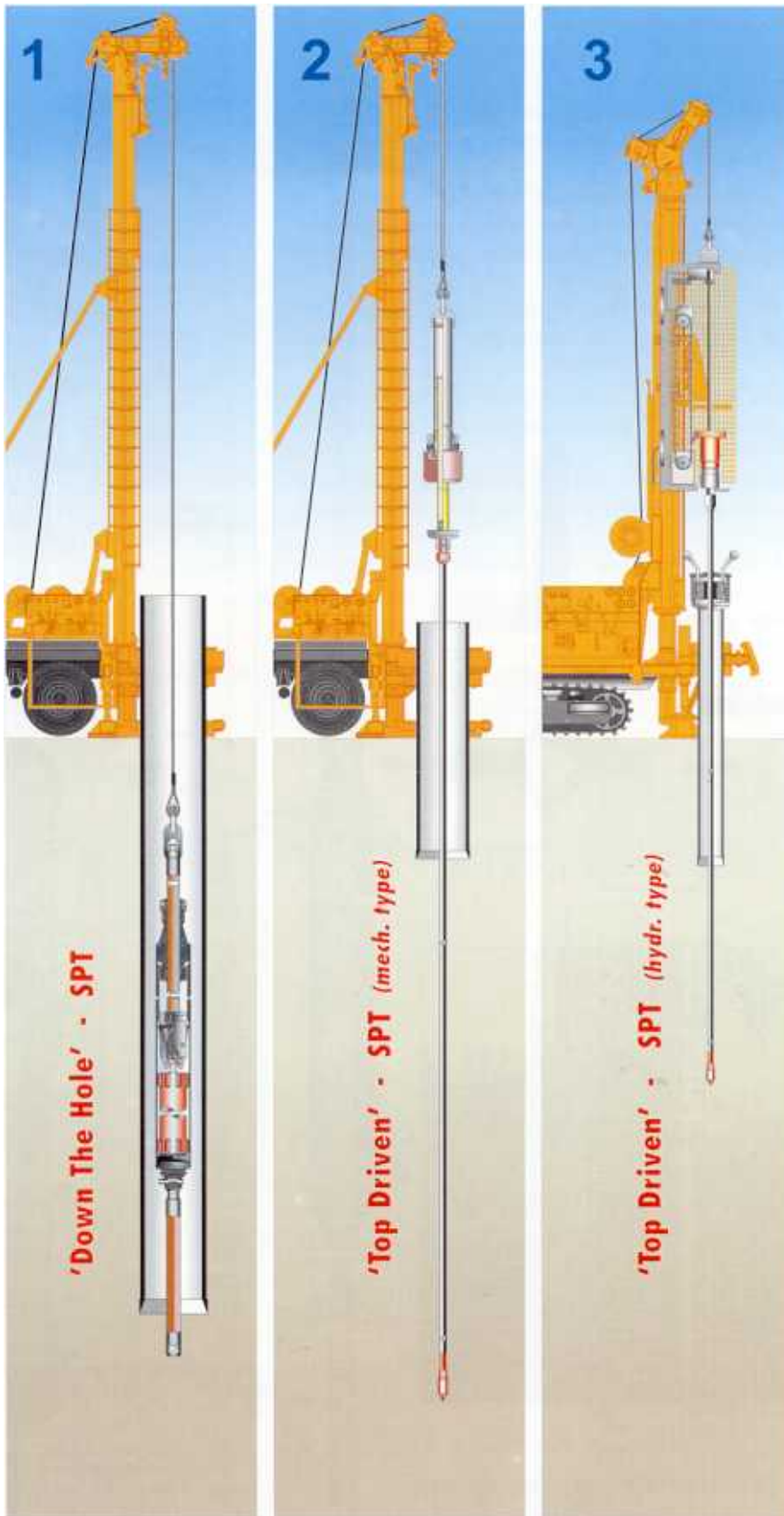




SPT

Standard Penetration Test

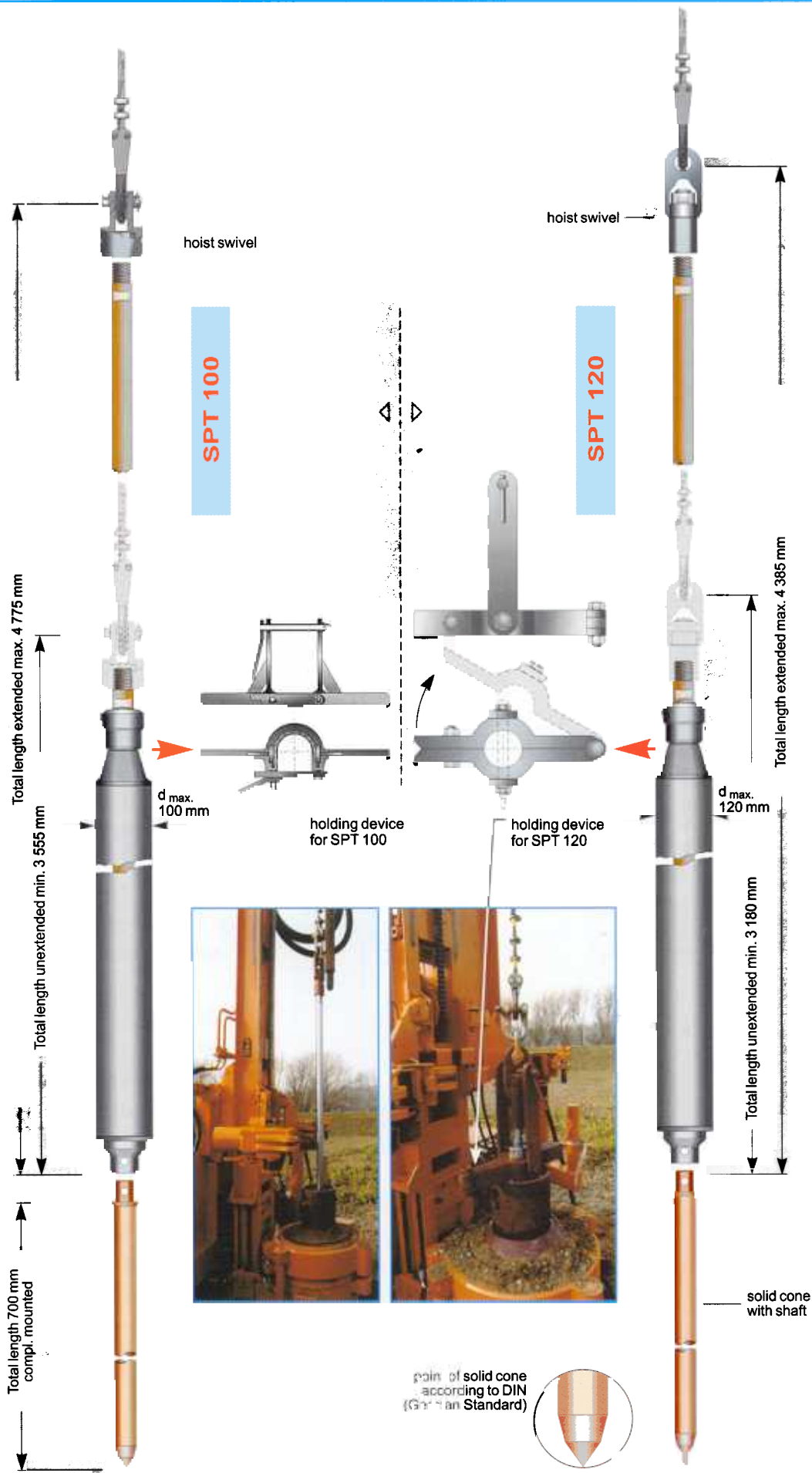


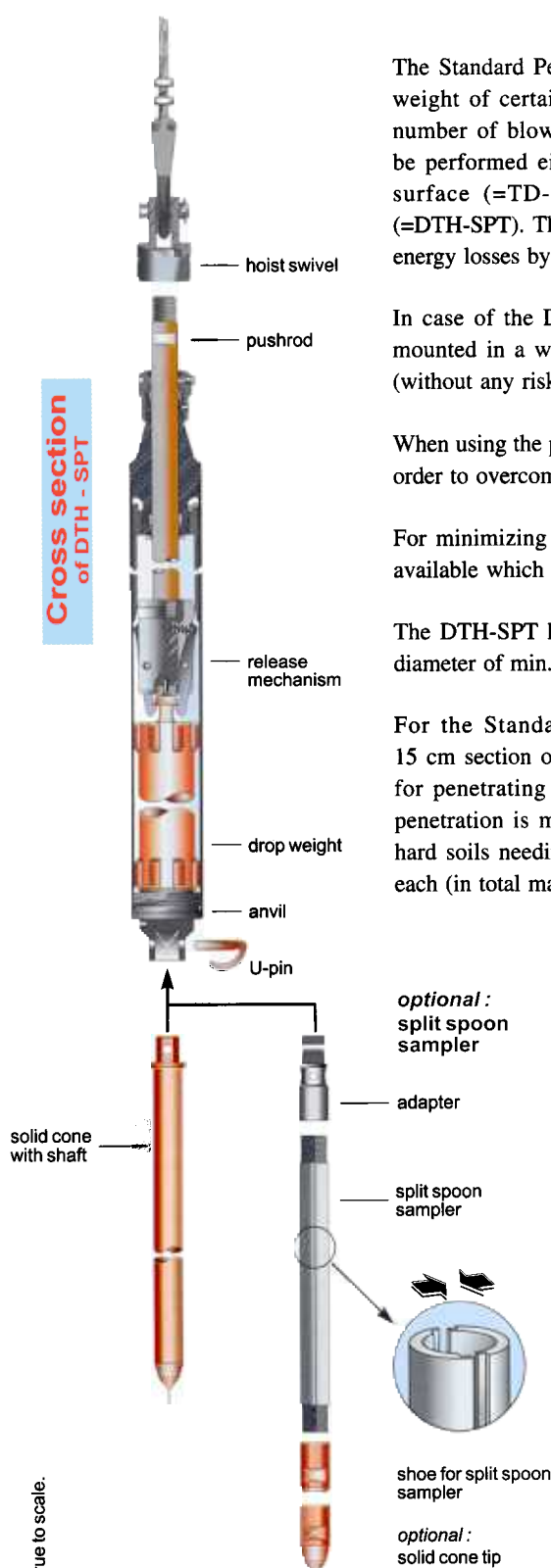
Application

The **Standard Penetration Test** is a dynamic penetration test defined by the ASTM-D 1586, BS 1377 and DIN 4094 (German Standard).

This method describes a procedure for using a split-barrel sampler to obtain representative samples of soil for identification purposes and other laboratory tests, and to obtain a measure of the resistance of the soil to penetration of the sampler.

1 DTH - Down The Hole-SPT





Ratio of lengths not true to scale.

The Standard Penetration Test SPT is performed from the base of a borehole where a drop weight of certain mass and falling distance drives a standardized cone into the soil. The number of blows required for a certain penetration depth is being recorded. The test can be performed either by a device with pick-up and release mechanism working above the surface (=TD-SPT) or a device working straight from the bottom of a borehole (=DTH-SPT). The latter has the advantage that it can be "wire-line" operated which precludes energy losses by rod vibration and friction.

In case of the DTH-SPT the drop weight as well as the automatic release mechanism are mounted in a water proof body enabling the standard penetrometer to be used under water (without any risk of falsification of the test result).

When using the penetrometer in water deeper than 20 m additional weights are recommended in order to overcome the increased friction between stuffing box and pushrod.

For minimizing the fitting length of the standard penetrometer, a special catching device is available which also prevents bending of the extracted pushrod.

The DTH-SPT hanging on a cable is lowered to the cleaned bottom of a borehole having a diameter of min. 130 mm for SPT 120 resp. min. diam. 110 mm for SPT 100.

For the Standard Penetration Test acc. to DIN 4094 the blows necessary for every 15 cm section of penetration must be counted for three times. The sum of the blows needed for penetrating from 15 cm through 45 cm has been defined as N_{30} . In soft soils where penetration is more than 15 cm by one blow, penetration must be stated per blow. In very hard soils needing more than 50 blows for 15 cm depth, the penetration depth for 50 blows each (in total max. 150 blows) has to be recorded.

Down-The-Hole Standard Penetrometer		
Penetrometer, Type	SPT 120	SPT 100
max. outside diam. mm	120	100
Code No.	266 00 000 0	260 06 000 1
Weight, kgs	165	149
Hoist swivel		
Code No.	169 03 001 3	260 06 013 1
Weight, kgs	5.4	4.5
Holding device		
Code No.	266 27 001 0	260 06 008 1
Weight, kgs	20.0	5.0

Accessories for penetrometers SPT 100, SPT 120	Code No.	Weight kgs
Adapter with valve	266 00 500 3	1.5
Spare rubber for adapter	266 00 500 3 P2	0.03
Split spoon sampler 24" = 609 mm	260 02 000 3	5.2
Shoe for split spoon sampler	266 00 513 3	0.5
Steel basket retainer	925 402 005	0.1
PVC-basket retainer	925 401 002	0.03
Solid cone for split spoon sampler	266 00 514 3	1.1
Solid cone with shaft 900 mm	266 00 512 3	17.0
U-pin, d = 1 5/8"	925 050 020	0.14

Accessories (only for SPT 120)	Code No.	Weight kgs
Additional weight for penetrometer	266 00 491 3 V	50.0
Additional weight for piston rod	270 06 025 3	50.0

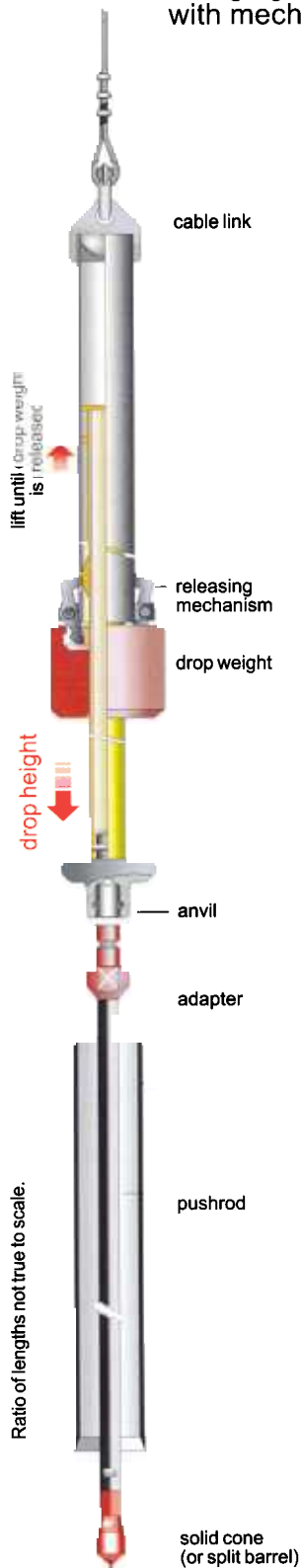
Technical data as per DIN 4094 Standard Penetration Test SPT

Drop weight	m	: 63.5 ± 0.5 kgs
Drop height	h	: 0.76 ± 0.02 m
Cone diameter	d	: 50.5 ± 0.5 mm
Cone cross section	A _c	: 20 cm ²
Cone apex angle		: 60° C
Measuring parameter	N ₃₀	: = number of blows required for every 30 cm of penetration.

Other SPT executions for different applications -

2 Mech. TD-SPT

Standard Penetrometer
-hanging on a cable-
with mech. automatic trip hammer



The hammer consists of an anvil with inner stem, a drop weight 63.5 kgs and an outer tube with a self-tripping mechanism that ensures a free fall height of exactly 760 mm.

The whole assembly is shackled to the winch rope, hoisted on to the adapter which has been screwed to the rod or pipe.

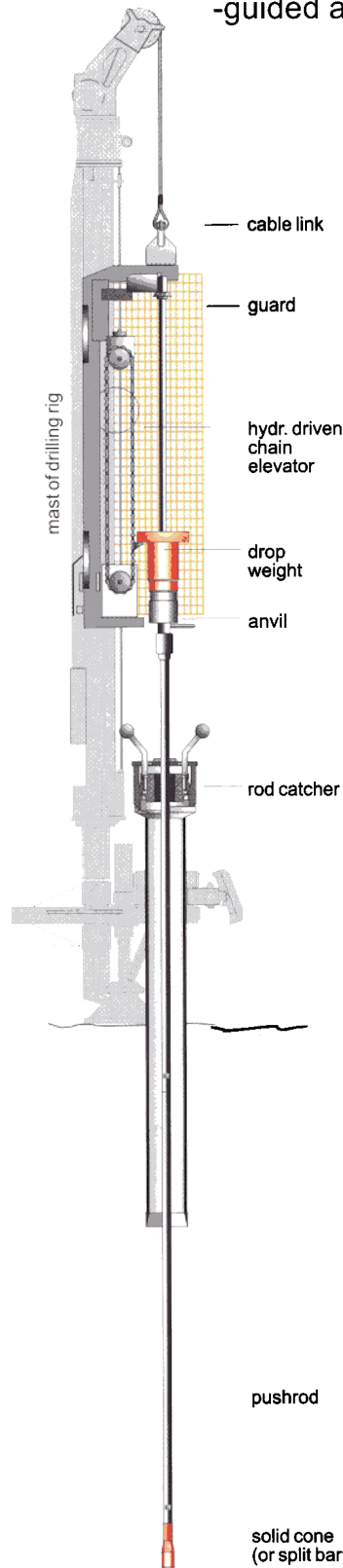
A locking pin is then removed, and the outer tube with release mechanism - carrying with it the drop weight - is raised by the winch until the drop weight is released automatically.

Technical Data:
Mech. TD-SPT
(Code No. 260 04 021 1)

Total length unextended (transport position)	: 1 800 mm
Total length extended	: 2 900 mm
max. OD	: 250 mm
Total weight	: 130 kgs

3 Hydr. TD-SPT

Standard Penetrometer
-guided along the mast-



Inside the hydr. penetrometer an endless roller chain is driven by a hydraulic motor. The drop weight is hoisted (by means of fixed pushers) and released automatically at a constant drop height. Drop weight and drop height can be supplied in compliance with ASTM, BS, DIN or any other Standards.

The complete unit is hanging on the winch rope and guided up and down along the mast of the rig.

Technical Data:
Hydr. TD-SPT
(Code No. 236 04 000 1)

Length	: 1 690 mm
Width	: 760 mm
Height	: 485 mm
Weight	: 250 kgs
Drop weight	: 63.5 kgs for SPT
Drop height	: 76.2 cm for SPT

The ancillary equipment is the same as for the mech. TD-SPT.

