COP M-series

DTH hammers and bits – sales brochure

Epiroc

Proudly presenting our six fastest DTH hammers

Welcome to Epiroc's all new M-series of DTH hammers. Our 6", 7" and 8" hammers are designed and built to perfection. They are faster, lighter, more service friendly and longer lasting than ever before.

COP M6

This is the fastest 6" DTH hammer on the market. It has been challenged in all altitudes and climates, and is now proved to be unbeatable in its class. Designed for the most common bit sizes, 165 mm and 171 mm.

COP M7

The 7" hammer is an all-new product, designed to bridge the productivity gap between 6" and 8" hammers. The ideal bit diameters for COP M7 range from 200 mm to 229 mm. Indeed, tests comparing COP M6 and COP M7, using 203 mm bits, show that COP M7 is 27 percent faster.

COP M8

COP M8 is the most powerful 8" DTH hammer ever. It fits most large rigs, and delivers outstanding rock penetration. This hammer is designed for bits ranging from 216 mm to 254 mm.

Covering all bit sizes

With the right choice of COP M-series hammer you can be assured to get maximum penetration rate and productivity for every hole diameter.

Low flow (LF) or high flow (HF)

Each and every COP M-series hammer can be quickly and easily adjusted to different compressor air pressures and air volumes. This two-in-one feature makes our hammers fit all rigs, operating at different altitudes and climates.

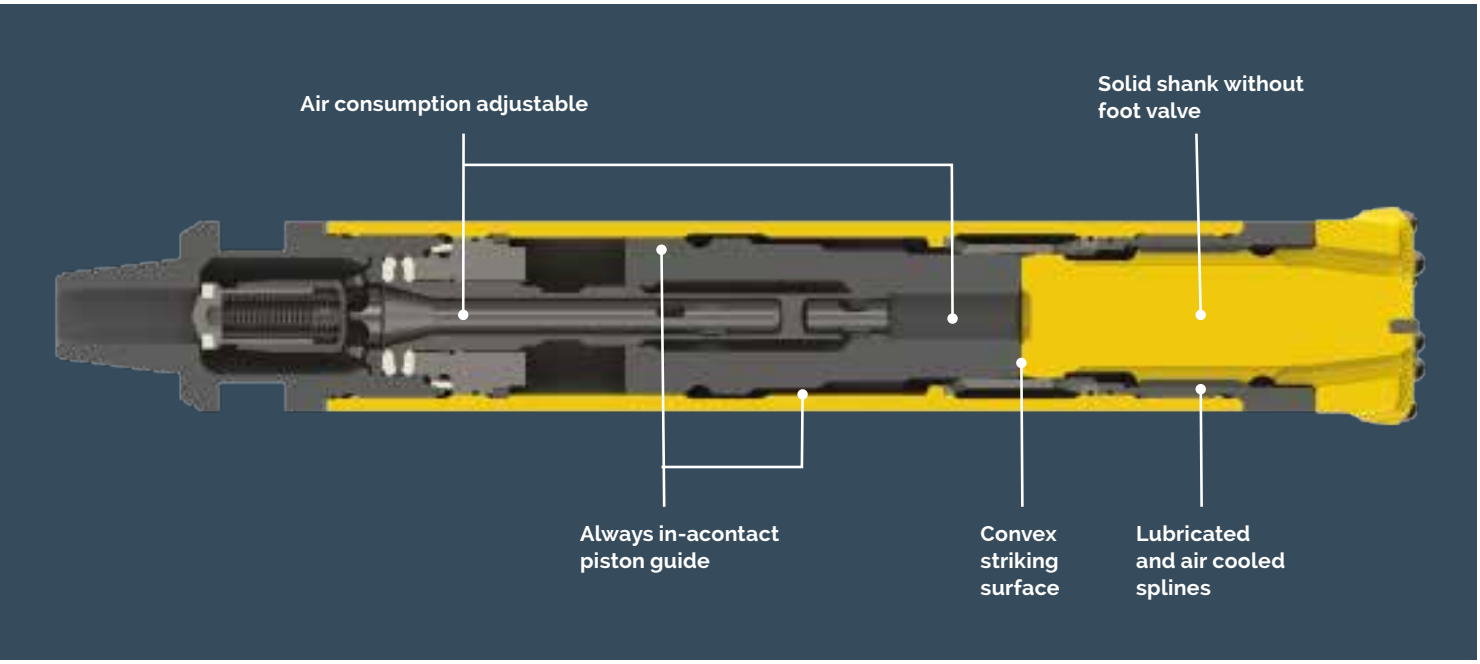

Epiroc
SECOROC COP M6
Epiroc
SECOROC COP M7
Epiroc
SECOROC COP M8

Ground breaking technology

The COP M-series DTH hammers come with new, innovative, and patented technology. A unique air cycle, and an all new bit design translate into great benefits for you. You need to look no further for increased drilling performance and return on investment.

Unique patented air cycle

The new patented air cycle of the COP M-series DTH hammers replaces a design that has been dominant on the market for more than 40 years. Ingenious new technology now features a much faster air cycle that allows for a shorter, lighter and faster hammer than ever before. Our DTH hammers are 25 percent more compact than before. And for many reasons less is more.



Lighter and safer

The COP M-series hammers weigh approximately 30 percent less than other hammers in their class. This means easier handling and increased safety for you.

The fastest DTH hammer ever

A unique piston design allows the COP M-series hammers to strike the rock at much higher frequency than other hammers. This means that less fuel is consumed giving you considerably lower running costs.

Long lasting

The new COP M-series design allows the same or better performance using fewer parts. High quality materials, precise manufacturing, and a simple and robust design gives these hammers low maintenance and long service life.

Durable bits

Our all-new DTH bits feature patented solid shanks, a new sealed air-flow system, special Enduro buttons and an innovative new outside flushing hole design. As a result, the COP M-series bits drill faster, last longer, and offer longer intervals between re-grinds.

All you can ask for

Production and test results for the COP M-series hammers have far exceeded expectations. Regardless of mining conditions this DTH series hammers and bits are outperforming the competition.

Outstanding productivity

Our most successful test shows a penetration rate increase of 64 percent when COP M7 was compared to one of our competitors. COP M6, M7 and M8 have proven themselves to be very effective in all kinds of rock, in all kinds of climates, and with a great variety of drill rigs.

Reliability is key

Strong and tough materials, fewer parts, new solid shank bits and long lasting interior parts make sure that the COP M-series hammers will give you much higher reliability. Everything is built to last. The bits have a solid shank and no exhaust tube. The buttons feature the durable, patented Enduro Extra treatment, which will increase the intervals between re-grinds by up to 20 percent. All in all, these DTH hammers and bits will offer you a much increased service life.

Quick and easy service

Thanks to the more compact and lighter design, handling is easier and safer. One example is that bits can be changed in a matter of minutes. By utilising our e-kits, you can keep the internal parts and re-build the hammer by exchanging the quicker wearing external parts. Why? You get an almost new hammer at a greatly reduced cost, with little or no loss in penetration rate.

We care for the environment

A smaller and lighter hammer is better for the environment. Less material is used. Less energy is required for transportation. On top of that, the COP M-series hammers have proven to be very energy efficient, using significantly less fuel per meter drilled. We strive to design and build the most environment-friendly tools for you.

E-kit external parts keep the COP M-series hammers going.

Sustaining the performance of DTH hammers

E-kit

The high quality internal hammer parts last longer than the parts that are in contact with the rock. The faster wearing external parts can easily be changed. With our e-kit the COP M-series hammers can cost-effectively be rebuilt 1-3 times with little or no loss in productivity.

The toughest bits

The COP M-series DTH bits are at the very cutting edge of technology. Tests have verified what our simulations predicted. These are the toughest, most durable bits to date.

New, harder, tougher

The COP M-series bits are completely redesigned to meet the demands for both high penetration rates and durability. The bit body is made of a harder and tougher grade of steel. A special heat treatment further enhances the bits wear resistance, giving an outstanding service life.

Patented solid shank

The new range of bits feature a unique, patented, tubeless solid shank. This design practically eliminates shank breaks. The result for you? Much fewer broken and lost bits. And higher quality blast holes.

Sealed exterior flushing

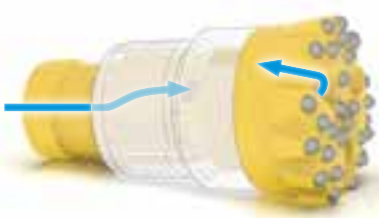
The flushing principle is entirely new. Air passes outside the shank and flows through three flushing holes in the bit face. Simple, ingenious, efficient, patented.

The strongest buttons

The patented Enduro Extra treatment gives the buttons a much tougher and more strike resistant characteristic. This means many more meters drilled between regrinds for you.

Convex face

Solid shank



Sealed air-flow


Strong Enduro Extra treated buttons
Sealed air-flow system
Flushing through the splines, keeping them constantly lubricated
Solid, robust shank

Put to the test

The COP M-series DTH hammers are tried and tested all over the world. At sea level and at high altitudes. In freezing temperatures and in scorching heat. In all types of rock and together with a wide variety of drill rigs. The result? It performs far better than expected.

Australia

COP M6: Handling extremely hard rock

Application
Blast hole drilling, volume mining

Geology and mineral
Gold/extremely hard and abrasive rock

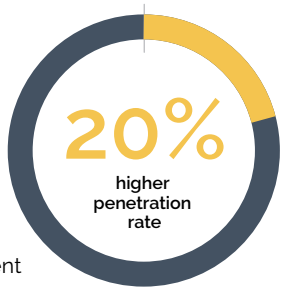
Drill rig
Epiroc SMARTROC D65

Test challenge
To reach a penetration rate of more than 20 m/h

Tested against
Competitor made DTH hammer and 165 mm bit

Epiroc test product
COP M6 hammer and COP M-series 165 mm bit

At side-by-side production, without regrinding the bit, test drilling was performed for approximately two thousand meters. During this time, the M6 hammer kept a steady air pressure of 28 bar, which meant that the air produced was effectively and cost efficiently used by the hammer. At 18.76 m/h, the COP M6 penetration rate was almost 20 percent higher than the competition..



Canada

COP M7: Bridging the productivity gap

Application
Blast hole drilling, volume mining

Geology and mineral
Iron/hard and abrasive rock

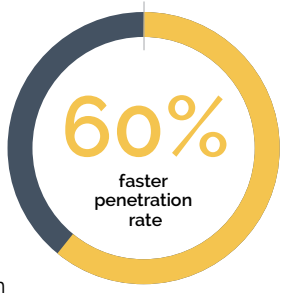
Drill rig
Epiroc SMARTROC D65

Test challenge
Using a larger, more productive hammer, without having to invest in larger drill rigs

Tested against
Epiroc COP 64G DTH hammer and 203 mm QL60 bit

Epiroc test product
COP M7 HF hammer and COP M-series 203 mm bit

COP M7 and COP 64G were used side-by-side, and were sometimes even swiched between rigs to get truly comparable productivity data. The performance of COP M7 with the new 203 mm COP M-series bit reached 0.5 m/min – an almost 60 percent improvement over earlier used hammers and bits. This clearly shows that COP M7 very effectively bridges the productivity gap between 6" and 8" DTH hammers.



West Africa

COP M8: Extremely durable

Application
Blast hole drilling, volume mining

Geology and mineral
Gold/hard and abrasive rock

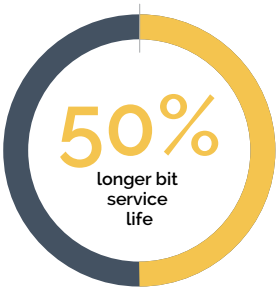
Drill rig
PV235

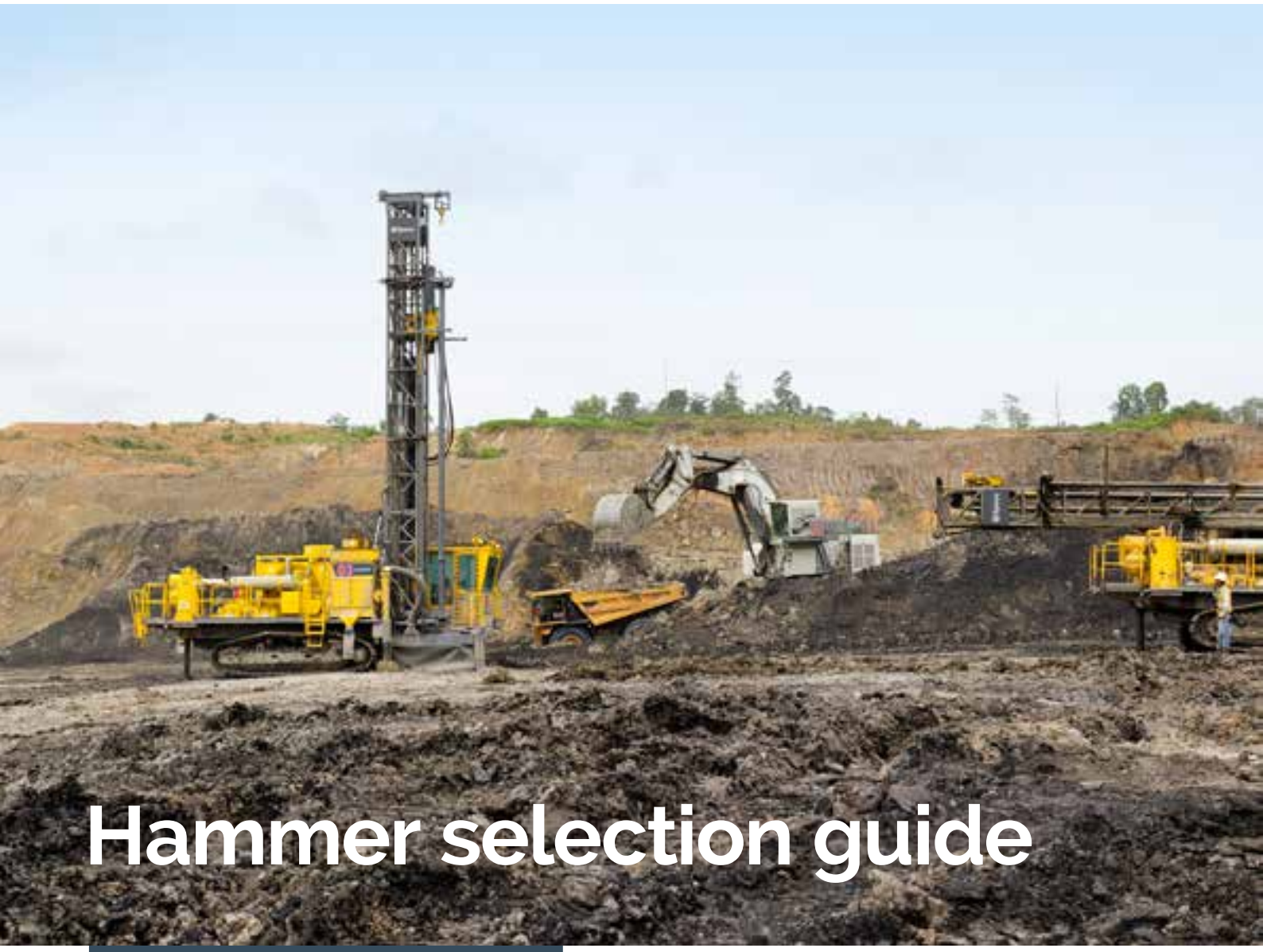
Test challenge
Check potential improvement over existing Epiroc RDT

Tested against
Epiroc QL80 DTH hammer and 229 mm bit

Epiroc test product
COP M8 HF hammer and COP M-series 229 mm bit

Using two PV235 rigs on the same bench, the performance of QL80 and COP M8 were monitored for penetration rate, bit consumption, bit grinding intervals and bit service life. The improvement was outstanding. COP M8 reached 15 percent faster penetration rate, 40 percent longer intervals between regrinds and 50 percent longer bit service life.





Hammer selection guide

Example

Site conditions

- Volume production, open pit mine
- 203 mm (8") holes
- Epiroc DM45 drill rig
- Rig handling capacity: 149-229 mm (5 7/8" - 9")
- Rig air package: 1070 cfm at 350 psi (500 l/s) at 24 bar
- Altitude: 1 800 m
- Average temperature: 10-20 °C

1. Go to table 1

Select hammer based on your chosen hole size.
In our example COP M7 is your optimal choice.

2. Go to table 2

Calculate the air-low based on altitude and temperature.
In our example the compressor capacity will be
81 percent of the 1070 cfm (500 l/s) rated volume,
or 870 cfm (410 l/s).

3. Go to COP M7 in chart 3

The compressor can deliver 870 cfm (410 l/s) at 24 bar.
You should use COP M7 LF (low flow) for best drilling performance.

Please note:

By checking your rig specification, make sure that your drill rig has the capacity to handle the COP M-series hammers.

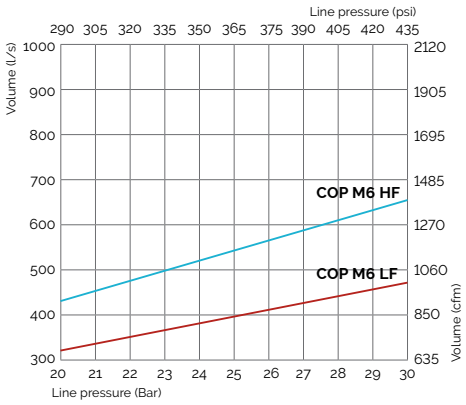
Table 1 Hammer class selection

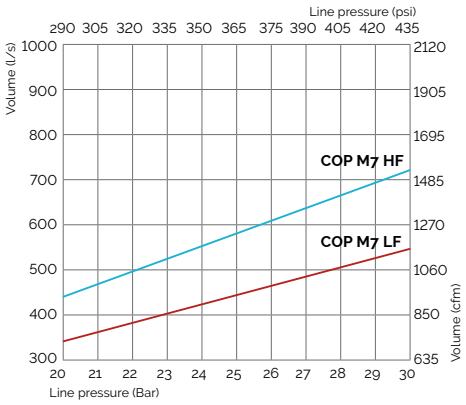
Bit size	mm	165	171	200	203	216	222	225	229	241	251	254	279	305
	inch	6 ½	6 ¾	7 ⅞	8	8 ½	8 ¾	8 55/64	9	9 ½	9 ⅞	10	11	12
Hammer type	COP M6													
	COP M7													
	COP M8													

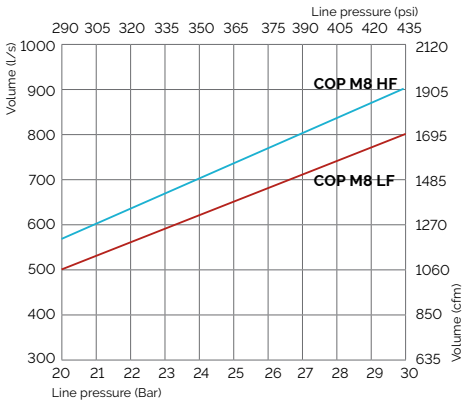
Table 2 Compressor efficiency chart

Ambient temperature	Celcius		-18	-12	-7	-1	4	10	16	21	27	32	38	43	49	54	60
	Farenheit		0	10	20	30	40	50	60	70	80	90	100	110	120	130	140
Altitude	m	Feet															
	3 048	10 000	77%	76%	74%	73%	71%	70%	68%	67%	66%	65%	64%	64%	63%	62%	62%
	2 743	9 000	81%	79%	78%	76%	75%	73%	72%	70%	69%	68%	67%	66%	66%	65%	65%
	2 438	8 000	85%	83%	81%	79%	78%	76%	75%	73%	72%	71%	70%	69%	69%	68%	68%
	2 134	7 000	88%	86%	84%	83%	81%	79%	78%	76%	75%	74%	73%	72%	72%	71%	70%
	1 829	6 000	92%	90%	88%	86%	84%	83%	81%	80%	78%	77%	76%	75%	75%	74%	73%
	1 524	5 000	95%	93%	91%	89%	88%	86%	84%	83%	81%	80%	79%	78%	77%	77%	76%
	1 219	4 000	99%	97%	95%	93%	91%	89%	87%	86%	84%	83%	82%	81%	80%	80%	79%
	914	3 000	102%	100%	98%	96%	94%	92%	91%	89%	87%	86%	85%	84%	83%	83%	82%
	610	2 000	106%	104%	102%	99%	97%	96%	94%	92%	90%	89%	88%	87%	86%	85%	85%
	305	1 000	109%	107%	105%	103%	101%	99%	97%	95%	93%	92%	91%	90%	89%	88%	88%
	0	0	113%	111%	108%	106%	104%	102%	100%	98%	96%	95%	94%	93%	92%	91%	90%
	-305	-1 000	117%	114%	112%	109%	107%	105%	103%	101%	99%	98%	97%	96%	95%	94%	93%
	-610	-2 000	120%	118%	115%	113%	111%	108%	106%	104%	102%	101%	100%	99%	98%	97%	96%

Chart 3 Volume versus Line pressure







For COP M6 a different control tube and cover will give you LF or HF versions.

COP M7 only needs a different control tube to get LF or HF versions.

COP M8 only needs a different cover to get LF or HF versions.

COP M-series hammer technical data

Hammer type	COP M6 HF		COP M6 LF		COP M7 HF		COP M7 LF		COP M8 HF		COP M8 LF	
Bith shank style	COP M6				COP M7				COP M8			
Dimensions	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Length without drill bit	869	34.2	869	34.2	1217.3	47.9	1217.3	47.9	1137.9	44.8	1137.9	44.8
Outside diameter	146	5 .8	146	5.8	175	6.89	175	6.89	194	7.64	194	7.64
Piston diameter	120	4.7	120	4.7	146.2	5.75	146.2	5.75	161	6.33	161	6.33
Recommended bit size	165-178	6.5-7	165-178	6.5-7	191–229	7.5–9	191–229	7.5–9	216-254	8.5-10	216-254	8.5-10
Wrench flat dimension	102	4	102	4	127	5	127	5	127	5	127	5
Weights	kg	lbs	kg	lbs	kg	lbs	kg	lbs	kg	lbs	kg	lbs
Piston weight	17.4	38.3	17.4	38.3	37.4	82.5	37.4	82.5	44.9	99	44.9	99
Weight without drill bit	77	170	77	170	177.3	258.6	177.3	258.6	201.2	435	201.2	435
Drilling parameters	bar	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar	psi
Working pressure	14-30	203-435	14-30	203-435	14-30	203-435	14-30	203-435	14-30	203-435	14-30	203-435
Rotation speed	20-70 rpm				20-70 rpm				20-50 rpm			
Feed force	kN	lbf	kN	lbf	kN	lbf	kN	lbf	kN	lbf	kN	lbf
Feed force range	7-20	1600-4500	7-20	1600-4500	12-31	2800-7000	12-31	2800-7000	30-35	6800-7900	30-35	6800-7900
Feed force at 16 bar	12.8	2877	13.9	3124	31	6969	31	6969	31.5	7087	31.5	7087
Air consumption	l/s	cfm	l/s	cfm	l/s	cfm	l/s	cfm	l/s	cfm	l/s	cfm
10 bar (150 psi)	162	343	214	453	167	353	116	245	265	561	213	451
15 bar (218 psi)	318	673	235	479	314	665	221	468	420	889	368	779
20 bar (290 psi)	428	906	311	658	423	897	327	692	579	1226	519	1099
24 bar (350 psi)	520	1101	373	790	563	1192	413	875	677	1434	579	1226
30 bar (465 psi)	665	1409	470	995	720	1525	542	1148	911	1930	811	1718
Impact rate	BPM	Hz	BPM	Hz	BPM	Hz	BPM	Hz	BPM	Hz	BPM	Hz
10 bar (150 psi)	1590	26.5	1686	28.1	1254	20.9	1242	20.7	1206	20.1	1206	20.1
15 bar (218 psi)	1830	30.5	1884	31.4	1326	22.1	1374	22.9	1344	22.4	1350	22.5
20 bar (290 psi)	2016	33.6	2052	34.2	1410	23.5	1500	25.0	1476	24.6	1494	24.9
24 bar (350 psi)	2118	35.3	2160	36.0	1488	24.8	1608	26.8	1560	26.3	1610	26.8
30 bar (465 psi)	2202	36.7	2286	38.1	1620	27.0	1752	29.2	1728	28.8	1782	29.7

COP M-series hammer assortment

Hammer series	Air flow	Product No.	Product Code	Back head connection	E-kit Product No.	Conversion kit HF-LF
COP M6	HF	89012344	9706-CM-HF-14P-01-OBO	API 3½ in Reg Pin	89012352	89012507
		TBA	9706-CM-HF-15P-01-OBO	API 3½ in IF Pin	89012353	
		TBA	9706-CM-HF-50P-01-OBO	CUBEX #28 Pin	89012354	
		89012351	9706-CM-HF-B1P-01-OBO	BECO 3½ in Pin	89012355	
	LF	89012343	9706-CM-LF-14P-01-OBO	API 3½ in Reg Pin	89012352	89012506
		89012345	9706-CM-LF-15P-01-OBO	API 3½ in IF Pin	89012353	
		89012348	9706-CM-LF-50P-01-OBO	CUBEX #28 Pin	89012354	
		89012350	9706-CM-LF-B1P-01-OBO	BECO 3½ in Pin	89012355	
COP M7	HF	89012640	9707-CM-HF-B2P-03-OBO	BECO 4 in PIN	89012642	89012624
		89012558	9707-CM-HF-17P-03-OBO	API 4½ in REG PIN	89012561	
		89012559	9707-CM-HF-B3P-03-OBO	BECO 4½ in PIN	89012560	
	LF	89012641	9707-CM-LF-B2P-03-OBO	BECO 4 in PIN	89012642	89012548
		89012625	9707-CM-LF-17P-03-OBO	API 4½ in REG PIN	89012561	
		89012643	9707-CM-LF-B3P-03-OBO	BECO 4½ in PIN	89012560	
COP M8	HF	89012174	9708-CM-HF-B2P-02-HBO	BECO 4 in PIN	89012194	89012584
		89012175	9708-CM-HF-17P-02-HBO	API 4½ in REG PIN	89012196	
		89012176	9708-CM-HF-B3P-02-HBO	BECO 4½ in PIN	89012195	
		89012242	9708-CM-HF-B5P-02-HBO	BECO 5¼ in PIN	89012243	
	LF	89012710	9708-CM-LF-B2P-02-HBO	BECO 4 in PIN	89012194	89012579
		89012292	9708-CM-LF-17P-02-HBO	API 4½ in REG PIN	89012196	
		89012711	9708-CM-LF-B3P-02-HBO	BECO 4½ in PIN	89012195	

COP M-series bit assortment

Shank type	Dia mm	Dia inch	Product No.	Product code	Face Type	No. X Button dia, mm (Outer 1)	No. X Button dia, mm (Inner)	No. X Button dia, mm (Front)	Gauge/ Button angle* (Outer)	Gauge/ Button angle* (Inner)	Flushing holes	Weight approx. (kg)	Weight approx. (lbs)
COP M6	165	6½	90030098	100-5165-01-1312,08-20*	Flat	9x19		10x16	35		3	22,8	50,3
	165	6½	90030088	100-5165-01-1312-,08-12**	Flat	9x19		10x16	35		3	22,8	50,3
	165	6½	90030090	100-5165-01-2312,08-20	Convex	9x19	6x16	5x16	35	20	3	22,4	49,4
	165	6½	90030091	100-5165-01-2312,08-12	Convex	9x19	6x16	5x16	35	20	3	22,4	49,4
	171	6¾	90030086	100-5171-01-1313,08-20	Flat	12x19		10x19	35		3	23,7	52,2
	171	6¾	90030089	100-5171-01-1313,08-12	Flat	12x19		10x19	35		3	23,7	52,2
	171	6¾	90030095	100-5171-01-2313,08-20	Convex	12x19	6x19	5x19	35	20	3	23,3	51,4
	171	6¾	90030094	100-5171-01-2313,08-12	Convex	12x19	6x19	5x19	35	20	3	23,3	51,4
COP M7	200	7⅞	90030105	100-5200-03-2313,08-20	Convex	12x19	9x19	9x19	35	15	3	45,3	99,9
	200	7⅞	90030106	100-5200-03-2313,08-12	Convex	12x19	9x19	9x19	35	15	3	45,3	99,9
	203	8	90030103	100-5203-03-2313,08-20	Convex	12x19	9x19	9x19	35	15	3	45,8	100,9
	203	8	90030104	100-5203-03-2313,08-12	Convex	12x19	9x19	9x19	35	15	3	45,8	100,9
	216	8½	90030101	100-5216-03-2313,08-20	Convex	12x19	9x19	12x19	35	15	3	47,4	104,5
	216	8½	90030102	100-5216-03-2313,08-12	Convex	12x19	9x19	12x19	35	15	3	47,4	104,5
	229	9	90030099	100-5229-03-2313,08-20	Convex	12x19	9x19	15x19	35	15	3	50,8	111,9
	229	9	90030100	100-5229-03-2313,08-12	Convex	12x19	9x19	15x19	35	15	3	50,8	111,9
COP M8	216	8½	90030115	100-5216-02-2313,08-20	Convex	12x19	9x19	11x19	35	15	3	53,9	118,8
	216	8½	90030116	100-5216-02-2313,08-12	Convex	12x19	9x19	11x19	35	15	3	53,9	118,8
	216	8½	90030117	100-5216-02-2343,08-20	SPEED	12x19	9x19	11x19	35	15	3	54,2	119,5
	222	8¾	90030113	100-5222-02-2313,08-20	Convex	12x19	9x19	11x19	35	15	3	54,6	120,4
	222	8¾	90030114	100-5222-02-2313,08-12	Convex	12x19	9x19	11x19	35	15	3	54,6	120,4
	229	9	90030111	100-5229-02-2313,08-20	Convex	12x19	9x19	11x19	35	15	3	55,4	122,1
	229	9	90030112	100-5229-02-2313,08-12	Convex	12x19	9x19	11x19	35	15	3	55,4	122,1
	251	9⅞	90030109	100-5251-02-2313,08-20	Convex	12x19	9x19	18x19	35	15	3	59,6	131,4
	251	9⅞	90030110	100-5251-02-2313,08-12	Convex	12x19	9x19	18x19	35	15	3	59,6	131,4
	254	10	90030107	100-5254-02-2313,08-20	Convex	12x19	9x19	18x19	35	15	3	60,0	132,2
	254	10	90030108	100-5254-02-2313,08-12	Convex	12x19	9x19	18x19	35	15	3	60,0	132,2

*20 for Hard – Medium Hard Rock

**12 For Iron Ore

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