 10 | 90 | **3,346** | 10 | 61 | **4,392** |
| | 110 | 68 | 50 | 60 | **2,260** | 42 | 68 | **2,694** | 10 | 100 | **3,472** | 10 | 68 | **4,896** |
| | 120 | 68 | 60 | 60 | **2,260** | 52 | 68 | **2,694** | 10 | 110 | **3,472** | 10 | 68 | **4,896** |
| | 130 | 68 | 65 | 65 | **2,260** | 62 | 68 | **2,694** | 10 | 120 | **3,472** | 10 | 68 | **4,896** |
| | 140 | 68 | 72 | 68 | **2,260** | 72 | 68 | **2,694** | 10 | 130 | **3,472** | 10 | 68 | **4,896** |
| | 150 | 68 | 82 | 68 | **2,260** | 82 | 68 | **2,694** | 10 | 140 | **3,472** | 10 | 68 | **4,896** |
| | 160 | 65 | 95 | 65 | **2,260** | 95 | 65 | **2,694** | 10 | 150 | **3,418** | 10 | 65 | **4,680** |
| | 180 | 65 | 115 | 65 | **2,260** | 115 | 65 | **2,694** | 10 | 170 | **3,418** | 10 | 65 | **4,680** |
| | 200 | 65 | 135 | 65 | **2,260** | 135 | 65 | **2,694** | 10 | 190 | **3,418** | 10 | 65 | **4,680** |
| | 220 | 65 | 155 | 65 | **2,260** | 155 | 65 | **2,694** | 10 | 210 | **3,418** | 10 | 65 | **4,680** |
| | 240 | 65 | 175 | 65 | **2,260** | 175 | 65 | **2,694** | 10 | 230 | **3,418** | 10 | 65 | **4,680** |
| | 260 | 65 | 195 | 65 | **2,260** | 195 | 65 | **2,694** | 10 | 250 | **3,418** | 10 | 65 | **4,680** |
| | 280 | 65 | 215 | 65 | **2,260** | 215 | 65 | **2,694** | 10 | 270 | **3,418** | 10 | 65 | **4,680** |
| | 300 | 65 | 235 | 65 | **2,260** | 235 | 65 | **2,694** | 10 | 290 | **3,418** | 10 | 65 | **4,680** |
| **6.0** Ø $d_K$ = 11.6mm **T40** | 60 | 37 | 24 | 36 | **2,237** | 24 | 36 | **2,592** | 6 | 54 | **2,910** | 6 | 37 | **2,664** |
| | 70 | 41 | 30 | 40 | **2,263** | 29 | 41 | **2,694** | 6 | 64 | **2,990** | 6 | 41 | **2,952** |
| | 80 | 46 | 35 | 45 | **2,263** | 34 | 46 | **2,694** | 6 | 74 | **3,080** | 6 | 46 | **3,312** |
| | 90 | 61 | 40 | 50 | **2,263** | 29 | 61 | **2,694** | 6 | 84 | **3,350** | 6 | 61 | **4,392** |
| | 100 | 61 | 40 | 60 | **2,260** | 39 | 61 | **2,694** | 10 | 90 | **3,346** | 10 | 61 | **4,392** |
| | 110 | 68 | 50 | 60 | **2,260** | 42 | 68 | **2,694** | 10 | 100 | **3,472** | 10 | 68 | **4,896** |
| | 120 | 68 | 60 | 60 | **2,260** | 52 | 68 | **2,694** | 10 | 110 | **3,472** | 10 | 68 | **4,896** |
| | 130 | 68 | 65 | 65 | **2,260** | 62 | 68 | **2,694** | 10 | 120 | **3,472** | 10 | 68 | **4,896** |
| | 140 | 68 | 72 | 68 | **2,260** | 72 | 68 | **2,694** | 10 | 130 | **3,472** | 10 | 68 | **4,896** |
| | 150 | 68 | 82 | 68 | **2,260** | 82 | 68 | **2,694** | 10 | 140 | **3,472** | 10 | 68 | **4,896** |
| | 160 | 65 | 95 | 65 | **2,260** | 95 | 65 | **2,694** | 10 | 150 | **3,418** | 10 | 65 | **4,680** |
| | 180 | 65 | 115 | 65 | **2,260** | 115 | 65 | **2,694** | 10 | 170 | **3,418** | 10 | 65 | **4,680** |
| | 200 | 65 | 135 | 65 | **2,260** | 135 | 65 | **2,694** | 10 | 190 | **3,418** | 10 | 65 | **4,680** |
| | 220 | 65 | 155 | 65 | **2,260** | 155 | 65 | **2,694** | 10 | 210 | **3,418** | 10 | 65 | **4,680** |
| | 240 | 65 | 175 | 65 | **2,260** | 175 | 65 | **2,694** | 10 | 230 | **3,418** | 10 | 65 | **4,680** |

For more information regarding measurement and design, see the SPAX design information at https://oxomi.com/p/3002034




WIROX A9J

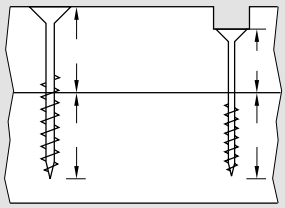
# Flat countersunk head. Partial thread. T-STAR *plus*

*4CUT. MULTI* Head. case hardened. slide-coated

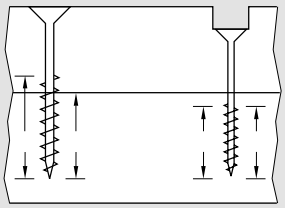
| Dimensions [mm] | | | | Packaging units | | | SPAX-No. | EAN code |
|---|---|---|---|---|---|---|---|---|
| Thread Ø d1 | Length total Ls | Length partial thread LgT | BIT size T | SPAX BOX [pieces] | Master carton [pieces] | Pallet qty | | |
| **8.0** Ø $d_K$ = 15.1 mm | 80 | 47 | 40 | 50 | 500 | 14,000 | 0191010800805 | 4003530243837 |
| | 100 | 57 | 40 | 50 | 500 | 14,000 | 0191010801005 | 4003530244100 |
| | 120 | 70 | 40 | 50 | 500 | 14,000 | 0191010801205 | 4003530244117 |
| | 140 | 80 | 40 | 50 | 500 | 14,000 | 0191010801405 | 4003530244124 |
| | 160 | 80 | 40 | 50 | 500 | 14,000 | 0191010801605 | 4003530244131 |
| | 180 | 80 | 40 | 50 | 500 | 14,000 | 0191010801805 | 4003530244148 |
| | 200 | 80 | 40 | 50 | 500 | 12,000 | 0191010802005 | 4003530244155 |
| | 220 | 80 | 40 | 50 | 500 | 12,000 | 0191010802205 | 4003530244162 |
| | 240 | 80 | 40 | 50 | – | 4,800 | 0191010802405 | 4003530244179 |
| | 260 | 80 | 40 | 50 | – | 4,800 | 0191010802605 | 4003530244186 |
| | 280 | 80 | 40 | 50 | – | 4,800 | 0191010802805 | 4003530244193 |
| | 300 | 80 | 40 | 50 | – | 4,800 | 0191010803005 | 4003530244209 |
| | 320 | 80 | 40 | 50 | – | 3,600 | 0191010803205 | 4003530244216 |
| | 340 | 80 | 40 | 50 | – | 3,600 | 0191010803405 | 4003530244223 |
| | 360 | 80 | 40 | 50 | – | 3,600 | 0191010803605 | 4003530244230 |
| | 380 | 80 | 40 | 50 | – | 3,600 | 0191010803805 | 4003530244247 |
| | 400 | 80 | 40 | 50 | – | 3,600 | 0191010804005 | 4003530244254 |
| | 450 | 80 | 40 | 50 | – | 3,000 | 0191010804505 | 4003530244261 |
| **10.0** Ø $d_K$ = 18.6 mm | 80 | 50 | 50 | 50 | 500 | 14,000 | 0191011000805 | 4003530244278 |
| | 100 | 60 | 50 | 50 | 500 | 14,000 | 0191011001005 | 4003530244285 |
| | 120 | 80 | 50 | 50 | 500 | 14,000 | 0191011001205 | 4003530244292 |
| | 140 | 80 | 50 | 50 | 500 | 14,000 | 0191011001405 | 4003530244308 |
| | 160 | 80 | 50 | 50 | 500 | 14,000 | 0191011001605 | 4003530244315 |
| | 180 | 80 | 50 | 50 | 500 | 14,000 | 0191011001805 | 4003530244322 |
| | 200 | 80 | 50 | 50 | 500 | 12,000 | 0191011002005 | 4003530244339 |
| | 220 | 80 | 50 | 50 | 500 | 12,000 | 0191011002205 | 4003530244346 |
| | 240 | 80 | 50 | 50 | – | 4,800 | 0191011002405 | 4003530244353 |
| | 260 | 80 | 50 | 50 | – | 4,800 | 0191011002605 | 4003530244360 |
| | 280 | 80 | 50 | 50 | – | 4,800 | 0191011002805 | 4003530245329 |
| | 300 | 80 | 50 | 50 | – | 4,800 | 0191011003005 | 4003530245336 |
| | 320 | 80 | 50 | 50 | – | 3,600 | 0191011003205 | 4003530245343 |
| | 340 | 80 | 50 | 50 | – | 3,600 | 0191011003405 | 4003530245350 |
| | 360 | 80 | 50 | 50 | – | 3,600 | 0191011003605 | 4003530245367 |
| | 380 | 80 | 50 | 50 | – | 3,600 | 0191011003805 | 4003530245374 |
| | 400 | 80 | 50 | 50 | – | 3,600 | 0191011004005 | 4003530245381 |
| | 450 | 80 | 50 | 50 | – | 3,000 | 0191011004505 | 4003530245398 |

Practical positioning guide for rooftop insulation flat countersunk head 8 mm with partial thread, see page 57

Shear



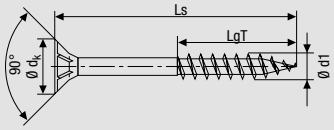
Withdrawal



## Load-carrying capacity values $F_{v.Rk}$ for shear and $F_{ax.\alpha.Rk}$ for withdrawal

| Product | | | Wood-Wood (C24). $\alpha = 90°$ | | | | | | Sheet steel-Wood (C24). $\alpha = 90°$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dimensions [mm] | | | Shear | | | Withdrawal | | | Shear | | | Withdrawal | | |
| Thread Ø d1 | Length total Ls | Length partial thread LgT | $t_1$ [mm] | $t_2$ [mm] | $F_{v.Rk}$ [N] | $t_1$ [mm] | $l_{ef}$ [mm] | $F_{ax.\alpha.Rk}$ [N] | $t_1$ [mm] | $t_2$ [mm] | $F_{v.Rk}$ [N] | $t_1$ [mm] | $l_{ef}$ [mm] | $F_{ax.\alpha.Rk}$ [N] |
| **8.0** Ø $d_K$ = 15.1 mm | 80 | 47 | 30 | 50 | **2,600** | 30 | 47 | **2,713** | 10 | 70 | **4,738** | 10 | 47 | **4,512** |
| | 100 | 57 | 40 | 60 | **2,889** | 40 | 57 | **2,713** | 10 | 90 | **4,981** | 10 | 57 | **5,472** |
| | 120 | 70 | 50 | 70 | **3,436** | 50 | 70 | **3,527** | 10 | 110 | **5,293** | 10 | 70 | **6,720** |
| | 140 | 80 | 60 | 80 | **3,436** | 60 | 80 | **3,527** | 10 | 130 | **5,533** | 10 | 80 | **7,680** |
| | 160 | 80 | 80 | 80 | **3,436** | 80 | 80 | **3,527** | 10 | 150 | **5,533** | 10 | 80 | **7,680** |
| | 180 | 80 | 100 | 80 | **3,436** | 100 | 80 | **3,527** | 10 | 170 | **5,533** | 10 | 80 | **7,680** |
| | 200 | 80 | 120 | 80 | **3,436** | 120 | 80 | **3,527** | 10 | 190 | **5,533** | 10 | 80 | **7,680** |
| | 220 | 80 | 140 | 80 | **3,436** | 140 | 80 | **3,527** | 10 | 210 | **5,533** | 10 | 80 | **7,680** |
| | 240 | 80 | 160 | 80 | **3,436** | 160 | 80 | **3,527** | 10 | 230 | **5,533** | 10 | 80 | **7,680** |
| | 260 | 80 | 180 | 80 | **3,436** | 180 | 80 | **3,527** | 10 | 250 | **5,533** | 10 | 80 | **7,680** |
| | 280 | 80 | 200 | 80 | **3,436** | 200 | 80 | **3,527** | 10 | 270 | **5,533** | 10 | 80 | **7,680** |
| | 300 | 80 | 220 | 80 | **3,436** | 220 | 80 | **3,527** | 10 | 290 | **5,533** | 10 | 80 | **7,680** |
| | 320 | 80 | 240 | 80 | **3,436** | 240 | 80 | **3,527** | 10 | 310 | **5,533** | 10 | 80 | **7,680** |
| | 340 | 80 | 260 | 80 | **3,436** | 260 | 80 | **3,527** | 10 | 330 | **5,533** | 10 | 80 | **7,680** |
| | 360 | 80 | 280 | 80 | **3,436** | 280 | 80 | **3,527** | 10 | 350 | **5,533** | 10 | 80 | **7,680** |
| | 380 | 80 | 300 | 80 | **3,436** | 300 | 80 | **3,527** | 10 | 370 | **5,533** | 10 | 80 | **7,680** |
| | 400 | 80 | 320 | 80 | **3,436** | 320 | 80 | **3,527** | 10 | 390 | **5,533** | 10 | 80 | **7,680** |
| | 450 | 80 | 370 | 80 | **3,436** | 370 | 80 | **3,527** | 10 | 440 | **5,533** | 10 | 80 | **7,680** |
| **10.0** Ø $d_K$ = 18.6 mm | 80 | 50 | 40 | 40 | **3,293** | 30 | 50 | **3,626** | 10 | 70 | **6,312** | 10 | 50 | **5,750** |
| | 100 | 60 | 40 | 60 | **3,770** | 40 | 60 | **3,626** | 10 | 90 | **6,946** | 10 | 60 | **6,900** |
| | 120 | 80 | 50 | 70 | **4,131** | 40 | 80 | **3,626** | 10 | 110 | **7,521** | 10 | 80 | **9,200** |
| | 140 | 80 | 60 | 80 | **4,796** | 60 | 80 | **4,714** | 10 | 130 | **7,521** | 10 | 80 | **9,200** |
| | 160 | 80 | 80 | 80 | **4,870** | 80 | 80 | **4,714** | 10 | 150 | **7,521** | 10 | 80 | **9,200** |
| | 180 | 80 | 100 | 80 | **4,870** | 100 | 80 | **4,714** | 10 | 170 | **7,521** | 10 | 80 | **9,200** |
| | 200 | 80 | 120 | 80 | **4,870** | 120 | 80 | **4,714** | 10 | 190 | **7,521** | 10 | 80 | **9,200** |
| | 220 | 80 | 140 | 80 | **4,870** | 140 | 80 | **4,714** | 10 | 210 | **7,521** | 10 | 80 | **9,200** |
| | 240 | 80 | 160 | 80 | **4,870** | 160 | 80 | **4,714** | 10 | 230 | **7,521** | 10 | 80 | **9,200** |
| | 260 | 80 | 180 | 80 | **4,870** | 180 | 80 | **4,714** | 10 | 250 | **7,521** | 10 | 80 | **9,200** |
| | 280 | 80 | 200 | 80 | **4,870** | 200 | 80 | **4,714** | 10 | 270 | **7,521** | 10 | 80 | **9,200** |
| | 300 | 80 | 220 | 80 | **4,870** | 220 | 80 | **4,714** | 10 | 290 | **7,521** | 10 | 80 | **9,200** |
| | 320 | 80 | 240 | 80 | **4,870** | 240 | 80 | **4,714** | 10 | 310 | **7,521** | 10 | 80 | **9,200** |
| | 340 | 80 | 260 | 80 | **4,870** | 260 | 80 | **4,714** | 10 | 330 | **7,521** | 10 | 80 | **9,200** |
| | 360 | 80 | 280 | 80 | **4,870** | 280 | 80 | **4,714** | 10 | 350 | **7,521** | 10 | 80 | **9,200** |
| | 380 | 80 | 300 | 80 | **4,870** | 300 | 80 | **4,714** | 10 | 370 | **7,521** | 10 | 80 | **9,200** |
| | 400 | 80 | 320 | 80 | **4,870** | 320 | 80 | **4,714** | 10 | 390 | **7,521** | 10 | 80 | **9,200** |
| | 450 | 80 | 370 | 80 | **4,870** | 370 | 80 | **4,714** | 10 | 440 | **7,521** | 10 | 80 | **9,200** |

For more information regarding measurement and design, see the SPAX design information at https://oxomi.com/p/3002034




# Flat countersunk head, Partial thread, T-STAR *plus*

With milled ribs, case hardened, slide-coated

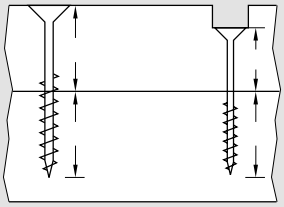
WIROX A9J

| Dimensions [mm] | | | | Packaging units | | | SPAX-No, | EAN code |
|---|---|---|---|---|---|---|---|---|
| Thread Ø d1 | Length total Ls | Length partial th-read LgT | BIT size T | SPAX BOX [pieces] | Master carton [pieces] | Pallet qty | | |
| **12.0** Ø $d_k$ = 22.6 mm | 100 | 60 | 50 | 25 | 250 | 7,000 | 0191011201005 | 4003530245404 |
| | 160 | 100 | 50 | 25 | 250 | 6,000 | 0191011201605 | 4003530245435 |
| | 220 | 100 | 50 | 25 | 250 | 6,000 | 0191011202205 | 4003530245466 |
| | 240 | 100 | 50 | 25 | – | 2,400 | 0191011202405 | 4003530245473 |
| | 350 | 100 | 50 | 25 | – | 1,800 | 0191011203505 | 4003530245510 |
| | 550** | 100 | 50 | 20 | – | 960 | 0191011205505 | 4003530245558 |

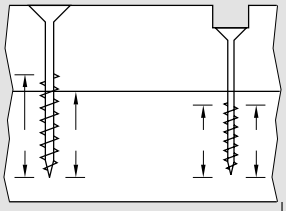
** alternative design

Article discontinued

Shear



Withdrawal



## **Load-carrying capacity values** $F_{v,Rk}$ for shear and $F_{ax,\alpha,Rk}$ for withdrawal

| Product | | | Wood-Wood (C24), $\alpha = 90°$ | | | | | | Sheet steel-Wood (C24), $\alpha = 90°$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dimensions [mm] | | | Shear | | | Withdrawal | | | Shear | | | Withdrawal | | |
| Thread Ø d1 | Length total Ls | Length partial thread LgT | $t_1$ [mm] | $t_2$ [mm] | $F_{v,Rk}$ [N] | $t_1$ [mm] | $l_{ef}$ [mm] | $F_{ax,\alpha,Rk}$ [N] | $t_1$ [mm] | $t_2$ [mm] | $F_{v,Rk}$ [N] | $t_1$ [mm] | $l_{ef}$ [mm] | $F_{ax,\alpha,Rk}$ [N] |
| **12.0** Ø $d_k$ = 22.6 mm | 100 | 60 | 40 | 60 | **4,736** | 40 | 60 | **4,944** | 12 | 88 | **9,034** | 12 | 60 | **7,920** |
| | 160 | 100 | 60 | 100 | **5,610** | 60 | 100 | **4,944** | 12 | 148 | **10,354** | 12 | 100 | **13,200** |
| | 220 | 100 | 120 | 100 | **6,595** | 120 | 100 | **6,427** | 12 | 208 | **10,354** | 12 | 100 | **13,200** |
| | 240 | 100 | 140 | 100 | **6,595** | 140 | 100 | **6,427** | 12 | 228 | **10,354** | 12 | 100 | **13,200** |
| | 350 | 100 | 250 | 100 | **6,595** | 250 | 100 | **6,427** | 12 | 338 | **10,354** | 12 | 100 | **13,200** |
| | 550** | 100 | 450 | 100 | **6,595** | 450 | 100 | **6,427** | 12 | 538 | **10,354** | 12 | 100 | **13,200** |

** alternative design  Article discontinued

## Explanations regarding the **load-carrying capacity tables**

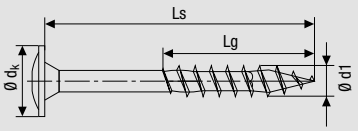
$F_{v,Rk}$ = Characteristic value for lateral load-carrying capacity per shear joint and connector under lateral load (shearing off), including $\Delta R_k$ increase in the characteristic value for load-carrying capacity $R_k$ proportionately by $\Delta R_k$ (hanging or rope effect)

$F_{ax,\alpha,Rk}$ = Characteristic value for axial load-carrying capacity per connector (withdrawal)

Wood (C24) = Characteristic density (ρ) k = 350 kg/m³

The characteristic values of the load-bearing capacity determined in each case must be reduced to the design values by means of the partial safety coefficients (ϒM) and modification coefficient (k mod). The partial safety factor (ϒM) is = 1.3. The modification coefficient kmod considers the influence of the service class (NKL) and the class of the shear forces duration (KLED) on the strength properties of the wood or the wood-based products.

For more information regarding measurement and design, see the SPAX design information at https://oxomi.com/p/3002034




# Washer head, Partial thread, T-STAR *plus*

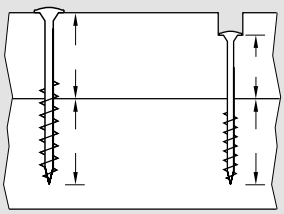
*4CUT,* case hardened, slide-coated

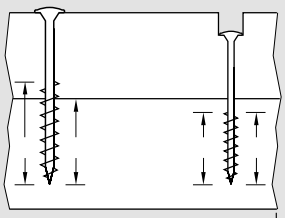
WIROX A9J

| Dimensions [mm] | | | | | Packaging units | | | SPAX-No, | EAN code |
|---|---|---|---|---|---|---|---|---|---|
| Thread Ø d1 | Length total Ls | Length thread Lg | | BIT size T | SPAX BOX [pieces] | Master carton [pieces] | Pallet qty | | |
| **6.0** Ø $d_k$ = 13.6 mm | 40 | 37 | ■ | 30 | 200 | 2,000 | 64,000 | 0251010600405 | 4003530257490 |
| | 60 | 56 | ■ | 30 | 200 | 2,000 | 56,000 | 0251010600605 | 4003530248351 |
| | 80 | 61 | ■ | 30 | 100 | 1,000 | 28,000 | 0251010600805 | 4003530245572 |
| | 100 | 61 | ❑ | 30 | 100 | 1,000 | 32,000 | 0251010601005 | 4003530245589 |
| | 120 | 68 | ❑ | 30 | 100 | 1,000 | 28,000 | 0251010601205 | 4003530245596 |
| | 140 | 68 | ❑ | 30 | 100 | 1,000 | 28,000 | 0251010601405 | 4003530245602 |
| | 160 | 65 | ❑ | 30 | 100 | 1,000 | 28,000 | 0251010601605 | 4003530245619 |
| | 180 | 65 | ❑ | 30 | 100 | 1,000 | 28,000 | 0251010601805 | 4003530245626 |
| | 200 | 65 | ❑ | 30 | 50 | 500 | 12,000 | 0251010602005 | 4003530248474 |
| | 220 | 65 | ❑ | 30 | 50 | – | 12,000 | 0251010602205 | 4003530250002 |
| | 250 | 65 | ❑ | 30 | 50 | – | 4,800 | 0251010602505 | 4003530248511 |
| | 280 | 65 | ❑ | 30 | 50 | – | 4,800 | 4003530248528 | 4003530253133 |
| | 300 | 65 | ❑ | 30 | 50 | – | 4,800 | 0251010603005 | 4003530248528 |
| **8.0** Ø $d_k$ = 20 mm | 50 | 46 | ■ | 40 | 50 | 500 | 16,000 | 0251720800505 | 4003530182358 |
| | 80 | 70 | ■ | 40 | 50 | 500 | 14,000 | 0251010800805 | 4003530165184 |
| | 100 | 80 | ■ | 40 | 50 | 500 | 14,000 | 0251010801005 | 4003530245640 |
| | 120 | 80 | ■ | 40 | 50 | 500 | 14,000 | 0251010801205 | 4003530245657 |
| | 140 | 80 | ❑ | 40 | 50 | 500 | 14,000 | 0251010801405 | 4003530245664 |
| | 160 | 80 | ❑ | 40 | 50 | 500 | 14,000 | 0251010801605 | 4003530245671 |
| | 180 | 80 | ❑ | 40 | 50 | 500 | 14,000 | 0251010801805 | 4003530245688 |
| | 200 | 80 | ❑ | 40 | 50 | 500 | 12,000 | 0251010802005 | 4003530245695 |
| | 220 | 80 | ❑ | 40 | 50 | 500 | 12,000 | 0251010802205 | 4003530245701 |
| | 240 | 80 | ❑ | 40 | 50 | – | 4,800 | 0251010802405 | 4003530245718 |
| | 260 | 80 | ❑ | 40 | 50 | – | 4,800 | 0251010802605 | 4003530245725 |
| | 280 | 80 | ❑ | 40 | 50 | – | 4,800 | 0251010802805 | 4003530245732 |
| | 300 | 80 | ❑ | 40 | 50 | – | 4,800 | 0251010803005 | 4003530245749 |
| | 320 | 80 | ❑ | 40 | 50 | – | 3,600 | 0251010803205 | 4003530245756 |
| | 340 | 80 | ❑ | 40 | 50 | – | 3,600 | 0251010803405 | 4003530245763 |
| | 360 | 80 | ❑ | 40 | 50 | – | 3,600 | 0251010803605 | 4003530245770 |
| | 380 | 80 | ❑ | 40 | 50 | – | 3,600 | 0251010803805 | 4003530245787 |
| | 400 | 80 | ❑ | 40 | 50 | – | 3,600 | 0251010804005 | 4003530245794 |
| | 450 | 80 | ❑ | 40 | 50 | – | 1,500 | 0251010804505 | 4003530245800 |
| | 500 | 80 | ❑ | 40 | 25 | – | 1,500 | 0251010805005 | 4003530257254 |
| | 550 | 80 | ❑ | 40 | 25 | – | 1,200 | 0251010805505 | 4003530257261 |

■ T-STAR *plus,* Full thread ❑ T-STAR *plus,* Partial thread

Washer head 8 mm also in stainless steel, see page 66
Practical positioning guide for rooftop insulation flat countersunk head 8 mm with partial thread, see page 57

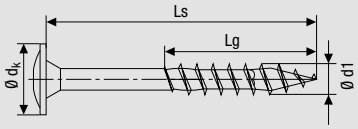



## **Load-carrying capacity values** $F_{v,Rk}$ for shear and $F_{ax,\alpha,Rk}$ for withdrawal

| Product | | | | Wood-Wood (C24), $\alpha = 90°$ | | | | | | Sheet steel-Wood (C24), $\alpha = 90°$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dimensions [mm] | | | | Shear | | | Withdrawal | | | Shear | | | Withdrawal | | |
| Thread Ø d1 | Length total Ls | Length thread Lg | | $t_1$ [mm] | $t_2$ [mm] | $F_{v,Rk}$ [N] | $t_1$ [mm] | $l_{ef}$ [mm] | $F_{ax,\alpha,Rk}$ [N] | $t_1$ [mm] | $t_2$ [mm] | $F_{v,Rk}$ [N] | $t_1$ [mm] | $l_{ef}$ [mm] | $F_{ax,\alpha,Rk}$ [N] |
| **6.0** Ø $d_K$ = 13.6 mm | 40 | 37 | ■ | | | | | | | 6 | 34 | **2.409** | 4 | 36 | **2.592** |
| | 60 | 56 | ■ | 24 | 36 | **1,867** | 24 | 36 | **2,592** | 6 | 54 | **3,219** | 4 | 56 | **4,032** |
| | 80 | 61 | ■ | 32 | 48 | **2,131** | 24 | 56 | **2,848** | 6 | 74 | **3,345** | 4 | 61 | **4,392** |
| | 100 | 61 | ❑ | 40 | 60 | **2,301** | 41 | 59 | **3,703** | 6 | 94 | **3,345** | 4 | 61 | **4,392** |
| | 120 | 68 | ❑ | 50 | 70 | **2,515** | 52 | 68 | **3,703** | 6 | 114 | **3,471** | 4 | 68 | **4,896** |
| | 140 | 68 | ❑ | 70 | 70 | **2,515** | 72 | 68 | **3,703** | 6 | 134 | **3,471** | 4 | 68 | **4,896** |
| | 160 | 65 | ❑ | 90 | 70 | **2,515** | 95 | 65 | **3,703** | 6 | 154 | **3,471** | 4 | 65 | **4,680** |
| | 180 | 65 | ❑ | 110 | 70 | **2,515** | 115 | 65 | **3,703** | 6 | 174 | **3,471** | 4 | 65 | **4,680** |
| | 200 | 65 | ❑ | 130 | 70 | **2,515** | 135 | 65 | **3,703** | 6 | 194 | **3,471** | 4 | 65 | **4,680** |
| | 220 | 65 | ❑ | 150 | 70 | **2,515** | 155 | 65 | **3,703** | 6 | 214 | **3,471** | 4 | 65 | **4,680** |
| | 250 | 65 | ❑ | 180 | 70 | **2,515** | 185 | 65 | **3,703** | 6 | 244 | **3,471** | 4 | 65 | **4,680** |
| | 280 | 65 | ❑ | 210 | 70 | **2,515** | 215 | 65 | **3,703** | 6 | 274 | **3,471** | 4 | 65 | **4,680** |
| | 300 | 65 | ❑ | 230 | 70 | **2,515** | 235 | 65 | **3,703** | 6 | 294 | **3,471** | 4 | 65 | **4,680** |
| **8.0** Ø $d_K$ = 20 mm | 50 | 46 | ■ | | | | | | | 4 | 46 | **2,268** | 4 | 46 | **4,416** |
| | 80 | 70 | ■ | 30 | 50 | **3,118** | 30 | 50 | **4,800** | 6 | 74 | **4,463** | 6 | 70 | **6,720** |
| | 100 | 80 | ■ | 40 | 60 | **3,514** | 40 | 60 | **5,200** | 10 | 90 | **5,533** | 10 | 80 | **7,680** |
| | 120 | 80 | ■ | 50 | 70 | **3,855** | 50 | 70 | **5,200** | 10 | 110 | **5,533** | 10 | 80 | **7,680** |
| | 140 | 80 | ❑ | 60 | 80 | **4,245** | 60 | 80 | **6,760** | 10 | 130 | **5,533** | 10 | 80 | **7,680** |
| | 160 | 80 | ❑ | 80 | 80 | **4,245** | 80 | 80 | **6,760** | 10 | 150 | **5,533** | 10 | 80 | **7,680** |
| | 180 | 80 | ❑ | 100 | 80 | **4,245** | 100 | 80 | **6,760** | 10 | 170 | **5,533** | 10 | 80 | **7,680** |
| | 200 | 80 | ❑ | 120 | 80 | **4,245** | 120 | 80 | **6,760** | 10 | 190 | **5,533** | 10 | 80 | **7,680** |
| | 220 | 80 | ❑ | 140 | 80 | **4,245** | 140 | 80 | **6,760** | 10 | 210 | **5,533** | 10 | 80 | **7,680** |
| | 240 | 80 | ❑ | 160 | 80 | **4,245** | 160 | 80 | **6,760** | 10 | 230 | **5,533** | 10 | 80 | **7,680** |
| | 260 | 80 | ❑ | 180 | 80 | **4,245** | 180 | 80 | **6,760** | 10 | 250 | **5,533** | 10 | 80 | **7,680** |
| | 280 | 80 | ❑ | 200 | 80 | **4,245** | 200 | 80 | **6,760** | 10 | 270 | **5,533** | 10 | 80 | **7,680** |
| | 300 | 80 | ❑ | 220 | 80 | **4,245** | 220 | 80 | **6,760** | 10 | 290 | **5,533** | 10 | 80 | **7,680** |
| | 320 | 80 | ❑ | 240 | 80 | **4,245** | 240 | 80 | **6,760** | 10 | 310 | **5,533** | 10 | 80 | **7,680** |
| | 340 | 80 | ❑ | 260 | 80 | **4,245** | 260 | 80 | **6,760** | 10 | 330 | **5,533** | 10 | 80 | **7,680** |
| | 360 | 80 | ❑ | 280 | 80 | **4,245** | 280 | 80 | **6,760** | 10 | 350 | **5,533** | 10 | 80 | **7,680** |
| | 380 | 80 | ❑ | 300 | 80 | **4,245** | 300 | 80 | **6,760** | 10 | 370 | **5,533** | 10 | 80 | **7,680** |
| | 400 | 80 | ❑ | 320 | 80 | **4,245** | 320 | 80 | **6,760** | 10 | 390 | **5,533** | 10 | 80 | **7,680** |
| | 450 | 80 | ❑ | 370 | 80 | **4,245** | 370 | 80 | **6,760** | 10 | 440 | **5,533** | 10 | 80 | **7,680** |
| | 500 | 80 | ❑ | 420 | 80 | **4,245** | 420 | 80 | **6,760** | 10 | 490 | **5,533** | 10 | 80 | **7,680** |
| | 550 | 80 | ❑ | 470 | 80 | **4,245** | 470 | 80 | **6,760** | 10 | 540 | **5,533** | 10 | 80 | **7,680** |

For more information regarding measurement and design, see the SPAX design information at https://oxomi.com/p/3002034




# Washer head, Partial thread, T-STAR *plus*

*4CUT,* case hardened, slide-coated

WIROX A9J

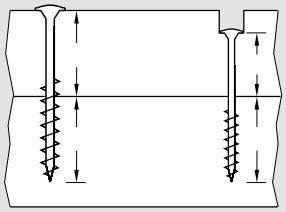
| Dimensions [mm] | | | | | Packaging units | | | SPAX-No. | EAN code |
|---|---|---|---|---|---|---|---|---|---|
| Thread Ø d1 | Length total Ls | Length thread Lg | | BIT size T | SPAX BOX [pieces] | Master carton [pieces] | Pallet qty | | |
| **10.0** Ø $d_K$ = 25 mm | 80 | 70 | ■ | 50 | 50 | 500 | 14,000 | 0251011000805 | 4003530245817 |
| | 100 | 80 | ■ | 50 | 50 | 500 | 14,000 | 0251011001005 | 4003530245824 |
| | 120 | 80 | ■ | 50 | 50 | 500 | 12,000 | 0251011001205 | 4003530245831 |
| | 140 | 80 | ❑ | 50 | 50 | 500 | 12,000 | 0251011001405 | 4003530245848 |
| | 160 | 80 | ❑ | 50 | 25 | 250 | 6,000 | 0251011001605 | 4003530165207 |
| | 180 | 80 | ❑ | 50 | 25 | 250 | 6,000 | 0251011001805 | 4003530245862 |
| | 200 | 80 | ❑ | 50 | 25 | 250 | 6,000 | 0251011002005 | 4003530245879 |
| | 220 | 80 | ❑ | 50 | 25 | 250 | 6,000 | 0251011002205 | 4003530165214 |
| | 240 | 80 | ❑ | 50 | 25 | – | 2,400 | 0251011002405 | 4003530245893 |
| | 260 | 80 | ❑ | 50 | 25 | – | 2,400 | 0251011002605 | 4003530245909 |
| | 280 | 80 | ❑ | 50 | 25 | – | 2,400 | 0251011002805 | 4003530245916 |
| | 300 | 80 | ❑ | 50 | 25 | – | 2,400 | 0251011003005 | 4003530245923 |
| | 320 | 80 | ❑ | 50 | 25 | – | 1,800 | 0251011003205 | 4003530245930 |
| | 340 | 80 | ❑ | 50 | 25 | – | 1,800 | 0251011003405 | 4003530245947 |
| | 360 | 80 | ❑ | 50 | 25 | – | 1,800 | 0251011003605 | 4003530245954 |
| | 380 | 80 | ❑ | 50 | 25 | – | 1,800 | 0251011003805 | 4003530245961 |
| | 400 | 80 | ❑ | 50 | 25 | – | 1,800 | 0251011004005 | 4003530245978 |
| | 425 | 80 | ❑ | 50 | 25 | – | 1,500 | 0251011004255 | 4003530292231 |
| | 450 | 80 | ❑ | 50 | 25 | – | 1,500 | 0251011004505 | 4003530245985 |
| | 475 | 80 | ❑ | 50 | 25 | – | 1,200 | 0251011004755 | 4003530292248 |
| | 500 | 80 | ❑ | 50 | 25 | – | 1,200 | 0251011005005 | 4003530249990 |

■ T-STAR *plus,* Full thread ❑ T-STAR *plus,* Partial thread

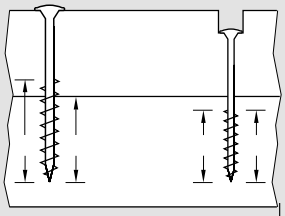
NEW

Washer head 8 mm also in stainless steel, see page 66
Practical positioning guide for rooftop insulation flat countersunk head 8 mm with partial thread, see page 57

Shear



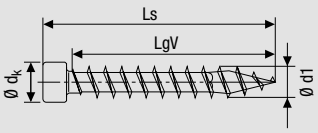
Withdrawal



## Load-carrying capacity values $F_{v,Rk}$ for shear and $F_{ax,\alpha,Rk}$ for withdrawal

| Product | | | | Wood-Wood (C24), $\alpha = 90°$ | | | | | | Sheet steel-Wood (C24), $\alpha = 90°$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dimensions [mm] | | | | Shear | | | Withdrawal | | | Shear | | | Withdrawal | | |
| Thread Ø d1 | Length total Ls | Length thread Lg | | $t_1$ [mm] | $t_2$ [mm] | $F_{v,Rk}$ [N] | $t_1$ [mm] | $l_{ef}$ [mm] | $F_{ax,\alpha,Rk}$ [N] | $t_1$ [mm] | $t_2$ [mm] | $F_{v,Rk}$ [N] | $t_1$ [mm] | $l_{ef}$ [mm] | $F_{ax,\alpha,Rk}$ [N] |
| **10.0** Ø $d_K$ = 25 mm | 80 | 70 | ■ | 40 | 40 | **3,539** | 30 | 50 | **5,750** | 10 | 70 | **6,890** | 6 | 70 | **8,050** |
| | 100 | 80 | ■ | 40 | 60 | **4,593** | 40 | 60 | **6,900** | 10 | 90 | **7,521** | 10 | 80 | **9,200** |
| | 120 | 80 | ■ | 50 | 70 | **5,012** | 50 | 70 | **7,188** | 10 | 110 | **7,521** | 10 | 80 | **9,200** |
| | 140 | 80 | ❑ | 60 | 80 | **5,417** | 60 | 80 | **7,188** | 10 | 130 | **7,521** | 10 | 80 | **9,200** |
| | 160 | 80 | ❑ | 80 | 80 | **5,992** | 80 | 80 | **9,200** | 10 | 150 | **7,521** | 10 | 80 | **9,200** |
| | 180 | 80 | ❑ | 100 | 80 | **5,992** | 100 | 80 | **9,200** | 10 | 170 | **7,521** | 10 | 80 | **9,200** |
| | 200 | 80 | ❑ | 120 | 80 | **5,992** | 120 | 80 | **9,200** | 10 | 190 | **7,521** | 10 | 80 | **9,200** |
| | 220 | 80 | ❑ | 140 | 80 | **5,992** | 140 | 80 | **9,200** | 10 | 210 | **7,521** | 10 | 80 | **9,200** |
| | 240 | 80 | ❑ | 160 | 80 | **5,992** | 160 | 80 | **9,200** | 10 | 230 | **7,521** | 10 | 80 | **9,200** |
| | 260 | 80 | ❑ | 180 | 80 | **5,992** | 180 | 80 | **9,200** | 10 | 250 | **7,521** | 10 | 80 | **9,200** |
| | 280 | 80 | ❑ | 200 | 80 | **5,992** | 200 | 80 | **9,200** | 10 | 270 | **7,521** | 10 | 80 | **9,200** |
| | 300 | 80 | ❑ | 220 | 80 | **5,992** | 220 | 80 | **9,200** | 10 | 290 | **7,521** | 10 | 80 | **9,200** |
| | 320 | 80 | ❑ | 240 | 80 | **5,992** | 240 | 80 | **9,200** | 10 | 310 | **7,521** | 10 | 80 | **9,200** |
| | 340 | 80 | ❑ | 260 | 80 | **5,992** | 260 | 80 | **9,200** | 10 | 330 | **7,521** | 10 | 80 | **9,200** |
| | 360 | 80 | ❑ | 280 | 80 | **5,992** | 280 | 80 | **9,200** | 10 | 350 | **7,521** | 10 | 80 | **9,200** |
| | 380 | 80 | ❑ | 300 | 80 | **5,992** | 300 | 80 | **9,200** | 10 | 370 | **7,521** | 10 | 80 | **9,200** |
| | 400 | 80 | ❑ | 320 | 80 | **5,992** | 320 | 80 | **9,200** | 10 | 390 | **7,521** | 10 | 80 | **9,200** |
| | 425 | 80 | ❑ | 345 | 80 | **5,992** | 345 | 80 | **9,200** | 10 | 415 | **7,521** | 10 | 80 | **9,200** |
| | 450 | 80 | ❑ | 370 | 80 | **5,992** | 370 | 80 | **9,200** | 10 | 440 | **7,521** | 10 | 80 | **9,200** |
| | 475 | 80 | ❑ | 395 | 80 | **5,992** | 395 | 80 | **9,200** | 10 | 465 | **7,521** | 10 | 80 | **9,200** |
| | 500 | 80 | ❑ | 420 | 80 | **5,992** | 420 | 80 | **9,200** | 10 | 490 | **7,521** | 10 | 80 | **9,200** |

For more information regarding measurement and design, see the SPAX design information at https://oxomi.com/p/3002034



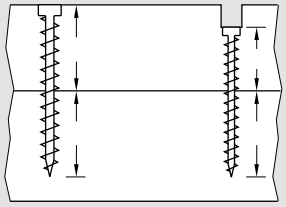

# Cylindrical head, Full thread, T-STAR *plus*

*4CUT*-point, case hardened, slide-coated

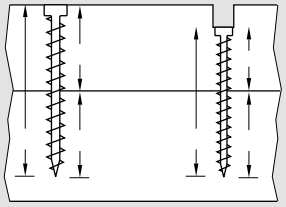
WIROX A9J

| Dimensions [mm] | | | | Packaging units | | | SPAX-No. | EAN code |
|---|---|---|---|---|---|---|---|---|
| Thread Ø d1 | Length total Ls | Length full thread LgV | BIT size T | SPAX BOX [pieces] | Master carton [pieces] | Pallet qty | | |
| **6.0** Ø $d_K$ = 8.4 mm | 80 | | 30 | 200 | 2,000 | 56,000 | 1211010600805 | 4003530246364 |
| | 100 | | 30 | 100 | 1,000 | 32,000 | 1211010601005 | 4003530246371 |
| | 120 | Thread | 30 | 100 | 1,000 | 28,000 | 1211010601205 | 4003530246388 |
| | 140 | close | 30 | 100 | 1,000 | 28,000 | 1211010601405 | 4003530246395 |
| | 160 | to | 30 | 100 | 1,000 | 28,000 | 1211010601605 | 4003530246401 |
| | 180 | head | 30 | 100 | 1,000 | 28,000 | 1211010601805 | 4003530246418 |
| | 200 | | 30 | 100 | 1,000 | 24,000 | 1211010602005 | 4003530246425 |

Shear



Withdrawal

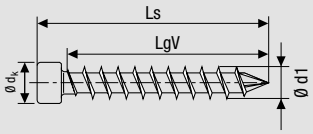


## **Load-carrying capacity values** $F_{v,Rk}$ for shear and $F_{ax,\alpha,Rk}$ for withdrawal

| Product | | | Wood-Wood (C24), $\alpha = 90°$ | | | | | |
|---|---|---|---|---|---|---|---|---|
| Dimensions [mm] | | | Shear | | | Withdrawal | | |
| Thread Ø d1 | Length total Ls | Length full thread LgV | $t_1$ [mm] | $t_2$ [mm] | **$F_{v,Rk}$ [N]** | $t_1$ [mm] | $l_{ef}$ [mm] | **$F_{ax,d1,k}$ [N/mm]** |
| **6.0** Ø $d_K$ = 8.4 mm | 80 | | 40 | 40 | **2,309** | 40 | 40 | **72,0** |
| | 100 | | 50 | 50 | **2,489** | 50 | 50 | **N/mm** |
| | 120 | Thread | 60 | 60 | **2,669** | 60 | 60 | |
| | 140 | close | 70 | 70 | **2,849** | 70 | 70 | **Max.** |
| | 160 | to | 80 | 80 | **3,029** | 80 | 80 | **$f_{tens,d}$=** |
| | 180 | head | 90 | 90 | **3,178** | 90 | 90 | **8.462 N** |
| | 200 | | 100 | 100 | **3,178** | 100 | 100 | |

see footnote below

Multiply the value $f_{axw,d1,k}$ with the effective thread length ($l_{ef}$, $l_{ef,k}$) in the respective wood component. Lower as appropriate for angle $\alpha < 90°$.
The design value for thread load-carrying capacity must not exceed the design value for steel load-carrying capacity $f_{tens,d}$.
For more information regarding measurement and design, see the SPAX design information at https://oxomi.com/p/3002034




# Cylindrical head, Full thread, T-STAR *plus*

With *CUT point,* case hardened, slide-coated

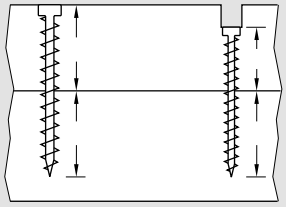
WIROX A9J

**8.0**
Ø $d_K$ = 10 mm

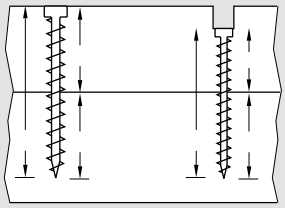
| Dimensions [mm] | | | | Packaging units | | | SPAX-No. | EAN code |
|---|---|---|---|---|---|---|---|---|
| Thread Ø d1 | Length total Ls | Length full thread LgV | BIT size T | SPAX BOX [pieces] | Master carton [pieces] | Pallet qty | | |
| | 120 | | 40 | 50 | 500 | 14,000 | 1221010801205 | 4003530292361 |
| | 140 | | 40 | 50 | 500 | 14,000 | 1221010801405 | 4003530294891 |
| | 160 | | 40 | 50 | 500 | 14,000 | 1221010801605 | 4003530257209 |
| | 180 | | 40 | 50 | 500 | 14,000 | 1221010801805 | 4003530257216 |
| | 200 | | 40 | 50 | 500 | 12,000 | 1221010802005 | 4003530246432 |
| | 220 | Thread | 40 | 50 | 500 | 12,000 | 1221010802205 | 4003530246449 |
| | 240 | close | 40 | 50 | – | 4,800 | 1221010802405 | 4003530246456 |
| | 260 | to | 40 | 50 | – | 4,800 | 1221010802605 | 4003530246463 |
| | 280 | head | 40 | 50 | – | 4,800 | 1221010802805 | 4003530246470 |
| | 300 | Kopf | 40 | 50 | – | 4,800 | 1221010803005 | 4003530246487 |
| | 325 | | 40 | 50 | – | 3,600 | 1221010803255 | 4003530292378 |
| | 350 | | 40 | 50 | – | 3,600 | 1221010803505 | 4003530246494 |
| | 375 | | 40 | 50 | – | 3,600 | 1221010803755 | 4003530292385 |
| | 400 | | 40 | 50 | – | 3,600 | 1221010804005 | 4003530246500 |
| | 425 | | 40 | 50 | – | 3,000 | 1221010804255 | 4003530292392 |
| | 450 | | 40 | 50 | – | 3,000 | 1221010804505 | 4003530246517 |
| | 475 | | 40 | 50 | – | 1,500 | 1221010804755 | 4003530294907 |
| | 500 | | 40 | 25 | – | 1,500 | 1221010805005 | 4003530257223 |
| | 550 | | 40 | 25 | – | 1,200 | 1221010805505 | 4003530257230 |
| | 600 | | 40 | 25 | – | 1,200 | 1221010806005 | 4003530257247 |

NEW

Shear



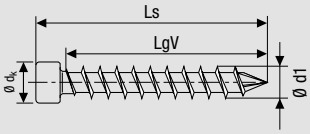
Withdrawal



## **Load-carrying capacity values** $F_{v,Rk}$ for shear and $F_{ax,\alpha,Rk}$ for withdrawal

| Product | | | Wood-Wood (C24), $\alpha = 90°$ | | | | | |
|---|---|---|---|---|---|---|---|---|
| Dimensions [mm] | | | Shear | | | Withdrawal | | |
| Thread Ø d1 | Length total Ls | Length full thread LgV | $t_1$ [mm] | $t_2$ [mm] | **$F_{v,Rk}$ [N]** | $t_1$ [mm] | $l_{ef}$ [mm] | **$F_{ax,d1,k}$ [N/mm]** |
| **8.0** Ø $d_K$ = 10 mm | 120 | | 60 | 60 | **3,995** | 60 | 60 | |
| | 140 | | 70 | 70 | **4,235** | 70 | 70 | |
| | 160 | | 80 | 80 | **4,475** | 80 | 80 | |
| | 180 | | 90 | 90 | **4,715** | 90 | 90 | |
| | 200 | | 100 | 100 | **4,955** | 100 | 100 | |
| | 220 | Thread | 110 | 110 | **5,110** | 110 | 110 | **96,0** |
| | 240 | close | 120 | 120 | **5,110** | 120 | 120 | **N/mm** |
| | 260 | to | 130 | 130 | **5,110** | 130 | 130 | |
| | 280 | head | 140 | 140 | **5,110** | 140 | 140 | **Max,** |
| | 300 | | 150 | 150 | **5,110** | 150 | 150 | **$f_{tens,d}$=** |
| | 325 | | 162 | 162 | **5,110** | 162 | 162 | |
| | 350 | | 175 | 175 | **5,110** | 175 | 175 | **13,077 N** |
| | 375 | | 187 | 187 | **5,110** | 187 | 187 | |
| | 400 | | 200 | 200 | **5,110** | 200 | 200 | |
| | 425 | | 212 | 212 | **5,110** | 212 | 212 | |
| | 450 | | 225 | 225 | **5,110** | 225 | 225 | |
| | 475 | | 237 | 237 | **5,110** | 237 | 237 | |
| | 500 | | 250 | 250 | **5,110** | 250 | 250 | |
| | 550 | | 275 | 275 | **5,110** | 275 | 275 | |
| | 600 | | 300 | 300 | **5,110** | 300 | 300 | |

Multiply the value $f_{axw,d1,k}$ with the effective thread length ($l_{ef}$, $l_{ef,k}$) in the respective wood component. Lower as appropriate for angle $\alpha < 90°$.
The design value for thread load-carrying capacity must not exceed the design value for steel load-carrying capacity $f_{tens,d}$.
For more information regarding measurement and design, see the SPAX design information at https://oxomi.com/p/3002034



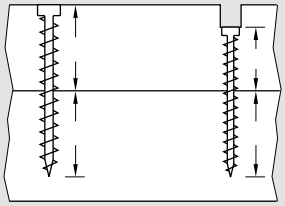

# Cylindrical head, Full thread, T-STAR *plus*

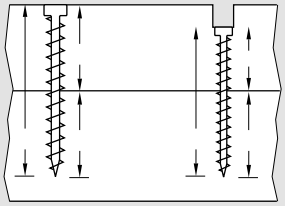
With *CUT point,* hardened, slide-coated

WIROX A9J

| Dimensions [mm] | | | | Packaging units | | | SPAX-No. | EAN code |
|---|---|---|---|---|---|---|---|---|
| Thread Ø d1 | Length total Ls | Length full thread LgV | BIT size T | SPAX BOX [pieces] | Master carton [pieces] | Pallet qty | | |
| **10.0** Ø $d_K$ = 12.3 mm | 120 | | 50 | 50 | 500 | 12,000 | 1221011001205 | 4003530292705 |
| | 140 | | 50 | 50 | 500 | 12,000 | 1221011001405 | 4003530292712 |
| | 160 | | 50 | 50 | 500 | 12,000 | 1221011001605 | 4003530292729 |
| | 180 | | 50 | 50 | 500 | 12,000 | 1221011001805 | 4003530292736 |
| | 200 | | 50 | 50 | 500 | 12,000 | 1221011002005 | 4003530292743 |
| | 220 | | 50 | 50 | 500 | 12,000 | 1221011002205 | 4003530292750 |
| | 240 | Thread | 50 | 50 | – | 4,800 | 1221011002405 | 4003530292767 |
| | 260 | close | 50 | 50 | – | 4,800 | 1221011002605 | 4003530292774 |
| | 280 | to | 50 | 50 | – | 4,800 | 1221011002805 | 4003530292781 |
| | 300 | head | 50 | 50 | – | 4,800 | 1221011003005 | 4003530292798 |
| | 325 | | 50 | 50 | – | 3,600 | 1221011003255 | 4003530292804 |
| | 350 | | 50 | 50 | – | 3,600 | 1221011003505 | 4003530292811 |
| | 375 | | 50 | 50 | – | 3,600 | 1221011003755 | 4003530292828 |
| | 400 | | 50 | 50 | – | 3,600 | 1221011004005 | 4003530292835 |
| | 425 | | 50 | 50 | – | 3,000 | 1221011004255 | 4003530292842 |
| | 450 | | 50 | 50 | – | 3,000 | 1221011004505 | 4003530292859 |
| | 500 | | 50 | 25 | – | 1,200 | 1221011005005 | 4003530292866 |
| | 550 | | 50 | 25 | – | 1,200 | 1221011005505 | 4003530292873 |
| | 600 | | 50 | 25 | – | 1,200 | 1221011006005 | 4003530292880 |
| | 650 | | 50 | 25 | – | 800 | 1221011006505 | 4003530292897 |
| | 700 | | 50 | 25 | – | 800 | 1221011007005 | 4003530292903 |
| | 750 | | 50 | 25 | – | 800 | 1221011007505 | 4003530292910 |
| | 800 | | 50 | 25 | – | 800 | 1221011008005 | 4003530292927 |

NEW

Shear 

Withdrawal 

## **Load-carrying capacity values** $F_{v,Rk}$ for shear and $F_{ax,\alpha,Rk}$ for withdrawal

| Product | | | Wood-Wood (C24), $\alpha = 90°$ | | | | | |
|---|---|---|---|---|---|---|---|---|
| Dimensions [mm] | | | Shear | | | Withdrawal | | |
| Thread Ø d1 | Length total Ls | Length full thread LgV | $t_1$ [mm] | $t_2$ [mm] | **$F_{v,Rk}$ [N]** | $t_1$ [mm] | $l_{ef}$ [mm] | **$F_{ax,d1,k}$ [N/mm]** |
| **10.0** Ø $d_K$ = 12.3 mm | 120 | | 60 | 60 | **5,300** | 60 | 60 | |
| | 140 | | 70 | 70 | **5,705** | 70 | 70 | |
| | 160 | | 80 | 80 | **5,992** | 80 | 80 | |
| | 180 | | 90 | 90 | **6,280** | 90 | 90 | |
| | 200 | | 100 | 100 | **6,567** | 100 | 100 | |
| | 220 | | 110 | 110 | **6,855** | 110 | 110 | **115** |
| | 240 | Thread | 120 | 120 | **7,142** | 120 | 120 | |
| | 260 | close | 130 | 130 | **7,384** | 130 | 130 | **N/mm** |
| | 280 | to | 140 | 140 | **7,384** | 140 | 140 | **Max.** |
| | 300 | head | 150 | 150 | **7,384** | 150 | 150 | **$f_{tens,d}$ =** |
| | 325 | | 162 | 162 | **7,384** | 162 | 162 | |
| | 350 | | 175 | 175 | **7,384** | 175 | 175 | **21,538 N** |
| | 375 | | 187 | 187 | **7,384** | 187 | 187 | |
| | 400 | | 200 | 200 | **7,384** | 200 | 200 | |
| | 425 | | 212 | 212 | **7,384** | 212 | 212 | |
| | 450 | | 225 | 225 | **7,384** | 225 | 225 | |
| | 500 | | 250 | 250 | **7,384** | 250 | 250 | |
| | 550 | | 275 | 275 | **7,384** | 275 | 275 | |
| | 600 | | 300 | 300 | **7,384** | 300 | 300 | |
| | 650 | | 325 | 325 | **7,384** | 325 | 325 | |
| | 700 | | 350 | 350 | **7,384** | 350 | 350 | |
| | 750 | | 375 | 375 | **7,384** | 375 | 375 | |
| | 800 | | 400 | 400 | **7,384** | 400 | 400 | |

see footnote below

Multiply the value $f_{axw,d1,k}$ with the effective thread length ($l_{ef}$, $l_{ef,k}$) in the respective wood component. Lower as appropriate for angle $\alpha < 90°$.
The design value for thread load-carrying capacity must not exceed the design value for steel load-carrying capacity $f_{tens,d}$.

For more information regarding measurement and design, see the SPAX design information at https://oxomi.com/p/3002034

SPAX Iso

# **The insulation screw**
for roofs and facades

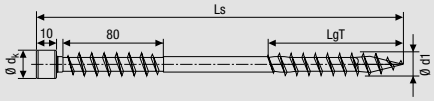
## SPAX-Iso

### the insulation screw for roofs and facades

The SPAX-Iso screw is suitable for installing soft materials used in over-rafter insulation. Pressure loads, such as those caused by roofing or snow loads, cannot be absorbed by compressible insulating materials. Partial-thread screws are not suitable for installing compressible insulating materials.

Thanks to SPAX-Iso, installing compressible insulating materials is not a problem. The fixing thread holds the counter-batten tight and transfers the compressive forces. This keeps the insulating material in shape..

You can also use the SPAX design software to calculate your projects at: https://holzbauberechnung.spax.com.




## Cylinder head, T-STAR *plus*

*4CUT,* fixing thread, case hardened, slide-coated

| Dimensions [mm] | | | | Verpackungseinheiten | | SPAX-No. | EAN code |
|---|---|---|---|---|---|---|---|
| Thread-Ø d1 | Lenght total Ls | Length partial th-read LgT | BIT size T | SPAX BOX [pieces] | Master carton [pieces] | | |
| **10.0** Ø $d_K$ = 12.3 mm | 200 | 80 | 50 | 50 | 500 | 0491011002005 | 4003530252761 |
| | 230 | 80 | 50 | 50 | 500 | 0491011002305 | 4003530252778 |
| | 260 | 80 | 50 | 50 | 500 | 0491011002605 | 4003530252785 |
| | 290 | 80 | 50 | 50 | 500 | 0491011002905 | 4003530252792 |
| | 320 | 80 | 50 | 50 | 500 | 0491011003205 | 4003530252808 |
| | 350 | 80 | 50 | 50 | 500 | 0491011003505 | 4003530252815 |

Article discontinued

**Penetration depth in rafter [mm]**

| Screw length [mm] | 200 | | 230 | | 260 | | 290 | | 320 | | 350 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Batten thickness [mm]** | **40** | **60** | **40** | **60** | **40** | **60** | **40** | **60** | **40** | **60** | **40** | **60** |
| **Insulating-material thick-ness [mm]*** | | | | | | | | | | | | |
| **60** | 91 | 70 | 121 | 100 | 151 | 130 | 181 | 160 | 211 | 190 | 241 | 220 |
| **80** | 70 | 48 | 100 | 78 | 130 | 108 | 160 | 138 | 190 | 168 | 220 | 198 |
| **100** | 48 | - | 78 | 56 | 108 | 86 | 138 | 116 | 168 | 146 | 198 | 176 |
| **120** | - | - | 56 | - | 86 | 64 | 116 | 94 | 146 | 124 | 176 | 154 |
| **140** | - | - | - | - | 64 | 43 | 94 | 73 | 124 | 103 | 154 | 133 |
| **160** | - | - | - | - | 43 | - | 73 | 51 | 103 | 81 | 133 | 111 |
| **180** | - | - | - | - | - | - | 51 | - | 81 | 59 | 111 | 89 |
| **200** | - | - | - | - | - | - | - | - | 59 | - | 89 | 68 |
| **220** | - | - | - | - | - | - | - | - | - | - | 68 | 46 |

Minimum thread depth in rafter = batten thickness or min. 4xd1 acc. to ETA-16/0617

* If the roof boarding is used, this has to be taken into account when calculating the thickness of the insulating material. E.g. 120 mm insulating material + 20 mm roof boarding = 140 mm in the table


SPAX – Construction

# Design guidelines

## Guidelines for the design of structural connections with SPAX fasteners

## SPAX Design guidelines

These guidelines apply to the design and installation of loadbearing connections with SPAX fasteners in accordance with BS EN 1995-1-1:2004+A2:2014 (Eurocode 5 resp. EC5) and its National Annex dated October 2012, and in accordance with the European Technical Approval ETA-12/0114.

It is aimed at quick predesign of loadbearing connections with SPAX fasteners, but is not intended to replace appropriate engineering and design by a design professional.

In absence of further specific provisions in the European Technical Approval (ETA), EC5 and its National Annexes apply to the design and installation of connections. Outside the European Union, national standards shall be considered as well.

This document solely covers requirements relative to load-carrying capacity and serviceability of connections.

In addition to EC5 provisions, specific design prescriptions are provided in the relevant sections, and shall be considered as minimum requirements. They may need to be extended to particular connection configurations.

Members of solid timber, glued-laminated timber, laminated veneer lumber (LVL), wood-based products
(in accordance with their ETA or national approval) or steel may be connected to further members of solid timber, glued-laminated timber, laminated veneer lumber (LVL), wood-based products (in accordance with their ETA or national approval).

Connections to wood-based panels (particle board, fibre board, OSB or plywood) may be designed in accordance with the prescriptions of the ETA or national approval of the relevant panel, provided screwed connection is accepted or covered in its scope.

This guide has been established in good faith and to the best of our knowledge. No liability is therefore engaged or accepted for any obvious mistake or error.

Please send any suggestion, question or proposal for corrections to technik@spax.com.

Use also the SPAX calculation software timber construction according to EC5 + ETA for the calculation of your projects under:
**https://holzbauberechnung.spax.com**

SPAX Designsoftware

# Verification of the load-bearing capacity

## Shear

### Design value for lateral load-carrying capacity

$$F_{v,Rd} = \frac{k_{mod} \cdot F_{v,Rk}}{\gamma_M} \quad [N] \quad \gamma_M = 1.3$$

### Verification of lateral load-carrying capacity

The following requirement must be met:

$$\frac{F_{v,Ed}}{n_{ef} \cdot F_{v,Rd}} \leq 1$$ (If $n_{ef}$ has already been taken into consideration in $F_{v,Rd}$, then it must not be considered again here.)

## Withdrawal capacity

### Design value for axial load-carrying capacity

To calculate the withdrawal load capacity, the design values of three different instances of failure are compared.
The lowest of these is the significant value.

$F_{ax,\alpha,Rd}$ = min. {
- Design value $F_{ax,\alpha,Rd,2}$ for failure related to withdrawing the thread
- Design value $f_{tens,d}$ for failure related to tensile strength (steel)
- Design value $F_{ax,\alpha,Rd,1} = \max\{F_{ax,\alpha,Rd,1}; F_{ax,\alpha,Rhead,d,1}\}$ for failure related to head pull-through capacity

**Design value related to withdrawing the thread:**

$$F_{ax,\alpha,Rd,2} = \frac{k_{mod} \cdot F_{ax,\alpha,Rk,2}}{\gamma_M} \quad [N] \quad \gamma_M = 1.3$$

**Design value for tensile strength (steel):**

$$f_{tens,d} = \frac{f_{tens,k}}{\gamma_M} \quad [N] \quad \gamma_M = 1.3$$

**Design value for head pull-through capacity**

$$F_{ax,\alpha,Rd,1} = \frac{k_{mod} \cdot \max\{F_{ax,\alpha,Rk,1}; F_{ax,\alpha,Rhead,k,1}\}}{\gamma_M} \quad [N] \quad \gamma_M = 1.3$$

### Verification of axial load-carrying capacity

The following requirement must be met:

$$\frac{F_{ax,\alpha,Ed}}{n_{ef} \cdot F_{ax,\alpha,Rd}} \leq 1$$ (If $n_{ef}$ has already been taken into consideration in $F_{ax,\alpha,Rd}$, then it must not be considered again here.)

### Verification of combined lateral and axial load-carrying capacity

The following requirement must be met:

$$\left(\frac{F_{v,Ed}}{n_{ef} \cdot F_{v,Rd}}\right)^2 + \left(\frac{F_{ax,\alpha,Ed}}{n_{ef} \cdot F_{ax,\alpha,Rd}}\right)^2 \leq 1$$ (If $n_{ef}$ has already been taken into consideration in $F_{v,Rd}$ and in $F_{ax,\alpha,Rd}$, then it must not be considered again here.)

ETA 3.9

## Modification coefficient $k_{mod}$
## Load effect duration class (LEDC)

**Classification of effects acc. to DIN EN 1991-1-1, DIN EN 1991-1-3, DIN EN 1991-1-4, DIN EN 1991-1-7, DIN EN 1991-3 and the associated national appendices in the load effect duration classes (LEDC)**

NA; Tab. NA.1

| | A | B |
|---|---|---|
| 1 | **Effect** | **LEDC** |
| 2 | **Densities and distributed loads** acc. to DIN EN 1991-1-1 | Constant |
| 3 | **Vertical imposed loads** acc. to DIN EN 1991-1-1 | |
| 4 | A Attics, living rooms and common rooms | Average |
| 5 | B Office spaces, work spaces, corridors | Average |
| 6 | C Rooms, meeting spaces and areas where people could gather (except for those categories specified under A, B, D and E) | Short |
| 7 | D Sales rooms | Average |
| 8 | E1 Storage facilities, factories and workshops, stands, storage spaces and entrances | Long |
| 9 | E2 Spaces where forklifts are operated | Average |
| 10 | F Areas with traffic and for parking (light vehicles, total load ≤ 30,000 N), entrance ramps to these areas | Average<br>Short |
| 11 | H Roofs where foot traffic is not permitted except for normal maintenance work and repairs | Short |
| 12 | K Helicopter loads | Short |
| 13 | T Staircases and landings | Short |
| 14 | Z Entrances, balconies and similar structures | Short |
| 15 | **Horizontal loads** acc. to DIN EN 1991-1-1 | |
| 16 | Horizontal imposed loads consisting of people on railings, guard rails and other structures that serve as barriers | Short |
| 17 | Horizontal loads for achieving sufficient longitudinal and transverse rigidity | [a] |
| 18 | Horizontal loads for helicopter landing pads on roofs,<br>– for horizontal imposed loads,<br>– for rollover protection | <br>Short<br>Very short |
| 19 | **Wind loads** acc. to DIN EN 1991-1-4 | Short/Very short[b] |
| 20 | **Snow and ice loads** acc. to DIN EN 1991-1-3 | |
| 21 | Ground elevation of the building location above sea level ≤ 1,000 m | Short |
| 22 | Ground elevation of the building location above sea level > 1,000 m | Average |
| 23 | **Impact loads** acc. to DIN EN 1991-1-7 | Very short |
| 24 | **Horizontal loads based on crane and machine operation** acc. to DIN EN 1991-3 | Short |

Effects due to changes in temperature or moisture are part of load effect duration class “Average”. NA; 2.3.1.2(2)P

Effects due to uneven settlement are part of load effect duration class “Constant”.

For wood components, ignoring the effect of temperature changes is permitted. NA; 2.3.1.2(2)P

For effects in a combination of loads with various LEDC, the LEDC with the shortest duration can be used to determine the modification coefficient $k_{mod}$. NA; 2.3.1.2(2)P

EC5; 3.1.3 (2)

[a] In accordance with the associated loads

[b] For wind, the average between Short and Very short can be used for $k_{mod}$

## Modification coefficient $k_{mod}$

### Calculation values for modification coefficient $k_{mod}$

EC5; Tab. 3.1

| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | **Material** | **Standard** | **Use class** | **Load effect duration class** | | | | |
| | | | | **Constant effect** | **Long effect** | **Average effect** | **Short effect** | **Very short effect** |
| 2 | Solid wood | EN 14081-1 | 1 | 0.60 | 0.70 | 0.80 | 0.90 | 1.10 |
| 3 | | | 2 | 0.60 | 0.70 | 0.80 | 0.90 | 1.10 |
| 4 | | | 3 | 0.50 | 0.55 | 0.65 | 0.70 | 0.90 |
| 5 | Glued laminated timber | EN 14080 | 1 | 0.60 | 0.70 | 0.80 | 0.90 | 1.10 |
| 6 | | | 2 | 0.60 | 0.70 | 0.80 | 0.90 | 1.10 |
| 7 | | | 3 | 0.50 | 0.55 | 0.65 | 0.70 | 0.90 |
| 8 | Laminated veneer lumber (LVL) | EN 14374, EN 14279 | 1 | 0.60 | 0.70 | 0.80 | 0.90 | 1.10 |
| 9 | | | 2 | 0.60 | 0.70 | 0.80 | 0.90 | 1.10 |
| 10 | | | 3 | 0.50 | 0.55 | 0.65 | 0.70 | 0.90 |
| 11 | Plywood | EN 636 | | | | | | |
| 12 | | Type EN 636-1 | 1 | 0.60 | 0.70 | 0.80 | 0.90 | 1.10 |
| 13 | | Type EN 636-2 | 2 | 0.60 | 0.70 | 0.80 | 0.90 | 1.10 |
| 14 | | Type EN 636-3 | 3 | 0.50 | 0.55 | 0.65 | 0.70 | 0.90 |
| 15 | OSB | EN 300 | | | | | | |
| 16 | | OSB/2 | 1 | 0.30 | 0.45 | 0.65 | 0.85 | 1.10 |
| 17 | | OSB/3, OSB/4 | 1 | 0.40 | 0.50 | 0.70 | 0.90 | 1.10 |
| 18 | | OSB/3, OSB/4 | 2 | 0.30 | 0.40 | 0.55 | 0.70 | 0.90 |
| 19 | Particle board | EN 312 | | | | | | |
| 20 | | Type P4, Type P5 | 1 | 0.30 | 0.45 | 0.65 | 0.85 | 1.10 |
| 21 | | Type P5 | 2 | 0.20 | 0.30 | 0.45 | 0.60 | 0.80 |
| 22 | | Type P6, Type P7 | 1 | 0.40 | 0.50 | 0.70 | 0.90 | 1.10 |
| 23 | | Type P7 | 2 | 0.30 | 0.40 | 0.55 | 0.70 | 0.90 |
| 24 | Fibreboard, hard | EN 622-2 | | | | | | |
| 25 | | HB.LA, HB.HLA1 or 2 | 1 | 0.30 | 0.45 | 0.65 | 0.85 | 1.10 |
| 26 | | HB.HLA1 or 2 | 2 | 0.20 | 0.30 | 0.45 | 0.60 | 0.80 |
| 27 | Fibreboard, medium-hard | EN 622-3 | | | | | | |
| 28 | | MBH.LA1 or 2<br>MBH.HLS1 or 2 | 1<br>1 | 0.20<br>0.20 | 0.40<br>0.40 | 0.60<br>0.60 | 0.80<br>0.80 | 1.10<br>1.10 |
| 29 | | MBH.HLS1 or 2 | 2 | – | – | – | 0.45 | 0.80 |
| 30 | Fibreboard, MDF | EN 622-5 | | | | | | |
| 31 | | MDF.LA, MDF.HLS | 1 | 0.20 | 0.40 | 0.60 | 0.80 | 1.10 |
| 32 | | MDF.HLS | 2 | – | – | – | 0.45 | 0.80 |

For wood material connections, if the modification coefficients $k_{mod}$ of the two components joined together ($k_{mod,1}$ and $k_{mod,2}$), then the following value can be used for $k_{mod}$:

EC5; 2.3.2.1(2)

$$k_{mod} = \sqrt{k_{mod,1} \cdot k_{mod,2}}$$

NA; Gl. (NA.114)

## Modification coefficient $k_{mod}$

**Calculation values for modification coefficients $k_{mod}$ for wood, wood material and gypsum material**

NA; Tab. NA.4

| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | **Material** | **Standard** | **Use class** | **Load effect duration class** | | | | |
| | | | | **Constant effect** | **Long effect** | **Average effect** | **Short Effect** | **Very short effect** |
| 2 | Laminated timber, cross-laminated timber, solid wood boards | | 1 | 0.60 | 0.70 | 0.80 | 0.90 | 1.10 |
| 3 | | | 2 | 0.60 | 0.70 | 0.80 | 0.90 | 1.10 |
| 4 | Gypsum board (Types GKB[a], GKF[a], GKBI and GKFI), gypsum fibreboard | DIN 18180, DIN EN 15283-2 | 1 | 0.20 | 0.40 | 0.60 | 0.80 | 1.10 |
| 5 | | | 2 | 0.15 | 0.30 | 0.45 | 0.60 | 0.80 |
| 6 | Cement particle board | | 1 | 0.30 | 0.45 | 0.65 | 0.85 | 1.10 |
| 7 | | | 2 | 0.20 | 0.30 | 0.45 | 0.60 | 0.80 |
| 8 | [a] Only Use class 1: | | | | | | | |

## Safety factor coefficient $\gamma_M$ for the strength characteristic on the material side

**Safety factor coefficient $\gamma_M$ for the strength characteristics in constant and temporary measurement situations**

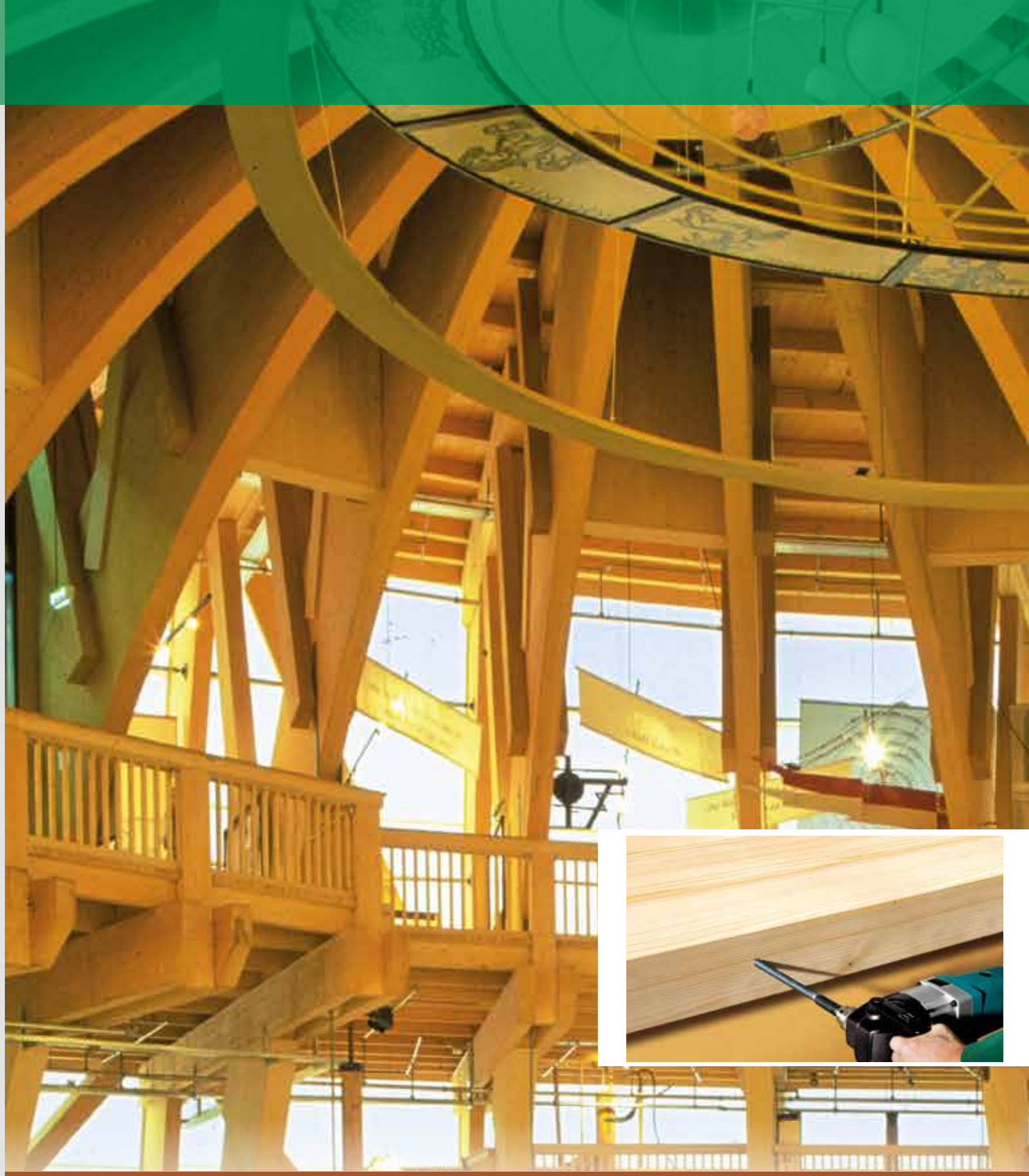
NA; Tab. NA.2 + NA.3

| | A | B |
|---|---|---|
| 1 | **Material** | $\gamma_M$ |
| 2 | Solid wood, particle board, hard fibreboard, medium-hard fibreboard, MDF fibreboard, soft fibreboard, laminated veneer lumber, plywood, OSB, glued laminated timber | 1.3 |
| 3 | Laminated timber, cross-laminated timber, solid wood boards, fibre-reinforced gypsum board, gypsum board, cement particle board | 1.3 |
| 4 | Steel in connections | |
| 5 | – Dowel-type connections subject to bending loads | 1.3 |
| 6 | – Parts subject to tensile or shearing loads when verifying the yield strength in the net cross section | 1.3 |
| 7 | – Verification of load-carrying capacity for boards with regard to nail plates | 1.25 |

For verification of steel parts, use the safety factor coefficients in DIN EN 1993 or the associated national appendices.

NA; 2.4.1

For exceptional measurement situations, apply safety factor coefficients $\gamma_M$ to 1.0.





SPAX-threaded rod

# **A better solution for transverse reinforcement** for large components made of glued laminated timber

## The alternative for transverse reinforcement
# SPAX threaded rod

The SPAX threaded rod is primarily used with large components (e.g. made of glued laminated timber) that require additional transverse reinforcement. The availability of long lengths up to 3,000 mm makes it an ideal product to replace glued-in metric threaded rods. Because they are less vulnerable to the negative influences of moisture and temperature change, the SPAX threaded rod is also suitable for later renovations on the construction site.

**For pre-drilling, the following drills having a diameter of 12 to 13 mm are recommendable:**

FAMAG, Remscheid: Auger BIT
WOODTEC FANKHAUSER,
CH-Vordemwald: Deep hole drill flushed with pressurised air

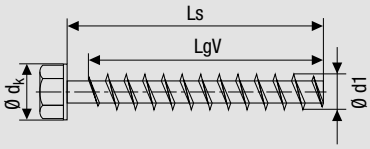
**The following machines are recommended for screwing-in:**

PROTOOL DRP 32-4,
BOSCH GBM 32-4,
FEIN angle screwing machine Mammut SCW 16-6,
MAKITA angle screwing machine DA 4301.

Shortening to desired length possible.

**Ideal accessory:**

SPAX-screw-sleeve, wrench size SW 11 for threaded rods without head



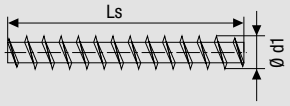

A2J

## SPAX-threaded rod

With hex head and shaft ring, synthetic coating

| Dimensions [mm] | | | | Packaging units | | SPAX-No. | EAN code |
|---|---|---|---|---|---|---|---|
| Thread-Ø d1 | Length total Ls** | Length full thread LgV | Widths across flats | Shaft ring [piece] | Pallet qty* | | |
| **16.0** Ø $d_K$ = 26 mm | 800 | | SW 22 | 25 | 500 | 35616000108011 | 4003530189067 |
| | 1,000 | | SW 22 | 25 | 500 | 35616000101011 | 4003530189074 |
| | 1,200 | Thread | SW 22 | 25 | 500 | 35616000102011 | 4003530189081 |
| | 1,400 | close | SW 22 | 25 | 500 | 35616000103011 | 4003530189098 |
| | 1,600 | to | SW 22 | 25 | 500 | 35616000104011 | 4003530189104 |
| | 1,800 | head | SW 22 | 25 | 300 | 35616000105011 | 4003530189111 |
| | 2,000 | | SW 22 | 25 | 300 | 35616000106011 | 4003530189128 |
| | 2,200 | | SW 22 | 25 | 300 | 35616000107011 | 4003530189135 |

* Dimensions 16 x 1,400 to 16 x 2,200 on special pallets ** Additional lengths on request




A2J

## SPAX-threaded rod

Without head, synthetic coating

| Dimensions [mm] | | Packaging units | | SPAX-No. | EAN code |
|---|---|---|---|---|---|
| Thread Ø d1 | Length total Ls** | Shaft ring [piece] | Pallet qty* | | |
| **16.0** | 3,000 | 10 | 100 | 35616000201011 | 4003530192821 |

** Additional lengths on request

# Construction accessories

**SPAX positioning guide for SPAX flat countersunk head and washer head 8 mm**

Practical screwing aid for rooftop insulation.

For use with SPAX 8 mm allowing precise and pinpoint fastening in the rafter (67° angle).

| | |
|---|---|
| SPAX-No. | 5001120800011 |
| EAN code | 4003530168956 |
| Packing unit | 1 piece in carton |

**SPAX screw-sleeve for threaded rods without head**

Screw-sleeve for SPAX-threaded rod.

For threaded rods without head. Wrench size SW11.

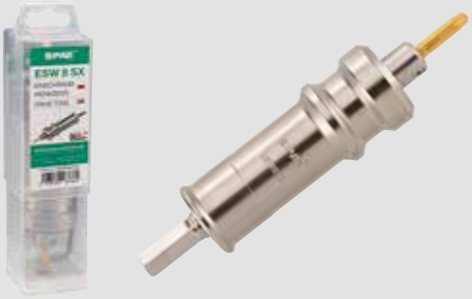
| | |
|---|---|
| SPAX-No. | 5001900900011 |
| EAN code | 4003530192845 |
| Packing unit | 1 piece in SPAX box |

**SPAX drive tool ESW 8 SX**

Maschinenaufnahme Sechskant SW 11

Suitable for SPAX countersunk head screw 8 mm and SPAX cylindrical head screws 8 mm.

| | |
|---|---|
| SPAX-No. | 5000940987329 |
| EAN code | 4003530267864 |
| Packing unit | 1 piece |



**SPAX drive tool ESW 10 SX**

Machine socket wrench hexagonal size 11

Suitable for SPAX countersunk head screw 10 mm and 12 mm.

| | |
|---|---|
| SPAX-No. | 5000940987339 |
| EAN code | 4003530267871 |
| Packing unit | 1 piece |


SPAX - Stainless steel

# **The wood construction product range** in stainless steel

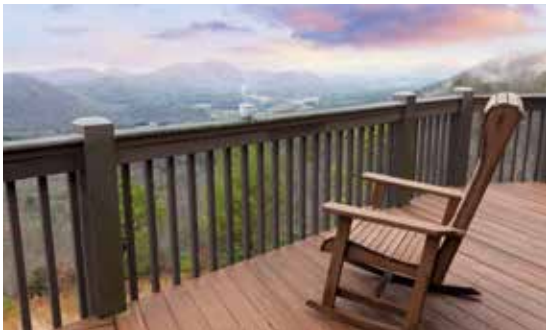
## Protection from corrosion in outdoor areas.
## **Stainless steel**

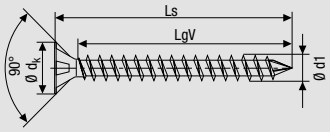
Galvanised protective coating is often not sufficient to protect steel screws from corrosion in outdoor areas for the long term. Rust is not only ugly, but it also costs money. In particular if the quality of expensive products or components is reduced and related damage occurs.

Expensive reworking and repairs are required. Rust can be prevented. SPAX stainless steel provides protection against corrosion!

**Advantages at a glance:**

- High-quality austenitic steel
- Provides protection against corrosion
- Particularly suited for use outdoors, on windows and doors, and in areas with moisture






A4
1.4578
AISI 316

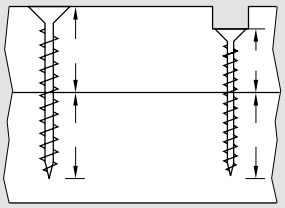
# Flat countersunk head, Partial thread, T-STAR *plus*

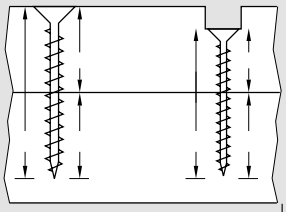
*MULTI-Head, 4CUT point,* slide-coated

13
DoP 1
ETA-12/0114

| Dimensions [mm] | | | | Packaging units | | | SPAX-No. | EAN code |
|---|---|---|---|---|---|---|---|---|
| Thread Ø d1 | Length total Ls | Length full thread LgV | BIT size T | SPAX BOX [pieces] | Master carton [pieces] | Pallet qty | | |
| **8.0** Ø $d_K$ = 15.1 mm | 100 | | 40 | 50 | 500 | 14,000 | 1208000801005 | 4003530292552 |
| | 120 | | 40 | 50 | 500 | 14,000 | 1208000801205 | 4003530292569 |
| | 140 | | 40 | 50 | 500 | 14,000 | 1208000801405 | 4003530292576 |
| | 160 | | 40 | 50 | 500 | 14,000 | 1208000801605 | 4003530292583 |
| | 180 | | 40 | 50 | 500 | 14,000 | 1208000801805 | 4003530244094 |
| | 200 | | 40 | 50 | 500 | 12,000 | 1208000802005 | 4003530292606 |
| | 220 | | 40 | 50 | 500 | 12,000 | 1208000802205 | 4003530292613 |
| | 240 | | 40 | 50 | – | 4,800 | 1208000802405 | 4003530292620 |
| | 260 | Thread | 40 | 50 | – | 4,800 | 1208000802605 | 4003530292637 |
| | 280 | close | 40 | 50 | – | 4,800 | 1208000802805 | 4003530292644 |
| | 300 | to | 40 | 50 | – | 4,800 | 1208000803005 | 4003530292651 |
| | 325 | head | 40 | 50 | – | 3,600 | 1208000803255 | 4003530292668 |
| | 350 | | 40 | 50 | – | 3,600 | 1208000803505 | 4003530186318 |
| | 375 | | 40 | 50 | – | 3,600 | 1208000803755 | 4003530292682 |
| | 400 | | 40 | 50 | – | 3,600 | 1208000804005 | 4003530292699 |
| **10.0** Ø $d_K$ = 18.6 mm | 160 | | 50 | 50 | 500 | 14,000 | 1208001001605 | 4003530182501 |
| | 200 | | 50 | 50 | 500 | 12,000 | 1208001002005 | 4003530182303 |
| | 220 | | 50 | 50 | 500 | 12,000 | 1208001002205 | 4003530182310 |
| | 240 | Thread | 50 | 50 | – | 4,800 | 1208001002405 | 4003530178689 |
| | 260 | close | 50 | 50 | – | 4,800 | 1208001002605 | 4003530182327 |
| | 280 | to | 50 | 50 | – | 4,800 | 1208001002805 | 4003530182334 |
| | 300 | head | 50 | 50 | – | 4,800 | 1208001003005 | 4003530182341 |
| | 350 | | 50 | 50 | – | 3,600 | 1208001003505 | 4003530182228 |
| | 400 | | 50 | 50 | – | 3,600 | 1208001004005 | 4003530182235 |
| **12.0** Ø $d_K$ = 18.6 mm | 400 | Thread | 50 | 25 | – | 1,800 | 1208001204005 | 4003530182242 |
| | 450 | close | 50 | 25 | – | 1,500 | 1208001204505 | 4003530182259 |
| | 500 | to | 50 | 25 | – | 1,500 | 1208001205005 | 4003530182266 |
| | 550 | head | 50 | 20 | – | 960 | 1208001205505 | 4003530182495 |

NEW




A4
1.4578
AISI 316

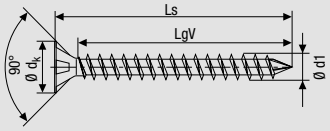
EDELSTAHL Rostfrei INOX STAINLESS STEEL

# Load-carrying capacity values $F_{v,Rk}$ for shear and $F_{ax,\alpha,Rk}$ for withdrawalforce

| Product | | | Wood-Wood (C24), $\alpha = 90°$ | | | | | | Sheet steel-Wood (C24), $\alpha = 90°$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dimensions [mm] | | | Shear | | | Withdrawal | | | Shear | | | Withdrawal | | |
| Thread Ø d1 | Length total Ls | Length full thread LgV | $t_1$ [mm] | $t_2$ [mm] | $F_{v,Rk}$ [N] | $t_1$ [mm] | $l_{ef}$ [mm] | $F_{ax,d1,k}$ [N/mm] | $t_1$ [mm] | $t_2$ [mm] | $F_{v,Rk}$ [N] | $t_1$ [mm] | $l_{ef}$ [mm] | $F_{ax,d1,k}$ [N/mm] |
| **8.0** Ø $d_K$ = 15.1 mm | 100 | | 50 | 50 | **3,286** | 50 | 50 | | 10 | 90 | **5,110** | 10 | 90 | **96.0** |
| | 120 | | 60 | 60 | **3,526** | 60 | 60 | | 10 | 110 | **5,590** | 10 | 110 | **N/mm** |
| | 140 | | 70 | 70 | **3,766** | 70 | 70 | **96.0** | 10 | 130 | **5,900** | 10 | 130 | **Max.** |
| | 160 | | 80 | 80 | **4,006** | 80 | 80 | **N/mm** | 10 | 150 | **5,900** | 10 | 150 | |
| | 180 | | 90 | 90 | **4,172** | 90 | 90 | **Max.** | 10 | 170 | **5,900** | 10 | 170 | $f_{ax,d1,k}$= |
| | 200 | | 100 | 100 | **4,172** | 100 | 100 | | 10 | 190 | **5,900** | 10 | 190 | |
| | 220 | | 110 | 110 | **4,172** | 110 | 110 | $f_{ax,d1,k}$= | 10 | 210 | **5,900** | 10 | 210 | **10.0 kN** |
| | 240 | | 120 | 120 | **4,172** | 120 | 120 | | 10 | 230 | **5,900** | 10 | 230 | |
| | 260 | Thread | 130 | 130 | **4,172** | 130 | 130 | **10.0 kN** | 10 | 250 | **5,900** | 10 | 250 | |
| | 280 | close | 140 | 140 | **4,172** | 140 | 140 | | 10 | 270 | **5,900** | 10 | 270 | |
| | 300 | to | 150 | 150 | **4,172** | 150 | 150 | | 10 | 290 | **5,900** | 10 | 290 | |
| | 325 | head | 162 | 162 | **4,172** | 162 | 162 | | 10 | 315 | **5,900** | 10 | 315 | |
| | 350 | | 175 | 175 | **4,172** | 175 | 175 | | 10 | 340 | **5,900** | | 340 | |
| | 375 | | 187 | 187 | **4,172** | 187 | 187 | | 10 | 365 | **5,900** | | 365 | |
| | 400 | | 200 | 200 | **4,172** | 200 | 200 | | 10 | 390 | **5,900** | | 390 | |
| **10.0** Ø $d_K$ = 18.6 mm | 160 | | 80 | 80 | **5,313** | 80 | 80 | | 10 | 150 | **8,521** | 10 | 150 | |
| | 200 | | 100 | 100 | **5,888** | 100 | 100 | **115.0** | 10 | 190 | **8,521** | 10 | 190 | **115.0** |
| | 220 | | 110 | 110 | **6,025** | 110 | 110 | **N/mm** | 10 | 210 | **8,521** | 10 | 210 | **N/mm** |
| | 240 | Thread | 120 | 120 | **6,025** | 120 | 120 | | 10 | 230 | **8,521** | 10 | 230 | |
| | 260 | close | 130 | 130 | **6,025** | 130 | 130 | **Max.** | 10 | 250 | **8,521** | 10 | 250 | **Max.** |
| | 280 | to | 140 | 140 | **6,025** | 140 | 140 | $f_{tens,d}$ = | 10 | 270 | **8,521** | 10 | 270 | $f_{tens,d}$ = |
| | 300 | head | 150 | 150 | **6,025** | 150 | 150 | **15,385 N** | 10 | 290 | **8,521** | 10 | 290 | **15,385 N** |
| | 350 | | 175 | 175 | **6,025** | 175 | 175 | | 10 | 340 | **8,521** | 10 | 340 | |
| | 400 | | 200 | 200 | **6,025** | 200 | 200 | | 10 | 390 | **8,521** | 10 | 390 | |
| **12.0** Ø $d_K$ = 18.6 mm | 400 | | 200 | 200 | **8,140** | 200 | 200 | **132.0** | 12 | 388 | **11,512** | 12 | 388 | **132.0** |
| | 450 | | 225 | 225 | **8,140** | 225 | 225 | **N/mm** | 12 | 438 | **11,512** | 12 | 438 | **N/mm** |
| | 500 | | 250 | 250 | **8,140** | 250 | 250 | | 12 | 488 | **11,512** | 12 | 488 | |
| | 550 | | 275 | 275 | **8,140** | 275 | 275 | **Max.** | 12 | 538 | **11,512** | 12 | 538 | **Max.** |
| | | | | | | | | $f_{tens,d}$ = | | | | | | $f_{tens,d}$ = |
| | | | | | | | | **21,538 N** | | | | | | **21,538 N** |

Multiply the value $f_{axw,d1,k}$ with the effective thread length ($l_{ef}$, $l_{ef,k}$) in the respective wood component. Lower as appropriate for angle $\alpha < 90°$.
The design value for thread load-carrying capacity must not exceed the design value for steel load-carrying capacity $f_{tens,d}$.

For more information regarding measurement and design, see the SPAX design information at https://oxomi.com/p/3002034




A2
1.4567
AISI 304

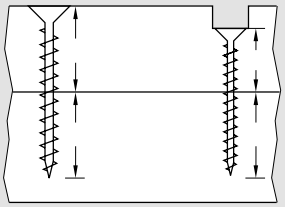
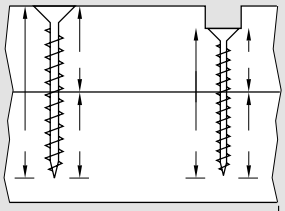
# Flat countersunk head, Full thread, T-STAR *plus*

*MULTI Head, CUT point,* slide-coated

13
DoP 1
ETA-12/0114

| Dimensions [mm] | | | | Packaging units | | | SPAX-No. | EAN code |
|---|---|---|---|---|---|---|---|---|
| Thread Ø d1 | Length total Ls | Length full thread LgV | BIT size T | SPAX BOX [pieces] | Master carton [pieces] | Pallet qty | | |
| **8.0** Ø $d_K$ = 15.1 mm | 100 | | 40 | 50 | 500 | 14,000 | 1207000801005 | 4003530292408 |
| | 120 | | 40 | 50 | 500 | 14,000 | 1207000801205 | 4003530292415 |
| | 140 | | 40 | 50 | 500 | 14,000 | 1207000801405 | 4003530292422 |
| | 160 | | 40 | 50 | 500 | 14,000 | 1207000801605 | 4003530292439 |
| | 180 | Thread | 40 | 50 | 500 | 14,000 | 1207000801805 | 4003530292446 |
| | 200 | close | 40 | 50 | 500 | 12,000 | 1207000802005 | 4003530292453 |
| | 220 | to | 40 | 50 | 500 | 12,000 | 1207000802205 | 4003530292460 |
| | 240 | head | 40 | 50 | – | 4,800 | 1207000802405 | 4003530292477 |
| | 260 | | 40 | 50 | – | 4,800 | 1207000802605 | 4003530292484 |
| | 280 | | 40 | 50 | – | 4,800 | 1207000802805 | 4003530292491 |
| | 300 | | 40 | 50 | – | 4,800 | 1207000803005 | 4003530292507 |
| | 325 | | 40 | 50 | – | 3,600 | 1207000803255 | 4003530292514 |
| | 350 | | 40 | 50 | – | 3,600 | 1207000803505 | 4003530292521 |
| | 375 | | 40 | 50 | – | 3,600 | 1207000803755 | 4003530292538 |
| | 400 | | 40 | 50 | – | 3,600 | 1207000804005 | 4003530292545 |

NEW

Shear  Withdrawal 

A2 1.4567 AISI 304

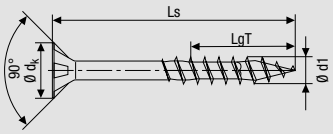
Rostfrei

# Load-carrying capacity values $F_{v,Rk}$ for shear and $F_{ax,\alpha,Rk}$ for withdrawal

| Product | | | Wood-Wood (C24), $\alpha = 90°$ | | | | | | Sheet steel-Wood (C24), $\alpha = 90°$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dimensions [mm] | | | Shear | | | Withdrawal | | | Shear | | | Withdrawal | | |
| Thread Ø d1 | Length total Ls | Length full thread LgV | $t_1$ [mm] | $t_2$ [mm] | **$F_{v,Rk}$ [N]** | $t_1$ [mm] | $l_{ef}$ [mm] | **$F_{ax,d1,k}$ [N/mm]** | $t_1$ [mm] | $t_2$ [mm] | **$F_{v,Rk}$ [N]** | $t_1$ [mm] | $l_{ef}$ [mm] | **$F_{ax,d1,k}$ [N/mm]** |
| **8.0** Ø $d_k$ = 15.1 mm | 100 | | 50 | 50 | **3,286** | 50 | 50 | | 10 | 90 | **5,110** | 10 | 90 | **96.0** |
| | 120 | | 60 | 60 | **3,526** | 60 | 60 | | 10 | 110 | **5,590** | 10 | 110 | **N/mm** |
| | 140 | | 70 | 70 | **3,766** | 70 | 70 | **96.0** | 10 | 130 | **5,900** | 10 | 130 | **Max.** |
| | 160 | | 80 | 80 | **4,006** | 80 | 80 | **N/mm** | 10 | 150 | **5,900** | 10 | 150 | |
| | 180 | Thread | 90 | 90 | **4,172** | 90 | 90 | **Max.** | 10 | 170 | **5,900** | 10 | 170 | **$f_{ax,d1,k}$=** |
| | 200 | close | 100 | 100 | **4,172** | 100 | 100 | | 10 | 190 | **5,900** | 10 | 190 | |
| | 220 | to | 110 | 110 | **4,172** | 110 | 110 | **$f_{ax,d1,k}$=** | 10 | 210 | **5,900** | 10 | 210 | **10.0 kN** |
| | 240 | head | 120 | 120 | **4,172** | 120 | 120 | | 10 | 230 | **5,900** | 10 | 230 | |
| | 260 | | 130 | 130 | **4,172** | 130 | 130 | **10.0 kN** | 10 | 250 | **5,900** | 10 | 250 | |
| | 280 | | 140 | 140 | **4,172** | 140 | 140 | | 10 | 270 | **5,900** | 10 | 270 | |
| | 300 | | 150 | 150 | **4,172** | 150 | 150 | | 10 | 290 | **5,900** | 10 | 290 | |
| | 325 | | 162 | 162 | **4,172** | 162 | 162 | | 10 | 315 | **5,900** | 10 | 315 | |
| | 350 | | 175 | 175 | **4,172** | 175 | 175 | | 10 | 340 | **5,900** | 10 | 340 | |
| | 375 | | 187 | 187 | **4,172** | 187 | 187 | | 10 | 365 | **5,900** | 10 | 365 | |
| | 400 | | 200 | 200 | **4,172** | 200 | 200 | | 10 | 390 | **5,900** | 10 | 390 | |

Multiply the value $f_{axw,d1,k}$ with the effective thread length ($l_{ef}$, $l_{ef,k}$) in the respective wood component. Lower as appropriate for angle $\alpha < 90°$.
The design value for thread load-carrying capacity must not exceed the design value for steel load-carrying capacity $f_{tens,d}$.

For more information regarding measurement and design, see the SPAX design information at https://oxomi.com/p/3002034




A2
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AISI 304

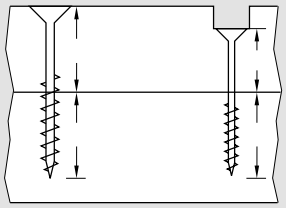
# Flat countersunk head, Partial thread, T-STAR *plus*

*MULTI-Head, 4CUT point,* slide-coated

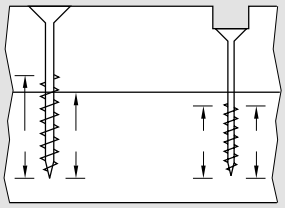
13
DoP 1
ETA-12/0114

| Dimensions [mm] | | | | Packaging units | | | SPAX-No. | EAN code |
|---|---|---|---|---|---|---|---|---|
| Thread Ø d1 | Length total Ls | Length partial th-read LgV | BIT size T | SPAX BOX [pieces] | Master carton [pieces] | Pallet qty | | |
| **6.0** Ø $d_k$ = 11.6 mm | 100 | 61 | 30 | 100 | 1,000 | 32,000 | 0197000601003 | 4003530092022 |
| | 120 | 68 | 30 | 100 | 1,000 | 28,000 | 0197000601203 | 4003530097775 |
| | 140 | 68 | 30 | 100 | 1,000 | 28,000 | 0197000601403 | 4003530097782 |
| | 160 | 65 | 30 | 100 | 1,000 | 28,000 | 0197000601603 | 4003530098727 |
| **8.0** Dia. $d_k$ = 15.1 mm | 80 | 47 | 40 | 50 | 500 | 14,000 | 0197000800805 | 4003530257292 |
| | 100 | 57 | 40 | 50 | 500 | 14,000 | 0197000801005 | 4003530257308 |
| | 120 | 70 | 40 | 50 | 500 | 14,000 | 0197000801205 | 4003530257315 |
| | 140 | 80 | 40 | 50 | 500 | 14,000 | 0197000801405 | 4003530257322 |
| | 160 | 80 | 40 | 50 | 500 | 14,000 | 0197000801605 | 4003530257339 |
| | 180 | 80 | 40 | 50 | 500 | 14,000 | 0197000801805 | 4003530257346 |
| | 200 | 80 | 40 | 50 | 500 | 12,000 | 0197000802005 | 4003530257353 |
| | 220 | 80 | 40 | 50 | 500 | 12,000 | 0197000802205 | 4003530257360 |
| | 240 | 80 | 40 | 50 | – | 4,800 | 0197000802405 | 4003530257377 |
| | 260 | 80 | 40 | 50 | – | 4,800 | 0197000802605 | 4003530257384 |
| | 280 | 80 | 40 | 50 | – | 4,800 | 0197000802805 | 4003530257391 |
| | 300 | 80 | 40 | 50 | – | 4,800 | 0197000803005 | 4003530257407 |

Shear



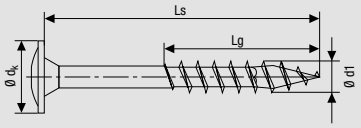
Withdrawal



## Load-carrying capacity values $F_{v,Rk}$ for shear and $F_{ax,\alpha,Rk}$ for withdrawal

| Product | | | Wood-Wood (C24), $\alpha = 90°$ | | | | | | Sheet steel-Wood (C24), $\alpha = 90°$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dimensions [mm] | | | Shear | | | Withdrawal | | | Shear | | | Withdrawal | | |
| Thread Ø d1 | Length total Ls | Length partial thread LgV | $t_1$ [mm] | $t_2$ [mm] | **$F_{v,Rk}$ [N]** | $t_1$ [mm] | $l_{ef}$ [mm] | **$F_{ax,d1,k}$ [N/mm]** | $t_1$ [mm] | $t_2$ [mm] | **$F_{v,Rk}$ [N]** | $t_1$ [mm] | $l_{ef}$ [mm] | **$F_{ax,d1,k}$ [N/mm]** |
| **6.0** Ø $d_K$ = 11.6 mm | 100 | 61 | 39 | 61 | **2,687** | 39 | 61 | **2,072** | 6 | 94 | **2,930** | 6 | 61 | **4,392** |
| | 120 | 68 | 52 | 68 | **2,813** | 52 | 68 | **2,072** | 6 | 114 | **3,060** | 6 | 68 | **4,896** |
| | 140 | 68 | 72 | 68 | **2,813** | 72 | 68 | **2,072** | 6 | 134 | **3,060** | 6 | 68 | **4,896** |
| | 160 | 65 | 95 | 65 | **2,759** | 95 | 65 | **2,072** | 6 | 154 | **3,010** | 6 | 65 | **4,680** |
| **8.0** Ø $d_K$ = 15.1 mm | 80 | 70 | 30 | 50 | **2,402** | 30 | 47 | **2,713** | 10 | 70 | **4,078** | 10 | 47 | **4,512** |
| | 100 | 57 | 40 | 60 | **2,736** | 40 | 57 | **2,713** | 10 | 90 | **4,318** | 10 | 57 | **5,472** |
| | 120 | 70 | 50 | 70 | **2,968** | 50 | 70 | **3,527** | 10 | 110 | **4,630** | 10 | 70 | **6,720** |
| | 140 | 80 | 60 | 80 | **2,968** | 60 | 80 | **3,527** | 10 | 130 | **4,870** | 10 | 80 | **7,680** |
| | 160 | 80 | 80 | 80 | **2,968** | 80 | 80 | **3,527** | 10 | 150 | **4,870** | 10 | 80 | **7,680** |
| | 180 | 80 | 100 | 80 | **2,968** | 100 | 80 | **3,527** | 10 | 170 | **4,870** | 10 | 80 | **7,680** |
| | 200 | 80 | 120 | 80 | **2,968** | 120 | 80 | **3,527** | 10 | 190 | **4,870** | 10 | 80 | **7,680** |
| | 220 | 80 | 140 | 80 | **2,968** | 140 | 80 | **3,527** | 10 | 210 | **4,870** | 10 | 80 | **7,680** |
| | 240 | 80 | 160 | 80 | **2,968** | 160 | 80 | **3,527** | 10 | 230 | **4,870** | 10 | 80 | **7,680** |
| | 260 | 80 | 180 | 80 | **2,968** | 180 | 80 | **3,527** | 10 | 260 | **4,870** | 10 | 80 | **7,680** |
| | 280 | 80 | 200 | 80 | **2,968** | 200 | 80 | **3,527** | 10 | 270 | **4,870** | 10 | 80 | **7,680** |
| | 300 | 80 | 220 | 80 | **2,968** | 220 | 80 | **3,527** | 10 | 290 | **4,870** | 10 | 80 | **7,680** |

Multiply the value$_{fax,d1,k}$ by the effective thread length ($_{lef}$,$_{lef}$, k) in the relevant wood component. Reduce accordingly for angles $\alpha$ <90°. The design value of the thread load-bearing capacity must not exceed the design value of the steel load-bearing capacity ftens $_{,d}$For further information on the design and implementation rules, see SPAX design information at https://oxomi.com/p/3002034

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Rost frei

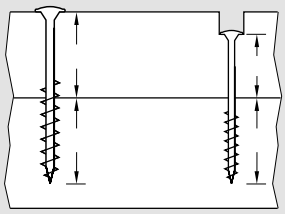
# Washer head, Partial thread, T-STAR *plus*

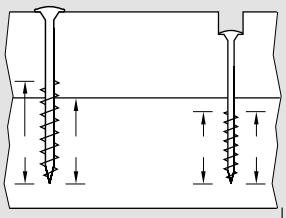
*4CUT,* slide-coated

| Dimensions [mm] | | | | | Packaging units | | | SPAX-No. | EAN code |
|---|---|---|---|---|---|---|---|---|---|
| Thread-Ø d1 | Length total Ls | Length thread Lg | | BIT size T | SPAX BOX [pieces] | Master carton [pieces] | Pallet qty | | |
| **6.0** Ø $d_K$ = 13,6 mm | 60 | 56 | ■ | 30 | 100 | 1,000 | 32,000 | 0257000600605 | 4003530183027 |
| | 80 | 61 | ■ | 30 | 100 | 1,000 | 28,000 | 0257000600805 | 4003530183034 |
| | 100 | 61 | ❑ | 30 | 100 | 1,000 | 32,000 | 0257000601005 | 4003530183041 |
| | 120 | 68 | ❑ | 30 | 100 | 1,000 | 28,000 | 0257000601205 | 4003530183058 |
| | 140 | 68 | ❑ | 30 | 100 | 1,000 | 28,000 | 0257000601405 | 4003530183065 |
| **8.0** Ø $d_K$ = 20 mm | 50 | 46 | ■ | 40 | 50 | 500 | 14,000 | 0257000800505 | 4003530182815 |
| | 60 | 56 | ■ | 40 | 50 | 500 | 14,000 | 0257000800605 | 4003530182839 |
| | 80 | 70 | ■ | 40 | 50 | 500 | 14,000 | 0257000800805 | 4003530176760 |
| | 100 | 80 | ■ | 40 | 50 | 500 | 14,000 | 0257000801005 | 4003530177880 |
| | 120 | 80 | ■ | 40 | 50 | 500 | 14,000 | 0257000801205 | 4003530177897 |
| | 140 | 80 | ❑ | 40 | 50 | 500 | 14,000 | 0257000801405 | 4003530177903 |
| | 160 | 80 | ❑ | 40 | 50 | 500 | 14,000 | 0257000801605 | 4003530177910 |
| | 180 | 80 | ❑ | 40 | 50 | 500 | 14,000 | 0257000801805 | 4003530182143 |
| | 200 | 80 | ❑ | 40 | 50 | 500 | 12,000 | 0257000802005 | 4003530182181 |
| | 220 | 80 | ❑ | 40 | 50 | 500 | 12000 | 0257000802205 | 4003530257414 |
| | 240 | 80 | ❑ | 40 | 50 | – | 4800 | 0257000802405 | 4003530257421 |
| | 260 | 80 | ❑ | 40 | 50 | – | 4800 | 0257000802605 | 4003530257438 |
| | 280 | 80 | ❑ | 40 | 50 | – | 4800 | 0257000802805 | 4003530257445 |
| | 300 | 80 | ❑ | 40 | 50 | – | 4800 | 0257000803005 | 4003530257452 |

■ T-STAR *plus,* Full thread ❑ T-STAR *plus,* Partial thread

Practical positioning guide for rooftop insulation flat countersunk head 8 mm with partial thread, see page 57

Shear 

Withdrawal 

## Load-carrying capacity values $F_{v,Rk}$ for shear and $F_{ax,\alpha,Rk}$ for withdrawal

| Product | | | | Wood-Wood (C24), $\alpha = 90°$ | | | | | | Sheet steel-Wood (C24), $\alpha = 90°$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dimensions [mm] | | | | Shear | | | Withdrawal | | | Shear | | | Withdrawal | | |
| Thread-Ø d1 | Length total Ls | Length thread Lg | | $t_1$ [mm] | $t_2$ [mm] | **$F_{v,Rk}$ [N]** | $t_1$ [mm] | $l_{ef}$ [mm] | **$F_{ax,\alpha,Rk}$ [N]** | $t_1$ [mm] | $t_2$ [mm] | **$F_{v,Rk}$ [N]** | $t_1$ [mm] | $l_{ef}$ [mm] | **$F_{ax,\alpha,Rk}$ [N]** |
| **6.0** Ø $d_K$ = 13,6 mm | 60 | 56 | ■ | 24 | 36 | **1,946** | 24 | 36 | **2,592** | 6 | 54 | **2,806** | 4 | 56 | **4,032** |
| | 80 | 61 | ■ | 32 | 48 | **2,010** | 24 | 56 | **2,848** | 6 | 74 | **2,932** | 4 | 61 | **4,392** |
| | 100 | 61 | ❑ | 40 | 60 | **2,010** | 41 | 59 | **2,848** | 6 | 94 | **2,932** | 4 | 61 | **4,392** |
| | 120 | 68 | ❑ | 50 | 70 | **2,222** | 52 | 68 | **2,848** | 6 | 114 | **3,058** | 4 | 68 | **4,896** |
| | 140 | 68 | ❑ | 70 | 70 | **2,222** | 72 | 68 | **2,848** | 6 | 134 | **3,058** | 4 | 68 | **4,896** |
| **8.0** Ø $d_K$ = 20 mm | 50 | 46 | ■ | | | | | | | 4 | 46 | **2,260** | 4 | 46 | **2,268** |
| | 60 | 56 | ■ | | | | | | | 4 | 56 | **2,760** | 4 | 56 | **5,376** |
| | 80 | 70 | ■ | 30 | 50 | **2,924** | 30 | 50 | **4,800** | 6 | 74 | **4,144** | 6 | 70 | **6,720** |
| | 100 | 80 | ■ | 40 | 60 | **3,357** | 40 | 60 | **5,200** | 10 | 90 | **4,868** | 10 | 80 | **7,680** |
| | 120 | 80 | ■ | 50 | 70 | **3,385** | 50 | 70 | **5,200** | 10 | 110 | **4,868** | 10 | 80 | **7,680** |
| | 140 | 80 | ❑ | 60 | 80 | **3,775** | 60 | 80 | **6,760** | 10 | 130 | **4,868** | 10 | 80 | **7,680** |
| | 160 | 80 | ❑ | 80 | 80 | **3,775** | 80 | 80 | **6,760** | 10 | 150 | **4,868** | 10 | 80 | **7,680** |
| | 180 | 80 | ❑ | 100 | 80 | **3,775** | 100 | 80 | **6,760** | 10 | 170 | **4,868** | 10 | 80 | **7,680** |
| | 200 | 80 | ❑ | 120 | 80 | **3,775** | 120 | 80 | **6,760** | 10 | 190 | **4,868** | 10 | 80 | **7,680** |
| | 220 | 80 | ❑ | 140 | 80 | **3,775** | 140 | 80 | **6,760** | 10 | 210 | **4,868** | 10 | 80 | **7,680** |
| | 240 | 80 | ❑ | 160 | 80 | **3,775** | 160 | 80 | **6,760** | 10 | 230 | **4,868** | 10 | 80 | **7,680** |
| | 260 | 80 | ❑ | 180 | 80 | **3,775** | 180 | 80 | **6,760** | 10 | 250 | **4,868** | 10 | 80 | **7,680** |
| | 280 | 80 | ❑ | 200 | 80 | **3,775** | 200 | 80 | **6,760** | 10 | 270 | **4,868** | 10 | 80 | **7,680** |
| | 300 | 80 | ❑ | 220 | 80 | **3,775** | 220 | 80 | **6,760** | 10 | 290 | **4,868** | 10 | 80 | **7,680** |

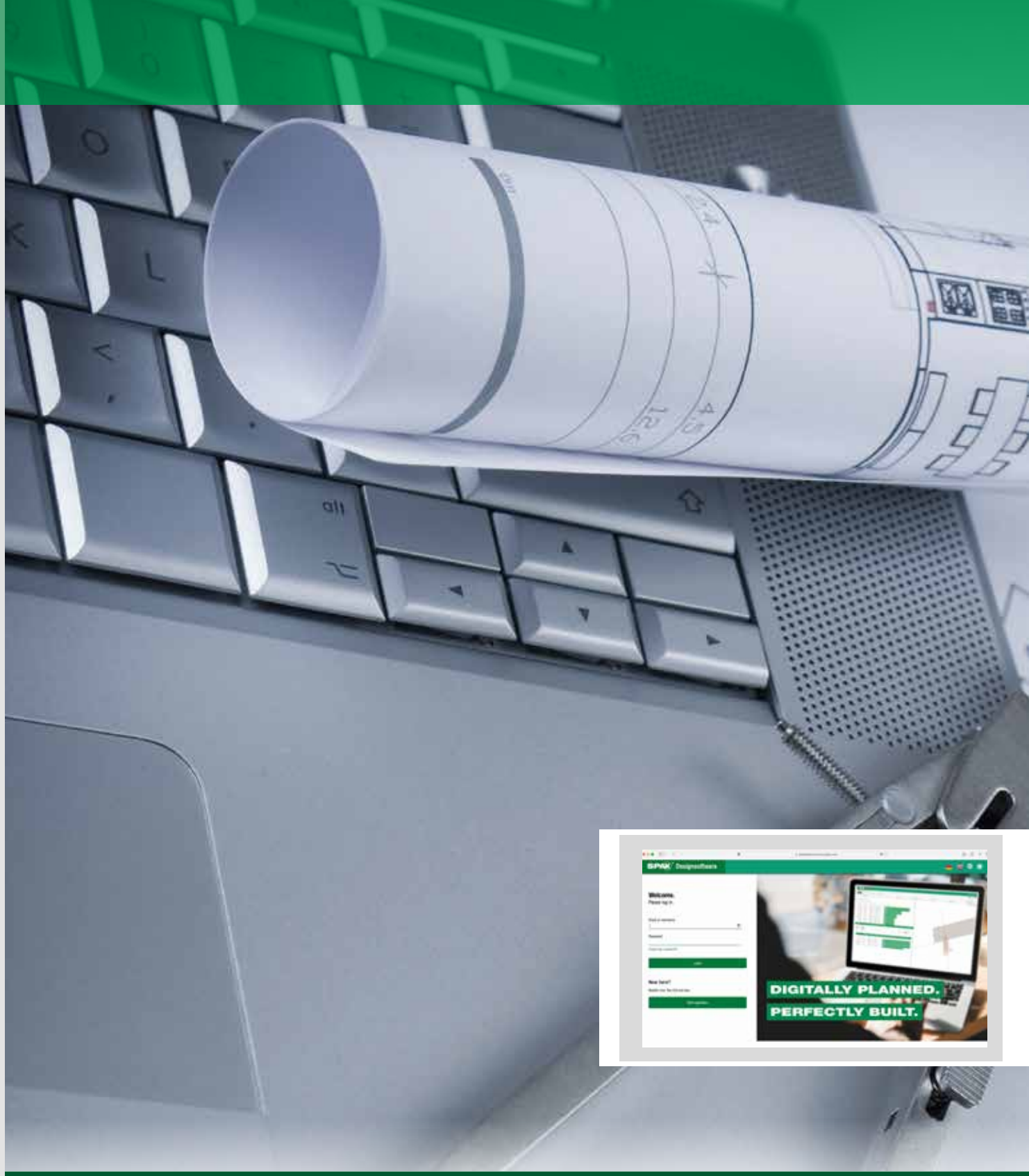
$F_{v,Rk}$ = Characteristic value for lateral load-carrying capacity per shear joint and connector under lateral load (shearing off), including $\Delta R_k$ increase in the characteristic value for load-carrying capacity $R_k$ proportionately by $\Delta R_k$ (hanging or rope effect)

$F_{ax,\alpha,Rk}$ = Characteristic value for axial load-carrying capacity per connector (withdrawal)

Wood (C24) = Characteristic density (ρ) k = 350 kg/m³

The characteristic values of the load-bearing capacity determined in each case must be reduced to the design values by means of the partial safety coefficients (ϒM) and modification coefficient (k mod). The partial safety factor (ϒM) is = 1.3. The modification coefficient kmod considers the influence of the service class (NKL) and the class of the shear forces duration (KLED) on the strength properties of the wood or the wood-based products.

For more information regarding measurement and design, see the SPAX design information at https://oxomi.com/p/3002034




SPAX Design Software

# **Planning and design**
of selected connections and reinforcements

## SPAX Design Software

### Connections and reinforcements in wood constructions

SPAX Design Software is an online solution that is compatible with the most common browsers such as Microsoft Internet Explorer, Google Chrome, Mozilla Firefox, Apple Safari, etc. The software does not require JAVA! With SPAX Design Software you always have access to the most current version and you don't need to download any applications.

You can save your project files on the SPAX server – similar to a cloud. This means that you can access your projects regardless of your location. Of course, you can also save them on your mobile device.

Several calculations can be organised in one managed project. You can quickly find your calculations with the search function.

Four languages are available in the SPAX Design Software: German, English, French and Spanish

Use also the SPAX calculation software timber construction according to EC5 + ETA for the calculation of your projects under:
**https://holzbauberechnung.spax.com**

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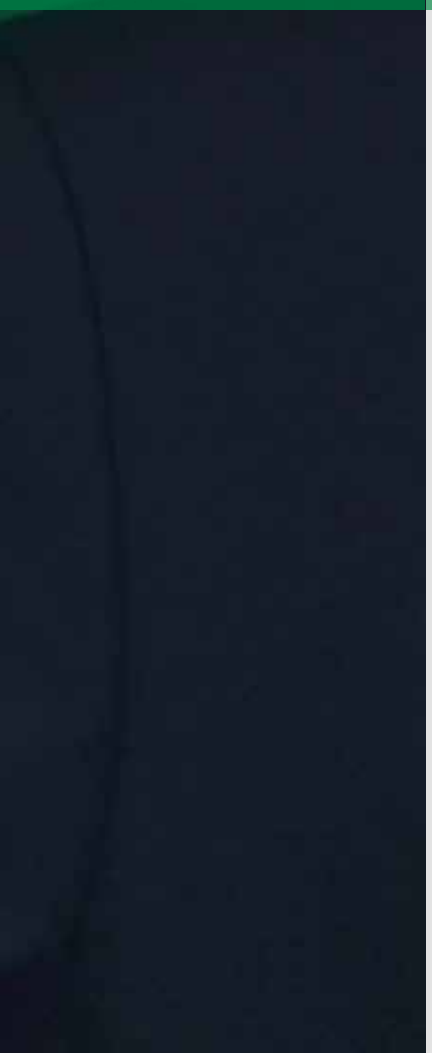
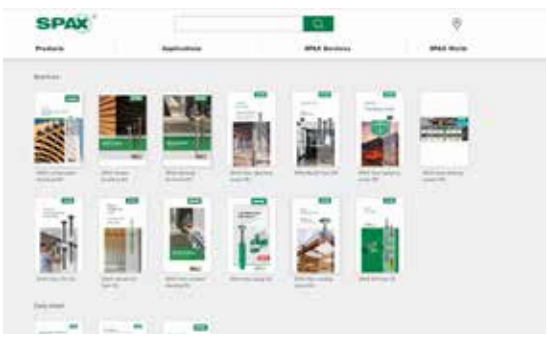
is available for download in several languages



## The SPAX download portal
with additional product information

In the SPAX download portal you will find extensive technical information about our products,
**e.g. declarations of performance (DoP), approvals, certificates, SPAX Design Software, etc.**

**https://oxomi.com/p/3002034**



SPAX Downloadportal

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