

OPTIONAL EQUIPMENT

With over 100 years of experience in manufacture and operation of mills, we can offer a wide range of equipment components, including:

- steel and rubber linings of an optimised shape improving grinding performance and steel alloys for special applications reaching up to 59HRC and a lifespan of 15,000 to 20,000 hours;
- grinding media in the form of balls and cylpebs made of high manganese steel or the latest ceramic components;
- contact and mechanical and electronically controlled spray lubrication systems;
- explosion protection devices;
- sprinkler systems.

SERVICE AND REPAIRS

Our mission is not only to sell and produce, but also to support you with our expertise from the very first start-up of a MAKRUM device, throughout the entire service life. We help, advise and provide maintenance services to make the machines reliable and durable for years.

See examples of repairs: dislocation of mills, regeneration of bearing shells, replacement of toothed-wheel rims, technical inspection, replacement of the type of equipment.



OUR ASSETS AND SOLUTIONS

- 100 years of experience in the design of ball mills.
- Full service and guidance on the selection of a device.
- Modern design and quality inspection methods.



OUR PROJECTS

Type	D [m]	L [m]	Grinding media weight [Mg]	Drive power [kW]	Nominal capacity [Mg/h]	Total weight [Mg]	Type	D [m]	L [m]	Grinding media weight [Mg]	Drive power [kW]	Nominal capacity [Mg/h]	Total weight [Mg]
4100	1,3	5,5	5,91	75	7,3	46,5	4163	3,4	13,5	106,00	2000	153	463
4101	2,7	3,6	18,67	400	36	123,5	4165	2,6	13,5	64,69	1000	82	284
4102	3,4	3,6	30,23	630	42	153,6	4166	2,6	12,5	59,90	1000	82	262,6
4103	4,2	4,76	60,00	1250	83	211	4167	3	13,5	87,33	1700	115	370
4104	3,2	4,5	33,00	630	50	164	4178	1,9	5,5	13,53	250	17	61,1
4105	5	5,5	102,00	2000	125	300	4179	2,6	7,5	35,94	400	32	127,5
4106	5,2	5,5	111,00	2500	160	370	4180	2,6	5,5	26,35	400	21	113,2
4107	1,3	5,5	5,91	75	6,9	43,5	4181	2,3	5	18,49	250	19	74,2
4108	1,3	5,5	5,91	75	7,1	45	4186	2,3	6,5	24,04	230	21	76,9
4111	1,3	5,5	8,00	160	7,4	46,7	4921	2	5,1	14,01	160	12	55,3
4112	1,8	8	18,00	250	24,5	78	4922	2,3	6,5	24,04	250	19	75,8
4113	2,7	3,6	19,00	400	40	125,4	4923	2,6	8,8	42,17	630	40	101,8
4115	1,3	2,5	2,69	30	4,9	12	4924	2,6	7,5	35,94	400	31	128,9
4129	2,1	2,6	7,00	160	12	47,3	4925	3	10,5	67,93	1250	90	215
4130	2	10	27,00	400	37	114,2	4926	3	10,25	50,00	1000	90	250
4131	2	8,8	22,50	320	28	94,8	4927	2,3	8	29,59	400	22,5	106
4131	2	8,8	22,50	320	16	86,5	4928	2,3	8	29,59	170	14,7	55,5
4131	2	8,8	22,50	320	28	72,2	4961	3	7,5	48,52	75	8	29
4132	2,2	10	35,00	630	52	146	4965	2,6	13	63,00	1000	82	274,6
4133	2	8,8	24,17	320	28	94,8	4966	3	13,5	84,00	1600	115	378
4139	1,5	5,7	8,60	132	12,2	40	4967	3,6	11	104,03	2000	148	
4142	2,4	12	48,56	630	67	201	4968	3,4	13,5	113,38	2000	156	492
4143	2,6	13	62,29	1000	85	270,1	4969	4,6	14	219,70	4500	206	520
4144	2,6	13	63,00	1000	84	259	4970	3,8	13,5	142,81	2400	170	524
4145	2,6	13	62,29	1000	83	265	4971	3,8	14	148,10	2700	206	549,5
4146	1,8	8	17,52	250	24,5	73	4975	2,6	13	64,00	1000	84	261
4148	3,4	13,5	106,00	2000	153	481	4986	4	12	96,00	2000	120	404
4150	2,3	5,2	19,23	250	20	66	4990	2,6	13,5	63,00	630	51	190
4151	3,4	5	43,00	630	57	156	4995	1,7	2,5	4,84	30	0,45	12,5
4152	3	7,5	48,52	915	61	212	4996	1,7	2,5	4,84	30	1,1	12,4
4153	2,3	6,5	24,04	350	31	120	9876	2,2	13	46,00	630	65	145
4156	3	9,5	61,46	1000	80	253	9884	1,7	3	5,81	110	11,5	45,6
4157	1,8	8	17,52	250	24,5	47	9885	1,8	5,5	13,00	160	9,1	57,5
4158	2,6	13	62,29	1000	79	245	9886	3,2	5,5	40,71	630	53,5	175
4159	2,6	13	62,29	1000	84	263							



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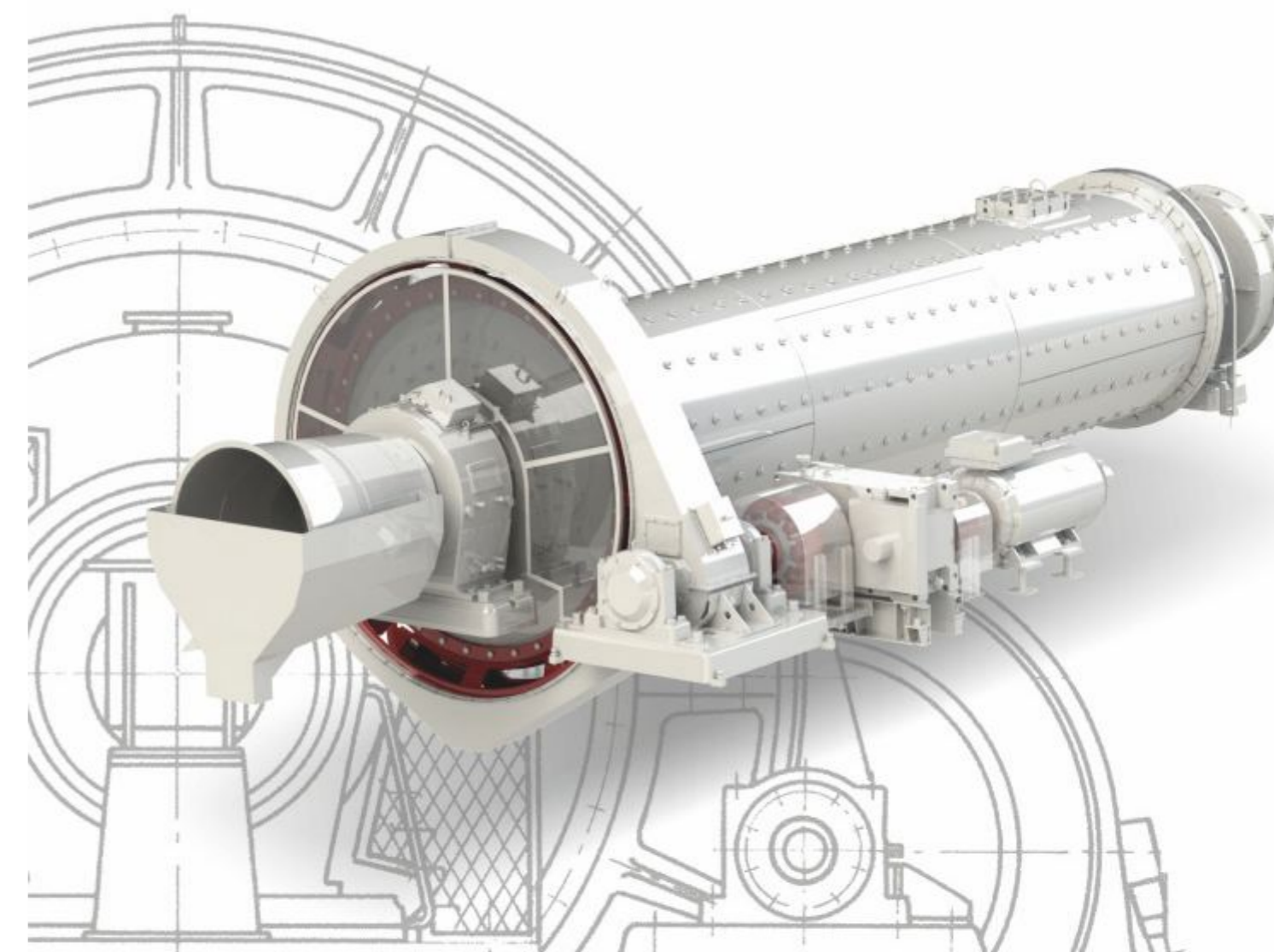
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MILLS

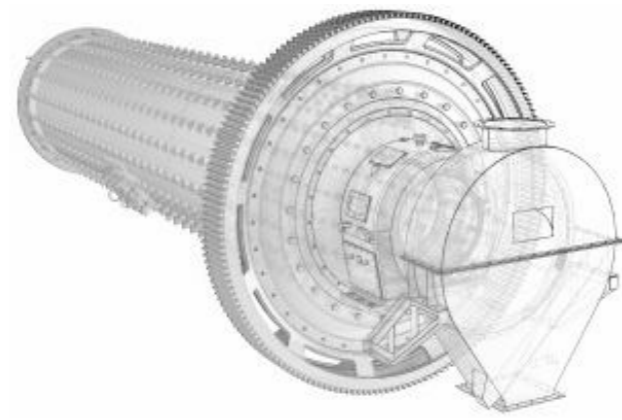
RELIABILITY THAT RETURNS



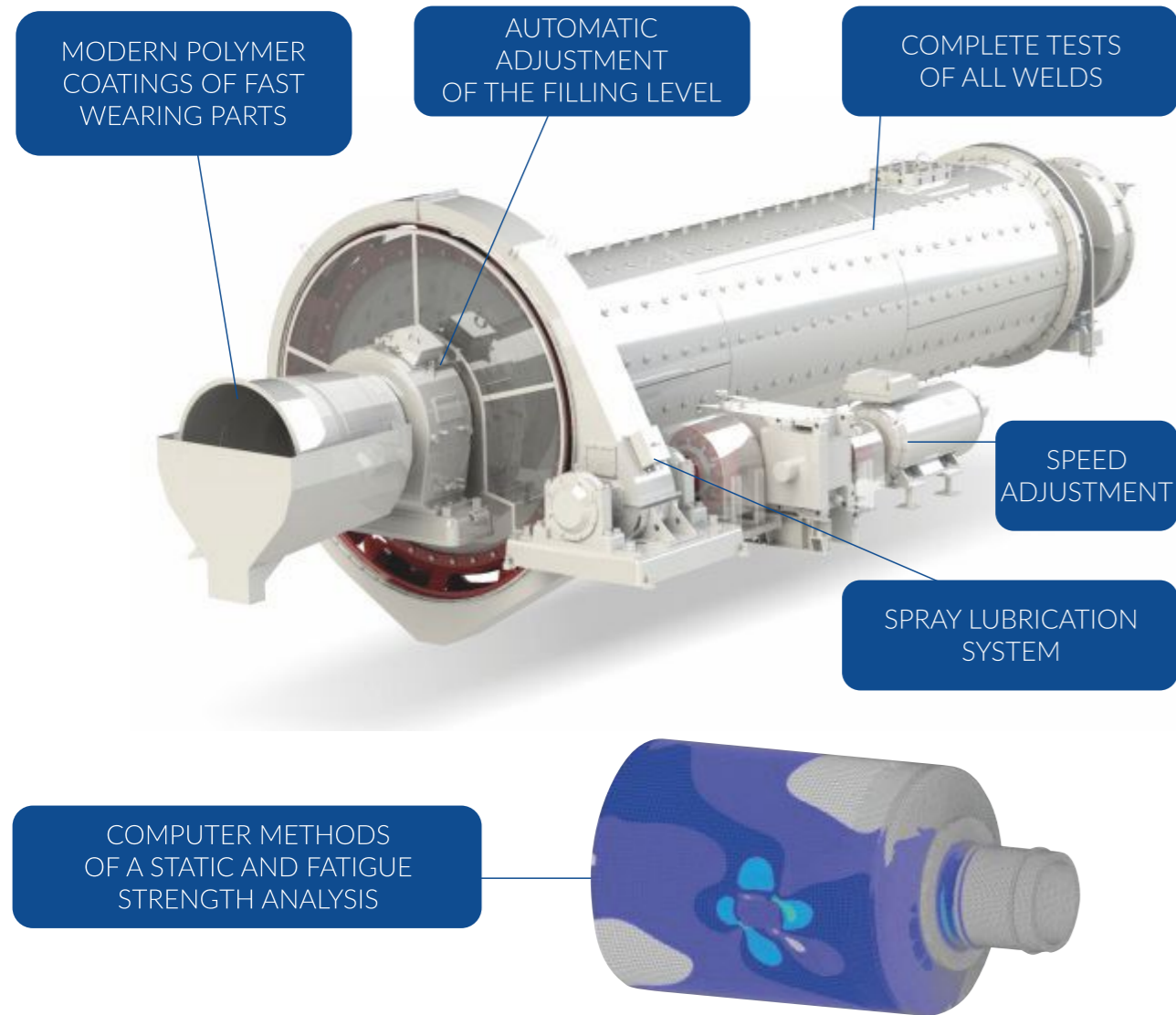
INNOVATION BASED ON EXPERIENCE

Ball mills are one of the main groups of products manufactured by MAKRUM. Many years of experience, a wide range of offered products and hundreds of successful projects made us a leader in manufacture of ball mills and grinding machines. Our offer is provided mainly for entities running their business in the following industries:

- cement,
- mining,
- ceramic,
- power,
- pharmaceutical,
- chemical.



Machines are delivered as complete systems or single devices for a designed processing line. Ball mills belong to the group of gravitational mills where balls, rods or cylpebs of different diameters serve as grinding media. They are used for wet and dry grinding of medium-hard and soft materials on a continuous and periodic basis. They operate both in closed and open cycles. The technology is based on the effect of centrifugal forces generated by rotations of the drum. Grinding media with ground material are lifted to a specific height and then they descend or slide one on another grinding the material.



TUBE MILLS

Type	D [m]	L [m]	Drive power [kW]	Grinding media weight [Mg]	Nominal capacity [Mg/h]	Total weight [Mg]
4111	1,3	5,5	75-110	7,3-11	2,87	26
4961	1,4	5	75-110	8-11	3,11	29
4139	1,5	5,7	90-160	10-14	4,16	40
9777	1,6	4,0	90-132	6-13	4,51	26,7
4112	1,8	8	200-315	22-29	8,85	78
4921	2	5,1	160-220	17-23	7,14	55,3
4131	2	8,8	320-450	28-40	12,32	94,8
4130	2	10	355-480	34-46	14,00	114,2
4132	2,2	10	450-630	42-56	17,28	146
9876	2,2	13	560-800	54-73	22,46	145
4181	2,3	5	250-355	20-31	9,52	74,2
4150	2,3	5,2	200-250	20-32	9,91	66
4153	2,3	6,5	315-450	30-40	12,38	120
4927	2,3	8	355-450	36-49	15,24	106
4142	2,4	12	630-900	67-92	25,09	201
4180	2,6	5,5	355-500	41-55	13,68	113,2
4924	2,6	7,5	400-560	45-60	18,66	128,9
4923	2,6	8,8	500-630	53-70	21,90	101,8
4166	2,6	12,5	710-1120	82-114	31,10	262,6
4144	2,6	13	800-1120	84-119	32,35	259
4165	2,6	13,5	900-1120	92-123	33,59	284
4152	3	7,5	630-900	69-93	25,40	212
4156	3	9,5	800-1120	80-117	32,17	253
4925	3	10,5	800-1120	85-113	35,56	215
4966	3	13,5	1120-1600	125-167	45,72	378
4148	3,4	13,5	1600-2000	153-216	59,72	481
4967	3,6	11	1400-2000	149-197	54,93	505
4970	3,8	13,5	2000-2500	170-273	75,58	524
4971	3,8	14	2000-2700	206-283	78,38	549,5
4986	4	12	1600-2500	177-236	74,85	404
4969	4,6	14	3000-4500	206-367	117,08	520

- an initial drying chamber can be adapted
- a mill of other dimensions can be designed

TUBE MILLS

4115	1,3	2,5	30-75	3,5-4,9	1,5	12
4995	1,7	2,5	30-75	6,3-8,8	2,7	12,5
9884	1,7	3	75-110	7,6-10,5	3,2	45,6
9885	1,8	5,5	110-160	6,6-9,1	6,6	57,5
4129	2,1	2,6	110-160	10-14,4	4,4	47,3
4101	2,7	3,6	400	24,5-36	10,3	123,5
4104	3,2	4,5	630	44,8-60	18,3	164
9886	3,2	5,5	630	53,5-74	22,4	175
4102	3,4	3,6	560-630	39-55	16,6	153,6
4151	3,4	5	630-900	55-76	23,1	156
4103	4,2	4,76	1250-1500	81-112	34,1	211
4105	5	5,5	2000-3000	125-186	56,3	300
4106	5,2	5,5	2500-3000	146-201	61,1	370

- ball or rod grinding media

CYCLICAL MILLS

4171	2,6	8,0	30,0	5,9	4,4	21,7
4172	1,9	4,0	15,0	2,6	2,2	9,9
4173	3,0	26,0	75,0	19,1	14,3	55,0
4951	0,7	0,2	0,8	0,1	0,1	0,7
4952	0,9	0,3	1,5	0,3	0,2	1,0
4953	1,1	0,4	4,8	0,3	0,2	2,1
4954	1,1	0,7	4,8	0,5	0,4	2,1
4955	1,5	1,2	5,5	0,9	0,7	4,6
4956	1,5	2,5	7,5	1,8	1,4	5,8
4957	1,9	4,0	15,0	2,9	2,2	8,6
4958	1,9	4,0	15,0	2,9	2,2	8,5
4991	1,1	0,7	4,0	0,5	0,4	1,1
4992	1,1	1,2	5,5	1,0	0,7	5,2
4993	1,7	2,5	15,0	1,8	1,4	8,6
4994	1,7	4,0	22,0	2,9	2,2	11,7

CONFIGURATION OF A MILL OPERATION VARIANT

TYPE	DRY <input checked="" type="checkbox"/>	PNEUMATIC	DRYING	WET	FLOW
CHAMBER	1-CHAMBER	2-CHAMBER	MULTI-CHAMBER <input checked="" type="checkbox"/>	INCL. DRYING CHAMBER	CONICAL
FILLING	BALL <input checked="" type="checkbox"/>	CYLPEBS	MINI-CYLPEBS	ROD	CERAMIC
OUTLET	GRAVITATIONAL THROUGH THE SPIGOT	GRAVITATIONAL AT THE END OF THE DRUM	MECHANICAL THROUGH THE SPIGOT <input checked="" type="checkbox"/>	PNEUMATIC THROUGH THE SPIGOT	FLOW THROUGH THE SPIGOT
DRIVE	INDEPENDENT RIM AND GEAR <input checked="" type="checkbox"/>	RIM INTEGRATED WITH THE GEAR	CENTRAL THROUGH THE SPIGOT	RIM ON THE SHELL	LOW-SPEED MOTOR (SAS)
MESH FRACTION INLET	TO THE FIRST CHAMBER	TO THE LAST CHAMBER <input checked="" type="checkbox"/>	IN THE MIDDLE OF THE DRUM	TO THE SEPARATED CHAMBER	

example of a mill configuration

PROCESS LINES

