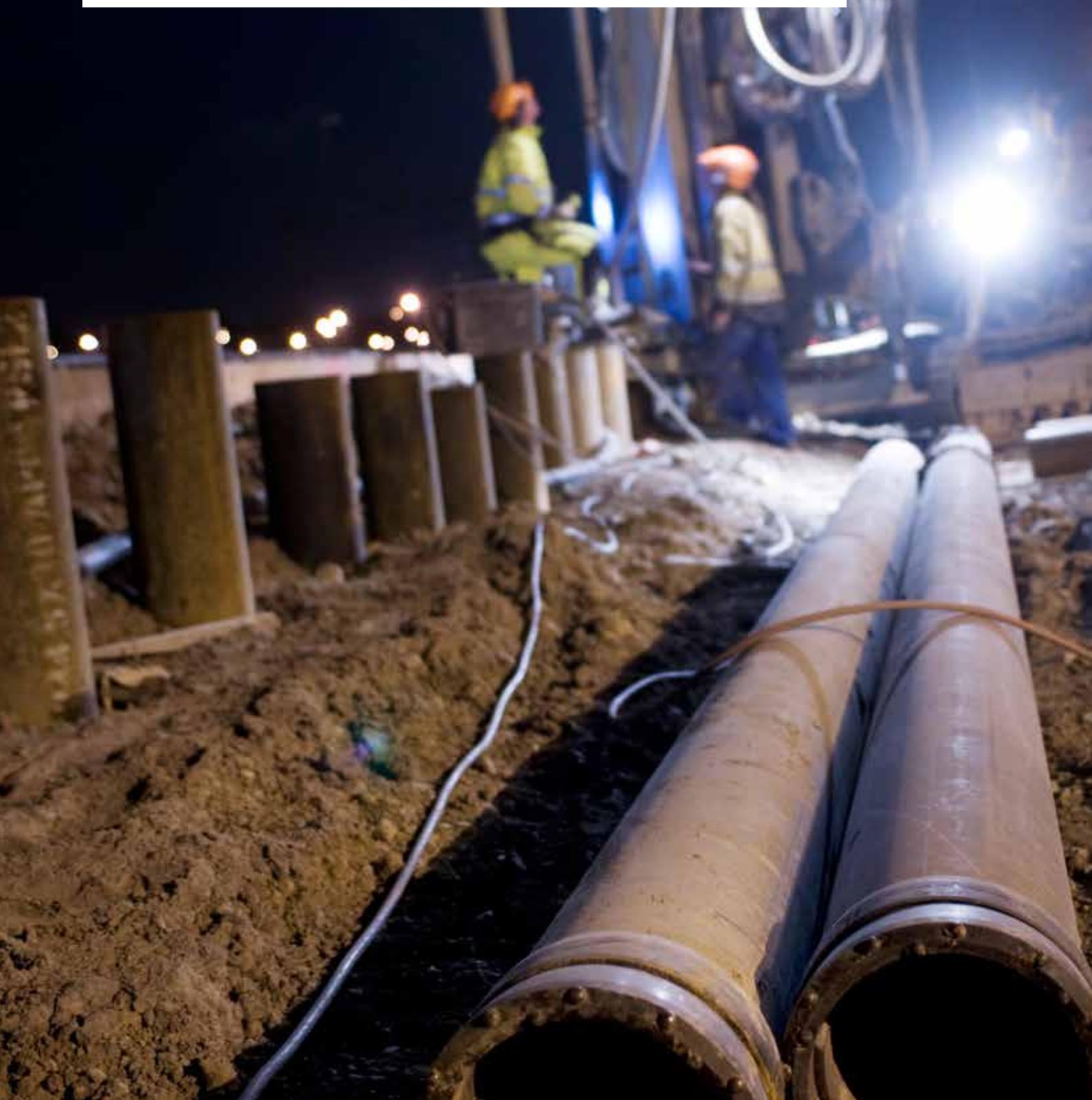


Secoroc Rock Drilling Tools

CASING ADVANCEMENT SYSTEMS

Atlas Copco







ATLAS COPCO

CASING ADVANCEMENT SYSTEMS

We have a long tradition of supplying geotechnical engineers with a wide range of equipment and services. Our product offer consists of rigs, grouting solutions, site investigation tools, DTH hammers and a full range of high performance casing advancement systems.

All our products are designed to minimize downtime and to maximize your productivity and profitability. When we are needed, we will quickly be at your site thanks to our worldwide Atlas Copco organization. Just contact your local Atlas Copco representative.

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CASING ADVANCEMENT SYSTEMS

Casing advancement systems, or drilled casings, are today's preferred method for drilling in difficult ground conditions, for example, where there are boulders or loose formations. This catalogue guides you to the right solution based on your requirements.

What is a casing advancement system?

As much as 90% of the land surface of the earth is covered with loose, unconsolidated material. When drilling in so-called overburden, the conditions are often challenging with risk for collapsing walls, hole deviations and failure to reach design depth or bedrock.

The casing advancement system is comprised of an ingeniously simple method of drilling through overburden while advancing the casing into the hole at the same time. This enables contractors to perform their work faster with higher quality and reduced risk.



See page 9 for a detailed description of a casing advancement system.

The system adds value whether the mission is to install foundation, support elements or simply case the hole in collapsing formation.

How to select a casing advancement system?

The choice of solution depends on several factors including ground conditions and application. This catalogue describes a complete system solution and different application scenarios, allowing you to select the right equipment from the extensive product portfolio.

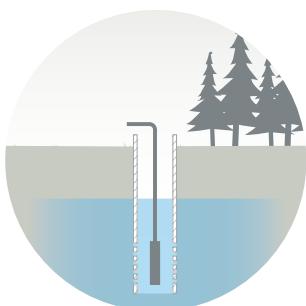
APPLICATIONS

Casing advancement systems can be used in a wide range of applications where you need to drill in difficult ground conditions. The following are examples of the most common applications.



Geothermal well drilling

Geothermal heating of houses are increasingly popular due to both economical advantages as well as environmental concerns. Casing advancement systems are often used to drill the holes through the overburden, keeping the hole open during installation of the heat exchange system and minimizing the impact on surrounding structures.



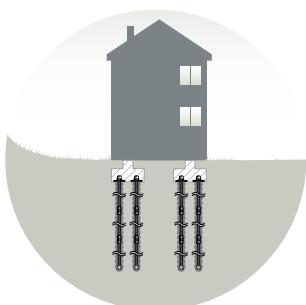
Water well drilling

Water well drilling is common in urban, developed areas where the well must be drilled quickly with minimum impact on the surroundings. Atlas Copco offers a solution that can be used with small, compact rigs (using the DTH drilling method) with excellent results in almost any ground condition.



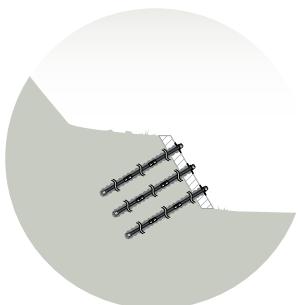
Pipe roofing

Pipe roofing is a method to pre-reinforce the ground ahead of a tunnel face to ensure that excavation can proceed safely. A steel casing is installed in an umbrella pattern around the excavation line, forming a protective arch under which the tunnel can advance.



Foundation work

Stringent demands on productivity, high drilling accuracy and the ability to drill inclined piles for foundation work make casing advancement systems increasingly popular for both end bearing and friction piles.



Anchoring

Tieback anchors, or ground anchors, are common all over the world. They are typically installed to provide support for slopes or other structures. They can be installed in combination with a retaining wall structure, as individual or systematic support.

DRILLING METHODS

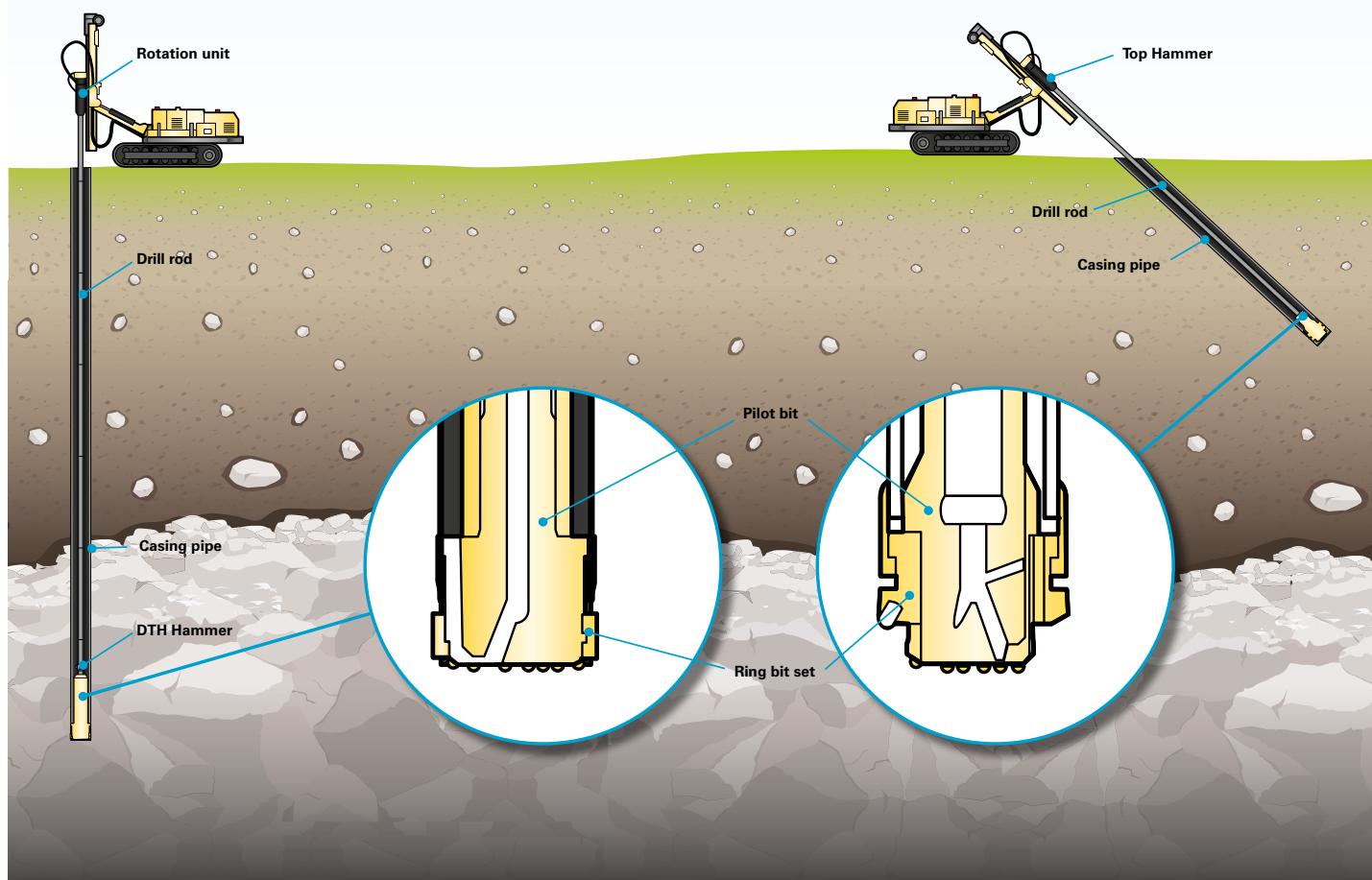
Atlas Copco casing advancement systems are available in versions for top hammer or down-the-hole (DTH) drilling. The selected drilling method depends on the diameter drilled, depth of the hole and the driller's preferred equipment.

DTH

DTH is a common method used to drill deep holes with great accuracy. It is suitable to use for straight piling or well drilling that requires the high performance needed for drilling large and deep holes. DTH systems are available in the diameters 114,3 - 219 mm.

Tophammer

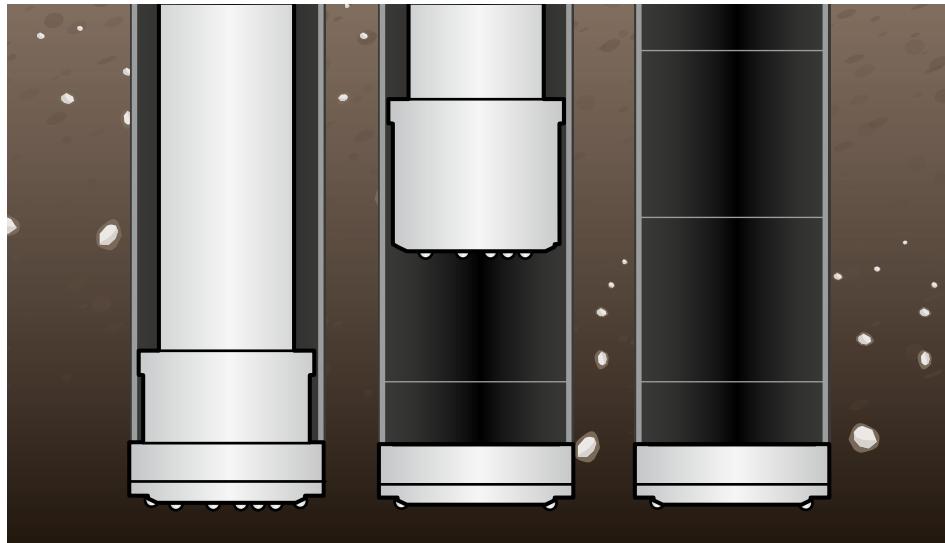
Tophammer drilling is a fast and efficient method for drilling shorter holes, straight or inclined. It is primarily used for smaller diameter holes in overburden drilling, such as anchoring piles or micropiles. Tophammer systems are available in the diameters 76,2 – 139,7 mm.



Casing types

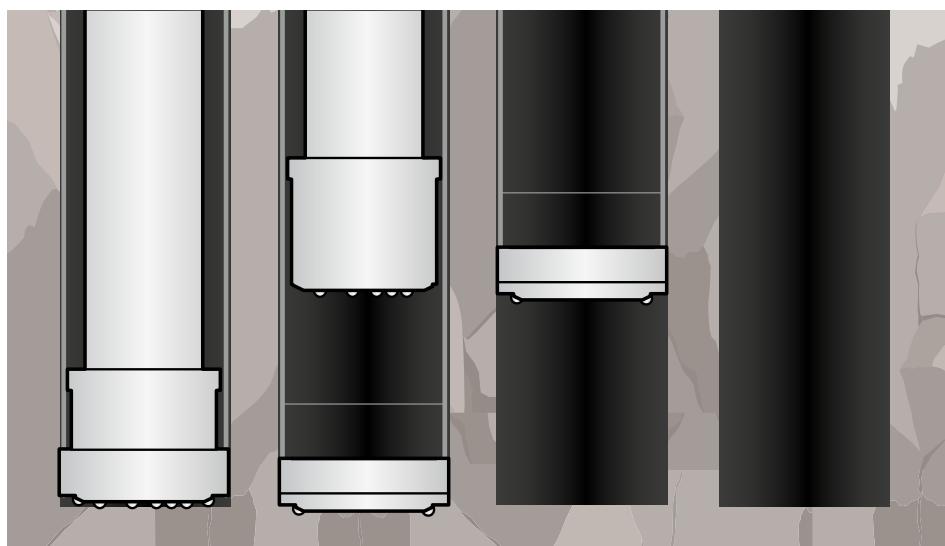
Permanent casing

There are different applications where the permanent casing is the preferred choice, the most common are water wells, geo-thermal wells, foundation works and pipe roofing. In water and thermal wells the casing is used as sacrificial element just to keep the hole open. In foundation works, the permanent casing can work as bearing structure of the pile, as sacrificial element to protect the pile against corrosion or just to keep the hole open.



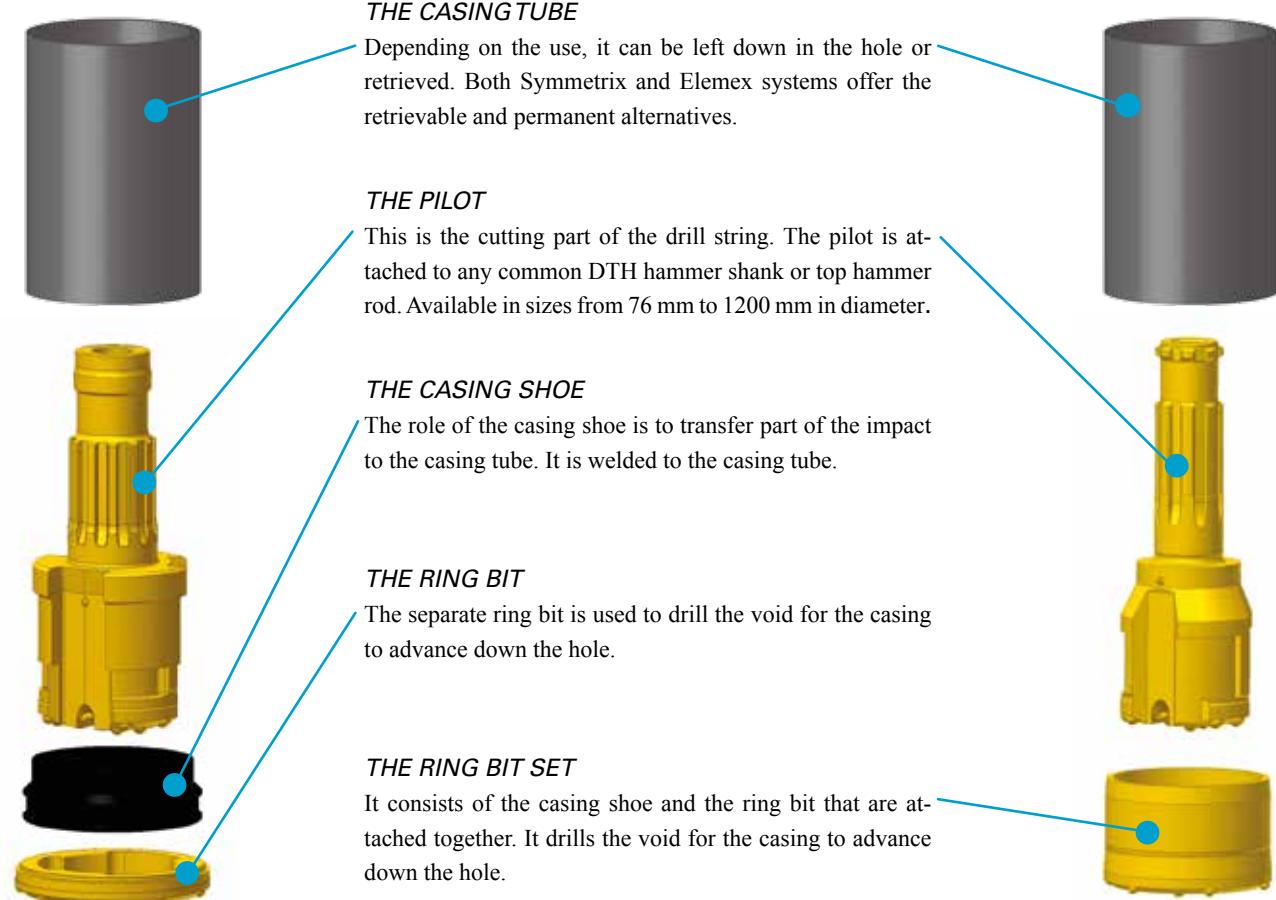
Retrievable casing

A retrievable casing is used when the casing only is needed during the drilling process, that is when it is used to keep the hole open during drilling and not used as support in the finished structure. This is a cost effective solution for eg. piles and anchoring, since the casing is retrieved from the hole and reused.



SYSTEM COMPONENTS

The casing advancement systems are available either as a solitary ring bit or as a ring bit set.



The Symmetrix and Elemex systems are part of a total overburden drilling solution from Atlas Copco. They work well in both DTH and tophammer drilling, and your choice depends primarily on the drilling conditions on site.

Symmetrix - Productivity and precision

Symmetrix is a versatile solution for overburden drilling where ground conditions are difficult, time is limited and precision is crucial. Whether used in ground with big boulders, inclined competent layers or hard bedrock, Symmetrix drills until the required depth is reached. The system drills more quickly and accurately than any other method available today. The unique design of Symmetrix provides reliable results, which saves contractors money.

Elemex - For improved air control

The Elemex casing advancement system is the preferred system for minimizing the risk of settlements in surrounding structures. The unique design of the pilot bit directs the air over the drill bit surface reducing the air leakage into the ground. The directed air flushing enables the driller to be in full control of the drilling process.

PRODUCT SELECTION GUIDE

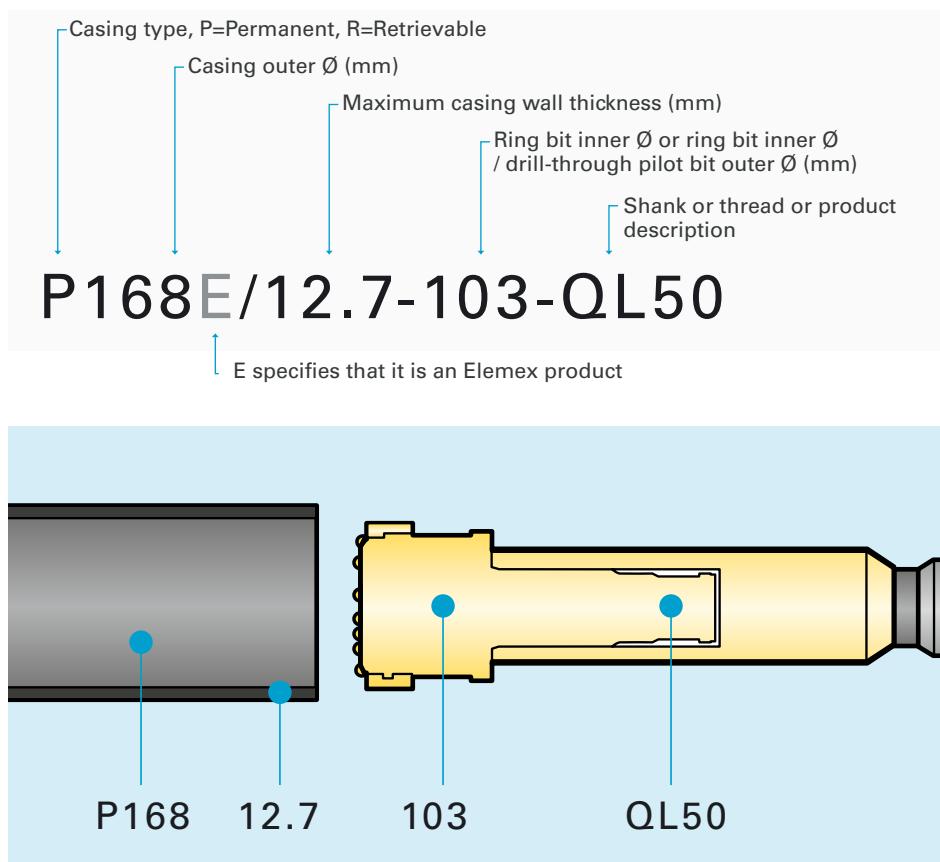
The matrix below will help you to select the appropriate model of Casing Advancement System for your application. The color codes used in the matrix are also found in the tables in the catalogue for your convenience.

		Applications					
		Geothermal Well drilling	Water well drilling	Pipe Roofing	Large Foundations	Small Foundations	Anchoring
Permanent casing	Ring bit set						
	Separate ring bit						
	Ring bit set						
	Retrievable casing						
	Ring bit set						

Description	Symmetrix	Elemex	Model
The system is designed for short holes and is available with both thin and thick casing wall.	✓	✓	V
Our most durable system, designed for deep holes.	✓	✓	W
The system is designed for deep holes where you need to drill shallow rock sockets below the casing with the pilot bit.	✓		WDT
The system designed specifically for pipe roofing and top hammer applications	✓		T
Cost efficient system with separate ring bit for installation of permanent casings when there is no need to drill below the casing.	✓	✓	SE
A retrievable system with a unique design that enables a large inner diameter	✓	✓	N
A retrievable system designed to allow drilling shallow rock sockets below the casing with the pilot bit.	✓		NDT

Product designation code

The designation code makes it easy to identify the key parameters of the system. This makes it easier to find the right system or parts of it.



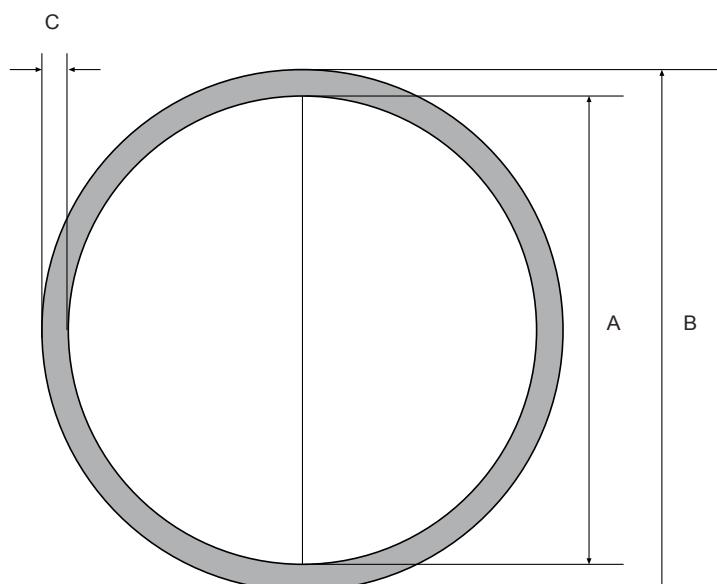
The casing dimensions are defined by:

a) Inner diameter

b) Outside diameter

c) Wall thickness

The dimensions are important and must be taken into account when selecting the right product. The content of the catalogue is organized by casing outer diameter. The maximum wall thickness is defined for all systems.



CASING OUTER DIAMETER 76,2 MM (3") - 114,3 MM (4 1/2")

Casing 76,2 mm (3") Permanent, Top hammer

Model Symmetrix / Element	Pilot bit						Ring bit set							
	Designation code	Pilot bit Outer ø		Weight	Product number	Designation code	Casing wall max thickness		Ring bit Inner ø		Ring bit Outer ø		Weight	Product number
		mm	inch				mm	inch	mm	inch	mm	inch		
T S	P76/8-41-R32	58	2,26	1,0	8092402214	P76/8-41-ring bit set	8,0	0,31	41	1,61	88	3,46	1,5	8092402215

Casing 88,9 mm (3 1/2") Permanent, Top hammer

Model Symmetrix / Element	Pilot bit						Ring bit set							
	Designation code	Pilot bit Outer ø		Weight	Product number	Designation code	Casing wall max thickness		Ring bit Inner ø		Ring bit Outer ø		Weight	Product number
		mm	inch				mm	inch	mm	inch	mm	inch		
T S	P89/8-54-T38	70	2,76	3,5	8092400954	P89/8-54-ring bit set	8,0	0,31	54	2,13	100	3,94	2,0	8092400976

Casing 101,6 mm (4") Permanent, Top hammer

Model Symmetrix / Element	Pilot bit						Ring bit set							
	Designation code	Pilot bit Outer ø		Weight	Product number	Designation code	Casing wall max thickness		Ring bit Inner ø		Ring bit Outer ø		Weight	Product number
		mm	inch				mm	inch	mm	inch	mm	inch		
T S	P102/8-65-T38	84	3,31	4,5	8092402721	R89/8-58-ring bit set	8,0	0,31	65	2,56	114	4,49	2,5	8092402722

Casing 114,3 mm (4 1/2") Permanent, Top hammer

Model Symmetrix / Element	Pilot bit						Ring bit set							
	Designation code	Pilot bit Outer ø		Weight	Product number	Designation code	Casing wall max thickness		Ring bit Inner ø		Ring bit Outer ø		Weight	Product number
		mm	inch				mm	inch	mm	inch	mm	inch		
T S	P114/10-75-T38	93	3,65	6,0	8092401737	P114/10-75-ring bit set	10,0	0,39	75	2,95	129	5,08	4,0	8092401735

Model Symmetrix / Element	Pilot bit						Casing shoe				Ring bit						
	Designation code	Pilot bit Outer ø		Weight	Product number	Designation code	Casing wall max thickness		Product number	Designation code	Ring bit Inner ø		Ring bit Outer ø		Weight	Product number	
		mm	inch				mm	inch			mm	inch	mm	inch			
S E	P114/10-61-T45	93	3,65	5,0	8092401669	P114/10-61-casing shoe	10,0	0,39	2,0	8092401164	P114/10-61-LH ring bit	61	2,40	125	4,92	2,5	8092402549
						P114/8-61-casing shoe	8,0	0,31	2,0	8092402153							

114,3 MM (4 1/2") CASING OUTER DIAMETER

Casing 114,3 mm (4 1/2") Permanent, DTH

Model Symmetrix / Element	Pilot bit							Ring bit set									
	Designation code	Pilot bit Outer ø		Weight	Product number	Designation code	Casing wall max thickness		Ring bit Inner ø		Ring bit Outer ø		Weight	Product number			
		mm	inch				mm	inch	mm	inch	mm	inch					
V E	P114E/8-75-DHD3.5	93	3,65	8,0	8092440007	P114E/10-75-ring bit set	8,0	0,31	75	2,95	129	5,08	5,5	8092440008			
T S	P114/8-75-COP34	93	3,65	8,0	8092402155	P114/10-75-ring bit set	8,0	0,31	75	2,95	129	5,08	4,0	8092401735			
	P114/8-75-DHD3.5	93	3,65	8,0	8092402156												
Model Symmetrix / Element	Pilot bit							Casing shoe									
	Designation code	Pilot bit Outer ø		Weight	Product number	Designation code	Casing wall max thickness		Weight	Product number	Designation code	Ring bit Inner ø		Ring bit Outer ø	Weight	Product number	
		mm	inch				mm	inch				mm	inch	mm	inch		
S E	P114/8-61-COP34	93	3,65	8,0	8092401387	P114/10-61-casing shoe	10,0	0,39	2,0	8092401164	P114/10-61-ring bit	61	2,40	125	4,92	2,5	8092401393
S E	P114/10-61-DHD3.5	93	3,65	8,0	8092401486	P114/8-61-casing shoe	8,0	0,31	2,0	8092402153							
S E	P114E/10-61-DHD3.5	93	3,65	8,0	8092440003	P114/10-61-casing shoe	10,0	0,39	2,0	8092401164	P114E/10-61-ring bit	61	2,40	125	4,92	4,0	8092440004
						P114/8-61-casing shoe	8,0	0,31	2,0	8092402153							

Casing 114,3 mm (4 1/2") Retrievable, Top hammer

Model Symmetrix / Element	Pilot bit							Ring bit set								
	Designation code	Pilot bit Outer ø		Weight	Product number	Designation code	Casing wall max thickness		Weight	Product number	Designation code	Ring bit Inner ø		Ring bit Outer ø	Weight	Product number
		mm	inch				mm	inch				mm	inch	mm	inch	
N S	R114/10-81-G2-R32 PILOT	92	3,61	4,0	8092403524	R114/10-81-G2-RING BIT SET	10,0	0,39	82	3,23	121	4,80	4,5	8092403513		
N S	R114/10-81-G2-T45 PILOT	92	3,61	4,0	8092403525											
N D T S	R114/10-80/91-T45	91	3,58	4,0	8092401615	R114/10-80/91-ring bit set	10,0	0,39	80	3,15	130	5,12	4,5	8092401072		

Casing 114,3 mm (4 1/2") Retrievable, DTH

Model Symmetrix / Element	Pilot bit							Ring bit set								
	Designation code	Pilot bit Outer ø		Weight	Product number	Designation code	Casing wall max thickness		Weight	Product number	Designation code	Ring bit Inner ø		Ring bit Outer ø	Weight	Product number
		mm	inch				mm	inch				mm	inch	mm	inch	
N S	R114/10-81-G2-COP32 PILOT	92	3,61	7,0	8092403517	R114/10-81-G2-RING BIT SET	10,0	0,39	81	3,23	121	4,80	4,5	8092403513		
N S	R114/10-81-G2-DHD3.5 PILOT	92	3,61	7,0	8092403512											
N E	R114E/10-81-G2-DHD3.5 PILOT	92	3,61	7,0	8092440433											

CASING OUTER DIAMETER 127,0 MM (5") - 139,7 mm (5 1/2")

Casing 127,0 mm (5") Retrievable, DTH

Model Symmetrix / Element	Pilot bit					Ring bit set								
	Designation code	Pilot bit Outer ø		Weight	Product number	Designation code	Casing wall max thickness		Ring bit Inner ø		Ring bit Outer ø		Weight	Product number
		mm	inch				mm	inch	mm	inch	mm	inch		
N S E	R127/10-95-G2-COP34 PILOT	106	4,13	9,0	8092403518	R127/10-95-G2-RING BIT SET	10,0	0,39	95	3,74	135	5,35	6,0	8092403477
	R127/10-95-G2-DHD3.5 PILOT	106	4,13	9,0	8092403476									
	R127E/10-95-G2-DHD3.5 PILOT	106	4,13	9,0	8092440412									

Casing 139,7 mm (5 1/2") Permanent, Top hammer

Model Symmetrix / Element	Pilot bit					Ring bit set								
	Designation code	Pilot bit Outer ø		Weight	Product number	Designation code	Casing wall max thickness		Ring bit Inner ø		Ring bit Outer ø		Weight	Product number
		mm	inch				mm	inch	mm	inch	mm	inch		
V S	P140/10-100-T45	117	4,59	6,0	8092402164	P140/10-100-ring bit set	10,0	0,39	100	3,94	158	6,22	4,0	8092402069

Casing 139,7 mm (5 1/2") Permanent, DTH

Model Symmetrix / Element	Pilot bit					Ring bit set								
	Designation code	Pilot bit Outer ø		Weight	Product number	Designation code	Casing wall max thickness		Ring bit Inner ø		Ring bit Outer ø		Weight	Product number
		mm	inch				mm	inch	mm	inch	mm	inch		
V S	P140/10-100-COP44/DHD340	117	4,61	13,0	8092402068	P140/10-100-ring bit set	10,0	0,39	100	3,94	158	6,22	4,0	8092402069
V E	P140/5-115-COP44/DHD340	128	5,02	14,0	8092400801	P140/5-115-ring bit set	5,0	0,20	115	4,53	159	6,26	3,5	8092401893
	P140/5-115-COP42	128	5,02	14,0	8092400800									
	P140/5-115-QL40	128	5,02	14,0	8092401494									
	P140/5-115-COP44 GOLD EXPRESS	128	5,02	14,0	8092402780									
V E	P140E/10-100-DHD340	117	4,61	13,0	8092440028	P140E/10-100-ring bit set	10,0	0,39	100	3,94	159	6,26	5,1	8092440032
	P140E/5-115-DHD340	128	5,02	14,0	8092440033	P140E/5-115-ring bit set	5,0	0,20	115	4,53	159	6,26	4,1	8092440038
W S	P140E/5-115-COP44G	128	5,02	14,0	8092440036	P140/6-115-RING BIT SET	5,0	0,20	115	4,53	159	6,26	3,5	8092403409
	P140/6-115-DHD340 PILOT	128	5,02	14,0	8092403361									
W D T S	P140/6-115-COP44G PILOT	128	5,02	14,0	8092403366	P140/10-100/116-ring bit set	10,0	0,39	100	3,94	157	6,18	5,5	8092403415
	P140/10-100/116-DHD340	116	4,57	12,5	8092401046									

139,7 MM (5 1/2") - 152,4 MM (6") CASING OUTER DIAMETER

Casing 139,7 mm (5 1/2") Permanent, DTH

Model Symmetrix/Element	Pilot bit				Casing shoe				Ring bit								
	Designation code	Pilot bit Outer ø		Weight	Product number	Designation code	Casing wall max thickness		Weight	Product number	Designation code	Ring bit Inner ø		Ring bit Outer ø	Weight		
		mm	inch				mm	inch				mm	inch				
S E S	P140/10-82-COP44/ DHD340	117	4,61	10,0	8092401090	P140/10-82-casing shoe	10,0	0,39	2,5	8092401167	P140/10-82-ring bit	82	3,23	151	5,94	3,5	8092401143
						P140/8-82-casing shoe	8,0	0,31	2,5	8092402170							
S E E	P140E/10-82-DHD340	117	4,61	10,0	8092440023	P140/10-82-casing shoe	10,0	0,39	2,5	8092401167	P140E/10-82-ring bit	82	3,23	151	5,94	6,0	8092440027
						P140/8-82-casing shoe	8,0	0,31	2,5	8092402170							

Casing 139,7 mm (5 1/2") Retrievable, DTH

Model Symmetrix/Element	Pilot bit				Ring bit set											
	Designation code	Pilot bit Outer ø		Weight	Product number	Designation code	Casing wall max thickness		Ring bit Inner ø		Ring bit Outer ø		Weight	Product number		
		mm	inch				mm	inch	mm	inch	mm	inch		mm	inch	
N S E	R140/10-104-G2-DHD340 PILOT	116	4,57	12,5	8092403478											
N S E	R140/10-104-G2-QL40 PILOT	116	4,57	12,5	8092403519	R140/10-104-G2-RING BIT SET	10,0	0,39	104	4,09	147	5,79	7,0	8092403479		
N D T	R140/12.7-97/108-DHD340	108	4,25	9,0	8092401359	R140/12.7-97/108-ring bit set	12,7	0,50	97	3,82	152	5,98	6,0	8092403417		

Casing 152,4 mm (6") Permanent, DTH

Model Symmetrix/Element	Pilot bit				Casing shoe				Ring bit								
	Designation code	Pilot bit Outer ø		Weight	Product number	Designation code	Casing wall max thickness		Weight	Product number	Designation code	Ring bit Inner ø		Ring bit Outer ø	Weight		
		mm	inch				mm	inch				mm	inch				
S E S	P152/10-94-COP44/DHD340	129	5,09	14,0	8092401097	P152/10-94-casing shoe	10,0	0,39	2,5	8092401168	P152/10-94-ring bit	94	3,70	162	6,38	4,0	8092401302
S E E	P152E/10-94-DHD340	129	5,09	14,0	8092440049	P152/10-94-casing shoe	10,0	0,39	2,5	8092401168	P152E/10-94-ring bit	94	3,70	162	6,38	5,3	8092440052

CASING OUTER DIAMETER 152,4 MM (6") - 168,3 mm (6 5/8")

Casing 152,4 mm (6") Retrievable, DTH

Model	Symmetric/Elmetex	Pilot bit						Ring bit set								
		Designation code		Pilot bit Outer ø		Weight	Product number	Designation code		Casing wall max thickness		Ring bit Inner ø		Ring bit Outer ø		Weight
				mm	inch			mm	inch	mm	inch	mm	inch	mm	inch	
N	S	R152/10-116-G2-DHD340	128	5,01	16,0	8092403480		R152/10-116-G2-RING BIT SET	10,0	0,39	116	4,57	160	6,30	9,0	8092403481
N	E	R152E/10-116-G2-DHD340 PILOT	128	5,01	16,0	8092440414										

N	D	T	S	R152/12.7-105/117-DHD340	117	4,61	12,0	8092401064	R152/12.7-105/117-ring bit set	12,7	0,50	105	4,13	162	6,38	7,0	8092403419
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Casing 168,3 mm (6 5/8") Permanent, DTH

Model	Symmetric/Elmetex	Pilot bit						Ring bit set								
		Designation code		Pilot bit Outer ø		Weight	Product number	Designation code		Casing wall max thickness		Ring bit Inner ø		Ring bit Outer ø		Weight
				mm	inch			mm	inch	mm	inch	mm	inch	mm	inch	
V	S	P168/12.7-125-COP54/DHD350	141	5,55	23,0	8092402070		P168/12.7-125-ring bit set	12,7	0,5	125	4,92	188	7,40	6,0	8092402071
V	S	P168/12.7-125-QL50	141	5,55	23,0	8092402177										

V	S	P168/5.5-140-COP54/DHD350	155	6,10	24,0	8092400802	P168/5.5-140-ring bit set	5,5	0,22	140	5,51	188	7,40	5,0	8092401894
V	S	P168/5.5-140-QL50	155	6,10	24,0	8092401444									

V	E	P168E/12.7-140-COP54/DHD350	141	5,55	23,0	8092440061	P168E/12.7-125-ring bit set	12,7	0,50	125	4,92	188	7,40	7,6	8092440064
V	E	P168E/12.7-125-QL50	141	5,55	23,0	8092440062									

V	E	P168E/5.5-140-DHD350	155	6,10	24,0	8092440070	P168E/5.5-140-ring bit set	5,5	0,22	140	5,51	188	7,40	5,8	8092440074
V	E	P168E/5.5-140-QL50	155	6,10	24,0	8092440072									

W	S	P168/7-140-COP54/DHD350	152	5,98	24,0	8092400588	P168/7-140-ring bit set	7,0	0,28	140	5,51	198	7,80	10,0	8092403420
W	S	P168/7-140-QL50	152	5,98	24,0	8092401497									

W	E	P168E/7-140-DHD350	155	5,98	24,0	8092440065	P168E/7-140-ring bit set	7,0	0,28	140	5,51	198	7,80	11,5	8092440394
W	E	P168E/7-140-QL50	155	5,98	24,0	8092440067									

W	D	S	P168/12.7-124/139-COP54/DHD350	139	5,47	25,0	8092401364	P168/12.7-124/139-ring bit set	12,7	0,50	124	4,88	182	7,17	9,0	8092403421
W	D	S	P168/12.7-124/139-QL50	139	5,47	25,0	8092401577									

168,3 MM (6 5/8") CASING OUTER DIAMETER

Casing 168,3 mm (6 5/8") Permanent, DTH

Model Symmetrix / Element	Pilot bit				Casing shoe				Ring bit					
	Designation code		Product number	Designation code		Product number	Designation code		Product number					
S E	P168/12.7-103-COP54/ DHD350	140	5,51	20,0	8092401435	P168/12.7-103-casing shoe	12,7	0,5	2,5	8092402066	P168/12.7-103-ring bit			
	P168/12.7-103-QL50	140	5,51	20,0	8092402181	P168/10-103-casing shoe	10,0	0,39	2,5	8092402067	103	4,06	179	
						P168/8-103-casing shoe	8,0	0,31	2,5	8092402182	7,05	4,5	8092401622	
S E	P168E/12.7-103- DHD350	140	5,51	20,0	8092401435	P168/12.7-103-casing shoe	12,7	0,5	2,5	8092402066	P168E/12.7-103-ring bit			
						P168/10-103-casing shoe	10,0	0,39	2,5	8092402067	103	4,06	179	
						P168/8-103-casing shoe	8,0	0,31	2,5	8092402182	7,05	4,5	8092440060	

Casing 168,3 mm (6 5/8") Retrievable, DTH

Model Symmetrix / Element	Pilot bit				Ring bit set										
	Designation code	Pilot bit Outer ø		Weight	Product number	Designation code		Casing wall max thickness		Ring bit Inner ø		Ring bit Outer ø		Weight	Product number
N E		mm	inch					mm	inch	mm	inch	mm	inch		
R168/10-132-G2- DHD350 PILOT	143	5,63	25,0	8092403482	R168/10-132-G2-RING BIT SET		10,0	0,39	131	5,20	178	6,97	11,5	8092403483	
R168/10-132-G2-QL50 PILOT	143	5,63	25,0	8092403520											
R168E/10-132-G2- DHD350 PILOT	143	5,63	25,0	8092440416											
R168E/10-132-G2- QL50 PILOT	143	5,63	25,0	8092440436											
N D T	S	R168/10-121/133- COP54/DHD350	133	5,24	15,0	8092401065	R168/10-121/133-ring bit set	10,0	0,39	121	4,76	184	7,24	9,0	8092403423

Casing 177,8 mm (7") Permanent, DTH

Model	Symmetrix / Element	Pilot bit					Ring bit set										
		Designation code		Pilot bit Outer ø		Weight	Product number	Designation code		Casing wall max thickness		Ring bit Inner ø		Ring bit Outer ø		Weight	Product number
				mm	inch			mm	inch	mm	inch	mm	inch	mm	inch		
V	S	P178/12.7-131-COP54/DHD350	150	5,91	33,0	8092402186		P178/12.7-131-ring bit set		12,7	0,50	131	5,16	196	7,72	7,5	8092402218
V	S	P178/12.7-131-QL50	150	5,91	33,0	8092402217											

V	E	P178E/12.7-131-DHD350	150	5,91	33,0	8092440087		P178E/12.7-131-ring bit set		12,7	0,50	131	5,16	196	7,72	8,9	8092440090
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W	S	P178/7-153-DHD360	162	6,39	35,0	8092400590		P178/7-153-ring bit set		7,0	0,28	153	6,02	196	7,72	6,5	8092403446
S	P178/7-153-QL60	162	6,39	35,0	8092400593												

E	P178E/7-153-DHD360	162	6,39	35,0	8092440091		P178E/7-153-ring bit set		7,0	0,28	153	6,02	196	7,72	7,6	8092440094	
W	E	P178E/7-153-QL60	162	6,39	35,0	8092440092											
E	P178E/7-153-SD6	162	6,39	35,0	8092440093												

W	S	P178/12.7-131-COP54/DHD350	150	5,91	35,0	8092401578		P178/12.7-131-ring bit set		12,7	0,50	134	5,28	192	7,56	8,5	8092403424
D	T	S	P178/12.7-131-QL50	150	5,91	35,0	8092401579										

Model	Symmetrix / Element	Pilot bit					Casing shoe				Ring bit											
		Designation code		Pilot bit Outer ø		Weight	Product number	Designation code		Casing wall max thickness		Weight	Product number	Designation code		Ring bit Inner ø		Ring bit Outer ø		Weight	Product number	
				mm	inch					mm	inch			mm	inch	mm	inch	mm	inch			
S	E	P178/12.7-114-COP54/DHD350	150	5,91	25,0	8092401107		P178/12.7-114-casing shoe		12,7	0,5	2,5	8092401172		P178/12.7-114-ring bit		114	4,49	187	7,36	5,0	8092401805
S	E	P178/12.7-114-QL50	150	5,91	25,0	8092401108		P178/10-114-casing shoe		10,0	0,39	2,5	8092402216									

S	E	P178E/12.7-114-DHD350	150	5,91	25,0	8092440083		P178/12.7-114-casing shoe		12,7	0,5	2,5	8092401172		P178E/12.7-114-ring bit		114	4,49	187	7,36	8,6	8092440086
								P178/10-114-casing shoe		10,0	0,39	2,5	8092402216									

177,8 MM (7") - 193,7 MM (7 5/8") CASING OUTER DIAMETER

Casing 177,8 mm (7") Retrievable, DTH

Model Symmetric/ Element		Pilot bit					Ring bit set									
		Designation code	Pilot bit Outer ø		Weight	Product number	Designation code	Casing wall max thickness		Ring bit Inner ø		Ring bit Outer ø		Weight	Product number	
			mm	inch				mm	inch	mm	inch	mm	inch			
N	S	R178/10-141-G2-DHD350 PILOT	153	6,01	30,0	8092403486	R168/10-132-G2-RING BIT SET	10,0	0,39	141	5,55	187	7,36	13,0	8092403487	
	S	R178/10-141-G2-QL50 PILOT	153	6,01	30,0	8092403521										
	E	R178E/10-141-G2-DHD350 PILOT	153	6,01	30,0	8092440417										
	E	R178E/10-141-G2-QL50 PILOT	153	6,01	30,0	8092440437										
N D T	S	R178/10-127/141-COP54/DHD350	141	5,55	20,0	8092401553	R178/10-127/141-ring bit set	10,0	0,39	127	5,00	191	7,52	10,0	8092403426	
	S	R178/10-127/141-QL50	141	5,55	25,0	8092402223										

Casing 193,7 mm (7 5/8") Permanent, DTH

Model Symmetric/ Element		Pilot bit					Ring bit set									
		Designation code	Pilot bit Outer ø		Weight	Product number	Designation code	Casing wall max thickness		Ring bit Inner ø		Ring bit Outer ø		Weight	Product number	
			mm	inch				mm	inch	mm	inch	mm	inch			
V	S	P194/12.7-147-DHD360	166	6,54	35,0	8092402226	P194/12.7-147-ring bit set	12,7	0,50	147	5,79	214	8,43	8,5	8092402228	
	S	P194/5.5-165-DHD360	180	7,09	37,0	8092402515										
V	S	P194/5.5-165-QL60	180	7,09	37,0	8092402229	P194/5.5-165-ring bit set	5,5	0,22	165	6,50	215	8,46	7,0	8092402516	
	E	P194E/12.7-147-DHD360	166	6,54	35,0	8092440105										
V	E	P194E/12.7-147-QL60	166	6,54	35,0	8092440106	P194E/12.7-147-ring bit set	12,7	0,50	147	5,79	214	8,43	10,5	8092440108	
	E	P194E/5.5-165-DHD360	180	7,09	37,0	8092440109										
V	E	P194E/5.5-165-QL60	180	7,09	37,0	8092440110	P194E/5.5-165-ring bit set	5,5	0,22	165	6,50	215	8,46	8,2	8092440112	
	S	P194/12.7-146/165-DHD360	165	6,50	25,0	8092401581	P194/12.7-146/165-ring bit set	12,7	0,50	146	5,75	212	8,35	11,0	8092403427	
W D T	S	P194/12.7-146/165-QL60	165	6,50	25,0	8092401582										

CASING OUTER DIAMETER 193,7 MM (7 5/8") - 219,1 mm (8 5/8")

Casing 193,7 mm (7 5/8") Permanent, DTH

Model	Symmetric / Element	Pilot bit				Casing shoe						Ring bit									
		Designation code		Pilot bit Outer ø		Weight	Product number	Designation code		Casing wall max thickness		Weight	Product number	Designation code		Ring bit Inner ø		Weight	Product number		
				mm	inch					mm	inch					mm	inch				
S	S	P194/12.7-127-DHD360		165	6,50	35,0	8092401110	P194/12.7-127-casing shoe		12,7	0,5	3,0	8092401173	P194/12.7-127-ring bit		127	5,00	206	8,11	5,5	8092401153
S	E	P194E/12.7-127-DHD360		165	6,50	35,0	8092440101	P194/12.7-127-casing shoe		12,7	0,5	3,0	8092401173	P194E/12.7-127-ring bit		127	5,00	206	8,11	10,9	8092440104

Casing 193,7 mm (7 5/8") Retrievable, DTH

Model	Symmetric / Element	Pilot bit						Ring bit set									
		Designation code		Pilot bit Outer ø		Weight	Product number	Designation code		Casing wall max thickness		Ring bit Inner ø		Ring bit Outer ø		Weight	Product number
				mm	inch					mm	inch	mm	inch	mm	inch		
N	S	R194/12.7-154-G2-DHD360 PILOT		167	6,56	35,0	8092403488	R194/12.7-154-G2-RING BIT SET		12,7	0,50	154	6,06	205	7,99	14,0	8092403489
N	S	R194/12.7-154-G2-QL60 PILOT		167	6,56	35,0	8092403522										
N	E	R194E/12.7-154-G2-DHD360		167	6,56	35,0	8092440418										
N	D	R194/14-142/157-DHD360		157	6,18	30,0	8092401360	R194/14-142/157-ring bit set		14,0	0,55	142	5,59	209	8,23	11,0	8092403429
N	T	R194/14-142/157-QL60		157	6,18	30,0	8092401490										

Casing 219,1 mm (8 5/8") Permanent, DTH

Model	Symmetric / Element	Pilot bit						Ring bit set									
		Designation code		Pilot bit Outer ø		Weight	Product number	Designation code		Casing wall max thickness		Ring bit Inner ø		Ring bit Outer ø		Weight	Product number
				mm	inch					mm	inch	mm	inch	mm	inch		
V	S	P219/12.7-171-DHD360		190	7,48	45,0	8092402978	P219/12.7-171-ring bit set		12,7	0,50	171	6,73	242	9,53	15,0	8092403432
W	S	P219/6.5-190-DHD360		202	7,95	45,0	8092400596	P219/6.5-190-ring bit set		6,5	0,26	190	7,48	246	9,70	13,7	8092403430
W	S	P219/6.5-190-QL60		202	7,95	45,0	8092401505										
W	E	P219E/12.7-171-DHD360		190	7,48	45,0	8092440335	P219E/12.7-171-ring bit set		12,7	0,50	171	6,73	242	9,53	15,0	8092440399
W	E	P219E/12.7-171-QL60		190	7,48	45,0	8092440345										
W	E	P219E/6.5-190-DHD360		202	7,95	45,0	8092440125	P219E/6.5-190-ring bit set		6,5	0,26	190	7,48	246	9,70	15,2	8092440398
W	E	P219E/6.5-190-QL60		202	7,95	45,0	8092440126										

219,1 MM (8 5/8") - 244,5 mm (9 5/8") CASING OUTER DIAMETER

Casing 219,1 mm (8 5/8") Permanent, DTH

Model Symmetric / Element	Pilot bit					Casing shoe					Ring bit						
	Designation code	Pilot bit Outer ø		Weight	Product number	Designation code	Casing wall max thickness		Weight	Product number	Designation code	Ring bit Inner ø		Ring bit Outer ø	Weight		
		mm	inch				mm	inch				mm	inch				
S E	P219/12.7-146-DHD360	190	7,48	45,0	8092401111	P219/12.7-146-casing shoe	12,7	0,5	3,0	8092401174	P219/12.7-146-ring bit	146	5,75	231	9,09	6,0	8092401154
	P219/12.7-146-QL60	190	7,48	45,0	8092401525	P219/10-146-casing shoe	10,0	0,39	3,0	8092402231							
S E	P219E/12.7-146-DHD360	190	7,48	45,0	8092440121	P219/12.7-146-casing shoe	12,7	0,5	3,0	8092401174	P219E/12.7-146-ring bit	146	5,75	231	9,09	12,7	8092440124
	P219E/12.7-146-QL60	190	7,48	45,0	8092440122	P219/10-146-casing shoe	10,0	0,39	3,0	8092402231							

Casing 219,1 mm (8 5/8") Retrievable, DTH

Model Symmetric / Element	Pilot bit					Ring bit set									
	Designation code	Pilot bit Outer ø		Weight	Product number	Designation code	Casing wall max thickness		Ring bit Inner ø	Ring bit Outer ø	Weight	Product number			
		mm	inch				mm	inch							
N D T	R219/12.7-175-G2-DHD360 PILOT	191	7,48	45,0	8092403484	R219/12.7-175-G2-RING BIT SET	12,7	0,50	175	6,89	227	8,95	18,6	8092403485	
	R219/12.7-175-G2-QL60 PILOT	191	7,48	45,0	8092403523										
	R219E/12.7-175-G2-DHD360 PILOT	191	7,48	45,0	8092440415										
	R219E/12.7-175-G2-QL60 PILOT	191	7,48	45,0	8092440438										
S	R219/14-166/180-COP64/DHD360	180	7,09	40,0	8092401068	R219/14-166/180-ring bit set	14,0	0,55	166	6,54	235	9,25	13,0	8092403434	
	R219/14-166/180-QL60	180	7,09	40,0	8092401555										

Casing 244,5 mm (9 5/8") Permanent, DTH

Model Symmetric / Element	Pilot bit					Ring bit set									
	Designation code	Pilot bit Outer ø		Weight	Product number	Designation code	Casing wall max thickness		Ring bit Inner ø	Ring bit Outer ø	Weight	Product number			
		mm	inch				mm	inch							
V W D T	P245E/12.7-200-DHD380	217	8,54	65,0	8092440325	P245E/12.7-200-ring bit set	12,7	0,50	200	7,87	269	10,59	19,0	8092440326	
	P245/12.7-194/214-DHD380	214	8,43	60,0	8092402240										
S	P245/12.7-194/214-QL80	214	8,43	45,0	8092401741	P245/12.7-194/214-ring bit set	12,7	0,50	194	7,64	268	10,55	18,0	8092403435	

CASING OUTER DIAMETER 244,5 MM (9 5/8") - 273,0 mm (10 3/4")

Casing 244,5 mm (9 5/8") Permanent, DTH

Model	Symmetrik / Element	Pilot bit				Casing shoe						Ring bit					
		Designation code	Pilot bit Outer ø		Weight	Product number	Designation code	Casing wall max thickness		Weight	Product number	Designation code	Ring bit Inner ø mm	Ring bit Outer ø mm	Weight	Product number	
			mm	inch				mm	inch								
S	S	P245/12.7-162-DHD380	212	8,35	65,0	8092402234	P245/12.7-162-casing shoe	12,7	0,5	4,0	8092401876	P245/12.7-162-ring bit					
	E	P245/12.7-162-QL80	212	8,35	65,0	8092401927	P245/10-162-casing shoe	10,0	0,39	4,0	8092402236	162	6,38	258	10,16	8,0	8092401875
	S						P245/8-162-casing shoe	8,0	0,31	4,0	8092402238						
S	E	P245E/12.7-162-DHD380	212	8,35	65,0	8092440138	P245/12.7-162-casing shoe	12,7	0,5	4,0	8092401876	P245E/12.7-162-ring bit					
	E	P245E/12.7-162-QL80	212	8,35	65,0	8092440140	P245/10-162-casing shoe	10,0	0,39	4,0	8092402236	162	6,38	258	10,16	18,4	8092440143
	S						P245/8-162-casing shoe	8,0	0,31	4,0	8092402238						

Casing 254,0 mm (10") Retrievable, DTH

Model	Symmetrik / Element	Pilot bit				Ring bit set														
		Designation code	Pilot bit Outer ø		Weight	Product number	Designation code	Casing wall max thickness		Ring bit Inner ø		Ring bit Outer ø		Weight	Product number					
			mm	inch				mm	inch	mm	inch	mm	inch							
N	S	R254/12.7-207-G2-DHD380 PILOT	226	8,79	70,0	8092403492	R254/12.7-207-G2-RING BIT SET						12,7	0,5	207	8,15	265	10,47	20,0	8092403493
	E	R254E/12.7-207-G2-DHD380 PILOT	226	8,79	70,0	8092440420														

Casing 273,0 mm (10 3/4") Permanent, DTH

Model	Symmetrik / Element	Pilot bit				Ring bit set														
		Designation code	Pilot bit Outer ø		Weight	Product number	Designation code	Casing wall max thickness		Ring bit Inner ø		Ring bit Outer ø		Weight	Product number					
			mm	inch				mm	inch	mm	inch	mm	inch							
W	S	P273/8-240-DHD380	254	10,0	85,0	8092400602	P273/8-240-ring bit set						8,0	0,31	240	9,45	298	11,73	17,0	8092403439
	S	P273/8-240-QL80	254	10,0	85,0	8092401511														
W	E	P273E/8-240-DHD380	254	10,0	85,0	8092440163	P273E/8-240-ring bit set						8,0	0,31	240	9,45	298	11,73	20,8	8092440402
	E	P273E/8-240-QL80	254	10,0	85,0	8092440164														
W	S	P273/12.7-222/243-DHD380	243	9,57	90,0	8092401366	P273/12.7-222/243-ring bit set	12,7	0,50	222	8,74	295	11,61	20,0	8092403440					

273,0 MM (10 3/4") - 323,9 mm (12 3/4") CASING OUTER DIAMETER

Casing 273,0 mm (10 3/4") Permanent, DTH

Model Symmetrix / Element	Pilot bit				Casing shoe				Ring bit														
	Designation code	Pilot bit Outer ø		Weight	Product number	Designation code	Casing wall max thickness		Weight	Product number	Designation code	Ring bit Inner ø		Ring bit Outer ø		Weight							
		mm	inch				mm	inch				mm	inch	mm	inch								
S E	P273/12.7-193-DHD380	241	9,48	85,0	809240112	P273/12.7-193-casing shoe	12,7	0,5	5,0	8092401175	P273/12.7-193-ring bit	193	7,60	291	11,46	9,0	8092401156						
	P273/12.7-193-QL80	241	9,48	85,0	8092401526	P273/10-193-casing shoe	10,0	0,39	5,0	8092402242													
E S E	P273E/12.7-193-DHD380	241	9,48	85,0	8092440159	P273/12.7-193-casing shoe	12,7	0,5	5,0	8092401175	P273E/12.7-193-ring bit	193	7,60	291	11,46	23,8	8092440162						
	P273E/12.7-193-QL80	241	9,48	85,0	8092440160	P273/10-193-casing shoe	10,0	0,39	5,0	8092402242													
N E	R273/12.7-226-G2-DHD380 PILOT	244	9,54	100,0	8092403494	R273/12.7-226-G2-RING BIT SET	12,7	0,50	226	8,90	284	11,22	30,0	8092403495	R273/20-207/226-ring bit set	20,0	0,79	207	8,15	291	11,46	20,0	8092403442
	R273E/12.7-226-G2-DHD380 PILOT	244	9,54	100,0	8092440421																		
N D T S	R273/20-207/226-DHD380	226	8,90	70,0	8092401557	R273/20-207/226-ring bit set	20,0	0,79	207	8,15	291	11,46	20,0	8092403442	R273/20-207/226-ring bit set	20,0	0,79	207	8,15	291	11,46	20,0	8092403442
	R273/20-207/226-QL80	226	8,90	70,0	8092401556																		

Casing 323,9 mm (12 3/4") Permanent, DTH

Model Symmetrix / Element	Pilot bit				Ring bit set																							
	Designation code	Pilot bit Outer ø		Weight	Product number	Designation code	Casing wall max thickness		Ring bit Inner ø		Ring bit Outer ø		Weight	Product number														
		mm	inch				mm	inch	mm	inch	mm	inch																
W S	P324/10-282-DHD380	298	11,73	130,0	8092401480	P324/10-282-ring bit set	10,0	0,39	282	11,10	350	13,78	25,0	8092403443	P324E/10-282-DHD380	298	11,73	130,0	8092440179	P324E/10-282-ring bit set	10,0	0,39	282	11,10	350	13,78	29,3	8092440404
	P324/10-282-SD10	298	11,73	130,0	8092402540																							
W D T S	P324E/10-282-DHD380	298	11,73	130,0	8092440179	P324E/10-282-ring bit set	10,0	0,39	282	11,10	350	13,78	25,0	8092403443	P324/12.7-272/294-DHD380	294	11,57	150,0	8092401586	P324/12.7-272/294-ring bit set	12,7	0,50	272	10,71	350	13,78	35,0	8092403470
	P324/12.7-272/294-QL80	294	11,57	150,0	8092401587																							

CASING OUTER DIAMETER 323,9 MM (12 3/4") - 355,6 mm (14")

Casing 323,9 mm (12 3/4") Permanent, DTH

Model	Symmetric / Elmetex	Pilot bit				Casing shoe						Ring bit						
		Designation code	Pilot bit Outer ø		Weight	Product number	Designation code	Casing wall max thickness		Weight	Product number	Designation code	Ring bit Inner ø		Weight	Product number		
			mm	inch				mm	inch				mm	inch				
S SE	S	P324/14.2-240-DHD380	288	11,32	130,0	8092401816	P324/12.7-240-casing shoe	12,7	0,5	6,0	8092402245	P324/14.2-240-ring bit	240	9,45	339	13,35	12,0	8092401810
	E	P324E/14.2-240-DHD380	288	11,32	130,0	8092440175	P324/10-240-casing shoe	10,0	0,39	6,0	8092402246		240	9,45	339	13,35	25,5	8092440178
	E	P324E/14.2-240-QL80	288	11,32	130,0	8092440176	P324/8-240-casing shoe	8,0	0,31	6,0	8092402247		240	9,45	339	13,35	25,5	8092440178

Casing 323,9 mm (12 3/4") Retrievable, DTH

Model	Symmetric / Elmetex	Pilot bit				Ring bit set									
		Designation code	Pilot bit Outer ø		Weight	Product number	Designation code	Casing wall max thickness		Ring bit Inner ø	Ring bit Outer ø	Weight	Product number		
			mm	inch				mm	inch						
NDT	S	R324/20-256/275-DHD380	275	10,83	150,0	8092401559	R324/20-256/275-ring bit set	20,0	0,79	256	10,08	344	13,54	35,0	8092401566
	S	R324/20-256/275-QL80	275	10,83	150,0	8092401558		12,7	0,50	310	12,20	377	14,84	60,0	8092401566

Casing 355,6 mm (14") Permanent, DTH

Model	Symmetric / Elmetex	Pilot bit				Ring bit set									
		Designation code	Pilot bit Outer ø		Weight	Product number	Designation code	Casing wall max thickness		Ring bit Inner ø	Ring bit Outer ø	Weight	Product number		
			mm	inch				mm	inch						
W	S	P356/12.7-310-QL120	326	12,83	210,0	8092402561	P356/12.7-310-ring bit set	12,7	0,50	310	12,20	377	14,84	60,0	8092402106
	S	P356/12.7-310-NUMA100	326	12,83	210,0	8092402105		12,7	0,50	310	12,20	377	14,84	64,3	8092402106
W	E	P356E/12.7-310-QL120	326	12,83	210,0	8092440191	P356E/12.7-310-ring bit set	12,7	0,50	310	12,20	377	14,84	64,3	8092440193
	E	P356E/12.7-310-NUMA100	326	12,83	210,0	8092440192		12,7	0,50	310	12,20	377	14,84	64,3	8092440193

406,4 mm (16") CASING OUTER DIAMETER

Casing 406,4 mm (16") Permanent, DTH

Model	Symmetric / Element	Pilot bit				Ring bit set											
		Designation code		Pilot bit Outer ø	Weight	Product number		Designation code		Casing wall max thickness		Ring bit Inner ø		Ring bit Outer ø		Weight	Product number
		mm	inch					mm	inch	mm	inch	mm	inch	mm	inch		
W	E	P406E/12.7-364-DHD112	379	14,92	250,0	8092440204		P406E/12.7-364-ring bit set		12,7	0,50	364	14,33	428	16,85	55,1	8092440207
	E	P406E/12.7-364-QL120	379	14,92	250,0	8092440205											

W	S	P406/12.7-354/377-DHD112	377	14,84	250,0	8092402080		P406/12.7-354/377-ring bit set		12,7	0,50	354	13,94	441	17,36	60,0	8092401054
D	S	P406/12.7-354/377-QL120	377	14,84	250,0	8092401589											

Model	Symmetric / Element	Pilot bit				Casing shoe				Ring bit												
		Designation code		Pilot bit Outer ø	Weight	Product number		Designation code		Casing wall max thickness		Weight	Product number		Designation code		Ring bit Inner ø	Ring bit Outer ø	Weight	Product number		
		mm	inch					mm	inch						mm	inch	mm	inch				
S	S	P406/16-328-DHD112	370	14,57	240,0	8092401996		P406/16-328-casing shoe		16,0	0,63	7,0	8092401177									
S	E	P406/16-328-QL120	370	14,57	240,0	8092402249		P406/12.7-328-casing shoe		12,7	0,50	7,0	8092402252		P406/16-328-ring bit		328	12,91	420	16,54	15,0	8092401158

S	E	P406E/16-328-QL120	370	14,57	240,0	8092440200		P406/16-328-casing shoe		16,0	0,63	7,0	8092401177		P406E/16-328-ring bit		328	12,91	420	16,54	30,8	8092440203
								P406/12.7-328-casing shoe		12,7	0,50	7,0	8092402252									

Casing 406,4 mm (16") Retrievable, DTH

Model	Symmetric / Element	Pilot bit				Ring bit set											
		Designation code		Pilot bit Outer ø	Weight	Product number		Designation code		Casing wall max thickness		Ring bit Inner ø		Ring bit Outer ø		Weight	Product number
		mm	inch					mm	inch	mm	inch	mm	inch	mm	inch		
N	E	R406E/12.7-352-QL120	370	14,57	260,0	8092440214		R406E/12.7-352-ring bit set		12,7	0,50	352	13,86	420	16,54	79,8	8092440216
N	E	R406E/12.7-352-SD12	370	14,57	260,0	8092440215											
N	S	R406/20-330/348-DHD112	348	13,70	260,0	8092402256		R406/20-330/348-ring bit set		20,0	0,79	330	12,99	420	16,54	70,0	8092402258
N	S	R406/20-330/348-QL120	348	13,70	260,0	8092402257											

Casing 508,0 mm (20") Permanent, DTH

Model	Symmetric / Element	Pilot bit				Ring bit set											
		Designation code		Pilot bit Outer ø		Weight	Product number	Designation code		Casing wall max thickness		Ring bit Inner ø		Ring bit Outer ø		Weight	Product number
				mm	inch					mm	inch	mm	inch	mm	inch		
W E	P508E/16-447-QL120	464	18,27	400,0	8092440242			P508E/16-447-ring bit set		16,0	0,63	447	17,60	518	20,39	60,6	8092440244
W D S T	P508/16-444/469-QL120	474	18,66	380,0	8092401591			P508/16-444/469-ring bit set		16,0	0,63	444	17,48	542	21,34	80,0	8092401592

Model	Symmetric / Element	Pilot bit				Casing shoe				Ring bit													
		Designation code		Pilot bit Outer ø		Weight	Product number	Designation code		Casing wall max thickness		Weight	Product number	Designation code		Ring bit Inner ø		Ring bit Outer ø		Weight	Product number		
				mm	inch					mm	inch					mm	inch	mm	inch				
S E	P508/16-423-QL120	471	18,54	350,0	8092402274			P508/16-423-casing shoe		16,0	0,63	10,0	8092402278										
S E	P508/16-423-QL200	471	18,54	350,0	8092402275			P508/12,7-423-casing shoe		12,7	0,50	10,0	8092402398			P508/16-423-ring bit		423	16,65	520	20,47	20,0	8092402397
S E	P508/16-423-NUMA180	471	18,54	350,0	8092402276			P508/10-423-casing shoe		10,0	0,39	10,0	8092402279										
N E	P508E/16-423-QL120	471	18,54	350,0	8092440236			P508/16-423-casing shoe		16,0	0,63	10,0	8092402278										
S E	P508E/16-423-QL200	471	18,54	350,0	8092440237			P508/12,7-423-casing shoe		12,7	0,50	10,0	8092402398			P508E/16-423-ring bit		423	16,65	520	20,47	42,6	8092440240
S E	P508E/16-423-NUMA180	471	18,54	350,0	8092440238			P508/10-423-casing shoe		10,0	0,39	10,0	8092402279										

Casing 508,0 mm (20") Retrievable, DTH

Model	Symmetric / Element	Pilot bit				Ring bit set											
		Designation code		Pilot bit Outer ø		Weight	Product number	Designation code		Casing wall max thickness		Ring bit Inner ø		Ring bit Outer ø		Weight	Product number
				mm	inch					mm	inch	mm	inch	mm	inch		
N E	R508E/14,2-446-QL120	445	17,52	420,0	8092440250			R508E/14,2-446-ring bit set		14,2	0,56	446	17,56	524	20,63	109,5	8092440252
N D S T	R508/16-422/447-QL120	447	17,60	380,0	8092402286			R508/16-422/447-ring bit set		16,0	0,63	422	16,61	526	20,71	80,0	8092401567

609,6 mm (24") CASING OUTER DIAMETER

Casing 609,6 mm (24") Permanent, DTH

Model Symmetry / Element	Pilot bit				Ring bit set										
	Designation code	Pilot bit Outer ø		Weight	Product number	Designation code		Casing wall max thickness		Ring bit Inner ø		Ring bit Outer ø		Weight	Product number
W E		mm	inch			mm	inch	mm	inch	mm	inch	mm	inch		
W E	P610E/16-553-QL200	552	21,72	550,0	8092440264	P610E/16-553-ring bit set		16,0	0,63	553	21,77	628	24,72	71,0	8092440267
W D S	P610/16-540/571-QL200	571	22,48	700,0	8092401368	P610/16-540/571-ring bit set		16,0	0,63	540	21,26	641	25,24	100,0	8092401369

Model Symmetry / Element	Pilot bit				Casing shoe						Ring bit						
	Designation code	Pilot bit Outer ø		Weight	Product number	Designation code	Casing wall max thickness		Weight	Product number	Designation code		Ring bit Inner ø		Ring bit Outer ø		Weight
S E		mm	inch				mm	inch			mm	inch	mm	inch	mm	inch	
S E	P610/16-521-QL200	572	22,50	550,0	8092402294	P610/16-521-casing shoe	16,0	0,63	13,0	8092402262	P610/16-521-ring bit	521	20,51	622	24,49	26,0	8092402010
S E	P610/16-521-NUMA180	572	22,50	550,0	8092401797	P610/14.2-521-casing shoe	14,2	0,56	13,0	8092401370	P610/12.7-521-casing shoe	12,7	0,50	13,0	8092402400		

E	P610E/16-521-QL200	572	22,50	550,0	8092440260	P610/16-521-casing shoe	16,0	0,63	13,0	8092402262	P610E/16-521-ring bit	521	20,51	622	24,49	54,0	8092440263
S E	P610E/16-521-NUMA180	572	22,50	550,0	8092440261	P610/14.2-521-casing shoe	14,2	0,56	13,0	8092401370	P610/12.7-521-casing shoe	12,7	0,50	13,0	8092402400		

Casing 609,6 mm (24") Retrievable, DTH

Model Symmetry / Element	Pilot bit				Ring bit set										
	Designation code	Pilot bit Outer ø		Weight	Product number	Designation code		Casing wall max thickness		Ring bit Inner ø		Ring bit Outer ø		Weight	Product number
N E		mm	inch					mm	inch	mm	inch	mm	inch		
N E	R610E/12.7-555-QL200	553	21,77	550,0	8092440273	R610E/12.7-555-ring bit set		12,7	0,50	555	21,85	637	25,08	132,0	8092440276
N D S	R610/16-532/551-QL200	551	21,69	550,0	8092402402	R610/16-532/551-ring bit set		16,0	0,63	532	20,94	633	24,92	100,0	8092402403

CASING OUTER DIAMETER Casing 711,2 mm (28") - 812,8 mm (32")

Casing 711,2 mm (28") Permanent, DTH

Model Symmetrix / Element	Pilot bit					Ring bit set									
	Designation code	Pilot bit Outer ø		Weight	Product number	Designation code		Casing wall max thickness		Ring bit Inner ø		Ring bit Outer ø		Weight	Product number
		mm	inch			mm	inch	mm	inch	mm	inch	mm	inch		
W E	P711E/16-641-QL200S	667	26,26	690,0	8092440376	P711E/16-641-ring bit set	16,0	0,63	641	25,24	732	28,83	147,0	8092440292	

W D S T	P711/16-641/673-QL200S	673	26,50	800,0	8092402302	P711/16-641/673-ring bit set	16,0	0,63	641	25,24	743	29,25	120,0	8092401596
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Model Symmetrix / Element	Pilot bit					Casing shoe				Ring bit								
	Designation code	Pilot bit Outer ø		Weight	Product number	Designation code	Casing wall max thickness		Weight	Product number	Designation code		Ring bit Inner ø		Ring bit Outer ø		Weight	Product number
		mm	inch				mm	inch			mm	inch	mm	inch	mm	inch		
S E S	P711/16-614-QL200S	670	26,39	690,0	8092402355	P711/16-614-casing shoe	16,0	0,63	20,0	8092402391	P711/16-614-ring bit	614	24,17	729	28,70	55,0	8092402392	
S E E	P711E/16-614-NUMA180	670	26,39	690,0	8092402393	P711/12.7-614-casing shoe	12,7	0,50	20,0	8092402357	P711E/16-614-ring bit	614	24,17	729	28,70	96,0	8092440290	
S E E	P711E/16-614-QL200S	670	26,39	690,0	8092440287	P711/16-614-casing shoe	16,0	0,63	20,0	8092402391	P711E/16-614-ring bit	614	24,17	729	28,70	165,0	8092440296	
S E E	P711E/16-614-NUMA180	670	26,39	690,0	8092440288	P711/12.7-614-casing shoe	12,7	0,50	20,0	8092402357	P711E/16-614-ring bit	614	24,17	729	28,70	165,0	8092440296	

Casing 711,2 mm (28") Retrievable, DTH

Model Symmetrix / Element	Pilot bit					Ring bit set									
	Designation code	Pilot bit Outer ø		Weight	Product number	Designation code		Casing wall max thickness		Ring bit Inner ø		Ring bit Outer ø		Weight	Product number
		mm	inch			mm	inch	mm	inch	mm	inch	mm	inch		
N E	R711E/16-641-QL200S	666	26,21	780,0	8092440295	R711E/16-641-ring bit set	16,0	0,63	641	25,24	731	28,78	165,0	8092440296	
N D T S	R711/16-632/657-QL200S	657	25,87	850,0	8092402304	R711/16-632/657-ring bit set	16,0	0,63	632	24,88	735	28,94	150,0	8092401568	

Casing 812,8 mm (32") Permanent, DTH

Model Symmetrix / Element	Pilot bit					Ring bit set									
	Designation code	Pilot bit Outer ø		Weight	Product number	Designation code		Casing wall max thickness		Ring bit Inner ø		Ring bit Outer ø		Weight	Product number
		mm	inch			mm	inch	mm	inch	mm	inch	mm	inch		
W E	P813E/16-738-QL200S	763	30,03	1000,0	8092440303	P813E/16-738-ring bit set	16,0	0,63	738	29,06	838	32,98	165,0	8092440304	

812,8 mm (32") - 914,4 mm (36") CASING OUTER DIAMETER

Casing 812,8 mm (32") Permanent, DTH

Model Symmetric / Element	Pilot bit				Casing shoe				Ring bit							
	Designation code	Pilot bit Outer ø		Weight	Product number	Designation code	Casing wall max thickness		Weight	Product number	Designation code	Ring bit Inner ø		Ring bit Outer ø	Weight	Product number
		mm	inch				mm	inch				mm	inch			
S E S	P813/16-709-QL200S	769	30,28	1000,0	8092402360	P813/16-709-casing shoe	16,0	0,63	30,0	8092402361	P813/16-709-ring bit	709	27,91	830	32,68	70,0 8092402409
S E E	P813E/16-709-QL200S	769	30,28	1000,0	8092440301	P813/16-709-casing shoe	16,0	0,63	30,0	8092402361	P813E/16-709-ring bit	709	27,91	830	32,68	124,0 8092440302

Casing 812,8 mm (32") Retrievable, DTH

Model Symmetric / Element	Pilot bit				Ring bit set								Product number				
	Designation code	Pilot bit Outer ø		Weight	Product number	Designation code								Product number			
		mm	inch			mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
N E S	R813E/16-736-QL200S	735	28,94	1100,0	8092440307	R813E/16-736-ring bit set	16,0	0,63	736	28,98	834	32,83	201,0	8092440308			
N D T S	R813/16-718/740-QL200S	740	29,13	1100,0	8092401794	R813/16-718/740-ring bit set	16,0	0,63	718	28,27	828	32,60	180,0	8092401795			

Casing 914,4 mm (36") Permanent, DTH

Model Symmetric / Element	Pilot bit				Ring bit set								Product number				
	Designation code	Pilot bit Outer ø		Weight	Product number	Designation code				Casing wall max thickness		Ring bit Inner ø		Ring bit Outer ø		Weight	Product number
		mm	inch			mm	inch	mm	inch	mm	inch	mm	inch	mm	inch		
W D T S	P914/19-834/866-QL200S	866	34,09	1400,0	8092403198	P914/19-834/866-ring bit set	19,0	0,75	834	32,83	944	37,16	180,0	8092403199			

Model Symmetric / Element	Pilot bit				Casing shoe				Ring bit				Product number				
	Designation code	Pilot bit Outer ø		Weight	Product number	Designation code	Casing wall max thickness		Weight	Product number	Designation code	Ring bit Inner ø		Ring bit Outer ø		Weight	Product number
		mm	inch				mm	inch				mm	inch	mm	inch		
S E S	P914/19-808-QL200S	869	34,21	1400,0	8092403110	P914/20-808-casing shoe	19,0	0,75	40,0	8092403132	P914/19-808-ring bit	808	31,81	932	36,69	90,0	8092403111
S E E	P914E/16-818-QL200S	851	33,50	1400,0	8092440311	P914/16-818-casing shoe	16,0	0,63	40,0	8092401317	P914E/16-818-ring bit	818	32,20	932	36,69	143,0	8092440312

CASING OUTER DIAMETER 1016 mm (40") - 1219 mm (48")

Casing 1016 mm (40") Permanent, DTH

Model	Symmetrix / Element	Pilot bit				Ring bit set									
		Designation code			Product number	Designation code							Product number		
W D T	S	P1016/16-940/976-QL200S	976	38,43	2000,0	8092402935	P1016/16-940/976-ring bit set	16,0	0,63	940	37,01	1044	41,10	200,0	8092402936

Casing 1016 mm (40") Retrievable, DTH

Model	Symmetrix / Element	Pilot bit				Ring bit set									
		Designation code			Product number	Designation code							Product number		
N D T	S	R1016/20-915/944-QL200S	944	37,17	2000,0	8092403219	R1016/20-915/944-ring bit set	20,0	0,79	915	36,02	1032	40,63	200,0	8092403220

Casing 1219 mm (48") Permanent, DTH

Model	Symmetrix / Element	Pilot bit				Ring bit set										
		Designation code	Pilot bit Outer ø		Weight	Product number	Designation code		Casing wall max thickness		Ring bit Inner ø		Ring bit Outer ø		Weight	Product number
			mm	inch			mm	inch	mm	inch	mm	inch	mm	inch		
W D T	S	P1219/20-1135/1172-QL300S	1171	46,10	3610,0	8092403374	P1219/20-1135/1172 ring bit set	20,0	0,79	1135	44,69	1253	49,33	137,0	8092403375	

Model	Symmetrix / Element	Pilot bit				Casing shoe				Ring bit								
		Designation code	Pilot bit Outer ø		Weight	Product number	Designation code	Casing wall max thickness		Weight	Product number	Designation code	Ring bit Inner ø		Ring bit Outer ø		Weight	Product number
			mm	inch				mm	inch				mm	inch	mm	inch		
S E	S	P1219/19-1103-QL300S	1170	46,06	3650,0	8092403526	P1219/19-1103 casing shoe	19,0	0,75	67,0	8092403268	P1219/19-1103 ring bit	1103	43,43	1233	48,54	135,0	8092403267

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