

Cutters and Drilling Tools

Cutting Edge Technology

About Us

MHWirth is a leading global provider of first-class drilling solutions and services designed to offer our valued customers with the safer, more efficient and reliable alternative. Our company vision drives an unparalleled commitment to quality and major economic advantages for our customers and stakeholders.

MHWirth has a global reach covering five continents with offices in more than 16 countries. Drawing upon our global market success, we continue to seize opportunities through an established strong regional presence. Our dedicated professionals consistently strive to enhance customer satisfaction and form meaningful collaborations by creating a personalized experience.

Cutters and Drilling Tools for Optimum Efficiency

The longevity of cutters is essential for an efficient operation. MHWirth's durable cutters deliver outstanding performance with maximum reliability, and therefore provide exceptional value during their lifetime.

Our cutters and drilling tools exactly match our customers' requirements and geological conditions. The computer assisted drill bit configuration safeguards optimal cutter geometry and the unique cutter arrangement ensures a self-centering bit. Our air-lift circulation simulation software determines the project's specific parameters for optimal bottom-hole cleaning as well as for selection of surface equipment.

Our long-lasting cutters significantly reduce downtime. The wear-resistant carbide inserts guarantee the durability of the tool – even in hard and highly abrasive rock.

Your Benefits at a Glance



Close Consultation and Support

Our experts provide comprehensive advice from the pre-engineering and tender phases. This includes giving an indication of expected rates of penetration along with advice on the selection of the most cost effective surface equipment.



Outstanding Drilling Progress

Our high-quality cutters allow for an exceptional high load per cutter. Our unique W-shaped design and an intertracking cutter arrangement on the cutter head grant smooth running and higher penetration rates. This reduces the project completion time significantly.



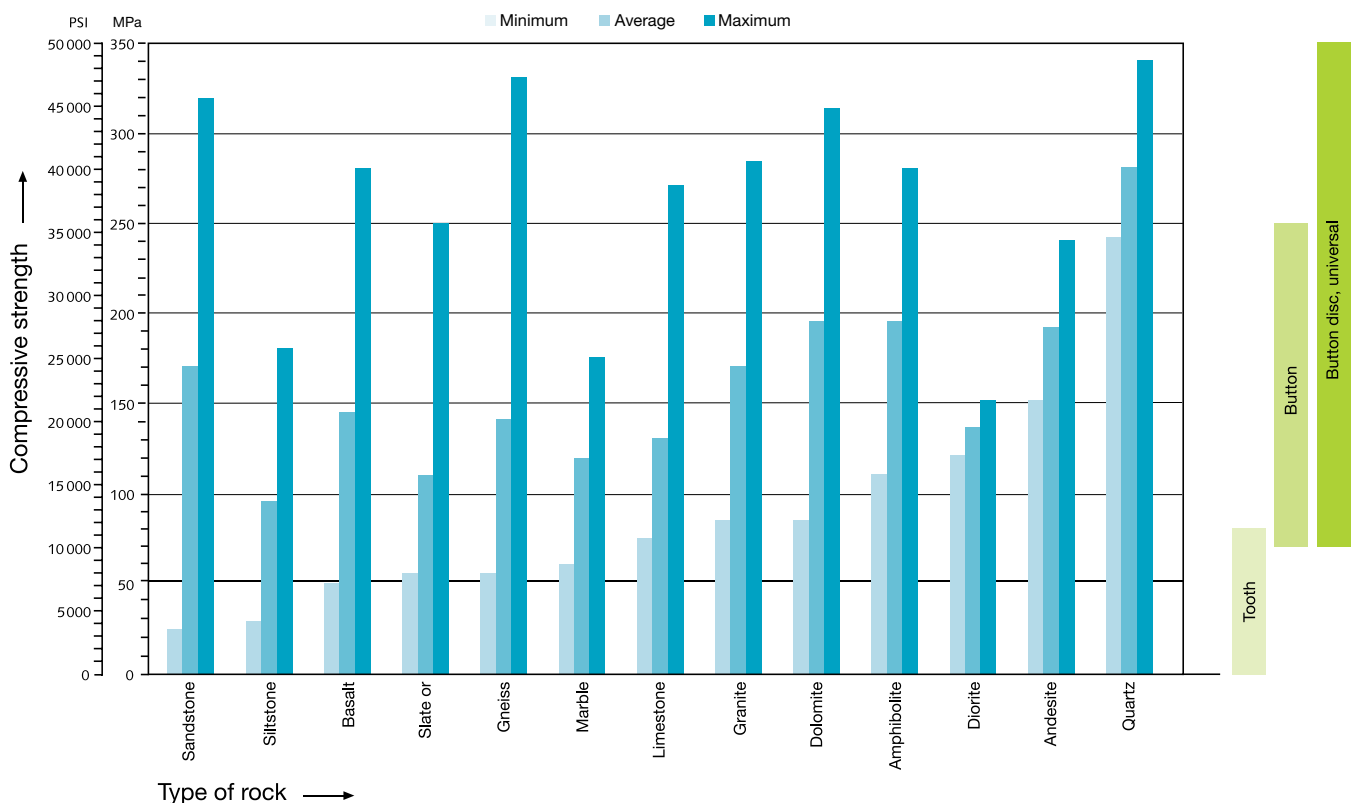
Unmatched Durability

Our special tungsten carbide composition, in combination with a high-grade matrix and our pressure balanced compensation, significantly increase the cutter's life span.

Cutter Selection

Rock	Compressive strength CSI [MPa]			Tensile strength TSI [MPa]			Content of abrasive minerals [MPa]			Characteristics
	min.	average	max.	min.	average	max.	min.	average	max.	
Sandstone	25	170	320	5.1	17.3	30.7	30	60	90	high abrasiveness, massive
Siltstone	30	95	180	4.1	8.5	19.0	5	15	33	low abrasiveness, inhomogenous
Basalt	50	145	280	7.3	14.0	23.3	17	24	30	soft, little abrasive content, fissures, can be split
Slate or schist	55	110	250	9.3	13.6	31.1	15	39	75	fissures and cracks present
Gneiss	55	140	330	7.7	17.2	30.6	25	43	66	cracks, fissures and crevices present
Marble	60	120	175	6.0	11.0	18.5	<5	5	15	non abrasive, cracks
Limestone	75	130	270	7.2	11.9	23.2	<5	5	15	non abrasive, brittle
Granite	85	170	285	7.8	13.8	22.5	30	45	60	hard and massive, few cracks and fissures, discontinuity
Dolomite	85	195	315	12.5	16.8	21.6	<5	5	15	very abrasive, but massive, high strength
Amphibolite	110	195	280	17.2	18.6	22.0	21	25	28	tough rock, very bad, not desirable
Diorite	120	135	150	13.8	14.5	15.0	25	35	45	hard and massive, few fissures and cracks, discontinuity
Andesite	150	190	240	12.0	17.9	23.8	24	27	30	high strength, fine grained
Quartz	240	280	340	15.3	19.0	24.3	75	8	100	very abrasive, massive, homogenous

CSI/TSI - 10 brittle, CSI/TSI > 10 tough

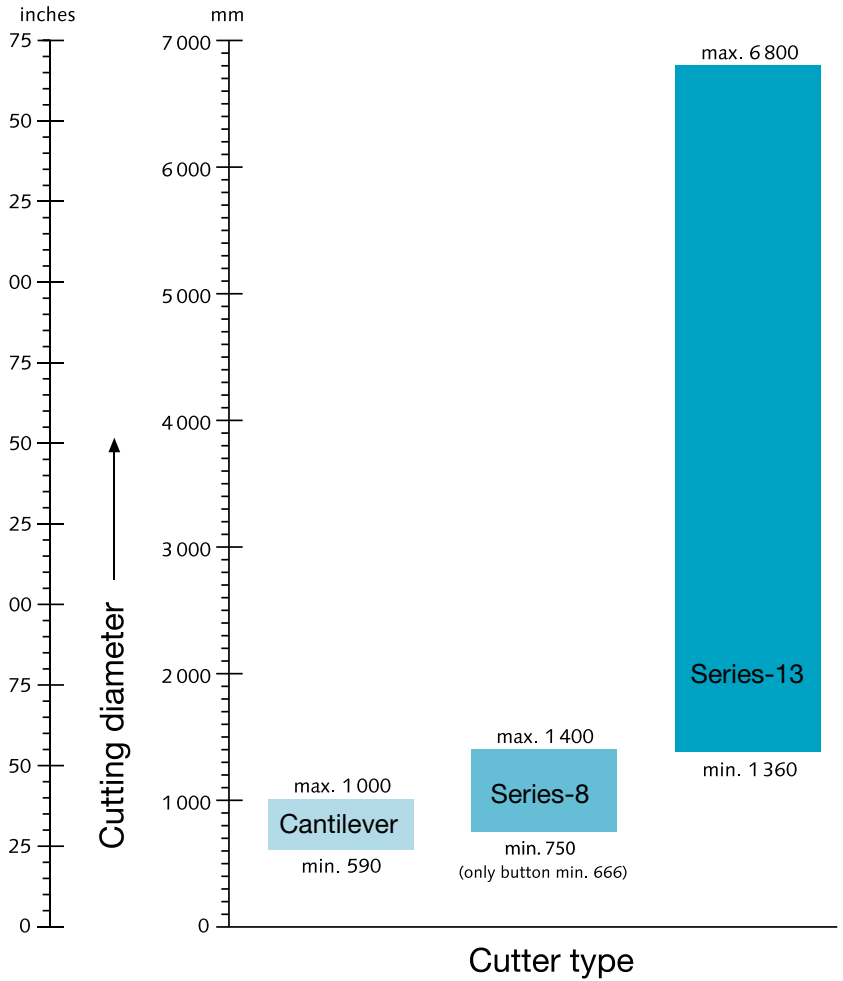


Cutter Size Selection

Our dual-piece design and large diameter roller bits consist of a bit body base and bit plate. The modular system allows for a broader range of applications for less capital investment.

Extensive research of tungsten-carbides have doubled the life-span of the MHWirth cutters over the past years.

In our cutters, muck is removed via our originally patented suction channel. This allows for an efficient bottom-hole cleaning and therefore ensures the maximum life of the cutters.



Type of Cutters

Series-13

Our series-13 cutters are used for bore holes larger than 1358 mm (54 in). The heavy-duty axle is fitted with combined axial-radial bearings and allows for a thrust force of up to 140 kN (31 500 lbf) per cutter. The axle square ensures stable and safe positioning of the cutter even in extreme drilling conditions. The pressure compensated bearing has lifetime lubrication and is maintenance free.



WD 13/20-3



W 13/20



Z 13/20 - M1W

Series-8

Our series-8 cutters cover the medium drilling range from 750 mm to 1400 mm (30 in to 54 in). Similar to the series-13 cutters, the series-8 cutters feature a heavy-duty, pressure compensated, maintenance-free bearing. A load of up to 80 kN (18 000 lbf) per cutter is possible. A round axle with a radial safety pin is used to facilitate the change of the cutters.



WD 8 - 3



W 8



Z 8 - M1W

Cantilever Cutters

The cutters of our cantilever series are applied in the drilling range from 500 mm to 1000 mm (20 in to 40 in). The essential design feature is the space saving and unilateral bearing, which allows assembly in restricted spaces. Pressure compensation and maintenance-free bearings are standard. Load can be up to 60 kN (13 500 lbf) per cutter. Fitting of the bit body is efficiently achieved by bolting the complete cutter with a cantilever foot onto the bit body.



WW 1



M 1 W

Bit Design Criteria

Geology	Compressive strength	Position	Cutter type	Cantilever	Series-8	Series-13
Medium hard, medium abrasive	< 80 MPa	Centre	Tooth cutter	M 1 W		
			Weight	26 kg (57 lb)		
		Face, gauge	Tooth cutter	M 4 W + M 5 W MR 4 W + MR 5 W	Z 8-M 1 W + M 2 W	Z 13/20-MAB + M 1 W + M 2 W
			Weight	34 kg (75 lb) 32 kg (71 lb)	17 kg (37 lb) 16 kg (35 lb)	100 kg (220 lb) 96 kg (212 lb) 95 kg (209 lb)
Max. thrust per cutter	25 kN (5 600 lbf)	35 kN (7 900 lbf)	40 kN (9 000 lbf)			
Hard, very abrasive	70–250 MPa	Centre	Button cutter	WW 1		
			Weight	30 kg (66 lb)		
		Face, gauge	Button cutter	WW 4 + WW 5	W 8	W 13/20
			Weight	40 kg (88 lb) 37 kg (82 lb)	25 kg (55 lb)	85 kg (187 lb)
Max. thrust per cutter	60 kN (13 500 lbf)	80 kN (18 000 lbf)	140 kN (31 500 lbf)			
Very hard, very abrasive	> 190 MPa or universal	Centre, face, gauge	Button disc cutter		WD 8-3 + WD 8-4	WD 13/20-3 + WD 13/20-4
			Weight		20 kg (44 lb) 19 kg (42 lb)	130 kg (287 lb)
			Max. thrust per cutter		80 kN (18 000 lbf)	140 kN (31 500 lbf)

Medium hard geology
 Hard geology
 Very hard geology



Special Tools and References

You can count on us to provide the necessary cutters and tools for your special drilling needs. Our offering comprises special cutters for underreamers, boring tools, milling tools and core barrels.

Cutters and drilling tools by MHWirth have proven to be exceptionally reliable and efficient in numerous projects around the world.



USA/Massachusetts – Boston Harbor

PBA 818, 50 diffuser shafts for sewage outfall with cutter lifetime of 900 meters in rock and with more than 140 MPa strength.



Australia – North West Shelf/ Goodwyn “A”

PBA 921, pile foundation of an oil production platform with undercut pile socket; with a diameter of 2.3 meters, maximum penetration rate of 2.7 m/h and maximum depth of 307 meters.



USA – Black Panther Mine

Blind shaft drilling project with a diameter of 6 meters, a depth of up to 3000 meters, and penetration up to 0.6 m/h.

