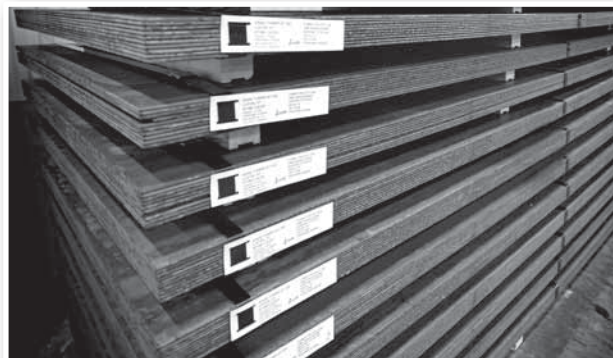


Applications

SWEBOR 400 is used to endure conditions of heavy wear and when great strength and good weldability is required.

SWEBOR 400 is used in applications such as loader buckets, mining truck bodies, wearing parts of agricultural machines, wearing parts of mining machines, waste removal equipment and cement trucks, wear plates, where demands on wear resistance are high. By using Swebor 400 thinner dimensions can be used and overall vehicle weight lowered, thus enabling increased payloads.



Dimensions and tolerances

Thickness	Max width (mm)	Max length (mm)
2,50-2,74 ±0,17	1300 -0/+20	8000 -0+5
2,75-2,99 ±0,17	1400 -0/+20	8000 -0+5
3,00-5,99 ±0,20	1525 -0/+20	8000 -0+5
6,00-9,99 ±0,25	1525 -0/+20	6100 -0+5
10,00-12,00 ±0,30	1525 -0/+20	6100 -0+5

Weight

The weight can be calculated using a density of 8 g/cm³.

Surface

Heat-treated and brushed mill finish. VCI treatment can be obtained upon agreement.

Flatness

Maximum permissible deviation from flatness 6 mm/m.

Chemical composition typical content (%) ladle analysis

Steel grade	C	Si	Mn	P	S	Cr	B
Swebor 400	0,18	0,25	1,20	0,020	0,010	0,20	0,002

Typical mechanical properties and carbon equivalent

Steel grade	Thickness (mm)	Yield strength R _{p0.2} N/mm ²	Tensile strength R _m N/mm ²	Elongation	Impact strength KV -40°C J	Hardness HBW ± 10%	CEV
Swebor 400	2,5-12	1050	1250	10	25	400	0,42

$$CEV = \frac{C + Mn}{6} + \frac{(Cr + Mo + V)}{5} + \frac{(Ni + Cu)}{15}$$

Certificates

Can be delivered with analysis certificate and hardness certificate upon agreement.

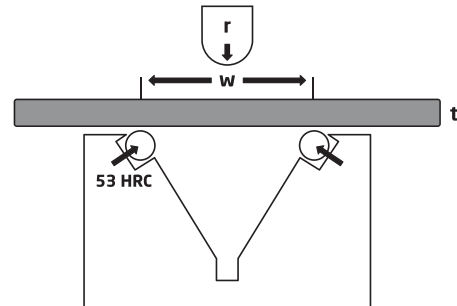
Welding

Swebor 400 can be welded. However, when the combined sheet thickness exceeds 30 mm preheating is needed. Approx. 100°C is the advisable temperature for preheating. Plates must be clean and dry. Commonly used filler metals for quenched steels are Esab 48.00 and OK autrod 12.51. If high strength is required for filler metal OK 75.75 or Ok Autrod 13.10/13.12 are suitable. Equivalent filler metals from other suppliers can also be used. Always use low-hydrogen welding consumables.

Free bending

Normative limit values for bending transverse. The following table is a "Rule of Thumb". Actual results may vary.

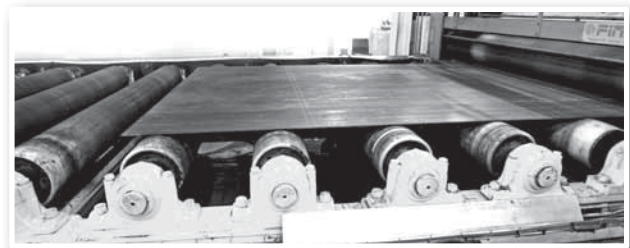
Thickness (mm)	Free bending <90° radius of curvature of the press/plate thickness R/t	Clear opening width/plate thickness W/t	Bending to Single V-groove 90° W/t
2,5	2,0	9	15
3,0	2,0	9	15
4,0	2,5	9	15
5,0	3,0	9	15
6,0	3,5	9	15
10,0	4,0	9	15
12,0	4,5	10	15



- » Bending should be done with one press
- » Slow pressing speed is recommended
- » Lower tool should be roller-type (see photo)

Drilling, turning and milling

Swebor 400 can be machined with high-speed steel and hard metal tools with a satisfactory service life if the feed rates and cutting speeds are correspondingly accommodated.



Cutting speed	Rotation speed r/min (drill d<5mm)	Feed mm/r	Rotation speed r/min (drill d<10mm)	Feed mm/r	Rotation speed r/min (drill d<10mm)	Feed mm/r	Rotation speed r/min (drill d<10mm)	Feed mm/r
High-speed drill								
~ 10m/s	500	0,07	300	0,10	200	0,15	150	0,20
Hard metal drill								
~ 100m/s	1040	0,10	830	0,15	700	0,16	600	0,17

In turning and milling feed values from 0,10 to 0,20 mm/tooth are good basic feed with high-speed drills. With hard metal tools ten times higher cutting speed values can be used (100-150 m/min).

Sawing and mechanical cutting

Sawing

Cutting length mm	Cutting length mm	Cutting length mm
100	200	300
Cutting speed m/min		
60	50	40

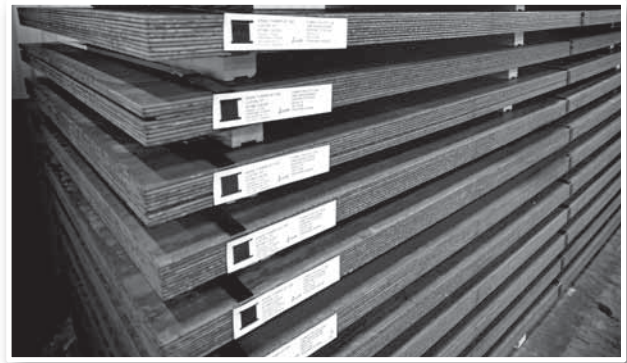
Mechanical cutting

Thickness mm	Cutting clearance mm	Camber degrees	Bevel angle degrees	Shear force kN/m
2,5-3	0,30-0,40	0-1	0-1	<100
4	0,35-0,50	0-1	0-2	150
5	0,40-0,60	2-3	0-3	200
6	0,50-0,70	3-4	0-3	250
8	0,65-1,30	3-5	0-5	300-400
10	0,80-1,80	4-6	0-5	400
12	1,00-2,20	4-6	0-5	500

Applications

SWEBOR 450 is used to endure conditions of extra-heavy wear and when great strength and good weldability is required.

SWEBOR 450 is used in applications such as loader buckets, mining truck bodies, wearing parts of agricultural machines, wearing parts of mining machines, waste removal equipment and cement trucks, wear plates, where demands on wear resistance are high. By using Swebor 450 thinner dimensions can be used and overall vehicle weight lowered, thus enabling increased payloads.



Dimensions and tolerances

Thickness	Max width (mm)	Max length (mm)
2,50-2,74 ±0,17	1300 -0/+20	8000 -0+5
2,75-2,99 ±0,17	1400 -0/+20	8000 -0+5
3,00-5,99 ±0,20	1525 -0/+20	8000 -0+5
6,00-9,99 ±0,25	1525 -0/+20	6100 -0+5
10,00-12,00 ±0,30	1525 -0/+20	6100 -0+5

Weight

The weight can be calculated using a density of 8 g/cm³.

Surface

Heat-treated and brushed mill finish. VCI treatment can be obtained upon agreement.

Flatness

Maximum permissible deviation from flatness 6 mm/m.

Chemical composition typical content (%) ladle analysis

Steel grade	C	Si	Mn	P	S	Cr	B
Swebor 450	0,24	0,25	1,00	0,020	0,010	0,20	0,002

Typical mechanical properties and carbon equivalent

Steel grade	Thickness (mm)	Yield strength R _{p0.2} N/mm ²	Tensile strength R _m N/mm ²	Elongation	Impact strength KV -20°C J	Hardness HBW ± 10%	CEV
Swebor 450	2,5-12	1200	1500	8	20	450	0,45

$$CEV = \frac{C + Mn}{6} + \frac{(Cr + Mo + V)}{5} + \frac{(Ni + Cu)}{15}$$

Certificates

Can be delivered with analysis certificate and hardness certificate upon agreement.

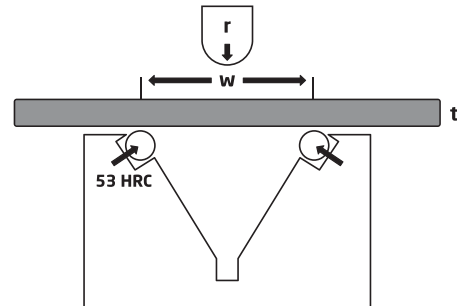
Welding

Swebor 450 can be welded. However, when the combined sheet thickness exceeds 30 mm preheating is needed. Approx. 100°C is the advisable temperature for preheating. Plates must be clean and dry. Commonly used filler metals for quenched steels are Esab 48.00 and OK autrod 12.51. If high strength is required for filler metal OK 75.75 or Ok Autrod 13.10/13.12 are suitable. Equivalent filler metals from other suppliers can also be used. Always use low-hydrogen welding consumables.

Free bending

Normative limit values for bending transverse. The following table is a "Rule of Thumb". Actual results may vary.

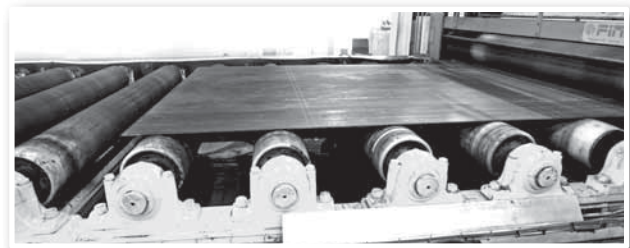
Thickness (mm)	Free bending <90° radius of curvature of the press/plate thickness R/t	Clear opening width/plate thickness W/t	Bending to Single V-groove 90° W/t
2,5	2,5	9	15
3,0	2,5	9	15
4,0	3,0	9	15
5,0	3,5	9	15
6,0	4,0	9	15
10,0	5,0	9	15
12,0	6,0	10	15



- » Bending should be done with one press
- » Slow pressing speed is recommended
- » Lower tool should be roller-type (see photo)

Drilling, turning and milling

Swebor 450 can be machined with high-speed steel and hard metal tools with a satisfactory service life if the feed rates and cutting speeds are correspondingly accommodated.



Cutting speed	Rotation speed r/min (drill d<5mm)	Feed mm/r	Rotation speed r/min (drill d<10mm)	Feed mm/r	Rotation speed r/min (drill d<10mm)	Feed mm/r	Rotation speed r/min (drill d<10mm)	Feed mm/r
High-speed drill								
~ 10m/s	500	0,07	300	0,10	200	0,15	150	0,20
Hard metal drill								
~ 100m/s	1040	0,10	830	0,15	700	0,16	600	0,17

In turning and milling feed values from 0,10 to 0,20 mm/tooth are good basic feed with high-speed drills. With hard metal tools ten times higher cutting speed values can be used (100-150 m/min).

Sawing and mechanical cutting

Sawing

Cutting length mm	Cutting length mm	Cutting length mm
100	200	300
Cutting speed m/min		
60	50	40

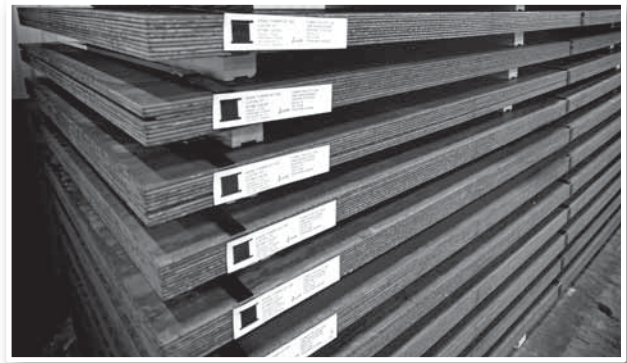
Mechanical cutting

Thickness mm	Cutting clearance mm	Camber degrees	Bevel angle degrees	Shear force kN/m
2,5-3	0,30-0,40	0-1	0-1	<100
4	0,35-0,50	0-1	0-2	150
5	0,40-0,60	2-3	0-3	200
6	0,50-0,70	3-4	0-3	250
8	0,65-1,30	3-5	0-5	300-400
10	0,80-1,80	4-6	0-5	400
12	1,00-2,20	4-6	0-5	500

Applications

SWEBOR 500 is used to endure conditions of extra-heavy wear and when great strength and good weldability is required.

SWEBOR 500 is used in applications such as loader buckets, mining truck bodies, wearing parts of agricultural machines, wearing parts of mining machines, waste removal equipment and cement trucks, wear plates, where demands on wear resistance are high. By using Swebor 500 thinner dimensions can be used and overall vehicle weight lowered, thus enabling increased payloads.



Dimensions and tolerances

Thickness	Max width (mm)	Max length (mm)
2,50-2,74 ±0,17	1300 -0/+20	8000 -0+5
2,75-2,99 ±0,17	1400 -0/+20	8000 -0+5
3,00-5,99 ±0,20	1525 -0/+20	8000 -0+5
6,00-9,99 ±0,25	1525 -0/+20	6100 -0+5
10,00-12,00 ±0,30	1525 -0/+20	6100 -0+5

Weight

The weight can be calculated using a density of 8 g/cm³.

Surface

Heat-treated and brushed mill finish. VCI treatment can be obtained upon agreement.

Flatness

Maximum permissible deviation from flatness 6 mm/m.

Chemical composition typical content (%) ladle analysis

Steel grade	C	Si	Mn	P	S	Cr	B
Swebor 500	0,27	0,30	1,20	0,020	0,010	0,30	0,002

Typical mechanical properties and carbon equivalent

Steel grade	Thickness (mm)	Yield strength R _{p0.2} N/mm ²	Tensile strength R _m N/mm ²	Elongation	Impact strength KV -20°C J	Hardness HBW ± 10%	CEV
Swebor 500	2,5-12	1250	1600	6	20	500	0,53

$$CEV = C + Mn/6 + (Cr + Mo + V)/5 + (Ni + Cu)/15$$

Certificates

Can be delivered with analysis certificate and hardness certificate upon agreement.

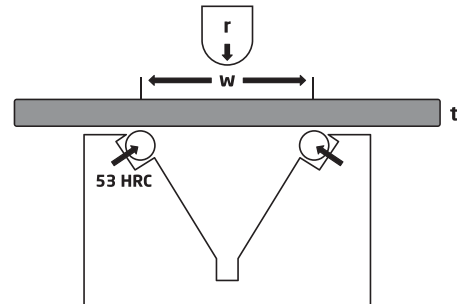
Welding

Swebor 500 can be welded. However, when the combined sheet thickness exceeds 30 mm preheating is needed. Approx. 100°C is the advisable temperature for preheating. Plates must be clean and dry. Commonly used filler metals for quenched steels are Esab 48.00 and OK autrod 12.51. If high strength is required for filler metal OK 75.75 or Ok Autrod 13.10/13.12 are suitable. Equivalent filler metals from other suppliers can also be used. Always use low-hydrogen welding consumables.

Free bending

Normative limit values for bending transverse. The following table is a "Rule of Thumb". Actual results may vary.

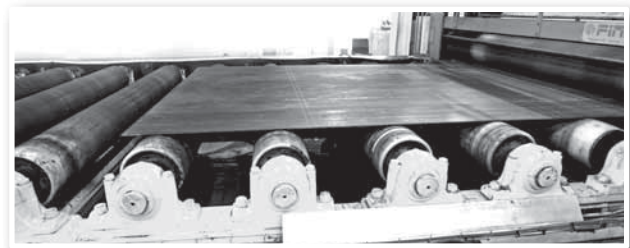
Thickness (mm)	Free bending <60° radius of curvature of the press/plate thickness R/t	Clear opening width/plate thickness W/t	Bending to Single V-groove 90° W/t
2,5	10,0	10	-
3,0	10,0	10	-
4,0	11,0	10	-
5,0	12,0	10	-
6,0	12,0	10	-
10,0	15,0	10	-
12,0	16,0	11	-



- » Bending should be done with one press
- » Slow pressing speed is recommended
- » Lower tool should be roller-type (see photo)

Drilling, turning and milling

Swebor 500 can be machined with high-speed steel and hard metal tools with a satisfactory service life if the feed rates and cutting speeds are correspondingly accommodated.



Cutting speed	Rotation speed r/min (drill d<5mm)	Feed mm/r	Rotation speed r/min (drill d<10mm)	Feed mm/r	Rotation speed r/min (drill d<15mm)	Feed mm/r	Rotation speed r/min (drill d<20mm)	Feed mm/r
High-speed drill								
~ 5m/s	300	0,07	140	0,10	90	0,15	70	0,20
Hard metal drill								
~ 100m/s	780	0,10	700	0,10	530	0,10	450	0,10

In turning and milling feed values from 0,10 to 0,20 mm/tooth are good basic feed with high-speed drills. With hard metal tools ten times higher cutting speed values can be used (80-150 m/min).

Sawing and mechanical cutting

Sawing

Cutting length mm	Cutting length mm	Cutting length mm
100	200	300
Cutting speed m/min		
60	50	40

SWEBOR 500 is not recommended to mechanical cutting. In exception cases cutting edges should be about 57 HRC. In these cases cutting result is bad and cutting edges wear very fast.