SHS AISI410

60° COUNTERSUNK SCREW

ELC-4645 ESR-4645 UKTA-0836 22/6195 ETA-11/0030

SMALL HEAD AND 3 THORNS TIP

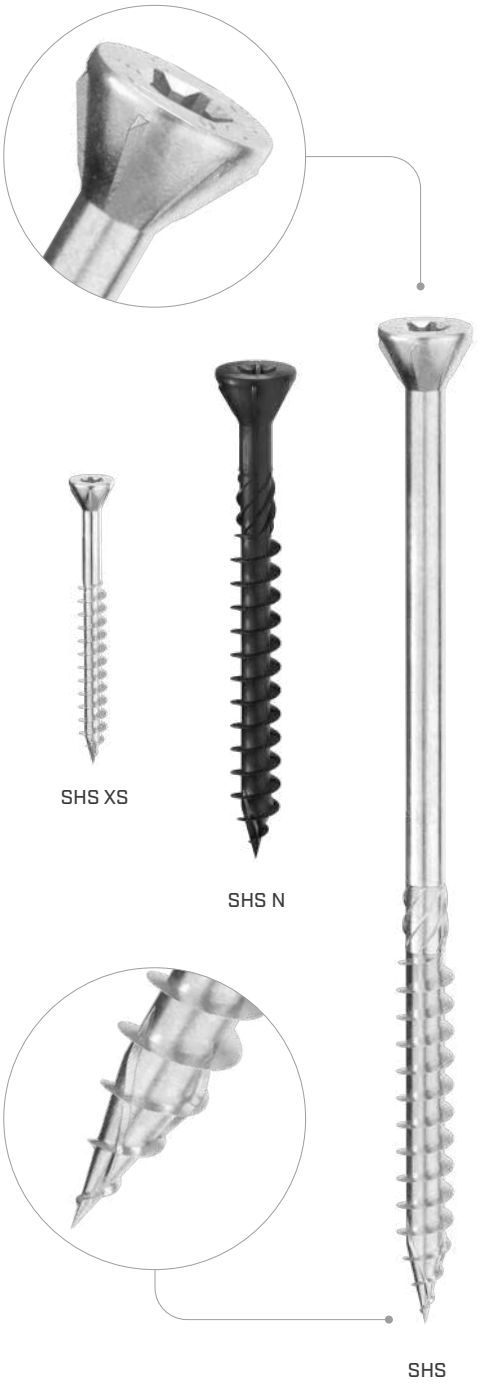
The concealed 60° head and 3 THORNS tip allow easy insertion of the screw into small thickness without creating openings in the timber.

OUTDOOR ON ACID WOOD

Martensitic stainless steel. This stainless steels offers the highest mechanical performance compared to the other available stainless steels. Suitable for outdoor applications and on acid wood, but away from corrosive agents (chlorides, sulphides, etc.).

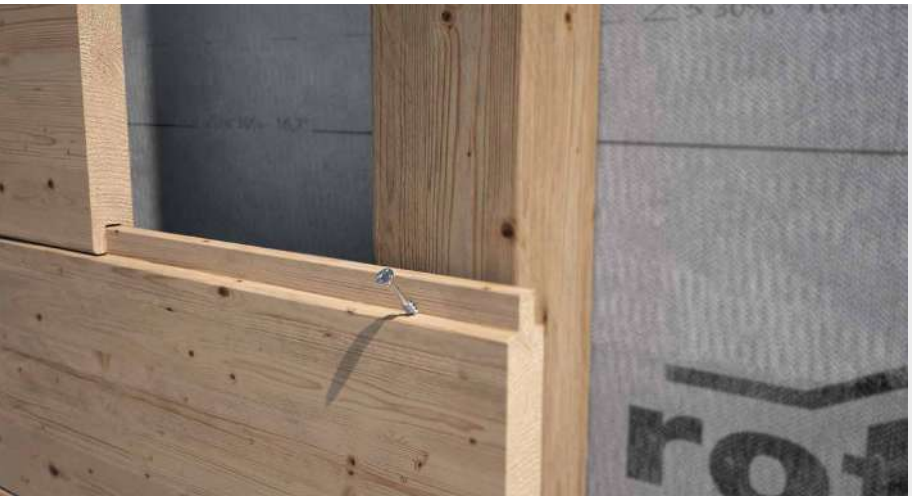
SMALL ELEMENTS FASTENING

The smaller diameter versions are ideal for fixing beads or small elements, the 0.14 inch (3,5 mm) diameter version is perfectly suited for fastening tongue-and-groove boards.



BIT INCLUDED

DIAMETER [in]	0.12 **0.14** **0.32** 0.48
LENGTH [in]	1/2 **1 9/16** **11** 39 3/8
EXPOSURE CONDITION	EC1 EC3 WET
ATMOSPHERIC CORROSIVITY	C1 C2
WOOD CORROSIVITY	T1 T2 T3 T4
MATERIAL	410 AISI — martensitic stainless steel AISI 410



FIELDS OF USE

- timber based panels
- solid timber
- glulam (Glued Laminated Timber)
- CLT, LVL
- high-density woods and acid woods

WINDOWS AND DOORS ON THE OUTSIDE

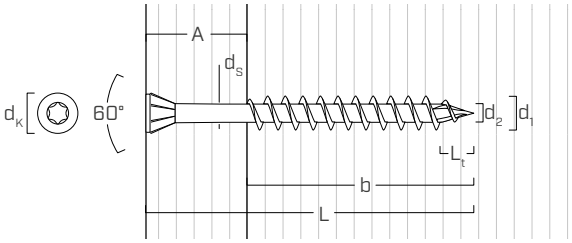
SHS AISI140 is the right choice for fastening small outdoor elements such as beads, façades and window/door frames.

External casing slats fixed with 0.24 and 0.32 inch (6 and 8 mm) diameter SHS AISI410 screws.

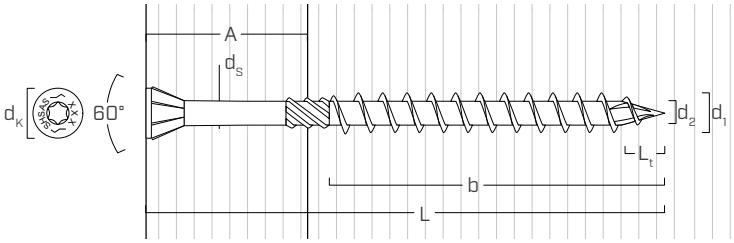
Fastening hardwood and acid wood in far-from-sea environments with SHS AISI410 0.32 inch (8 mm) diameter.

GEOMETRY AND MECHANICAL CHARACTERISTICS

Ø0.14 in



Ø0.18 in - Ø0.20 in - Ø.24 in - Ø0.32 in



GEOMETRY

Nominal diameter	**d_1**	**[in](1)**	**0.14**	**0.18**	**0.20**	**0.24**	**0.32**
Outer thread diameter	**d_1**	[mm]	3,5	4,5	5	6	8
		[in]	**0.138**	**0.177**	**0.197**	**0.236**	**0.315**
Head diameter	d_K	[in]	0.226	0.295	0.335	0.433	0.512
Root diameter	d_2	[in]	0.089	0.110	0.134	0.156	0.213
Shank diameter	d_S	[in]	0.104	0.124	0.144	0.169	0.228
Head thickness	t_1	[in]	0.157	0.183	0.201	0.268	0.283
Tip Length	L_t	[in]	0.138	0.177	0.197	0.236	0.315
Pre-drilling hole diameter(2)	$d_{V,G\leq0.55}$	[in]	-	-	1/8	5/32	13/64
Pre-drilling hole diameter(3)	$d_{V,G>0.55}$	[in]	-	-	9/64	5/32	15/64

(1) The nominal diameter of the screw is converted into imperial units and rounded up to the nearest decimal point.
(2) Pre-drilling applies to timber with G≤0.55 (optional).
(3) Pre-drilling applies to timber with G>0.55 (required).

MECHANICAL PARAMETERS

Nominal diameter	**d_1**	[in]	0.18	0.20	0.24	0.32
Tensile strength (allowable)	f_{tens}	[lbf]	740	810	1170	2180
Bending yield strength (specified)	$F_{y,b}$	[psi]	185000	164000	150000	180000

Nominal diameter	**d_1**	[in]		0.18	0.20	0.24	0.32
Withdrawal (design value)	W_{90}	[lbf/in]	G = 0.35	86	103	131	172
			G = 0.42	99	119	151	199
			G = 0.49	111	133	171	225
			G = 0.55	121	146	188	247
minimum embedded length		[in]		1 1/16	1 3/16	1 7/16	1 7/8

CODES AND DIMENSIONS

SHS XS AISI410

d_1 [mm] [in]	CODE	L [mm]	L [in]	b [mm]	b [in]	A [in]	pcs
3,5 **0.14 #6 TX 10**	**SHS3540AS(*)**	40	1 9/16	26	1 1/32	1/2	500
	SHS3550AS(*)	50	1 15/16	34	1 5/16	1/2	500
	SHS3560AS(*)	60	2 3/8	40	1 9/16	3/4	500
4,5 **0.18 #9 TX 20**	**SHS4550AS**	50	1 15/16	30	1 3/16	3/4	500
	SHS4560AS	60	2 3/8	35	1 3/8	3/4	500
	SHS4570AS	70	2 3/4	40	1 9/16	1	200
5 **0.20 #11 TX 25**	**SHS550AS**	50	1 15/16	24	15/16	1	200
	SHS560AS	60	2 3/8	30	1 3/16	1	200
	SHS570AS	70	2 3/4	35	1 3/8	1 1/4	100
	SHS580AS	80	3 1/8	40	1 9/16	1 1/2	100
	SHS5100AS	100	4	50	1 15/16	1 3/4	100

(*)Not evaluated in ERS-4645.

SHS N AISI410 - black version

d_1 [mm] [in]	CODE	L [mm]	L [in]	b [mm]	b [in]	A [in]	pcs
4,5 **0.18 #9 TX 20**	**SHS4550ASN**	50	1 15/16	30	1 3/16	3/4	100
	SHS4560ASN	60	2 3/8	35	1 3/8	3/4	100
5 **0.20 #11 TX 25**	**SHS550ASN**	50	1 15/16	24	15/16	1	100
	SHS560ASN	60	2 3/8	30	1 3/16	1	200

SHS AISI410

d_1 [mm] [in]	CODE	L [mm]	L [in]	b [mm]	b [in]	A [in]	pcs
6 **0.24 #14 TX 30**	**SHS680AS**	80	3 1/8	40	1 9/16	1 1/2	100
	SHS6100AS	100	4	50	1 15/16	1 3/4	100
	SHS6120AS	120	4 3/4	60	2 3/8	2 1/4	100
	SHS6140AS	140	5 1/2	75	2 15/16	2 1/2	100
	SHS6160AS	160	6 1/4	75	2 15/16	3 1/4	100
	SHS6180AS	180	7 1/8	75	2 15/16	4	100
	SHS6200AS	200	8	75	2 15/16	4 3/4	100
8 **0.32 TX 40**	**SHS8120AS**	120	4 3/4	60	2 3/8	2 1/4	100
	SHS8140AS	140	5 1/2	60	2 3/8	3	100
	SHS8160AS	160	6 1/4	80	3 1/8	3	100
	SHS8180AS	180	7 1/8	80	3 1/8	3 3/4	100
	SHS8200AS	200	8	80	3 1/8	4 1/2	100
	SHS8220AS	220	8 5/8	80	3 1/8	5 1/2	100
	SHS8240AS	240	9 1/2	80	3 1/8	6 1/4	100
	SHS8260AS	260	10 1/4	80	3 1/8	7	100
	SHS8280AS	280	11	80	3 1/8	7 3/4	100

APPLICATION

Oak
Quercus petraea
ρ_k = 42-47 lb/ft³
pH ~ 3,9

Oak or European oak
Quercus robur
ρ_k = 43-60 lb/ft³
pH = 3,4-4,2

Douglas fir
Pseudotsuga menziesii
ρ_k = 32-47 lb/ft³
pH = 3,3-5,8

American black cherry
Prunus serotina
ρ_k = 31-39 lb/ft³
pH ~ 3,9

European chestnut
Castanea sativa
ρ_k = 36-37 lb/ft³
pH = 3,4-3,7

Red oak
Quercus rubra
ρ_k = 34-61 lb/ft³
pH = 3,8-4,2

Blue Douglas fir
Pseudotsuga taxifolia
ρ_k = 32-47 lb/ft³
pH = 3,1-4,4

Maritime pine
Pinus pinaster
ρ_k = 31-39 lb/ft³
pH ~ 3,8

Possible installation on acid wood but away from corrosive agents (chlorides, sulphides, etc.).

Find out the pH and density of the various wood species on page 354.

"aggressive" woods high acidity

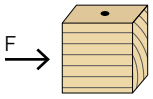
"standard" timbers low acidity

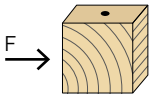
FAÇADES IN DARK TIMBER

Specially designed to match façades made of charred wood, the black SHS N variant ensures perfect compatibility and offers an excellent aesthetic result. Thanks to its resistance to corrosion, it can be used outdoors, allowing to create striking and long-lasting black façades.

MINIMUM DISTANCES FOR SHEAR LOADS | TIMBER

screws inserted **WITHOUT pre-drilled hole** — **G ≤ 0.48**

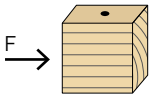


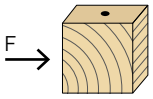


d_1	[in]		0.14	0.18	0.20	0.24	0.32
	[mm]		3,5	4,5	5	6	8
a_1	[in]	**15·d**	2 1/16	2 11/16	2 15/16	3 1/2	**3 1/8**
a_2	[in]	**5·d**	11/16	7/8	1	1 3/16	1 9/16
$a_{3,t}$	[in]	**15·d**	2 1/16	2 11/16	2 15/16	3 1/2	4 3/4
$a_{3,c}$	[in]	**10·d**	1 3/8	1 3/4	1 15/16	2 3/8	3 1/8
$a_{4,t}$	[in]	**10·d**	1 3/8	1 3/4	1 15/16	2 3/8	3 1/8
$a_{4,c}$	[in]	**5·d**	11/16	7/8	1	1 3/16	1 9/16

	0.14	0.18	0.20	0.24	0.32
	3,5	4,5	5	6	8
10·d	1 3/8	1 3/4	1 15/16	2 3/8	**1 9/16**
5·d	11/16	7/8	1	1 3/16	1 9/16
15·d	2 1/16	2 11/16	2 15/16	3 1/2	4 3/4
10·d	1 3/8	1 3/4	1 15/16	2 3/8	3 1/8
10·d	1 3/8	1 3/4	1 15/16	2 3/8	3 1/8
5·d	11/16	7/8	1	1 3/16	1 9/16

screws inserted **WITHOUT pre-drilled hole** — **0.48 < G ≤ 0.50**

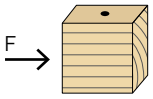


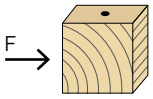


d_1	[in]		0.14	0.18	0.20	0.24	0.32
	[mm]		3,5	4,5	5	6	8
a_1	[in]	**15·d**	2 1/16	2 11/16	2 15/16	3 1/2	4 3/4
a_2	[in]	**5·d**	11/16	7/8	1	1 3/16	1 9/16
$a_{3,t}$	[in]	**15·d**	2 1/16	2 11/16	2 15/16	3 1/2	4 3/4
$a_{3,c}$	[in]	**10·d**	1 3/8	1 3/4	1 15/16	2 3/8	3 1/8
$a_{4,t}$	[in]	**10·d**	1 3/8	1 3/4	1 15/16	2 3/8	3 1/8
$a_{4,c}$	[in]	**5·d**	11/16	7/8	1	1 3/16	1 9/16

	0.14	0.18	0.20	0.24	0.32
	3,5	4,5	5	6	8
10·d	1 3/8	1 3/4	1 15/16	2 3/8	**2 3/16**
5·d	11/16	7/8	1	1 3/16	1 9/16
15·d	2 1/16	2 11/16	2 15/16	3 1/2	4 3/4
10·d	1 3/8	1 3/4	1 15/16	2 3/8	3 1/8
10·d	1 3/8	1 3/4	1 15/16	2 3/8	3 1/8
5·d	11/16	7/8	1	1 3/16	1 9/16

screws inserted **WITHOUT pre-drilled hole** — **G > 0.50**

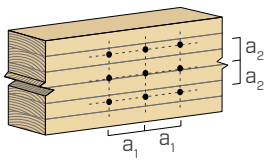




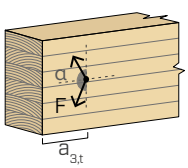
d_1	[in]		0.14	0.18	0.20	0.24	0.32
	[mm]		3,5	4,5	5	6	8
a_1	[in]	**15·d**	2 1/16	2 11/16	2 15/16	3 1/2	4 3/4
a_2	[in]	**7·d**	1	1 1/4	1 3/8	1 5/8	2 3/16
$a_{3,t}$	[in]	**20·d**	2 3/4	3 1/2	4	4 3/4	6 1/4
$a_{3,c}$	[in]	**15·d**	2 1/16	2 11/16	2 15/16	3 1/2	4 3/4
$a_{4,t}$	[in]	**12·d**	1 5/8	2 1/8	2 3/8	2 13/16	3 3/4
$a_{4,c}$	[in]	**7·d**	1	1 1/4	1 3/8	1 5/8	2 3/16

	0.14	0.18	0.20	0.24	0.32
	3,5	4,5	5	6	8
10·d	1 3/8	1 3/4	1 15/16	2 3/8	3 1/8
7·d	1	1 1/4	1 3/8	1 5/8	2 3/16
20·d	2 3/4	3 1/2	4	4 3/4	6 1/4
15·d	2 1/16	2 11/16	2 15/16	3 1/2	4 3/4
12·d	1 5/8	2 1/8	2 3/8	2 13/16	3 3/4
7·d	1	1 1/4	1 3/8	1 5/8	2 3/16

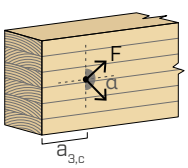
α = load-to-grain angle
d = d_1 = nominal diameter of the screw



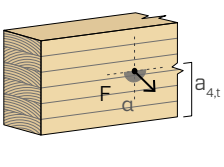
stressed end
-90° < α < 90°



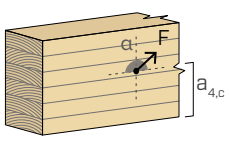
unloaded end
90° < α < 270°



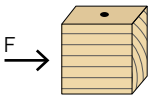
stressed edge
0° < α < 180°

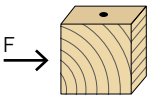


unload edge
180° < α < 360°



screws inserted **WITH pre-drilled hole**

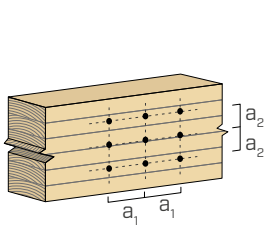




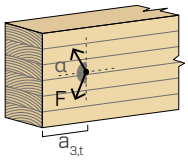
d_1	[in]		0.14	0.18	0.20	0.24	0.32
	[mm]		3,5	4,5	5	6	8
a_1	[in]	**10·d**	1 3/8	1 3/4	1 15/16	2 3/8	3 1/8
a_2	[in]	**4·d**	9/16	11/16	13/16	15/16	1 1/4
$a_{3,t}$	[in]	**12·d**	1 5/8	2 1/8	2 3/8	2 13/16	3 3/4
$a_{3,c}$	[in]	**7·d**	1	1 1/4	1 3/8	1 5/8	2 3/16
$a_{4,t}$	[in]	**7·d**	1	1 1/4	1 3/8	1 5/8	2 3/16
$a_{4,c}$	[in]	**3·d**	7/16	9/16	9/16	11/16	15/16

	0.14	0.18	0.20	0.24	0.32
	3,5	4,5	5	6	8
5·d	11/16	7/8	1	1 3/16	1 9/16
4·d	9/16	11/16	13/16	15/16	1 1/4
12·d	1 5/8	2 1/8	2 3/8	2 13/16	3 3/4
7·d	1	1 1/4	1 3/8	1 5/8	2 3/16
7·d	1	1 1/4	1 3/8	1 5/8	2 3/16
3·d	7/16	9/16	9/16	11/16	15/16

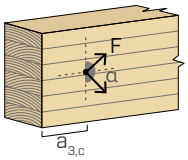
α = load-to-grain angle
d = d_1 = nominal diameter of the screw



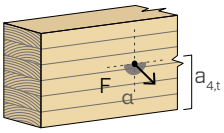
stressed end
-90° < α < 90°



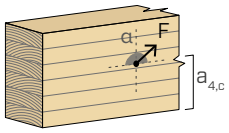
unloaded end
90° < α < 270°



stressed edge
0° < α < 180°



unload edge
180° < α < 360°



NOTES

- Values in blue are from Table 10 of ESR-4645 (REDUCED CONNECTION GEOMETRY REQUIREMENTS BASED ON TESTING);
- The minimum spacing and distances comply with ESR-4645, where d refers to the nominal diameter of the screw, and are valid for screw installed into sawn lumber, structural glued laminated timber and cross laminated timber;
- Wood member stresses must be checked in accordance with the corresponding Sections of the NDS; end distances, edge distances and fastener spacing may need to be increased accordingly.

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