

Dear customers,

We offer you one of the most comprehensive manhole steps production programme in Europe.

Seventeen years of manhole steps, forming technology and concrete schafts producing machines production inspired us to project complete manhole steps product line and made us able to offer you the highest quality for very favourable prices.

We thank this way to Structural Fund of European Union for help with building up one of the most progressive and most ecologically considerate manhole steps production in the world.

We thank also to all our customers for trust and information, which we got from you and we hope that you will easily use our products and these will bring a longlasting use to final customers.

Stanislav Ulm Company agent

Principles kept during manhole steps projection and production

1. Continuing of current product line



2. The best possible tread

All grab surfaces newly contain anti-slip ribs for safer grip (see pos. – d).

Treads are optimized for safer stepping with minimized pollution during use and fast water flow off the surface (see pos.-a).

3. Optimalization of all installation kinds

All step types are able to be installed directly, into fixing tails or into additionally drilled holes (see fixing tails, page 13) according to customers needs and usage.

Fixing tails are designed to avoid water flow between fixing tail and concrete after concreting. All steps contain surfaces for hammering into fixing tails or drilled holes (see pos. - b).

For direct installation we offer version with "wings" (see pos. – c) for steps with larger outreach from concrete (value P = 162 mm or 152 mm) where there is a risk of eversion (decreasing of the tread) immediately after production. When using steps with "wings" there is a pressure decrease between the step and concrete of more than 40 %.



4. As least as possible influence on water tightness during installation

Steps are designed so that while using direct installation into schaft rings with thickness 9cm concrete cover behind fixing tails would be 3cm. It minimalize risk of schafts water tightness loss.

5. Placing of letterings according to customers wishes in the middle of the tread

There can be placed a company sign or logo on the tread of all step types. Shape of logo is limited only by dimensions and step production technology.

6. Economical point of view

Already during projection of our steps was taken account of final product sales price, thanks to choosing suitable type of step for particular way of installation we are able to minimize your costs.

7. Guarantee, quality

All steps are made of materials in accordance with EN 13101 standard requirements. Quality of used materials is continuously checked and tested.

In KASI company is instituted quality management system ČSN EN ISO 9001.

Drill two holes for every step into desired wall with spacing according to step type 328 mm or 150 mm, 70 mm depth. It is important to keep axial parallelism and holes alignment. 0000 Holes diameter for installation into concrete is 26 mm. Declared pull-out force depends on wall material parameters. Quoted value is obtained for concrete of min. class B25. While installing into softer materials (HEBEL brick) drill hole with diameter 25 mm. 2. Hammer the step into drilled and cleaned hole. Tips can be soaked in cement grout before hammering. 3. ┓ The step must be hammered at least 60 mm (no pin cut can be outside the hole).

Manhole step installation

Step replacement during repairs

1. pic. A pic. B pic. C L > 5KN $L > 5KNR > 5KN$ $R > 5KN$ $L + R$	 Installation into fixing tails (pic. A) or into drilled holes (pic. B) Pull out with force higher than 5 kN 10 mm on the right side and than 20 mm on left. Repeat this until step is pulled out Direct installation (pic. C) – right next to wall cut crossways the plastic coating on both sides of the step. Pull out the step from the wall including steel tips out of the cut plastic.
2. pic. C	Steps installed directly (pic. C) Drill the rest of plastic coating out of the concrete using drill diameter of 30 mm.
3. pic. A pic. B + pic. C 1.	Installation into fixing tails (pic. A) . Clean fixing tails and hammer in a new step. Installation into drilled holes (pic. B) and steps installed directly (pic. C) Put mortar with minimal strength of 40 MPa into hole and hammer in a new step.

Manhole Steps – SA

SA manhole steps dimensions according to EN13101

P = 127



SA manhole step



Manhole step for single step ladder – type D

L = 295 mm; P = 127 mm; T = 25 mm; W = 37 mm; H = 35 mm Vertical load

- deflection \leq 10 mm under 2 kN vertical load with permanent deflection \leq 2 mm

Pull-out/anchorage: minimum force 5 kN Impact: Mass of 20 kg dropped from a height of 1 m Twist: \leq 5 mm measured along front of step

SA manhole step P = 137



Manhole step for single step ladder - type D

L = 295 mm; P = 137 mm; T = 25 mm; W = 37 mm; H = 35 mm Vertical load

- deflection \leq 10 mm under 2 kN vertical load with permanent deflection \leq 2 mm

Pull-out/anchorage: minimum force 5 kN Impact: Mass of 20 kg dropped from a height of 1 m Twist: \leq 5 mm measured along front of step

SAKS

Steel with polyethylene encapsulation

EN 13101 MSS DII

Vertical load – permanent deflection \leq 50 mm under 4 kN vertical load – class II

SAKC

Stainless steel with polyethylene encapsulation

EN 13101 SSS DI

Vertical load – permanent deflection \leq 10 mm under 4 kN vertical load – class I

SAKA

Aluminium with polyethylene encapsulation

EN 13101 ALS DII

Vertical load – permanent deflection \leq 50 mm under 4 kN vertical load – class II

SARS

Steel with polyethylene encapsulation

EN 13101 MSS DII

Vertical load – permanent deflection \leq 50 mm under 4 kN vertical load – class II

SARC

Stainless steel with polyethylene encapsulation EN 13101 SSS DI

Vertical load – permanent deflection \leq 10 mm under 4 kN vertical load – class I

SARA

Aluminium with polyethylene encapsulation

EN 13101 ALS DII

Vertical load – permanent deflection \leq 50 mm under 4 kN vertical load – class II

SA m	anhole	step	P =	152
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SASS

Steel with polyethylene encapsulation EN 13101 MSS DII Vertical load – permanent deflection \leq 50 mm under 4 kN vertical load – class II

SASC

Stainless steel with polyethylene encapsulation

EN 13101 SSS DI

Vertical load – permanent deflection \leq 10 mm under 4 kN vertical load – class I

SASSI

Steel with polyethylene encapsulation EN 13101 MSS DI Vertical load – permanent deflection \leq 10 mm under 4 kN vertical load – class I

Manhole step for single step ladder – type D

L = 295 mm; P = 152 mm; T = 25 mm; W = 37 mm; H = 35 mm

Vertical load – deflection ≤ 10 mm under 2 kN vertical load with permanent deflection ≤ 2 mm

P = 152

Pull-out/anchorage: minimum force 5 kN Impact: Mass of 20 kg dropped from a height of 1 m Twist: \leq 5 mm measured along front of step

SA manhole step



Step is designed for direct installation

SASSK

Steel with polyethylene encapsulation EN 13101 MSS DII Vertical load – permanent deflection \leq 50 mm under 4 kN vertical load

SASCK

Stainless steel with polyethylene encapsulation

EN 13101 SSS DI

– class II

Vertical load – permanent deflection \leq 10 mm under 4 kN vertical load – class I

Steel with polyethylene encapsulation EN 13101 MSS DI Vertical load – permanent deflection \leq 10 mm under 4 kN vertical load – class I

Manhole step for single step ladder – type D

L=295 mm; P=152 mm; T=25 mm; W=37 mm; H=35 mm

Vertical load – deflection \leq 10 mm under 2 kN vertical load with permanent deflection \leq 2 mm

SA manhole step

EN 13101 SSS DI, DIN 19555-A-SSS Vertical load – permanent deflection ≤ 10 mm under 4 kN vertical load – class I

SADSI

Steel with polyethylene encapsulation

EN 13101 MSS DI, DIN 19555-A-MSS

Vertical load – permanent deflection \leq 10 mm under 4 kN vertical load – class I

Manhole step for single step ladder - type D

L = 295 mm; P = 162 mm; T = 25 mm; W = 37 mm; H = 35 mm

Vertical load – deflection \leq 10 mm under 2 kN vertical load with permanent deflection \leq 2 mm

P = 162

Pull-out/anchorage: minimum force 5 kN Impact: Mass of 20 kg dropped from a height of 1 m Twist: \leq 5 mm measured along front of step

SA manhole step



SADSK

Steel with polyethylene encapsulation EN 13101 MSS DII Vertical load – permanent deflection \leq 50 mm under 4 kN vertical load

- class II SADCK

Stainless steel with polyethylene encapsulation

EN 13101 SSS DI, DIN 19555-A-SSS

Vertical load – permanent deflection \leq 10 mm under 4 kN vertical load – class I

SADSIK

Steel with polyethylene encapsulation

EN 13101 MSS DI, DIN 19555-A-MSS

Vertical load – permanent deflection \leq 10 mm under 4 kN vertical load – class l

Manhole step for single step ladder – type D

L=295 mm; P=162 mm; T=25 mm; W=37 mm; H=35 mm

Vertical load – deflection \leq 10 mm under 2 kN vertical load with permanent deflection \leq 2 mm

Pull-out/anchorage: minimum force 5 kN Impact: Mass of 20 kg dropped from a height of 1 m Twist: \leq 5 mm measured along front of step



SADS

SADC

SADS

SADSK

SB, SC manhole steps dimensions according to EN13101



Manhole SC P = 127



SCKS

Steel with polyethylene encapsulation EN 13101 MSS DII Vertical load – permanent deflection ≤ 50 mm under 4 kN vertical load - class II SCKC

Stainless steel with polyethylene encapsulation EN 13101 SSS DI Vertical load – permanent deflection \leq 10 mm under 4 kN vertical load – class I

SCKA

Aluminium with polyethylene encapsulation EN 13101 ALS DII

Vertical load – permanent deflection ≤ 50 mm under 4 kN vertical load – class II

Manhole step for single step ladder - type D

L = 335 mm; P = 127 mm; T = 25 mm; W = 60 mm; H = 20 mm

Vertical load – deflection \leq 10 mm under 2 kN vertical load with permanent deflection \leq 2 mm

SCSS

5050

8008

SCSSIK

SCSCK

SCSSK

Manhole SC P = 152



SCSS

Steel with polyethylene encapsulation EN 13101 MSS DII Vertical load – permanent deflection \leq 50 mm under 4 kN vertical load – class II

SCSC

Stainless steel with polyethylene encapsulation EN 13101 SSS DI Vertical load – permanent deflection \leq 10 mm under 4 kN vertical load – class I

SCSSI

Steel with polyethylene encapsulation

EN 13101 MSS DI

Vertical load – permanent deflection \leq 10 mm under 4 kN vertical load – class l

Manhole step for single step ladder – type D

L = 335 mm; P = 152 mm; T = 25 mm; W = 60 mm; H = 20 mm

Vertical load – deflection \leq 10 mm under 2 kN vertical load with permanent deflection \leq 2 mm

Pull-out/anchorage: minimum force 5 kN Impact: Mass of 20 kg dropped from a height of 1 m Twist: \leq 5 mm measured along front of step

Manhole SC

P = 152



Step is designed for direct installation

SCSSK

Steel with polyethylene encapsulation EN 13101 MSS DII Vertical load – permanent deflection \leq 50 mm under 4 kN vertical load – class II

SCSCK

Stainless steel with polyethylene encapsulation

EN 13101 SSS DI

Vertical load – permanent deflection \leq 10 mm under 4 kN vertical load – class I

SCSSIK

Steel with polyethylene encapsulation EN 13101 MSS DI Vertical load – permanent deflection \leq 10 mm under 4 kN vertical load – class I

Manhole step for single step ladder – type D

L = 335 mm; P = 152 mm; T = 25 mm; W = 60 mm; H = 20 mm

Vertical load – deflection \leq 10 mm under 2 kN vertical load with permanent deflection \leq 2 mm

Manhole SB P = 152



SBSS

Steel with polyethylene encapsulation EN 13101 MSS DII Vertical load – permanent deflection \leq 50 mm under 4 kN vertical load – class II

SBSC

Stainless steel with polyethylene encapsulation

EN 13101 SSS DI

Vertical load – permanent deflection \leq 10 mm under 4 kN vertical load – class I

SBSSI

Steel with polyethylene encapsulation EN 13101 MSS DI Vertical load – permanent deflection \leq 10 mm under 4 kN vertical load – class I

Manhole step for single step ladder – type D

L = 335 mm; P = 152 mm; T = 25 mm; W = 100 mm; H = 20 mm

Vertical load – deflection ≤ 10 mm under 2 kN vertical load with permanent deflection ≤ 2 mm

Pull-out/anchorage: minimum force 5 kN Impact: Mass of 20 kg dropped from a height of 1 m Twist: \leq 5 mm measured along front of step

Manhole SB P = 152



Step is designed for direct installation

SBSSK

Steel with polyethylene encapsulation EN 13101 MSS DII

Vertical load – permanent deflection \leq 50 mm under 4 kN vertical load – class II

SBSCK

Stainless steel with polyethylene encapsulation

EN 13101 SSS DI

Vertical load – permanent deflection \leq 10 mm under 4 kN vertical load – class I

Steel with polyethylene encapsulation EN 13101 MSS DI Vertical load – permanent deflection \leq 10 mm under 4 kN vertical load – class I

Manhole step for single step ladder - type D

L = 335 mm; P = 152 mm; T = 25 mm; W = 100 mm; H = 20 mm

Vertical load – deflection \leq 10 mm under 2 kN vertical load with permanent deflection \leq 2 mm

Pull-out/anchorage: minimum force 5 kN Impact: Mass of 20 kg dropped from a height of 1 m Twist: \leq 5 mm measured along front of step

SBSCK

Manhole SB P = 162

SBDS

Steel with polyethylene encapsulation EN 13101 MSS DII Vertical load – permanent deflection \leq 50 mm under 4 kN vertical load – class II

SBDC

Stainless steel with polyethylene encapsulation EN 13101 SSS DI, DIN 19555-B-SSS Vertical load – permanent deflection \leq 10 mm under 4 kN vertical load - class I

SBDSI

Steel with polyethylene encapsulation

EN 13101 MSS DI, DIN 19555-B-MSS

Vertical load – permanent deflection \leq 10 mm under 4 kN vertical load - class I

Manhole step for single step ladder – type D

L = 335 mm; P = 162 mm; T = 25 mm; W = 100 mm; H = 20 mm

Vertical load – deflection \leq 10 mm under 2 kN vertical load with permanent deflection \leq 2 mm

Pull-out/anchorage: minimum force 5 kN Impact: Mass of 20 kg dropped from a height of 1 m Twist: \leq 5 mm measured along front of step

Manhole SB P = 162

SBDSK

Steel with polyethylene encapsulation

Stainless steel with polyethylene encapsulation

EN 13101 SSS DI, DIN 19555-B-SSS

Vertical load – permanent deflection \leq 10 mm under 4 kN vertical load – class I

Steel with polyethylene encapsulation

EN 13101 MSS DI, DIN 19555-B-MSS

– class I

Manhole step for single step ladder - type D

L = 335 mm; P = 162 mm; T = 25 mm; W = 100 mm; H = 20 mm

Vertical load – deflection \leq 10 mm under 2 kN vertical load with permanent deflection \leq 2 mm

Pull-out/anchorage: minimum force 5 kN Impact: Mass of 20 kg dropped from a height of 1 m Twist: \leq 5 mm measured along front of step

Step is designed for direct installation

EN 13101 MSS DII Vertical load – permanent deflection \leq 50 mm under 4 kN vertical load

– class II SBDCK

SBDSIK

Vertical load – permanent deflection \leq 10 mm under 4 kN vertical load

SBDCK

SBDSK



SBDS

SBDS

Direct replace of casting double manhole steps according to DIN 1212E and other types of casting double manhole steps

Our manhole steps are against DIN 1212E made of steel core with PE-HD coating.

They are distinguished i.a.

- manifold higher anticorrosive stability
- more comfortable grip and tread
- lesser risk of chipping of the manhole step caused by an object dropped into schaft
- easier installation into manholes, including optional using of fixing tails in production
- option of additional installation into drilled holes
- guaranteed absence of sharp edges, which mainly occured on casting steps in the plane of separation – therefor safer use, and all of that for a price at least comparable to current casting steps 1212E

Manhole step for double-row step ladder SD



SDDS

Steel with polyethylene encapsulation EN 13101 MSS D

SDDC

Stainless steel with polyethylene encapsulation EN 13101 SSS D



L = 15



Manhole step for double step ladder SD

 $L = 157\,\text{mm}; P = 162\,\text{mm}; T = 25\,\text{mm}; W = 100\,\text{mm}; H = 25\,\text{mm}$

Vertical load

- deflection \leq 10 mm under 2 kN vertical load with permanent deflection \leq 2 mm
- permanent deflection \leq 10 mm under 4 kN vertical load

Fixing tails

Fixing tails for single manhole steps



Use for single manhole steps into schaft rings with diameter DN 800 – DN 1500 Pull-out/anchorage: minimum force 5 kN



STHLJ

LEFT fixing tail for single manhole steps Angle of front plate 18°, Material: PE-HD

STHPJ

RIGHT fixing tail for single manhole steps Angle of front plate 18°, Material: PE-HD

Fixing tails for double manhole steps



Use for double manhole steps into schaft rings with diameter DN 800 - DN 1500Use for single manhole steps into schaft rings with diameter DN 2000 - DN 3000

Pull-out/anchorage: minimum force 5 kN



STHLD

LEFT fixing tail for double manhole steps Angle of front plate 7°, Material: PE-HD

STHPD

RIGHT fixing tail for double manhole steps Angle of front plate 7°, Material: PE-HD

Fixing tails for straight walls



Use for manhole steps installation into prefabricated concrete straight walls.

Pull-out/anchorage: minimum force 5 kN



STHLR

LEFT fixing tail for prefabricated concrete parts Material: PE-HD

STHPR

RIGHT fixing tail for prefabricated concrete parts Material: PE-HD

Pocket manhole steps and fliers

Pocket manhole steps and fliers

Pocket steps are produced according to KASI company rules

- basis of these rules is european standard EN 13101 "Steps for underground man entry chambers"

Rules in accordance with EN 13101 regulate:

- testing and own supervision
- material used for steps production including stainless material with minimal quality X6CrNiTi 18-10
 steel according to EN 10083-1 or -3
- steps dimensions: P stand-off = 130 mm (minimum according to standard = 120 mm)
 - T of carrying section = 25mm (min. according to standard = 20 mm)
 - L length of tread for double step ladder = 160 mm (min. according to standard = 145 mm)

Anti-slip ribs on tread makes climbing safer, their positions optimize water flow off the surface Grab bar surface contains anti-slip ribs for safer grip



STN

Pocket step with short grab bar



STKSK

Grab bar material: Steel with polyethylene encapsulation Pocket material: PE-HD

STKCK

Grab bar material: Stainless steel, with polyethylene encapsulation Pocket material: PE-HD

Pocket step for double climb

L = 160 mm; P = 130 mm; T = 25 mm

Vertical load

- − deflection \leq 10 mm under 2 kN vertical load with permanent deflection \leq 2 mm
- permanent deflection \leq 10 mm under 4 kN vertical load

Pull-out/anchorage: minimum force 5 kN



STKCD

STKSD

200

Pocket step with long grab bar



STKSD

Grab bar material: Steel with polyethylene encapsulation Pocket material: PE-HD

STKCD

Grab bar material: Stainless steel with polyethylene encapsulation Pocket material: PE-HD

Pocket step for double climb

 $L = 160\,mm; P = 130\,mm; T = 25\,mm$

Vertical load

- deflection \leq 10 mm under 2 kN vertical load with permanent deflection \leq 2 mm
- permanent deflection \leq 10 mm under 4 kN vertical load

Pull-out/anchorage: minimum force 5 kN







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