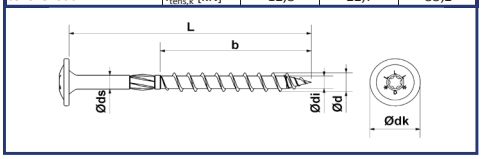
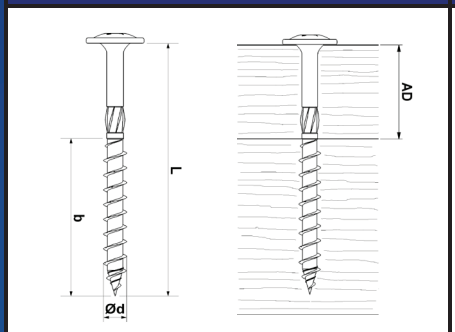
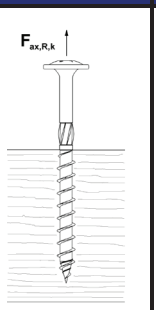
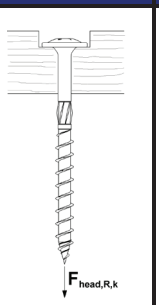
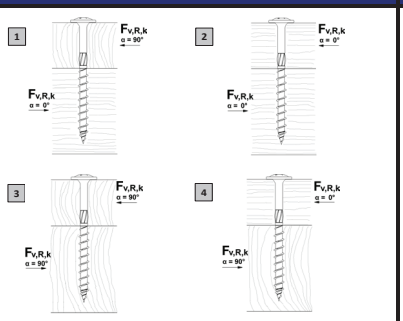
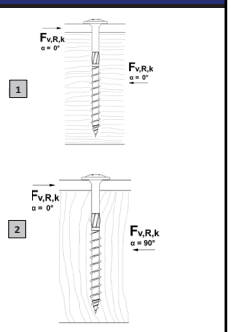
Star Drive GPR®
Washer head

schmid schrauben hainfeld

nominal diameter	d [mm]	6,0	8,0	10,0
head diameter	dk [mm]	14,0	20,0	25,0
core diameter	di [mm]	4,0	5,3	6,2
shaft diameter	ds [mm]	4,3	5,9	7,1
drive	TX	30	40	50
tensile load	$f_{tens,k}$ [kN]	12,8	22,7	33,2



dimensions				extraction resistance		head traction resistance		wood-wood shearing					steel-wood shearing		
															
d x L [mm]	b [mm]	AD [mm]	dk [mm]	zul. N_z [kN]	$F_{ax,R,k}$ [kN]	zul. $N_{z,Kopf}$ [kN]	$F_{head,R,k}$ [kN]	zul. N [kN] α=0°...90°	1. $F_{v,R,k}$ [kN] α_{AD}=90° α_{ET}=0°	2. $F_{v,R,k}$ [kN] α=0°	3. $F_{v,R,k}$ [kN] α=90°	4. $F_{v,R,k}$ [kN] α_{AD}=0° α_{ET}=90°	zul. N [kN] α=0°...90°	1. $F_{v,R,k}$ [kN] α=0°	2. $F_{v,R,k}$ [kN] α=90°
Ø 6,0															
6,0 x 60	36	24	14	1,08	2,81	0,98	3,27	0,61	1,94	1,94	1,94	1,94	0,77	3,02	3,02
6,0 x 80	48	32	14	1,44	3,74	0,98	3,27	0,61	2,26	2,26	2,26	2,26	0,77	3,25	3,25
6,0 x 100	48	52	14	1,44	3,74	0,98	3,27	0,61	2,46	2,46	2,46	2,46	0,77	3,57	3,57
6,0 x 120	64	56	14	1,92	4,99	0,98	3,27	0,61	2,46	2,46	2,46	2,46	0,77	3,57	3,57
6,0 x 140	64	76	14	1,92	4,99	0,98	3,27	0,61	2,46	2,46	2,46	2,46	0,77	3,57	3,57
6,0 x 160	64	96	14	1,92	4,99	0,98	3,27	0,61	2,46	2,46	2,46	2,46	0,77	3,57	3,57
6,0 x 180	64	116	14	1,92	4,99	0,98	3,27	0,61	2,46	2,46	2,46	2,46	0,77	3,57	3,57
6,0 x 200	64	136	14	1,92	4,99	0,98	3,27	0,61	2,46	2,46	2,46	2,46	0,77	3,57	3,57
Ø 8,0															
8,0 x 80	54	26	20	2,16	4,62	2,00	7,04	a)	a)	a)	a)	a)	1,36	6,18	5,30
8,0 x 100	54	46	20	2,16	4,62	2,00	7,04	1,10	4,14	4,71	3,96	4,35	1,36	6,18	5,30
8,0 x 120	54	66	20	2,16	4,62	2,00	7,04	1,10	4,35	4,71	4,09	4,35	1,36	6,18	5,30
8,0 x 140	84	56	20	3,36	7,19	2,00	7,04	1,10	4,96	5,31	4,69	4,96	1,36	6,82	5,94
8,0 x 160	84	76	20	3,36	7,19	2,00	7,04	1,10	4,96	5,31	4,69	4,96	1,36	6,82	5,94
8,0 x 180	100	80	20	4,00	8,56	2,00	7,04	1,10	4,96	5,31	4,69	4,96	1,36	7,17	6,28
8,0 x 200	100	100	20	4,00	8,56	2,00	7,04	1,10	4,96	5,31	4,69	4,96	1,36	7,17	6,28
8,0 x 220	100	120	20	4,00	8,56	2,00	7,04	1,10	4,96	5,31	4,69	4,96	1,36	7,17	6,28
8,0 x 240	100	140	20	4,00	8,56	2,00	7,04	1,10	4,96	5,31	4,69	4,96	1,36	7,17	6,28
8,0 x 260	100	160	20	4,00	8,56	2,00	7,04	1,10	4,96	5,31	4,69	4,96	1,36	7,17	6,28
8,0 x 280	100	180	20	4,00	8,56	2,00	7,04	1,10	4,96	5,31	4,69	4,96	1,36	7,17	6,28
8,0 x 300	100	200	20	4,00	8,56	2,00	7,04	1,10	4,96	5,31	4,69	4,96	1,36	7,17	6,28
8,0 x 320	100	220	20	4,00	8,56	2,00	7,04	1,10	4,96	5,31	4,69	4,96	1,36	7,17	6,28
8,0 x 340	100	240	20	4,00	8,56	2,00	7,04	1,10	4,96	5,31	4,69	4,96	1,36	7,17	6,28
8,0 x 360	100	260	20	4,00	8,56	2,00	7,04	1,10	4,96	5,31	4,69	4,96	1,36	7,17	6,28
8,0 x 380	100	280	20	4,00	8,56	2,00	7,04	1,10	4,96	5,31	4,69	4,96	1,36	7,17	6,28
8,0 x 400	100	300	20	4,00	8,56	2,00	7,04	1,10	4,96	5,31	4,69	4,96	1,36	7,17	6,28
Ø 10,0															
10,0 x 100	60	40	25	3,00	5,70	3,13	9,50	1,60	4,86	5,86	4,64	5,51	2,13	8,14	6,91
10,0 x 120	60	60	25	3,00	5,70	3,13	9,50	1,70	5,67	6,17	5,30	5,67	2,13	8,14	6,91
10,0 x 140	60	80	25	3,00	5,70	3,13	9,50	1,70	5,67	6,17	5,30	5,67	2,13	8,14	6,91
10,0 x 160	100	60	25	5,00	9,50	3,13	9,50	1,70	6,62	7,12	6,25	6,62	2,13	9,09	7,86
10,0 x 180	100	80	25	5,00	9,50	3,13	9,50	1,70	6,62	7,12	6,25	6,62	2,13	9,09	7,86
10,0 x 200	100	100	25	5,00	9,50	3,13	9,50	1,70	6,62	7,12	6,25	6,62	2,13	9,09	7,86
10,0 x 220	100	120	25	5,00	9,50	3,13	9,50	1,70	6,62	7,12	6,25	6,62	2,13	9,09	7,86
10,0 x 240	100	140	25	5,00	9,50	3,13	9,50	1,70	6,62	7,12	6,25	6,62	2,13	9,09	7,86
10,0 x 260	100	160	25	5,00	9,50	3,13	9,50	1,70	6,62	7,12	6,25	6,62	2,13	9,09	7,86

ASTRA TRADE | ul. Rydlówka 5 | 30-363 Kraków, Poland
tel./fax: +48 12 269 81 85 | biuro@astra-trade.pl

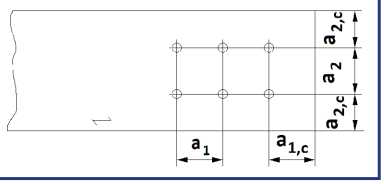
Star Drive GPR®
Washer head

schmid schrauben hainfeld

dimensions				extraction resistance		head traction resistance		wood-wood shearing					steel-wood shearing		
d x L [mm]	b [mm]	AD [mm]	dk [mm]	zul. N_z [kN]	$F_{ax,R,k}$ [kN]	zul. $N_{z,Kopf}$ [kN]	$F_{head,R,k}$ [kN]	zul. N [kN] α=0°...90°	1. $F_{v,R,k}$ [kN] α_{AD}=90° α_{ET}=0°	2. $F_{v,R,k}$ [kN] α=0°	3. $F_{v,R,k}$ [kN] α=90°	4. $F_{v,R,k}$ [kN] α_{AD}=0° α_{ET}=90°	zul. N [kN] α=0°...90°	1. $F_{v,R,k}$ [kN] α=0°	2. $F_{v,R,k}$ [kN] α=90°
Ø 10,0															
10,0 x 280	100	180	25	5,00	9,50	3,13	9,50	1,70	6,62	7,12	6,25	6,62	2,13	9,09	7,86
10,0 x 300	100	200	25	5,00	9,50	3,13	9,50	1,70	6,62	7,12	6,25	6,62	2,13	9,09	7,86
10,0 x 320	100	220	25	5,00	9,50	3,13	9,50	1,70	6,62	7,12	6,25	6,62	2,13	9,09	7,86
10,0 x 340	100	240	25	5,00	9,50	3,13	9,50	1,70	6,62	7,12	6,25	6,62	2,13	9,09	7,86
10,0 x 360	100	260	25	5,00	9,50	3,13	9,50	1,70	6,62	7,12	6,25	6,62	2,13	9,09	7,86
10,0 x 380	100	280	25	5,00	9,50	3,13	9,50	1,70	6,62	7,12	6,25	6,62	2,13	9,09	7,86
10,0 x 400	100	300	25	5,00	9,50	3,13	9,50	1,70	6,62	7,12	6,25	6,62	2,13	9,09	7,86

minimum distances [b]	Ø 8,0	Ø10,0
a_1 [mm]	40,0	70,0
a_2 [mm]	40,0	50,0
$a_{1,c}$ [mm]	40,0	100,0
$a_{2,c}$ [mm]	32,0	40,0

Distance a2 can be reduced to 2.5 x d if 25 x d^2 can be maintained for the product for the distances a1 and a2. Does not apply to d > 8 mm.



General definitions

a) ...For these measurements, there are no shearing distances for wood-wood connections, because the necessary thickness of fixture according to ETA 12/0373 Appendix 7 Table A6.9 is not reached. For steel-wood connections there is no stipulated minimum thickness of fixture.

b)...The minimum distances are specified according to ETA 12/0373 A.7.3 for axial load.

- The screw thread extraction values were calculated with an angle of 45° to 90° to the wood grain direction.
- Geometry and mechanical properties comply with ETA 12/0373.
- The specified values relate to wood with a gross density ρ_k = 350 kg/m³.
- The thickness of fixture (AD) was selected equal to the shaft length.
- All values were calculated using the length of the screw thread when completely screwed in.
- In the case of steel-wood connections, a steel sheet with a thickness t = d was taken as the basis of the calculation.
- Misprints and printing errors reserved.
- The specified values are planning aids. Projects are to be carried out only by authorised specialists.
- The design value of bearing capacity $F_{R,d}$ for the final form of the wood connection results from the characteristic values as follows:

$$F_{R,d} = \frac{F_{R,k} \cdot k_{mod}}{\gamma_m}$$

$F_{R,d}$ ...design value of bearing capacity on shearing and extraction per connection element
$F_{R,k}$ ...characteristic value of bearing capacity on shearing and extraction per connection element
γ_m, k_{mod} ...coefficients of corresponding national norms

Our technicians are always pleased to help you with any questions: info@schrauben.at

Difference - characteristic and permissible values

- Permissible values - load (grey columns):
  - Measurement according to **DIN 1052:1988** and according to German licences **Z-9.1-435**
- Characteristic values (blue columns):
  - Measurement according to **EC5** and **ETA 12/0373**

ASTRA TRADE | ul. Rydlówka 5 | 30-363 Kraków, Poland
tel./fax: +48 12 269 81 85 | biuro@astra-trade.pl