

HAUPA Step-drills

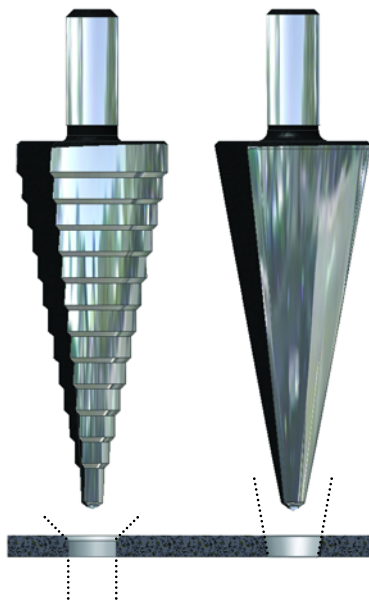
are the ideal tool for sheet-metal working. Typically used in the electrical industry, in the sanitary-/heating-industry, during mechanical engineering, or in the switch-cabinet construction.

The drills operate with hand drills or into stationary-machines and are an indispensable companion of work at assembling, particularly with changing requirements of the drilling-range.

They are suitable for sheet-metals, plates, profiles and pipes from steel, brass, copper, aluminum or stainless steel. Step drills are designed for drilling exact round and cylindrical holes.

The transition-area to the next drilling-diameter is constructed to deburr the existing drilling diameter, or also chamfer exactly.

All tools make it possible to center, drill out and deburr in only one processing step. It is not necessary to pre-drill.



HAUPA Cone-drills

are like step-drills the best suitable way for the sheet metal working. In contrary to the step-drill, the conical shape unite a multiplicity of hole-diameters in one tool.

The drills operate with hand drills or into stationary-machines and are an indispensable companion of work at assembling, particularly with changing requirements of the drilling-range.

They are suitable for sheet-metals, plates, profiles and pipes from steel, brass, copper, aluminum or stainless steel.

Cone-drills are geometrically evenly conically laid out, which provides in application a quiet running, burr-free holes, and even a good splinter removal.

All tools make it possible to center, drill out and deburr in only one processing step. It is not necessary to pre-drill.

Why are HAUPA Step-drills and Cone-drills so singular in it's quality

HAUPA-drills are subject to complex quality controls and constant examinations during the production. By constructing the cutting-characteristics we paid attention to the optimum fulfilment of the drilling task. Tolerances of $\pm 0,05\text{mm}$ over the entire production process guarantees the final product absolute accuracy to size, quiet running and excellent stock removal capacity.

Regularly independent external quality inspections in the Remscheider VPA (official test laboratory) ensure absolute transparency regarding cutting-results and material quality. Spectrographic analysis of the steel in connection with hardness structure analyses ensure continuous quality. Of course it is our most ambitious goal, to increase the requirements and constantly improve the results.



Which steel quality is used ?

All drills are manufactured of high-quality high-speed steel of the quality 1.3343 / DMo5 / E:M2 / HS 6-5-2. This quality is characterised by high tenacity and good cutting results. It is particularly suitable for the production of high-stressable cutting tools. The drills are all hardened on HRC 63-64.

... and where is he coming from ?

- HAUPA-Drills are manufactured to 100 % of German-Steel.
- In the heart of the German tool-industry, in Remscheid, it will be processed for becoming a high-quality gumption product and a master of its class.

... **100 % MADE IN GERMANY³**

Service life of the drills ?

HAUPA-drills are conceived for the "constant, rough employment". Of course each material of a cutting edge was in application subject to a wear. Statements to service lives depend therefore always on the adequate employment of the tools and the material which can be worked on. When the user will consider the recommended cutting speed and cooling (see rotary guide values), he will have a longlasting tool.

Rotary guide value for step drills / cone drills

- Take notice of the cutting speed
- Grease the cutting lips in case of application

Material	Mild steel < 700 N/mm ²	Mild steel > 700 N/mm ²	Alloy steel < 1000 N/mm ²	Cast iron < 250 N/mm ²	Cast iron > 250 N/mm ²	Stainless steel
Material gauge	6,0 mm	6,0 mm	6,0 mm	6,0 mm	6,0 mm	3,0 mm
Lubricant	Drilling paste	Drilling paste	Drilling paste	Air	Air	Drilling paste
Vc = m / min	25	20 - 25	20	15	10	5
ø mm	U/min r.p.m.	U/min r.p.m.	U/min r.p.m.	U/min r.p.m.	U/min r.p.m.	U/min r.p.m.
4,0 - 12,0	1900 - 600	1700 - 580	1550 - 520	1190 - 400	800 - 250	400 - 130
4,0 - 20,0	1900 - 400	1700 - 350	1550 - 300	1190 - 240	800 - 160	400 - 80
12,0 - 20,0	600 - 400	600 - 350	520 - 300	400 - 240	250 - 160	130 - 80
4,0 - 24,0	1900 - 300	1700 - 280	1550 - 250	1190 - 200	800 - 130	400 - 65
6,0 - 30,0	1300 - 250	1200 - 230	1000 - 200	780 - 150	530 - 100	250 - 50
20,0 - 30,0	400 - 250	350 - 230	300 - 200	230 - 150	160 - 100	80 - 50
6,0 - 36,0	1300 - 220	1200 - 200	1000 - 170	780 - 130	530 - 90	250 - 45
30,0 - 40,0	250 - 200	230 - 180	200 - 150	150 - 120	100 - 80	50 - 40
40,0 - 50,0	200 - 160	180 - 140	150 - 125	120 - 90	80 - 65	40 - 30
50,0 - 60,0	160 - 130	140 - 110	125 - 100	90 - 80	65 - 50	30 - 25



Material	CuZn alloy brittle	CuZn alloy tough	AL alloy < 11% Si	Thermo- plastic	Duro- plastic	Wood
Material gauge	6,0 mm	6,0 mm	6,0 mm	6,0 mm	6,0 mm	25,0 mm
Lubricant	Air	Air	Drilling paste	H ₂ O	Air	Air
Vc = m / min	60	35	30	20	15	> 40
ø mm	U/min r.p.m.	U/min r.p.m.	U/min r.p.m.	U/min r.p.m.	U/min r.p.m.	U/min r.p.m.
4,0 - 12,0	4700 - 1550	2750 - 920	2350 - 790	1550 - 520	1190 - 400	3000 - 1000
4,0 - 20,0	4700 - 950	2750 - 550	2350 - 470	1550 - 300	1190 - 240	3000 - 650
12,0 - 20,0	1550 - 950	920 - 550	790 - 470	520 - 300	400 - 240	1000 - 650
4,0 - 24,0	4700 - 790	2750 - 460	2350 - 400	1550 - 250	1190 - 200	3000 - 550
6,0 - 30,0	3150 - 630	1850 - 370	1590 - 310	1000 - 200	780 - 150	2100 - 420
20,0 - 30,0	950 - 630	550 - 370	470 - 310	300 - 200	230 - 150	650 - 420
6,0 - 36,0	3150 - 530	1850 - 300	1590 - 260	1000 - 170	780 - 130	2100 - 350
30,0 - 40,0	630 - 470	370 - 280	310 - 240	200 - 150	150 - 120	420 - 310
40,0 - 50,0	470 - 380	280 - 220	240 - 190	150 - 125	120 - 90	310 - 250
50,0 - 60,0	380 - 310	220 - 185	190 - 150	125 - 100	90 - 80	250 - 210

Cone Drills

suitable for mechanical engineering and sheet metal-working
for general drilling-tasks without special drilling-defaults

Precision - Conical Drill

Manufactured of High Speed Steel DMo5

- Radial- and axial relief-grinded
- Straight fluted, parallel shank
- Stepless drilling in thinnest sheets without pre-drilling
- Burr-free drilling without deformation of the sheet
- Laserscaled in the flute to see the reached diameter
- Best drilling results by using the lubricating paste
- Materials up to 6 mm are easily processed, by consideration of the cutting speed.



Quality	Order No.	Drill-Range ø	Shank ø	l—mm—l	Cutting lips
HSS	23 13 00	3 - 14 mm	6 mm	62	2
HSS	23 13 01	6 - 20 mm	8 mm	70	2
HSS	23 13 30	6 - 22,5 mm	8 mm	80	2
HSS	23 13 05	6 - 30 mm	10 mm	95	2
HSS	23 13 02	16 - 30 mm	10 mm	75	2
HSS	23 13 04	26 - 40 mm	12 mm	78	2
HSS	23 13 06	36 - 50 mm	12 mm	78	2
HSS	23 13 07	46 - 60 mm	13 mm	78	2

three-flats
shank



Precision - Conical Drill Set

In industrial steel-case

- equipped with 3 drills and lubricating paste



Quality	Order No.	Drill-Range ø	Content
HSS	23 13 12	3 - 30 mm	ø 3 - 14 mm; ø 6 - 20 mm; ø 16 - 30 mm lubricating paste

Step Drill

suitable for mechanical engineering, electrical assembly and sheet metal-working for special drilling-tasks with appropriate diameter-defaults

Precision - Step Drill 1 mm or 2 mm rising

Manufactured of High Speed Steel DMO5

- Up to 6 mm gauge
- Radial- and axial relief-grinded
- Straight fluted, parallel shank
- Stepless drilling in thinnest sheets without pre-drilling
- Burr-free drilling without deformation of the sheet
- The Step Drill drills and simultaneously deburres with the following step
- Laserscaled in the flute to see the reached diameter
- Best drilling results by using the lubrication paste



Quality	Order No.	Drill-Range ø	Shank ø	Steps	—mm—	Cutting lips
Typ 1 mm rising:						
HSS	23 13 36	4 - 12 mm	6 mm	9	69	2
HSS	23 13 38	12 - 20 mm	9 mm	10	74	2
HSS	23 13 40	20 - 30 mm	12 mm	11	93	2
HSS	23 13 42	30 - 40 mm	12 mm	11	93	2
HSS	23 13 55	40 - 50 mm	12 mm	11	97	2
Typ 2 mm rising:						
HSS	23 13 50	4 - 12 mm	6 mm	5	69	2
HSS	23 13 52	4 - 20 mm	8 mm	9	73	2
HSS	23 13 54	6 - 30 mm	10 mm	13	95	2



Precision - Step Drill Set 1 mm rising

In industrial steel-case

- equipped with 3 drills and lubricating paste



Quality	Order No.	Drill-Range ø	Content
HSS	23 13 27	4 - 30 mm	ø 4 - 12 mm; ø 12 - 20 mm; ø 20 - 30 mm lubrication paste

Step Drill

suitable for mechanical engineering and electrical assembly
for METRIC cable connections with thread core hole & through hole sizes EN 60423

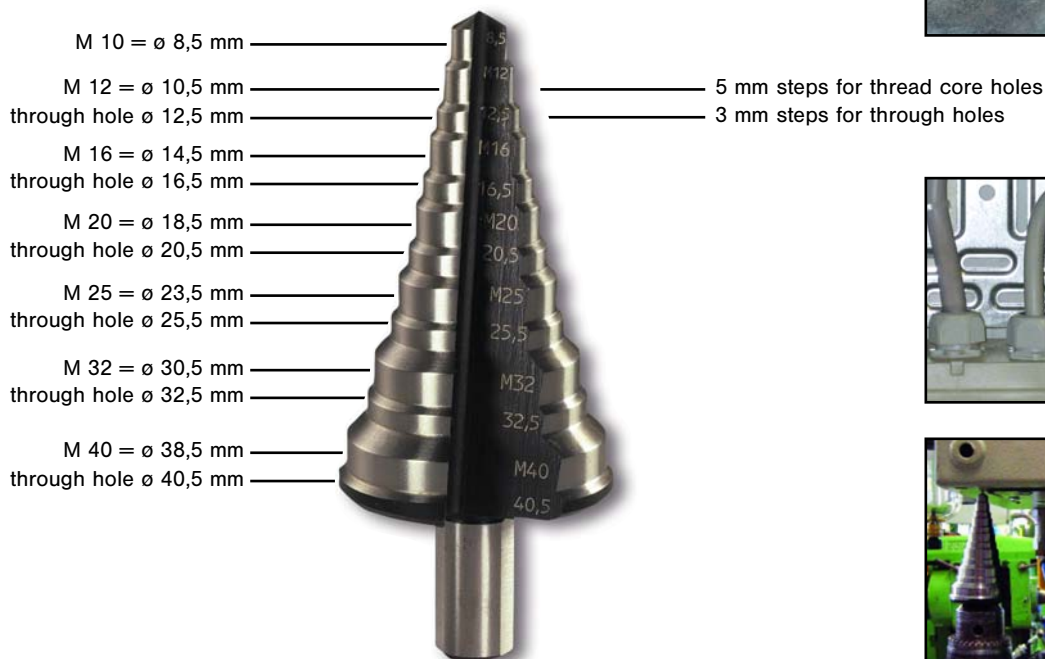
Precision - Step Drill Multi for rough thread core holes & through holes EN 60423

Manufactured of High Speed Steel DMO5

- Up to 6 mm gauge
- Radial- and axial relief-grinded
- Straight fluted, parallel shank
- Stepless drilling in thinnest sheets without pre-drilling
- Burr-free drilling without deformation of the sheet
- The Step Drill drills and simultaneously deburres with the following step
- Laserscaled in the flute to see the reached diameter
- Best drilling results by using the lubrication paste



Quality	Order No.	Drill-Range \varnothing	Shank \varnothing	Steps	— mm —	Cutting lips
HSS	23 13 19	M 10 - M 40 thread core hole + through hole	12 mm	13	97	2



Step Drill

suitable for mechanical engineering and electrical assembly
for METRIC cable connections with through hole sizes EN 50262

Precision - Step Drill for through holes EN 50262

Manufactured of High Speed Steel DMO5

- Up to 6 mm gauge
- Radial- and axial relief-grinded
- Straight fluted, parallel shank
- Stepless drilling in thinnest sheets without pre-drilling
- Burr-free drilling without deformation of the sheet
- The Step Drill drills and simultaneously deburres with the following step
- Best drilling results by using the lubrication paste



Quality	Order No.	Drill-Range \varnothing	Shank \varnothing	Steps	— mm —	Cutting lips
HSS	23 13 24	M 8 - M 40 metric through hole	12 mm	8	77	2



Step Drill

suitable for mechanical engineering and electrical assembly
for METRIC cable connections with thread core hole sizes EN 60423

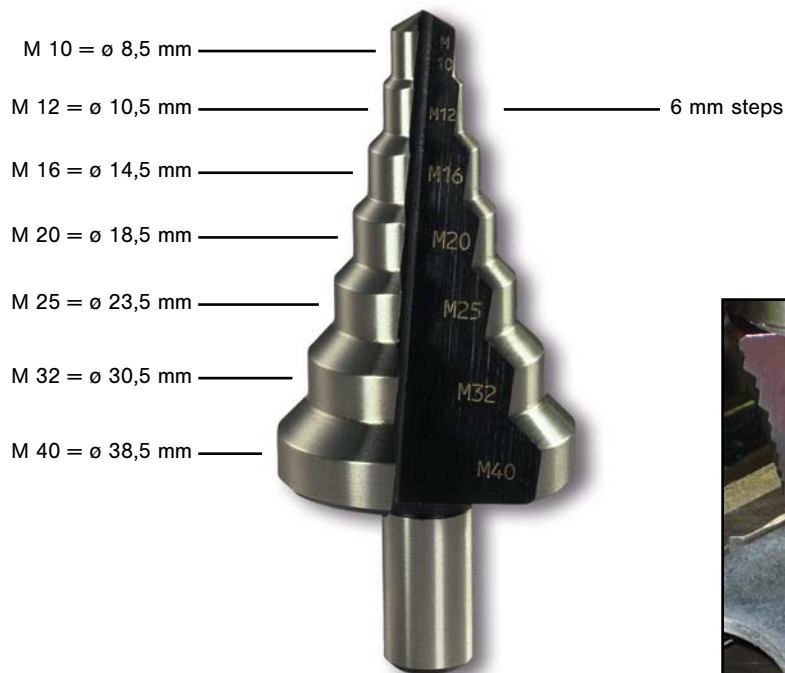
Precision - Step Drill Multi for rough thread core holes EN 60423

Manufactured of High Speed Steel DMo5

- Up to 6 mm gauge
- Radial- and axial relief-grinded
- Straight fluted, parallel shank
- Stepless drilling in thinnest sheets without pre-drilling
- Burr-free drilling without deformation of the sheet
- The Step Drill drills and simultaneously deburres with the following step
- Best drilling results by using the lubrication paste



Quality	Order No.	Drill-Range \varnothing	Shank \varnothing	Steps	— mm —	Cutting lips
HSS	23 13 26	M 10 - M 40 metric core hole	12 mm	7	86	2



Step Drill

particularly suitable for the electrical assembly
for drilling using PG - thread through hole sizes

Precision - Step Drill for PG rough thread through holes

Manufactured of High Speed Steel DMO5

- Up to 6 mm gauge
- Radial- and axial relief-grinded
- Straight fluted, parallel shank
- Stepless drilling in thinnest sheets without pre-drilling
- Burr-free drilling without deformation of the sheet
- The Step Drill drills and simultaneously deburres with the following step
- Laserscaled in the flute to see the reached diameter
- Best drilling results by using the lubrication paste



Information of the PG-dimensions:
Still further used, but will be replaced in favour of the metric system.

Quality	Order No.	Drill-Range ø	Shank ø	Steps	l—mm—l	Cutting lips
HSS	23 13 22	PG 7 - PG 21 through hole	12 mm	7	75	2
HSS	23 13 20	PG 7 - PG 29 through hole	12 mm	10	85	2



Order No. 23 13 20



Step Drill

particularly suitable for the electrical assembly
for drilling using PG - thread core hole sizes

Precision - Step Drill for PG rough thread core holes

Manufactured of High Speed Steel DMO5

- Up to 6 mm gauge
- Radial- and axial relief-grinded
- Straight fluted, parallel shank
- Stepless drilling in thinnest sheets without pre-drilling
- Burr-free drilling without deformation of the sheet
- The Step Drill drills and simultaneously deburrs with the following step
- Laserscaled in the flute to see the reached diameter
- Best drilling results by using the lubrication paste

**!! Please note: discontinued item!!
only briefly available**



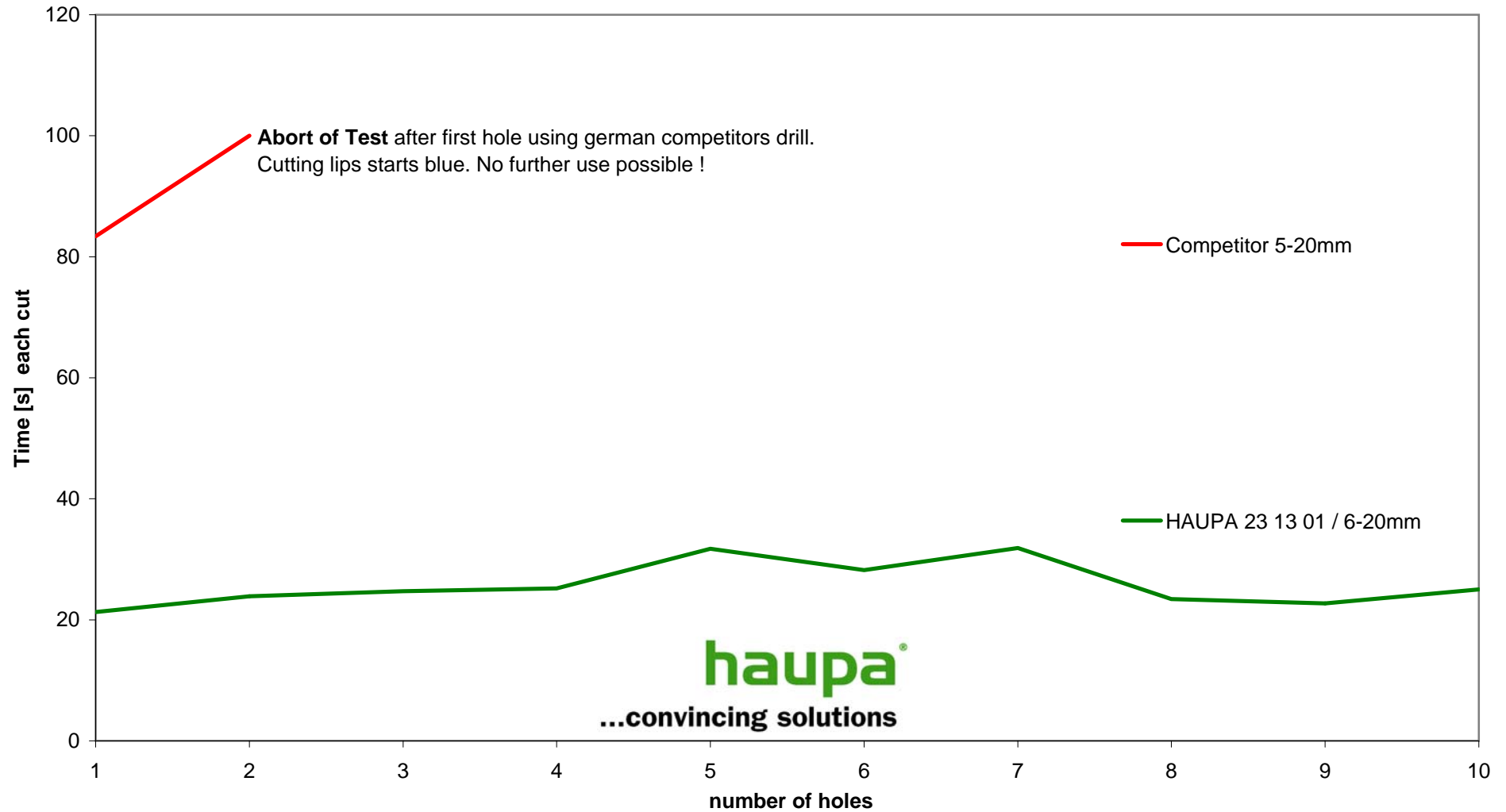
Information of the PG-dimensions:

Still further used, but will be replaced in favour of the metric system.

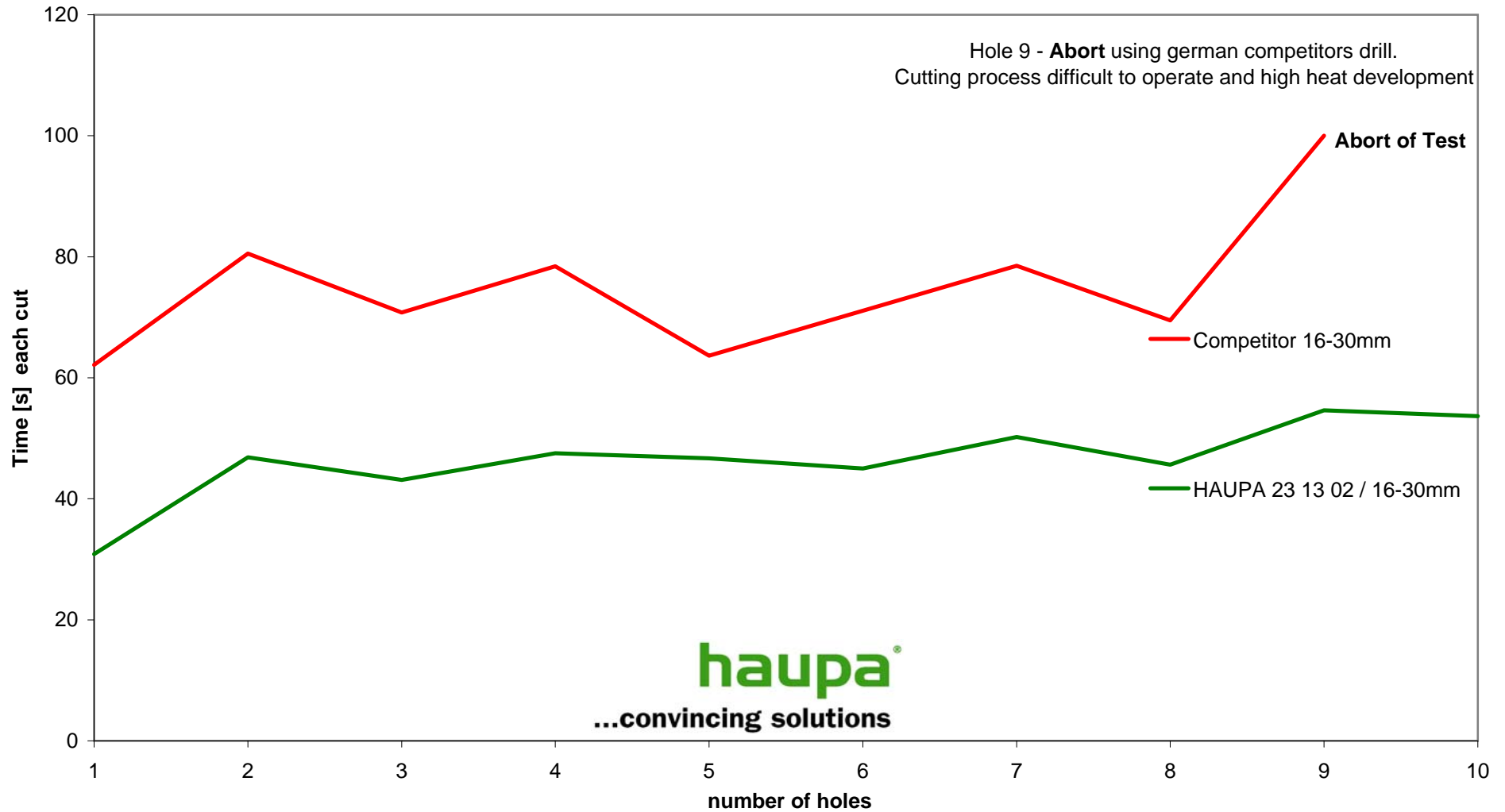
Quality	Order No.	Drill-Range ø	Shank ø	Steps	l—mm—l	Cutting lips
HSS	23 13 23	PG 7 - PG 21 core hole	12 mm	6	80	2



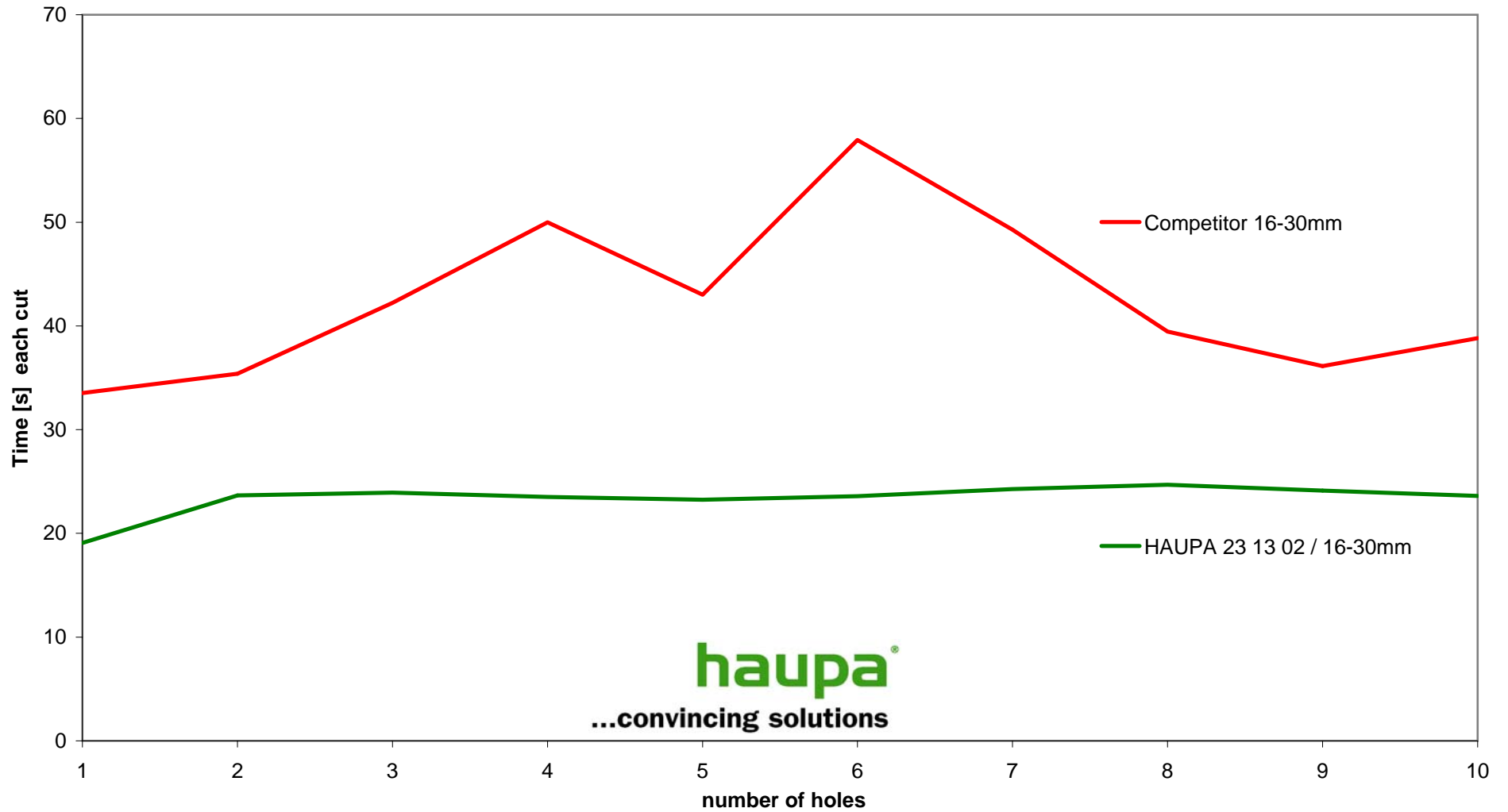
Cone drill **HAUPA 23 13 01** in material ST37-2
3,0mm thickness / 415 N/mm²



Cone drill **HAUPA 23 13 02** in material **ST37-2**
3,0mm thickness / 415 N/mm²



Cone drill **HAUPA 23 13 02** in material ST W22
1,5mm thickness / 320 N/mm²



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...convincing solutions

Step drill HAUPA 23 13 54 in material in ST 37-2
3,0mm thickness / 370 N/mm²

