ОКП 52 6473

ОКС77.140.01

УТВЕРЖДАЮ
Генеральный директор
ОАО «Металлист»


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«03» декабря 2007г

# STEEL SCREW-PILES

## SPECIFICATIONS

**5264-006-05773342-2007**

**First carrying into effect**

**The holder of the original document — Metallist, JSC**

**Entry date December, 03, 2007**

**Without any time limitation**

РАЗРАБОТАНЫ

Главный инженер
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«03» декабря 2007

2007г

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30.01.08г

# INTRODUCTION

The specifications are applicable to the screw-piles (hereinafter referred to as piles), and are designed to be used for construction and repair of various buildings, bridge footings, high-voltage transmission lines, antenna and mast constructions, open distribution devices, pole lines etc., including temporary structures, in accordance with the developed and approved construction documentation. The piles can be used for soil fixing when constructing in close proximity to different-purpose structures.

The piles are metal structures consisting of cast screw tips (hereinafter referred to as tips) welded to shafts made of weldless steel tube.

The piles with bearing compressive/tension loads can be used in any climatic conditions and in all soil types except for rocky soil, boulder ground and pebble rock

## 1. ASSORTMENT

1.1 The pile-shaft wall thickness is 10mm.

The piles are classified:

1.1.1 By operational conditions, including:

Piles VSL – for building and construction work in thawed and seasonal freezing grounds;

Piles VSLM – for building and construction work in permanently frozen soils.

1.1.2 By length: from 3,0m to 12,0m.

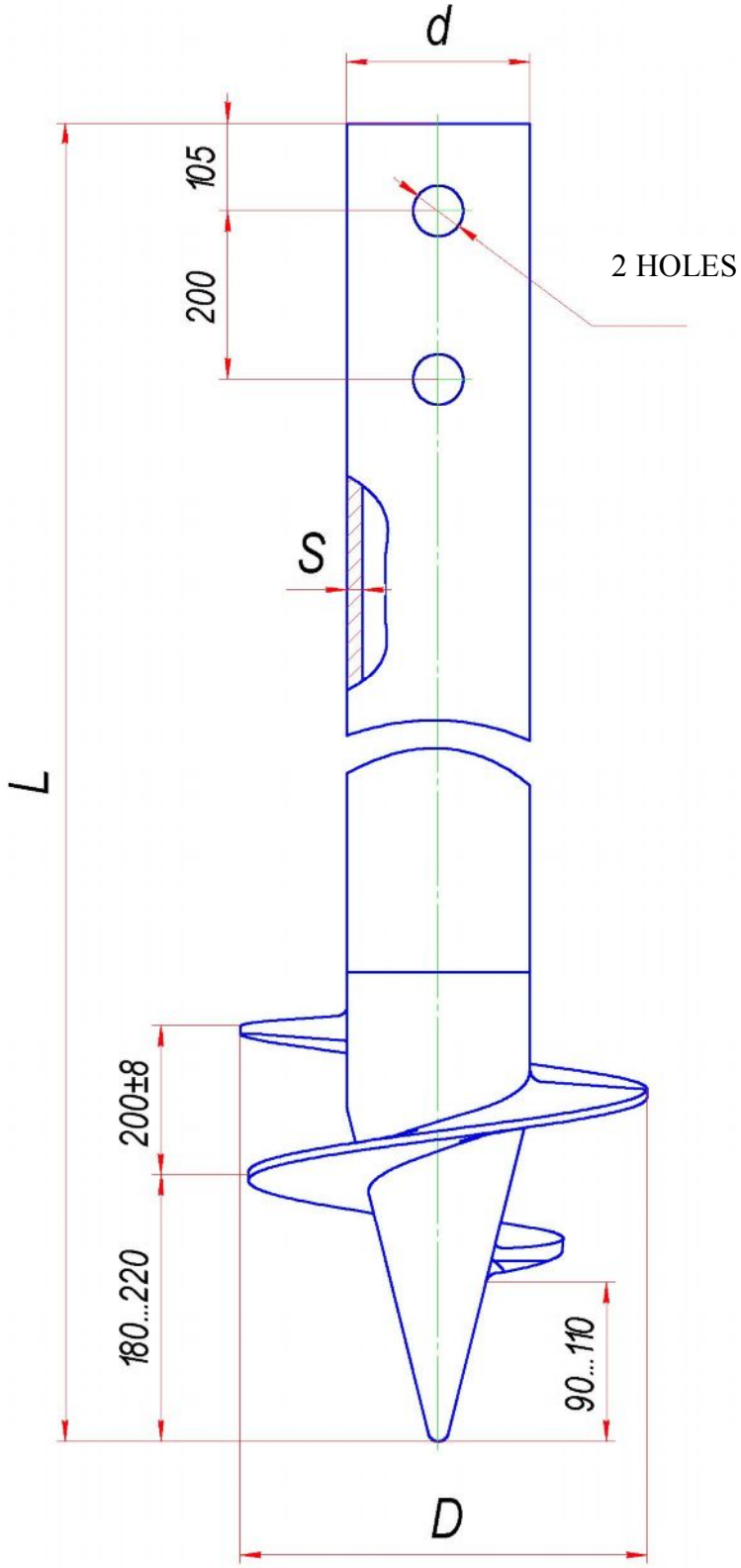
1.1.3 By pile-shaft nominal outer diameter: 168mm, 219mm, and 325mm.

1.1.4 By screw-tip blade nominal maximum diameter: 300, 500, and 850mm;

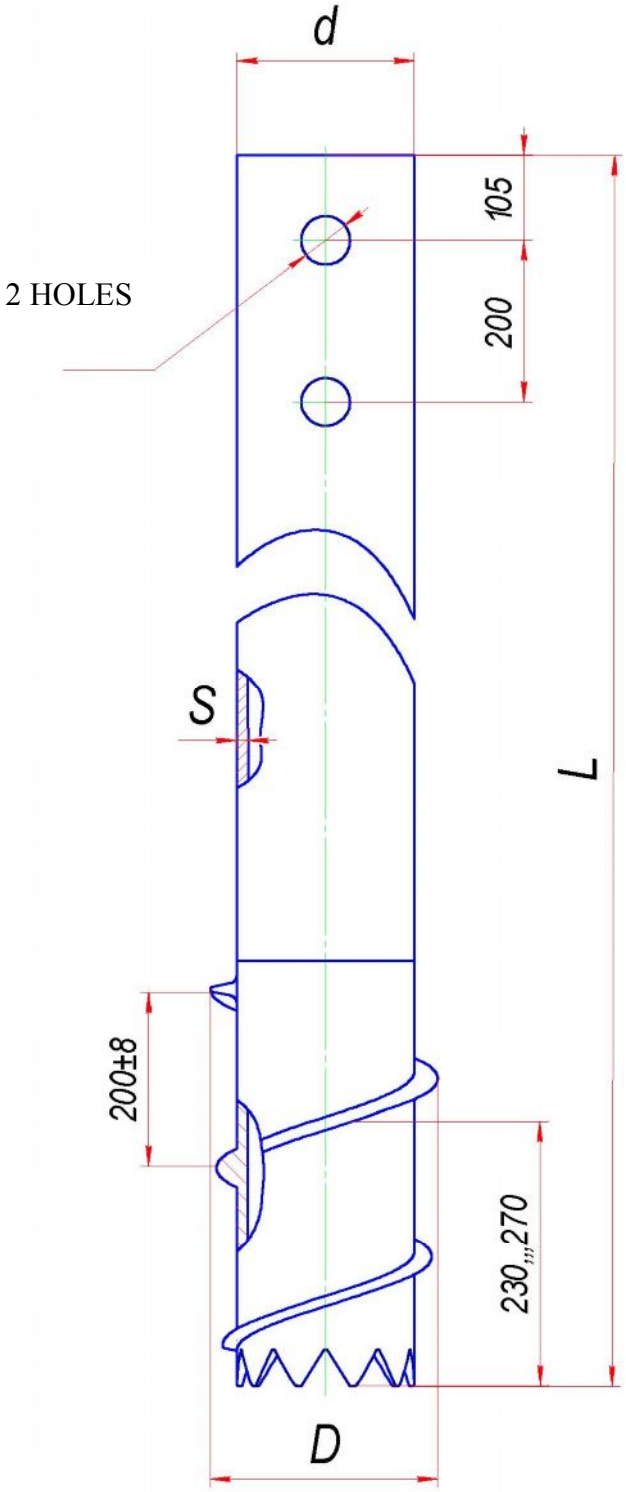
1.1.5 By pile-shaft material: carbon steel 20, GOST 8732, construction steel 09G2S, GOST 19281;

1.1.6 By screw-tip material: carbon steel 25L, 35L, GOST 977.

1.2 Basic parameters and sizes must be in accordance with those shown in table 1 and in pictures 1 and 2.




Picture 1- Steel screw pile with a cast screw tip for building and construction work in thawed and seasonal freezing grounds




Picture 2- Steel screw pile with a cast screw tip for building and construction work in permanently frozen soils

Table 1 – Basic parameters and sizes of the screw-piles

| Тип | Length, m | Pile-shaft nominal outer diameter, mm | Screw-tip blade maximum diameter, mm | Weight, kg* | Blade bearing surface area, $m^2$ ** |
|---|---|---|---|---|---|
| VSL | 3 | 168 | 500 | 173 | 0,162 |
| | 4 | | | 219 | |
| | 5 | | | 265 | |
| | 6 | | | 311 | |
| VSL | 3 | 219 | 500 | 200 | 0,162 |
| | 4 | | | 251 | |
| | 5 | | | 302 | |
| | 6 | | | 354 | |
| VSL | 3 | 219 | 850 | 250 | 0,532 |
| | 4 | | | 301 | |
| | 5 | | | 352 | |
| | 6 | | | 403 | |
| VSL | 10 | 325 | 850 | 1040,5 | 0,532 |
| | 11 | | | 1133 | |
| | 12 | | | 1225,5 | |
| VSLM | 3 | 219 | 300 | 235 | 0,037 |
| | 4 | | | 300 | |
| | 5 | | | 365 | |
| | 6 | | | 429 | |

**Notes:**
* Estimated weight;
** For reference;
*** Estimated weight is calculated on request

1.3 Other pile-shaft wall thickness is available as agreed upon.

1.4 Requirement for geometry accuracy of manufacturing the piles:

1.4.1 Limit deviation for pile length must not exceed: ±50mm for length of up to 6m; and ±70mm for length exceeding 6m.

1.4.2 Limit deviation for pile-shaft outer diameter and wall thickness must not exceed the values stated in technological normative documents for tubes with normal accuracy of the manufacture according to the given parameters.

1.4.3 Limit deviation for screw-tip blade nominal maximum diameter must not exceed ±9mm for VSL-type piles; and ±8mm for VSLM-type piles.

## 2. PRODUCT SPECIFICATIONS

2.1 The screw-piles must correspond to the specification and design documentation requirements, and be manufactured in accordance with the production procedures containing the complete set of requirements for the manufacture of the piles.

**2.2 Requirements to materials.**

2.2.1 The pile-shafts must be manufactured of weldless tubes (assortment according to GOST 8731, product specification according to GOST 8732: normal accuracy of manufacture, carbon steel 20 (GOST 1050), construction steel 09G2S (GOST 19281).

2.2.2 The screw-tips must be manufactured of construction nonalloy steel 25L and 35L (GOST 977, group 2).

Requirements for geometry accuracy of manufacturing the screw-tips must correspond to manufacturer's design documentation.

Technical requirements for screw-tips must correspond to GOST 977 and the requirements stated in the drawing.

**2.3 Requirements to the manufactured goods**

2.3.1 Requirements for the types, location and quality of the weld joints must correspond to the technical requirements stated in manufacturer's assembly drawings.

2.3.2 The weld joints must be cleared out from dross, weld spatter, and cold laps. The weld metal and heat-affected zone must not contain cracks of any location and length.

2.3.3 The repair of the faulty weld joints are allowed at the manufacturer'.

2.3.4 The weld joints rupture strength must be:

- not less than 410 (42) N/mm (kgf/mm) for the pile-shafts made of carbon steel 20,
- not less than 450 (46) N/mm (kgf/mm) for the pile-shafts made of construction steel 9G2S;
- impact strength — not less than 60 J/cm (6 kgf m/cm); bend angle is from 100° to 120° (GOST 6996).

2.3.5 The weld joints must be full penetrated.

2.3.6 The piles must have single-layer anticorrosive coating. The coating must correspond to GOST 9.032: class VI for outer appearance and group U1 for operational conditions.

2.3.7 Estimated maximum load capacity of the piles must correspond to the values stated in table 2.

Table 2 — Maximum loads for the piles as function of the nominal outer diameter of the pile-shafts.

| Nominal outer diameter of the pile-shaft, mm | Maximum compressive load , kN (kgf), not less than | Maximum breaking load , kN (kgf), not less than | Maximum torque, kNm (kgfm) |
|---|---|---|---|
| 168 | 608 (62041) | 565,5 (57704) | 46,07 (4700) |
| 219 | 800(81632) | 6960 (71020) | 80,97 (8262) |
| 325 | 800(81632) | 6960 (71020) | 80,97 (8262) |