



SANDVIK RR910 & RR920 REMEDIAL SERVICE BITS

TECHNICAL SPECIFICATION

WORKOVER BIT RANGE

The RR910 family of drill bits are steel tooth type of bits that runs on an open bearing platform to provide cost effective and high performance drilling. The product line incorporates all of Sandvik's design, manufacturing, and materials expertise to yield high quality and reliable performance. Cutting structure designs are based on proven configurations, for today's challenging downhole conditions.

The newly released RR920 family introduces sealed bearing technology to the workover range for maximum performance in applications that were previously limited by bearing failures.

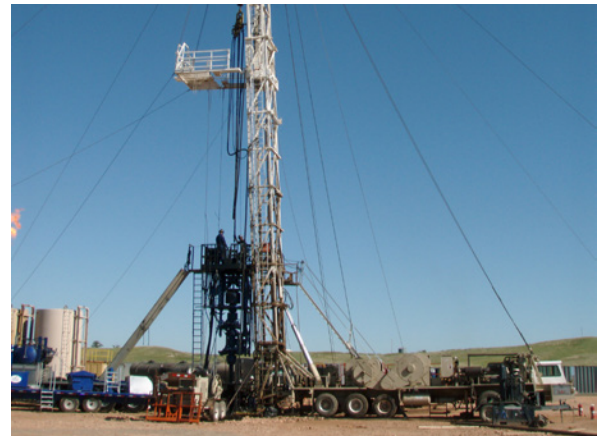
SANDVIK ROLLER CONE BITS EXCEED THE LIMITS

Sandvik roller cone bits are optimized for service life at the maximum possible penetration rate for the drilling conditions. Teeth quantity and size are designed to achieve a balance between productivity and life in a wide range of formations expected in workover drilling. There is never a compromise on quality.

Bearings withstand the high axial and radial forces that are generated during drilling. The bearing design, geometry and material selection are critical factors that go into the development of new bits.

MORE THAN JUST BITS

We pride ourselves on being your total solutions provider and preferred partner of choice. In line with this value, our high performance drilling tools provide longer life and the lowest overall operating costs. Great performing products backed by our global reach of experienced and dedicated personnel make Sandvik the natural choice as your drill string components solutions provider.



Sandvik offers a variety of services designed to improve your drilling process. These services include:

- Drilling performance audits and recommendations
- Product selection
- Dull bit evaluation
- Performance feedback

We are pleased to offer customers on site support including training for the appropriate use of all our products for your application.

When you purchase our product you receive much more than a drill bit. The Sandvik experience includes service and support during and after the sale. Although we have a global footprint, our service is local by design. Our sales and product specialists are stationed in your communities so we can understand your needs and deliver solutions efficiently and responsively. Your local Sandvik team is supported by application Drillmasters who work together with a focus to improve your drilling operation.

MILLED TOOTH WORKOVER BIT ASSORTMENT

Bit Type & IADC CODE (RR910, RR920)

Size (inches)	Size (mm)	OFS	OFM	OFMs	OFH	Pin Connection	Approx. Weight	
		IADC 121	IADC 221	IADC 226	IADC 321		kg	lbs
3 5/8	92		368053			2 3/8" API	3.8	8.4
3 3/4	95		368003			2 3/8" API	3.8	8.4
3 7/8	98		368001	0100522-01	368004	2 3/8" API	4.0	8.8
4 1/8	105		368012			2 3/8" API	4.2	9.3
4 1/4	108		368013			2 3/8" API	4.6	10.1
4 1/2	114		368014			2 3/8" API	4.5	9.9
4 4/7	116		0100521-01			2 7/8" API	6.0	13.2
4 5/8	117		368007			2 7/8" API	6.2	13.7
4 3/4	121		368002		368005	2 7/8" API	6.2	13.7
4 7/8	124		368006		368052	2 7/8" API	6.6	14.6
5 5/8	143		0105224-01			3 1/2" API	10.5	23.1
5 3/4	146		0100525-01			3 1/2" API	10.6	23.4
5 7/8	149	368017	0100526-01			3 1/2" API	11.0	24.3
6	152		368008			3 1/2" API	12.4	27.3
6 1/8	156		368009		368041	3 1/2" API	12.6	27.8
6 1/4	159		368010		368011	3 1/2" API	13.0	28.7
6 1/2	165		0100523-01			3 1/2" API	13.5	29.7

RECOMMENDED PARAMETERS

	OFS	OFM	OFH
Down Pressure (lbs per inch of bit diameter)	1,000 - 3,000	1,000 - 3,500	1,000 - 4,000
Down Pressure (kg per inch of bit diameter)	453 - 1359	453 - 1583	453 - 1812
Typical Rotation Speed	50 - 200	50 - 150	40 - 100

* Please note, this is our current product offering at time of printing. Additions to this offering occur over time as needed. Follow up with your Sandvik representative for the latest information

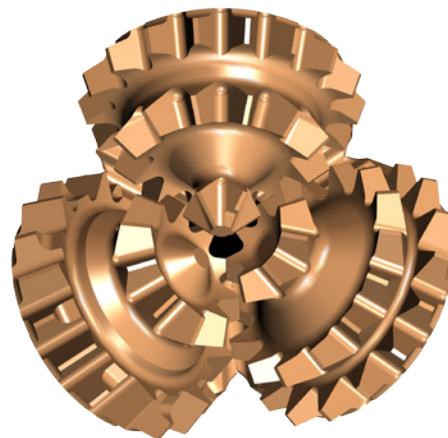
BIT TYPES

TYPE OFS - SOFT

IADC - 121

The fastest drilling bit in unconsolidated formations or rock with low compressive strength. Features long, hardened steel teeth for maximum penetration and cleaning.

Rock formations such as clays, gypsum, soft shales, salts, soft poorly cemented sand formations and other soft formations with low compressive strength and high drill ability.



Compressive strength	0 to 4,000 psi (0 to 30 MPa)
Weight on bit	1,000 to 3,000 lbs per inch of bit diameter
Rotary speed	50 – 200 rpm

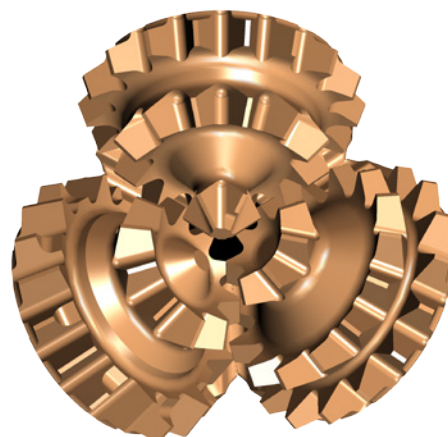
FEATURES	BENEFITS
Open Roller Bearing	Low cost, high quality bearing capable of high speeds
Aggressive cutting structure	Maximizes ROP in soft formations
Maximum offset	Allows drilling at high ROP in speed sensitive formations

TYPE OFM - MEDIUM

IADC - 221

Usually the best bit to use when work over is needed. Designed for formation of medium compressive strength and where formations vary from soft to hard streaks. Features closer spaced teeth with ample gage protection.

Rock formations such as sandstones, limestone, hematite ores, medium to hard shales and other formations with low compressive strength.



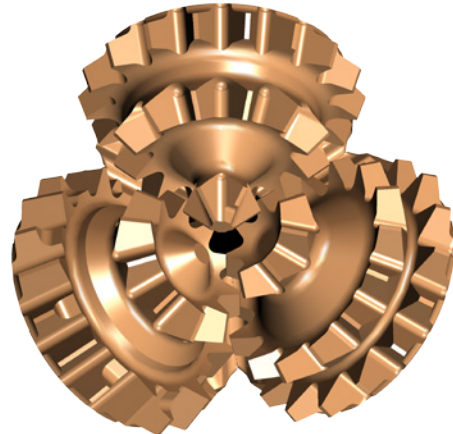
Compressive strength	3,000 to 7,000 psi (20 to 50 MPa)
Weight on bit	1,000 to 3,500 lbs per inch of bit diameter
Rotary speed	50 – 150 rpm

FEATURES	BENEFITS
Open Roller Bearing	Low cost, high quality bearing capable of high speeds.
Semi-aggressive cutting structure	Maximizes ROP in medium formations.

NEW TYPE OFMS - MEDIUM
IADC - 226

Based on our successful OFM design, but with internal seals to extend bearing life in challenging or deep hole environments.

Rock formations such as sandstones, limestone, hematite ores, medium to hard shales and other formations with low compressive strength.



Compressive strength	3,000 to 7,000 psi (20 to 50 MPa)
Weight on bit	1,000 to 3,500 lbs per inch of bit diameter
Rotary speed	50 – 150 rpm

FEATURES	BENEFITS
Sealed Friction Bearing	Eliminates common bearing issues, high quality bearing capable of high speeds and long runs.
Semi-aggressive cutting structure	Maximizes ROP in medium formations.

TYPE OFH - HARD
IADC - 321

Used in strong, abrasive formations. Smaller, more abundant teeth provide strength to optimize penetration rate and bit life while providing gage protection.

Rock formations such as hard limestone, dolomites, hard highly cemented sandstones, hard quartz shales, metamorphic rocks and other hard semi-abrasive or abrasive formations.



Compressive strength	6,000 to 10,000 psi (40 to 70 MPa)
Weight on bit	1,000 to 4,000 lbs per inch of bit diameter
Rotary speed	40 – 100 rpm

FEATURES	BENEFITS
Open Roller Bearing	Low cost, high quality bearing capable of high speeds
Highly durable cutting structure	Maintains high ROP in hard formations

BIT SIZES AND CLEARANCES IMPERIAL UNITS

ENGLISH UNITS

Casing Specifications				Bit Sizes and Diametrical Clearance		
Casing Size O.D. (in.)	Casing Coupling Dia O.D. (in.)	Wt per ft. With Couplings (lbs)	Inside Diameter of Casing (in.)	Bit Size (in.)	Thousandths	Nearest 64th
4 1/2	5,000	9.50	4,090	3 7/8	0.215	7/32
4 1/2	5,000	11.60	4,000	3 7/8	0.125	1/8
4 1/2	5,000	13.50	3,920	3 3/4	0.170	11/64
5	5,563	11.50	4,560	4 1/4	0.310	5/16
5	5,563	13.00	4,594	4 1/4	0.244	1/4
5	5,563	15.00	4,408	4 1/4	0.158	5/32
5	5,563	18.00	4,276	4 1/8	0.151	5/32
5 1/2	6,050	13.00	5,044	4 3/4	0.294	19/64
5 1/2	6,050	14.00	5,012	4 3/4	0.262	17/64
5 1/2	6,050	15.50	4,950	4 3/4	0.200	13/64
5 1/2	6,050	17.00	4,892	4 3/4	0.142	9/64
5 1/2	6,050	20.00	4,778	4 5/8	0.153	5/32
5 1/2	6,050	23.00	4,670	4 1/2	0.170	11/64
6	6,625	15.00	5,524	5 3/8	0.149	5/32
6	6,625	18.00	5,424	5 1/8	0.299	19/64
6	6,625	20.00	5,352	5 1/8	0.227	15/64
6	6,625	23.00	5,240	5 1/8	0.115	7/64
6 5/8	7,390	17.00	6,135	6	0.135	9/64
6 5/8	7,390	20.00	6,049	5 7/8	0.174	11/64
6 5/8	7,390	24.00	5,921	5 5/8	0.296	19/64
6 5/8	7,390	28.00	5,791	5 5/8	0.166	11/64
6 5/8	7,390	32.00	5,675	5 3/8	0.300	19/64
7	7,656	17.00	6,538	6 1/4	0.288	9/32
7	7,656	20.00	6,456	6 1/4	0.206	13/64
7	7,656	23.00	6,366	6 1/4	0.116	7/64
7	7,656	26.00	6,276	6 1/8	0.151	5/32
7	7,656	29.00	6,184	6	0.184	3/16
7	7,656	32.00	6,094	6	0.094	3/32
7	7,656	35.00	6,004	5 7/8	0.129	1/8
7	7,656	38.00	5,920	5 3/4	0.170	11/64
7 5/8	8,500	20.00	7,125	6 3/4	0.375	3/8
7 5/8	8,500	24.00	7,025	6 3/4	0.275	9/32
7 5/8	8,500	26.40	6,969	6 3/4	0.219	7/32
7 5/8	8,500	29.70	6,875	6 3/4	0.125	1/8
7 5/8	8,500	33.70	6,765	6 5/8	0.140	9/64
7 5/8	8,500	39.00	6,625	6 1/4	0.375	3/8

BIT SIZES AND CLEARANCES METRIC UNITS

METRIC UNITS

Casing Specifications				Bit Sizes and Diametrical Clearance	
Casing Size O.D. (mm)	Casing Coupling Dia O.D. (mm.)	Wt per m. With Couplings (kg)	Inside Diameter of Casing (mm)	Bit Size (mm)	(mm)
114.30	127.00	14.14	103.89	98.43	5.46
114.30	127.00	17.26	101.60	98.43	3.18
114.30	127.00	20.09	99.57	95.25	4.32
127.00	141.30	17.11	115.82	107.95	7.87
127.00	141.30	19.35	116.69	107.95	8.74
127.00	141.30	22.32	111.96	107.95	4.01
127.00	141.30	26.79	108.61	104.78	3.84
139.70	153.67	19.35	128.12	120.65	7.47
139.70	153.67	20.83	127.30	120.65	6.65
139.70	153.67	23.07	125.73	120.65	5.08
139.70	153.67	25.30	124.26	120.65	3.61
139.70	153.67	29.76	121.36	117.48	3.89
139.70	153.67	34.23	118.62	114.30	4.32
152.40	168.28	22.32	140.31	136.53	3.78
152.40	168.28	26.79	137.77	130.18	7.59
152.40	168.28	29.76	135.94	130.18	5.77
152.40	168.28	34.23	133.10	130.18	2.92
168.28	187.71	25.30	155.83	152.40	3.43
168.28	187.71	29.76	153.64	149.23	4.42
168.28	187.71	35.72	150.39	142.88	7.52
168.28	187.71	41.67	147.09	142.88	4.22
168.28	187.71	47.62	144.15	136.53	7.62
177.80	194.46	25.30	166.07	158.75	7.32
177.80	194.46	29.76	163.98	158.75	5.23
177.80	194.46	34.23	161.70	158.75	2.95
177.80	194.46	38.69	159.41	155.58	3.84
177.80	194.46	43.16	157.07	152.40	4.67
177.80	194.46	47.62	154.79	152.40	2.39
177.80	194.46	52.09	152.50	149.23	3.28
177.80	194.46	56.55	150.37	146.05	4.32
193.68	215.90	29.76	180.98	171.45	9.53
193.68	215.90	35.72	178.44	171.45	6.99
193.68	215.90	39.29	177.01	171.45	5.56
193.68	215.90	44.20	174.63	171.45	3.18
193.68	215.90	50.15	171.83	168.28	3.56
193.68	215.90	58.04	168.28	158.75	9.52

Sandvik Mining reserves the right to make changes to the information on this data sheet without prior notification to users. Please contact a Sandvik representative for clarification on specifications and options.