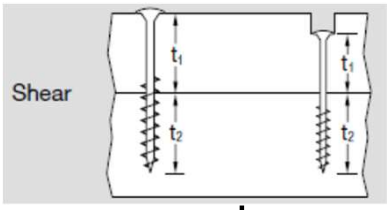
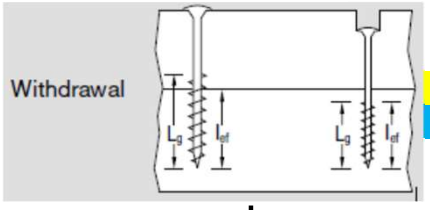
Characteristic Loads According to SPAX ETA and EC5

SPAX Washer Head





Head pull-through
Thread pull-out

Product			Wood - Wood, α = 90°						Sheet Steel - Wood, α = 90°					
Dimensions (mm)			Shear			Withdrawal			Shear			Withdrawal		
Thread Diam. d_1	Screw Length L_s	Thread Length L_g	t_1 (mm)	t_2 (mm)	$F_{v,Rk}$ (kN)	t_1 (mm)	l_{ef} (mm)	$F_{ax,Rk}$ (kN)	t_1 (mm)	t_2 (mm)	$F_{v,Rk}$ (kN)	t_1 (mm)	l_{ef} (mm)	$F_{ax,Rk}$ (kN)
6	60	56	24	36	**1.92**	24	36	**2.88**	6	54	**2.76**	6	54	**4.24**
	80	61	32	48	**2.23**	24	56	**3.17**	6	74	**2.92**	6	61	**4.89**
	100	61	40	60	**2.49**	41	59	**4.12**	6	94	**2.92**	6	61	**4.89**
	120	68	50	70	**2.73**	52	68	**4.12**	6	114	**3.06**	6	68	**5.45**
	140	68	70	70	**2.73**	72	38	**4.12**	6	134	**3.06**	6	68	**5.45**
	160	65	90	70	**2.73**	95	65	**4.12**	6	154	**3.00**	6	65	**5.21**
	180	65	110	70	**2.73**	115	65	**4.12**	6	174	**3.00**	6	65	**5.21**
8	80	70	30	50	**3.19**	30	50	**5.34**	6	74	**4.60**	6	70	**7.47**
	100	80	40	60	**3.27**	40	60	**5.78**	10	90	**4.86**	10	80	**8.54**
	120	80	50	70	**4.60**	50	70	**5.78**	10	110	**4.86**	10	80	**8.54**
	140	80	60	80	**4.86**	60	80	**7.52**	10	130	**4.86**	10	80	**8.54**
	160	80	80	80	**4.86**	80	80	**7.52**	10	150	**4.86**	10	80	**8.54**
	180	80	100	80	**4.86**	100	80	**7.52**	10	170	**4.86**	10	80	**8.54**
	200	80	120	80	**4.86**	120	80	**7.52**	10	190	**4.86**	10	80	**8.54**
	220	80	140	80	**4.86**	140	80	**7.52**	10	210	**4.86**	10	80	**8.54**
	240	80	160	80	**4.86**	160	80	**7.52**	10	230	**4.86**	10	80	**8.54**
	260	80	180	80	**4.86**	180	80	**7.52**	10	250	**4.86**	10	80	**8.54**
	280	80	200	80	**4.86**	200	80	**7.52**	10	270	**4.86**	10	80	**8.54**
	300	80	220	80	**4.86**	220	80	**7.52**	10	290	**4.86**	10	80	**8.54**
	320-450	80	240-370	80	**4.86**	240-370	80	**7.52**	10	310-440	**4.86**	10	80	**8.54**
10	80	70	40	40	**4.00**	30	50	**6.40**	10	70	**6.18**	6	70	**8.96**
	100	80	40	60	**4.64**	40	60	**7.68**	10	90	**6.50**	10	80	**10.24**
	120	80	50	70	**5.40**	50	70	**8.00**	10	110	**6.50**	10	80	**10.24**
	140	80	60	80	**5.94**	60	80	**8.00**	10	130	**6.50**	10	80	**10.24**
	160	80	80	80	**6.50**	80	80	**10.24**	10	150	**6.50**	10	80	**10.24**
	180	80	100	80	**6.50**	100	80	**10.24**	10	170	**6.50**	10	80	**10.24**
	200	80	120	80	**6.50**	120	80	**10.24**	10	190	**6.50**	10	80	**10.24**
	220	80	140	80	**6.50**	140	80	**10.24**	10	210	**6.50**	10	80	**10.24**
	240	80	160	80	**6.50**	160	80	**10.24**	10	230	**6.50**	10	80	**10.24**
	260	80	180	80	**6.50**	180	80	**10.24**	10	250	**6.50**	10	80	**10.24**
	280	80	200	80	**6.50**	200	80	**10.24**	10	270	**6.50**	10	80	**10.24**
	300	80	220	80	**6.50**	220	80	**10.24**	10	290	**6.50**	10	80	**10.24**
	320 - 450	80	240-370	80	**6.50**	240-370	80	**10.24**	10	310-440	**6.50**	10	80	**10.24**

NOTES:

Load at an angle of 90° between load direction and grain direction.

The above characteristic loads relate to the failure mode with the lowest value.

They are for Radiata Pine timber with a characteristic density of 400 kg/m^3 (design density of 550 kg/m^3).

Minimum edge distance and spacing must comply with local standards or the SPAX Design Guide.

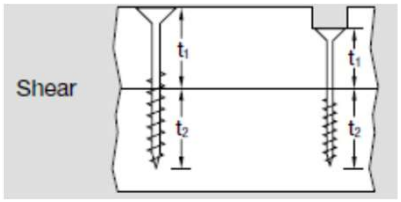
The specified characteristic values must be lowered by safety factor coefficients to the design values for load-carrying capacity.

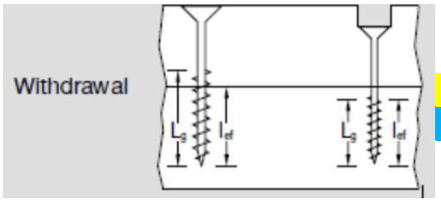
The safety factor coefficients depend on the environmental conditions (k_{mod}) and the load effect duration class (γ_m)

Refer to the SPAX Design Guide and ETA 12/0114 for more detailed design.

Characteristic Loads According to SPAX ETA and EC5

SPAX Countersunk Head





Head pull-through
Thread pull-out

Product			Wood - Wood, α = 90°						Sheet Steel - Wood, α = 90°					
Dimensions (mm)			Shear			Withdrawal			Shear			Withdrawal		
Thread Diam. d_1	Screw Length L_s	Length Partial Thread L_g	t_1 (mm)	t_2 (mm)	**$F_{v,Rk}$ (kN)**	t_1 (mm)	l_{ef} (mm)	**$F_{ax,Rk}$ (kN)**	t_1 (mm)	t_2 (mm)	**$F_{v,Rk}$ (kN)**	t_1 (mm)	l_{ef} (mm)	**$F_{ax,Rk}$ (kN)**
8	80	47	30	50	**2.49**	30	47	**3.01**	6	70	**3.98**	6	47	**5.02**
	100	57	40	60	**3.07**	40	57	**3.01**	10	90	**4.25**	10	57	**6.08**
	120	70	50	70	**3.71**	50	70	**3.92**	10	110	**4.60**	10	70	**7.47**
	140	80	60	80	**3.71**	60	80	**3.92**	10	130	**4.87**	10	80	**8.54**
	160	80	80	80	**3.71**	80	80	**3.92**	10	150	**4.87**	10	80	**8.54**
	180	80	100	80	**3.71**	100	80	**3.92**	10	170	**4.87**	10	80	**8.54**
	200	80	120	80	**3.71**	120	80	**3.92**	10	190	**4.87**	10	80	**8.54**
	220	80	140	80	**3.71**	140	80	**3.92**	10	210	**4.87**	10	80	**8.54**
	240	80	160	80	**3.71**	160	80	**3.92**	10	230	**4.87**	10	80	**8.54**
	260	80	180	80	**3.71**	180	80	**3.92**	10	250	**4.87**	10	80	**8.54**
	280	80	200	80	**3.71**	200	80	**3.92**	10	270	**4.87**	10	80	**8.54**
	300	80	220	80	**3.71**	220	80	**3.92**	10	290	**4.87**	10	80	**8.54**
	320-450	80	240-370	80	**3.71**	240-370	80	**3.92**	10	310-440	**4.87**	10	80	**8.54**
10	80	50	40	40	**3.73**	30	50	**4.03**	10	70	**5.54**	10	50	**6.40**
	100	60	40	60	**4.17**	40	60	**4.03**	10	90	**5.86**	10	60	**7.68**
	120	80	50	70	**4.59**	50	70	**4.03**	10	110	**6.50**	10	80	**10.24**
	140	80	60	80	**5.25**	60	80	**5.24**	10	130	**6.50**	10	80	**10.24**
	160	80	80	80	**5.25**	80	80	**5.24**	10	150	**6.50**	10	80	**10.24**
	180	80	100	80	**5.25**	100	80	**5.24**	10	170	**6.50**	10	80	**10.24**
	200	80	120	80	**5.25**	120	80	**5.24**	10	190	**6.50**	10	80	**10.24**
	220	80	140	80	**5.25**	140	80	**5.24**	10	210	**6.50**	10	80	**10.24**
	240	80	160	80	**5.25**	160	80	**5.24**	10	230	**6.50**	10	80	**10.24**
	260	80	180	80	**5.25**	180	80	**5.24**	10	250	**6.50**	10	80	**10.24**
	280	80	200	80	**5.25**	200	80	**5.24**	10	270	**6.50**	10	80	**10.24**
	300	80	220	80	**5.25**	220	80	**5.24**	10	290	**6.50**	10	80	**10.24**
	320 - 450	80	240-370	80	**5.25**	240-370	80	**5.24**	10	310-440	**6.50**	10	80	**10.24**

NOTES:

Load at an angle of 90° between load direction and grain direction.

The above characteristic loads relate to the failure mode with the lowest value.

They are for Radiata Pine timber with a characteristic density of 400 kg/m^3 (design density of 550 kg/m^3).

Minimum edge distance and spacing must comply with local standards or the SPAX Design Guide.

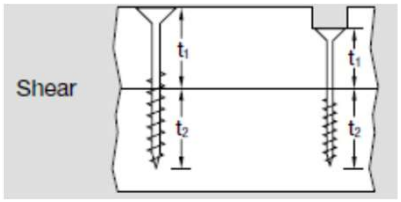
The specified characteristic values must be lowered by safety factor coefficients to the design values for load-carrying capacity.

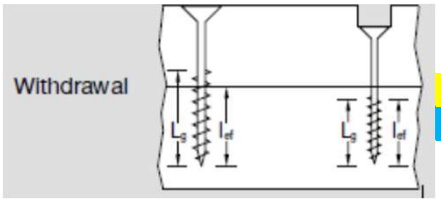
The safety factor coefficients depend on the environmental conditions (k_{mod}) and the load effect duration class (γ_m)

Refer to the SPAX Design Guide and ETA 12/0114 for more detailed design.

Characteristic Loads According to SPAX ETA and EC5

SPAX Countersunk Head





Head pull-through
Thread pull-out

Product			Wood - Wood, α = 90°						Sheet Steel - Wood, α = 90°					
Dimensions (mm)			Shear			Withdrawal			Shear			Withdrawal		
Thread Diam. d_1	Screw Length L_s	Length Partial Thread L_g	t_1 (mm)	t_2 (mm)	**$F_{v,Rk}$ (kN)**	t_1 (mm)	l_{ef} (mm)	**$F_{ax,Rk}$ (kN)**	t_1 (mm)	t_2 (mm)	**$F_{v,Rk}$ (kN)**	t_1 (mm)	l_{ef} (mm)	**$F_{ax,Rk}$ (kN)**
12	100	60	40	60	**5.33**	40	60	**5.50**	12	88	**7.53**	12	60	**8.81**
	120	80	50	70	**5.76**	40	80	**5.50**	12	108	**8.26**	12	80	**11.75**
	140	80	60	80	**6.25**	60	80	**5.50**	12	128	**8.26**	12	80	**11.75**
	160	100	60	100	**6.25**	60	100	**5.50**	12	148	**9.00**	12	100	**14.69**
	180	100	80	100	**7.12**	80	100	**7.15**	12	168	**9.00**	12	100	**14.69**
	200	100	100	100	**7.12**	100	100	**7.15**	12	188	**9.00**	12	100	**14.69**
	220	100	120	100	**7.12**	120	100	**7.15**	12	208	**9.00**	12	100	**14.69**
	240	100	140	100	**7.12**	140	100	**7.15**	12	228	**9.00**	12	100	**14.69**
	260	100	160	100	**7.12**	160	100	**7.15**	12	248	**9.00**	12	100	**14.69**
	280	100	180	100	**7.12**	180	100	**7.15**	12	268	**9.00**	12	100	**14.69**
	300	100	200	100	**7.12**	200	100	**7.15**	12	288	**9.00**	12	100	**14.69**
	350-600	100	250-500	100	**7.12**	250-500	100	**7.15**	12	338-588	**9.00**	12	100	**14.69**

NOTES:

Load at an angle of 90° between load direction and grain direction.

The above characteristic loads relate to the failure mode with the lowest value.

They are for Radiata Pine timber with a characteristic density of 400 kg/m^3 (design density of 550 kg/m^3).

Minimum edge distance and spacing must comply with local standards or the SPAX Design Guide.

The specified characteristic values must be lowered by safety factor coefficients to the design values for load-carrying capacity.

The safety factor coefficients depend on the environmental conditions (k_{mod}) and the load effect duration class (γ_m)

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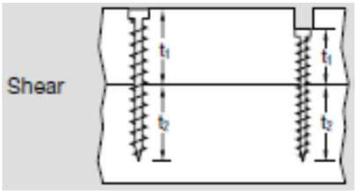
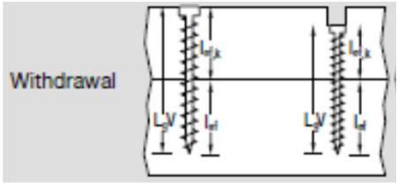
Characteristic Loads According to SPAX ETA and EC5

SPAX Cylinder Head
Full Thread





Product			Wood - Wood, α = 90°					
Dimensions (mm)			Shear			Withdrawal		
Thread Diam. d_1	Screw Length L_s	Length Partial Thread L_g	t_1 (mm)	t_2 (mm)	**$F_{v,Rk}$ (kN)**	t_1 (mm)	l_{ef} (mm)	**$F_{ax,Rk}$ (kN)**
6	80	Thread close to head	40	40	**2.50**	40	40	**3.20**
	100		50	50	**2.70**	50	50	**4.01**
	120		60	60	**2.90**	60	60	**4.81**
	140		70	70	**3.10**	70	70	**5.61**
	160		80	80	**3.30**	80	80	**6.41**
	180		90	90	**3.40**	90	90	**7.21**
	200		100	100	**3.40**	100	100	**8.01**
8	200	Thread close to head	100	100	**5.40**	100	100	**10.68**
	220		110	110	**5.46**	110	110	**11.75**
	240		120	120	**5.46**	120	120	**12.82**
	260		130	130	**5.46**	130	130	**13.89**
	280		140	140	**5.46**	140	140	**14.96**
	300		150	150	**5.46**	150	150	**16.02**
	350		175	175	**5.46**	175	175	**17.00**
	400		200	200	**5.46**	200	200	**17.00**
	450		225	225	**5.46**	225	225	**17.00**

NOTES:

Load at an angle of 90° between load direction and grain direction.

The above characteristic loads relate to the failure mode with the lowest value.

They are for Radiata Pine timber with a characteristic density of 400 kg/m^3 (design density of 550 kg/m^3).

Minimum edge distance and spacing must comply with local standards or the SPAX Design Guide.

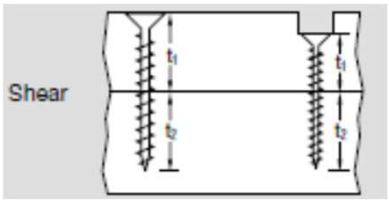
The specified characteristic values must be lowered by safety factor coefficients to the design values for load-carrying capacity.

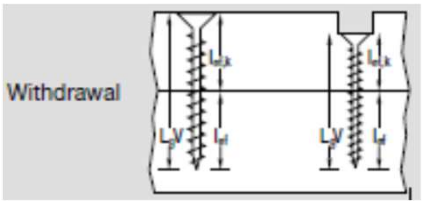
The safety factor coefficients depend on the environmental conditions (k_{mod}) and the load effect duration class (γ_m)

Refer to the SPAX Design Guide and ETA 12/0114 for more detailed design.

Characteristic Loads According to SPAX ETA and EC5

SPAX Countersunk Head
Full Thread





Product			Wood - Wood, α = 90°						Sheet Steel - Wood, α = 90°					
Dimensions (mm)			Shear			Withdrawal			Shear			Withdrawal		
Thread Diam. d_1	Screw Length L_s	Length Partial Thread L_g	t_1 (mm)	t_2 (mm)	**$F_{v,Rk}$ (kN)**	t_1 (mm)	l_{ef} (mm)	**$F_{ax,Rk}$ (kN)**	t_1 (mm)	t_2 (mm)	**$F_{v,Rk}$ (kN)**	t_1 (mm)	l_{ef} (mm)	**$F_{ax,Rk}$ (kN)**
8	160	Thread close to head	80	80	**4.87**	80	80	**8.55**	10	150	**7.63**	10	150	**16.02**
	180		90	90	**5.13**	90	90	**9.61**	10	170	**7.63**	10	170	**17.00**
	200		100	100	**5.40**	100	100	**10.68**	10	190	**7.63**	10	190	**17.00**
	220		110	110	**5.46**	110	110	**11.75**	10	210	**7.63**	10	210	**17.00**
	240		120	120	**5.46**	120	120	**12.82**	10	230	**7.63**	10	230	**17.00**
	260		130	130	**5.46**	130	130	**13.89**	10	250	**7.63**	10	250	**17.00**
	280		140	140	**5.46**	140	140	**14.96**	10	270	**7.63**	10	270	**17.00**
	300		150	150	**5.46**	150	150	**16.02**	10	290	**7.63**	10	290	**17.00**
	350		175	175	**5.46**	175	175	**17.00**	10	340	**7.63**	10	340	**17.00**
	400		200	200	**5.46**	200	200	**17.00**	10	390	**7.63**	10	390	**17.00**
	450		225	225	**5.46**	225	225	**17.00**	10	440	**7.63**	10	440	**17.00**
	500		250	250	**5.46**	250	250	**17.00**	10	490	**7.63**	10	490	**17.00**
	550		275	275	**5.46**	275	275	**17.00**	10	540	**7.63**	10	540	**17.00**
	600		300	300	**5.46**	300	300	**17.00**	10	590	**7.63**	10	590	**17.00**
10	200	Thread close to head	100	100	**7.15**	100	100	**12.8**	10	190	**11.02**	10	190	**23.57**
	220		110	110	**7.47**	110	110	**14.08**	10	210	**11.02**	10	210	**26.08**
	240		120	120	**7.79**	120	120	**15.36**	10	230	**11.02**	10	230	**28.00**
	260		130	130	**7.89**	130	130	**16.64**	10	250	**11.02**	10	250	**28.00**
	280		140	140	**7.89**	140	140	**17.92**	10	270	**11.02**	10	270	**28.00**
	300		150	150	**7.89**	150	150	**19.19**	10	290	**11.02**	10	290	**28.00**
	350		175	175	**7.89**	175	175	**22.39**	10	340	**11.02**	10	340	**28.00**
	400		200	200	**7.89**	200	200	**25.59**	10	390	**11.02**	10	390	**28.00**
	450		225	225	**7.89**	225	225	**28.00**	10	440	**11.02**	10	440	**28.00**
	500		250	250	**7.89**	250	250	**28.00**	10	490	**11.02**	10	490	**28.00**
	550		275	275	**7.89**	275	275	**28.00**	10	540	**11.02**	10	540	**28.00**
	600		300	300	**7.89**	300	300	**28.00**	10	590	**11.02**	10	590	**28.00**
	800		400	400	**7.89**	400	400	**28.00**	10	790	**11.02**	10	790	**28.00**

NOTES:

Load at an angle of 90° between load direction and grain direction.

The above characteristic loads relate to the failure mode with the lowest value.

They are for Radiata Pine timber with a characteristic density of 400 kg/m^3 (design density of 550 kg/m^3).

Minimum edge distance and spacing must comply with local standards or the SPAX Design Guide.

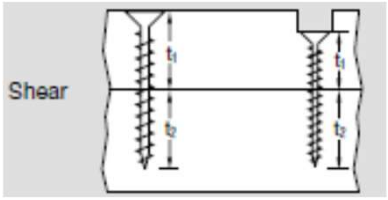
The specified characteristic values must be lowered by safety factor coefficients to the design values for load-carrying capacity.

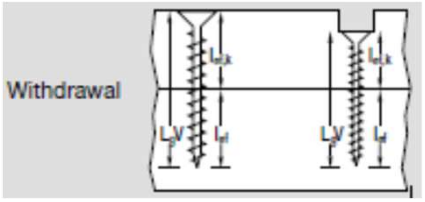
The safety factor coefficients depend on the environmental conditions (k_{mod}) and the load effect duration class (γ_m)

Refer to the SPAX Design Guide and ETA 12/0114 for more detailed design.

Characteristic Loads According to SPAX ETA and EC5

SPAX Countersunk Head
Full Thread





Product			Wood - Wood, α = 90°						Sheet Steel - Wood, α = 90°					
Dimensions (mm)			Shear			Withdrawal			Shear			Withdrawal		
Thread Diam. d_1	Screw Length L_s	Length Partial Thread L_g	t_1 (mm)	t_2 (mm)	**$F_{v,Rk}$ (kN)**	t_1 (mm)	l_{ef} (mm)	**$F_{ax,Rk}$ (kN)**	t_1 (mm)	t_2 (mm)	**$F_{v,Rk}$ (kN)**	t_1 (mm)	l_{ef} (mm)	**$F_{ax,Rk}$ (kN)**
12	200	Thread close to head	100	100	**9.00**	100	100	**14.69**	10	190	**14.21**	10	190	**27.06**
	220		110	110	**9.37**	110	110	**16.16**	10	210	**14.89**	10	210	**29.93**
	240		120	120	**9.74**	120	120	**17.63**	10	230	**14.89**	10	230	**32.81**
	260		130	130	**10.11**	130	130	**19.09**	10	250	**14.89**	10	250	**35.69**
	280		140	140	**10.47**	140	140	**20.56**	10	270	**14.89**	10	270	**38.00**
	300		150	150	**10.66**	150	150	**20.03**	10	290	**14.89**	10	290	**38.00**
	350		175	175	**10.66**	175	175	**25.70**	10	340	**14.89**	10	340	**38.00**
	400		200	200	**10.66**	200	200	**29.38**	10	390	**14.89**	10	390	**38.00**
	450		225	225	**10.66**	225	225	**33.05**	10	440	**14.89**	10	440	**38.00**
	500		250	250	**10.66**	250	250	**36.72**	10	490	**14.89**	10	490	**38.00**
	550		275	275	**10.66**	275	275	**38.00**	10	540	**14.89**	10	540	**38.00**
	600		300	300	**10.66**	300	300	**38.00**	10	590	**14.89**	10	590	**38.00**

NOTES:

Load at an angle of 90° between load direction and grain direction.

The above characteristic loads relate to the failure mode with the lowest value.

They are for Radiata Pine timber with a characteristic density of 400 kg/m^3 (design density of 550 kg/m^3).

Minimum edge distance and spacing must comply with local standards or the SPAX Design Guide.

The specified characteristic values must be lowered by safety factor coefficients to the design values for load-carrying capacity.

The safety factor coefficients depend on the environmental conditions (k_{mod}) and the load effect duration class (γ_m)

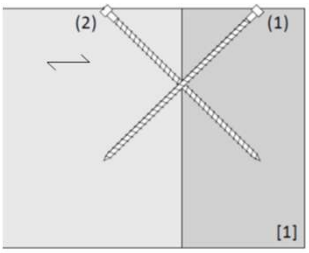
Refer to the SPAX Design Guide and ETA 12/0114 for more detailed design.

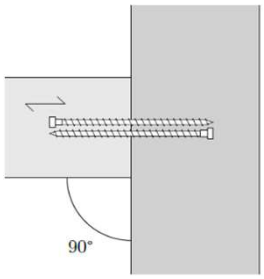
Characteristic Loads According to SPAX ETA and EC5

SPAX Full Thread (cylinder head or countersunk head) at 45°

Beam and joist application with 1 pair of screws crossing diagonally with an angle 45° to the grain.

Product		Wood - Wood, α = 45°			
Dimensions (mm)		Withdrawal			
Thread Diam. d_1	Screw Length L_s	l_{ef1} (mm)	l_{ef2} (mm)	$F_{ax,Rk}$ (kN)	
6 (cylinder head)	100	50	50	**3.64**	
	120	60	60	**4.37**	
	140	70	70	**5.10**	
	160	80	80	**5.83**	
	180	90	90	**6.56**	
	200	100	100	**7.28**	
8	160	80	80	**7.77**	CSK only
	180	90	90	**8.73**	CSK only
	200	100	100	**9.71**	
	220	110	110	**10.68**	
	240	120	120	**11.65**	
	260	130	130	**12.62**	
	280	140	140	**13.59**	
	300	150	150	**14.56**	
	350	175	175	**16.99**	
	400	200	200	**17.00**	
	450	225	225	**17.00**	
10 (CSK only)	200	100	100	**11.63**	
	220	110	110	**12.79**	
	240	120	120	**13.96**	
	260	130	130	**15.12**	
	280	140	140	**16.28**	
	300	150	150	**17.44**	
	350	175	175	**20.35**	
	400	200	200	**23.26**	
	450	225	225	**26.17**	
	500	250	250	**28.00**	
	550	275	275	**28.00**	
	600	300	300	**28.00**	
	800	400	400	**28.00**	





NOTES:

Load at an angle of 45° between load direction and grain direction of joist (2).

The above characteristic loads relate to the failure mode with the lowest value.

They are for Radiata Pine timber with a characteristic density of 400 kg/m^3 (design density of 550 kg/m^3).

Minimum edge distance and spacing must comply with local standards or the SPAX Design Guide.

The specified characteristic values must be lowered by safety factor coefficients to the design values for load-carrying capacity.

The safety factor coefficients depend on the environmental conditions (k_{mod}) and the load effect duration class (γ_m)

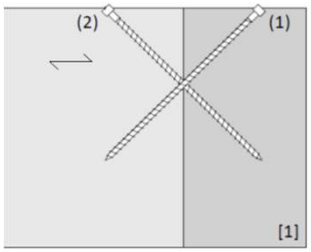
Refer to the SPAX Design Guide and ETA 12/0114 for more detailed design.

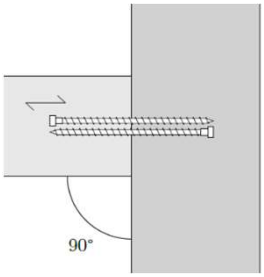
Characteristic Loads According to SPAX ETA and EC5

SPAX Countersunk Head Full Thread at 45°

Beam and joist application with 1 pair of screws crossing diagonally with an angle 45° to the grain.

Product		Wood - Wood, α = 45°		
Dimensions (mm)		Withdrawal		
Thread Diam. d_1	Screw Length L_s	l_{ef1} (mm)	l_{ef2} (mm)	**$F_{ax,Rk}$ (kN)**
12	200	100	100	**13.35**
	220	110	110	**14.68**
	240	120	120	**16.02**
	260	130	130	**17.35**
	280	140	140	**18.68**
	300	150	150	**18.20**
	350	175	175	**23.36**
	400	200	200	**26.70**
	450	225	225	**30.04**
	500	250	250	**33.37**
	550	275	275	**36.72**
	600	300	300	**38.00**





NOTES:

Load at an angle of 45° between load direction and grain direction.

The above characteristic loads relate to the failure mode with the lowest value.

They are for Radiata Pine timber with a characteristic density of 400 kg/m^3 (design density of 550 kg/m^3).

Minimum edge distance and spacing must comply with local standards or the SPAX Design Guide.

The specified characteristic values must be lowered by safety factor coefficients to the design values for load-carrying capacity.

The safety factor coefficients depend on the environmental conditions (k_{mod}) and the load effect duration class (γ_m)

Refer to the SPAX Design Guide and ETA 12/0114 for more detailed design.