

Evolution.
**The proven
solution
for perfect
production
reliability.**

Proven solution for maximum investment protection.

The answer for powerful die casting.

Evolution is the proven solution for aluminum and magnesium die casting with a locking force range from 2,600 to 9,000 kN. The system is optimal for foundries that have the highest requirements for the quality of the die cast parts and for the flexibility during production. Thanks to the customizable Evolution technology, the process can be adjusted precisely for the components to be manufactured and to their properties.



1

Proven locking unit for the highest level of reliability.

- Already over 2,000 times in use
- Solid design
- Rapid movements

2

Bühler technology for the best casting results.

- Using unique Bühler SC (shot control) systems, every die casting process is controlled in real time
- Reproducible casting results
- A process that is controlled, stable, and preserves the die

3

30 % additional shot capacity for reliable production.

- Powerful injection unit
- High dynamics for improved die filling
- Power reserves to compensate for process fluctuations and for a stable production

4

Intuitive DataView machine control.

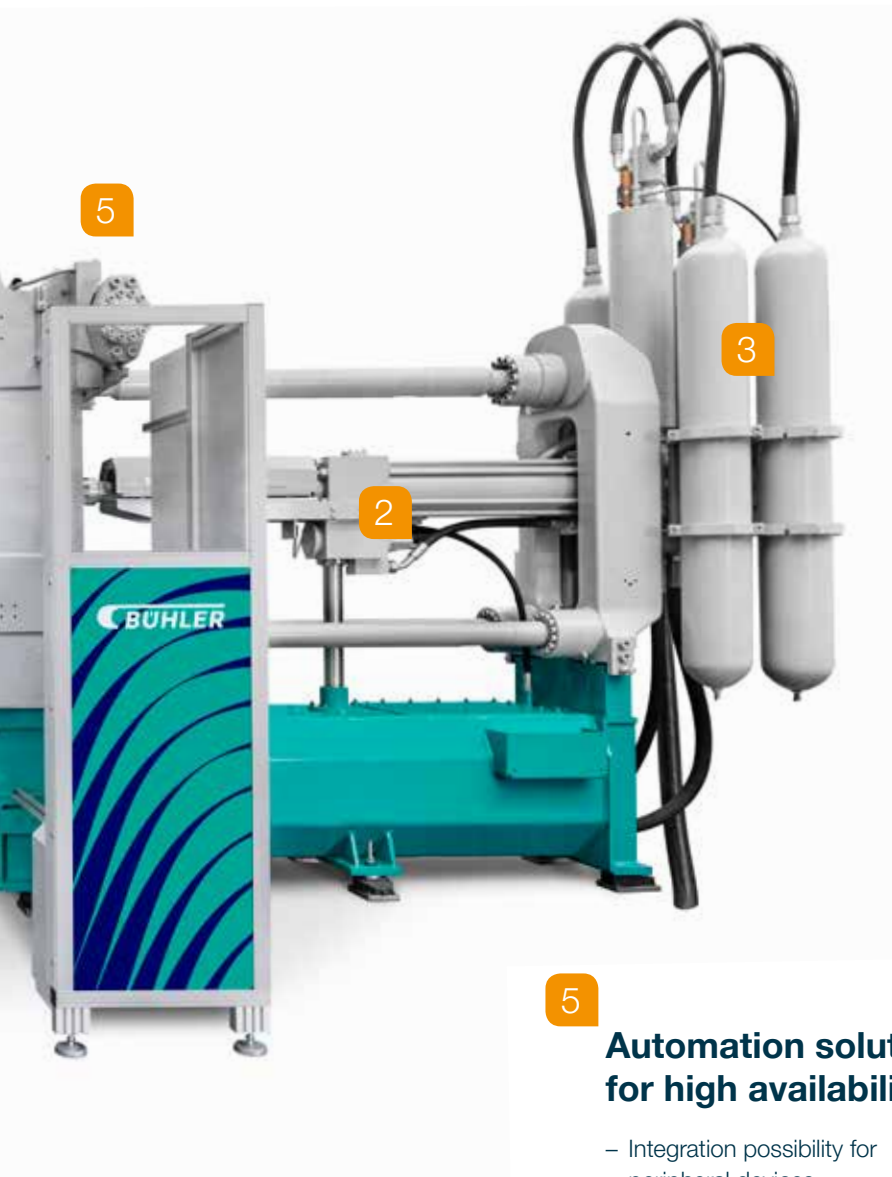
- Intuitive and user-friendly control system for up to 25 % shorter programming time
- Integrated process and system diagnostics
- Interactive real-time control of the die-casting machine

5

5

Automation solution for high availability.

- Integration possibility for peripheral devices
- High productivity due to synchronized communication of the cell participants
- Stable production process for maximum availability



Reliability, power and quality. The solution for demanding parts.



Proven locking unit for the highest level of reliability.

The Evolution from Bühler is based on the proven three-platen technology with a toggle system that has already seen more than 2,000 installations worldwide. The design distinguishes itself due to its extraordinarily high level of stability and reliability, as well as its rapid movements. Among other features, its optional core pull unit, squeeze pins and tempering system manifolds on the fixed and moving platens provide a high level of flexibility.



Intuitive DataView control system.

DataView makes it easy for your operators to control your die-casting machine from the ergonomic user interface. Simple graphical interfaces and recipe management make programming up to 25 % faster. You can manage real-time control and adjustments direct from the touch screen. Prompts and alarms help with your daily operation and provide practical assistance for targeted diagnostics and analyses. This user-friendly interface is available in a number of languages.

25%

shorter programming time



Bühler SC casting technology with up to 30 % higher performance.

Bühler has developed the unique SC (shot control) die casting technique with real-time closed loop control for maximum quality and efficiency. A generously designed hydraulic system provides sufficient power reserves to compensate for process fluctuations, which enables stable production. The high dynamics support optimal part filling. The die-casting process is continuously monitored using SC technology and is controlled in real time. The system automatically reacts to deviations and corrects them immediately. This allows a process that has a high level of reproducibility and casting that particularly preserves the die. In addition, automated algorithms assist with programming optimal casting profiles, which results in shorter cycle times and a higher part quality.

Maximum process flexibility.

No single component and no single process are exactly the same. Therefore, the Evolution solution is flexible, with three performance levels for the injection unit and numerous additional options, can be configured precisely for specific applications. This means that each and every foundry receives a complete solution that is tailored to its specific needs. It provides the highest level of flexibility with regard to processes and technology. Hardware and software can be upgraded at any time, which ensures maximum protection of your investment.

30%

higher performance

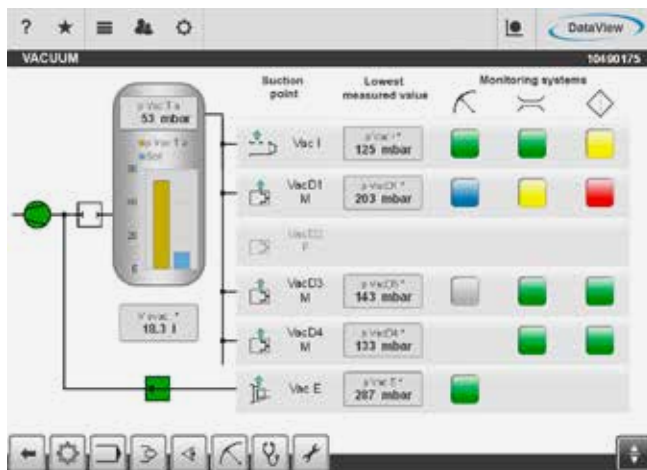
Automation solution for high availability. **The die-casting cell as an integrated production solution.**



High availability of the cell requires system components that are synchronized with each other. The Bühler peripherals can be integrated, programmed and controlled on the DataView control unit. This allows not only comprehensive analysis and diagnostic options, also the relevant production and process data is available centrally.



Optimally synchronized cell. Seamlessly integrated peripheral devices for maximum availability.



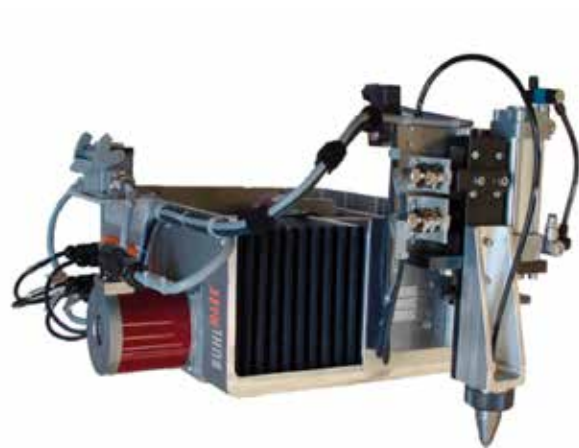
SmartVac – Vacuum system with higher process transparency.

The SmartVac vacuum system is integrated seamlessly into the die-casting system. It is controlled centrally with the DataView control unit. All relevant vacuum parameters are measured, monitored and assigned to the process directly – for comprehensive process transparency and optimum quality of the components.

SmartVac allows the use of many commercially available vacuum valves. Two suction points on the die and one on the die shot sleeve can be controlled and monitored independently of one another simultaneously.

The vacuum level and the suction level can be adjusted individually and targeted to the component and to the appropriate process. In addition, cyclical tests allow quick conclusions about the current condition of the filter, which allows for proactive maintenance.

- Achieves the ideal vacuum level quickly
- Centrally operated
- Increased process transparency



BuhlMark – Permanent marking for complete traceability.

BuhlMark is a marking device that can be used flexibly and allows alphanumeric characters and codes to be applied in three different stamping types.

The quick and permanent marking ensures unique and constant traceability. The device was specially optimized for use in the harsh conditions found in foundries. It has a completely protected stamping unit, and is therefore extremely low maintenance.

Marking codes can be programmed directly on the control unit, and are a part of the die program. This means that all data is centrally available and enables error-free and quick change of dies.

- Complete traceability of parts
- Efficient and low-cost maintenance
- High flexibility



BuhlRob – Reliable and fast extraction of parts.

BuhlRob is a robot specifically designed for part removal in foundries. The system is based on the proven ABB or KUKA technologies. BuhlRob distinguishes itself through its compact design, its high range and a high working load. Compensation movements prevent collisions and thus also production interruptions during removal. In this way, BuhlRob contributes to a higher availability of the cell.

Additionally, the device is integrated into the die-casting machine control unit and allows graphical visualization of the robot's functions. This allows all data to be clearly available and simplifies handling for the user.

- User-friendly
- Specially designed for foundries
- Fast extraction



BuhlSpray – efficient spraying.

BuhlSpray is a two axis spraying device, and is offered in three expansion stages. With tools for up to eight spraying and blowing cycles, the device is also suitable for intricate cavities. The robust design and the simple structure contribute to a high level of availability for the die-casting cell. The cycle time is minimized and productivity is increased thanks to the high dynamics of the device.

BuhlSpray can be integrated seamlessly into the die-casting machines's control unit, which provides for simpler handling and quicker changing of dies.

- Easy and quick change of dies
- Rapid movements
- Centrally operated



BuhlLadle – Precise and consistent dosing.

BuhlLadle is a ladling device for precise and consistent dosing of liquid aluminum. The device is distinguished by its robust design and its simple handling, and is entirely integrated into the control unit of the die-casting machine. The speeds and ladle angle can be programmed at will thanks to the servo technology. The extraordinary positioning accuracy increases the dosing consistency and reduces the cycle times.

- Short cycle time
- High dosing consistency
- Simple handling

SmartVac.

Technical data.

		200/63	300/100
Volumetric capacity of the vacuum tank	l	200	300
Vacuum pump (Busch)	m ³ /h	63	100
Installed power	kW	2.7	2.7
Die evacuation unit		1	1
Control system		DataView	DataView
Interface to DCM		B	B
Monitored die evacuation channels		max. 2	max. 2
Controlling/monitoring of chill events		B	B
Controlling/monitoring of hydraulic die valves		B	B
Controlling/monitoring of electric die valves		B	B
Profile monitoring per evacuation channel		B	B
Monitoring of contamination per evacuation channel		B	B
Alarm handling		B	B
Archiving of production data		B	B
Optimizing of 1 st phase on the DCM		B	B
Piping between vacuum generator and evacuation units on the DCM		B	B
Options			
Controlling/monitoring of mechanic die valves		o	o
Shot sleeve evacuation unit		o	o
Die evacuation unit 2		o	o
Miscellaneous			
Die valves		-	-
Suitable for Evolution		42-53	66-90

BuhlMark.

Technical data.

Marking times for scribing and dot embossing (approximate)*

Font set A: DIN 1451 or OCR-A – scribing

Font set B: HS (fast writing = slightly angular characters) – scribing to max. R32

Font set C: 7 × 5 (dot matrix) – dot embossing only

The following marking cycle times were achieved with a marking unit 315 with marking controller EG-Box (ZAM5) with the marking heads DD20 L and R32 K.

Font height in mm	SH 1.8 mm			SH 2 mm			SH 2.5 mm			SH 3 mm			SH 4 mm			SH 5 mm			SH 6 mm			SH 7 mm		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Figure set																								
2 figures	0.4	0.4	0.7	0.4	0.4	0.8	0.5	0.5	0.9	0.6	0.6	0.9	0.7	0.7	1.1	0.8	0.8	1.1	0.9	0.9	1.2	1.0	1.1	1.3
5 figures	0.9	0.8	1.6	0.9	0.9	1.6	1.1	1.0	1.8	1.2	1.1	1.9	1.4	1.4	2.1	1.6	1.6	2.3	1.8	1.8	2.5	2.0	2.1	2.7
10 figures	2.0	1.8	3.3	2.1	1.8	3.4	2.4	2.1	3.8	2.6	2.4	4.0	3.1	2.9	4.5	3.6	3.4	4.9	4.0	3.9	5.3	4.5	4.3	5.7
15 figures single-spaced	2.8	2.6	4.8	3.0	2.7	5.0	3.4	3.1	5.5	3.7	3.5	5.8	4.5	4.2	6.7	5.2	4.9	7.2	5.8	5.7	7.8	6.5	6.4	8.3
30 figures single-spaced	5.8	5.2	9.7	6.2	5.5	10.2	7.0	6.3	11.1	7.8	7.1	11.9	9.3	8.6	13.5	10.6	9.9	14.6	11.4	10.9	15.3	12.3	11.8	16.0
40 figures single-spaced	7.8	6.9	12.9	8.2	7.4	13.6	9.3	8.4	14.8	10.3	9.4	15.9	12.0	11.1	17.7	13.1	12.4	18.7	14.4	13.7	19.7	15.6	14.9	20.6
Max. figures per second	5.15	5.77	3.09	4.86	5.44	2.93	4.30	4.76	2.69	3.87	4.25	2.52	3.32	3.60	2.26	3.05	3.22	2.14	2.77	2.93	2.03	2.57	2.68	1.94

Marking time for data matrix code ECC 200 (approximate)**

Embossing: bidirectional = forward and backward embossing

Code size in mm	6 × 6	9 × 9	10 × 10	12 × 12	15 × 15	20 × 20
Embossing mode	Bi	Bi	Bi	Bi	Bi	Bi
10 × 10 dots	1.7	1.9	2.0	2.2	–	–
12 × 12 dots	2.3	2.8	2.8	3.0	3.3	–
14 × 14 dots	3.2	3.7	3.8	4.1	4.5	5.1
16 × 16 dots	3.7	4.3	4.5	4.8	5.2	5.9
18 × 18 dots	4.6	5.3	5.5	5.9	6.4	7.8
20 × 20 dots	5.5	6.3	6.6	7.1	7.7	8.6
22 × 22 dots	–	7.3	7.6	8.2	8.9	9.9

* All descriptions are purely marking times – in-feed movements of the marking unit or marking heads as well as intermediate movements and movements towards the marking position or return to Home Position are not included. The marking times are reference values. Binding time specifications are only made by marking trial with an original workpiece. The marking speed can have a significant impact on the marking. The quality of the marking depends also on the built-in situation, rigidity of the marking unit parts (please notice our installation instructions), marking position, workpiece geometry and surface of the workpiece.

** All times stated are pure marking times, exclusive of feed travel of the marking unit or marking head or of detour travel and lengthy travel to the marking point.

BuhlRob.

Technical data.

Model 2600F / 20-1.65

Number of axes		6
Handling weight (gripper and load)	kg	20
Maximum reach	mm	1653
Programming		RAPID
Connected power	kVA	4.5
Interference contour robot (no gripper and load) (radius)	mm	348
Robot weight	kg	272
Dimensions of control cabinet (LWH)	mm	725 × 710 × 970 (1370)
Suitable for Evolution		26–34
Suitable for Evolution under certain conditions		42–53

Model 4600F / 45-2.05

Number of axes		6
Handling weight (gripper and load)	kg	45
Maximum reach	mm	2051
Programming		RAPID
Connected power	kVA	7.8
Interference contour robot (no gripper and load) (radius)	mm	400
Robot weight	kg	425
Dimensions of control cabinet (LWH)	mm	725 × 710 × 970 (1370)
Suitable for Evolution		42–53
Suitable for Evolution under certain conditions		34/66–90

Model 4600F / 40-2.55

Number of axes		6
Handling weight (gripper and load)	kg	40
Maximum reach	mm	2552
Programming		RAPID
Connected power	kVA	7.8
Interference contour robot (no gripper and load) (radius)	mm	400
Robot weight	kg	440
Dimensions of control cabinet (LWH)	mm	725 × 710 × 970 (1370)
Suitable for Evolution		66–90
Suitable for Evolution under certain conditions		53

Model 6700F / 205-2.8

Number of axes		6
Handling weight (gripper and load)	kg	205
Maximum reach	mm	2794
Programming		RAPID
Connected power	kVA	13
Interference contour robot (no gripper and load) (radius)	mm	650
Robot weight	kg	1260
Dimensions of control cabinet (LWH)	mm	725 × 710 × 970 (1370)
Suitable for Evolution		–
Suitable for Evolution under certain conditions		84–90

BuhlSpray.

Technical data.

Model 1M 4/2		V1000 H800	V1000 H1000	V1200 H1000	V1400 H1200	V1600 H1400
Vertical stroke	mm	1000	1000	1200	1400	1600
Horizontal stroke	mm	800	1000	1000	1200	1400
Number of spray-blow circuits		4	4	4	4	4
Number of die release agents		2	2	2	2	2
No. of high-pressure blow circuits		2	2	2	2	2
Spray head		Flextool	Flextool	Flextool	Flextool	Flextool
Drive type		AC-Servo	AC-Servo	AC-Servo	AC-Servo	AC-Servo
Connected power	kW	8	8	8	8	8
Dimensions of sprayer (LWH)	mm	1780 × 1060 × 1987	1980 × 1060 × 1987	1980 × 1060 × 2188	2180 × 1060 × 2387	2380 × 1060 × 2587
Weight of die spray unit	kg	650	650	650	700	700
Suitable for Evolution		–	42 – 53	42 – 53	53 – 90	66 – 90
Suitable for Evolution under certain conditions		26 – 34	–	–	42	–

Model 2M 6/2		V1200 H1200	V1400 H1200	V1600 H1200
Vertical stroke	mm	1200	1400	1600
Horizontal stroke	mm	1200	1200	1200
Number of spray-blow circuits		6	6	6
Number of die release agents		2	2	2
No. of high-pressure blow circuits		2	2	2
Spray head		Flextool	Flextool	Flextool
Drive type		AC-Servo	AC-Servo	AC-Servo
Connected power	kW	11	11	11
Dimensions of sprayer (LWH)	mm	2284 × 1332 × 2400	2284 × 1332 × 2600	2284 × 1332 × 2800
Weight of die spray unit	kg	1050	1050	1050
Suitable for Evolution		66	66 – 90	66 – 90
Suitable for Evolution under certain conditions		–	–	–

Subject to change without notice.

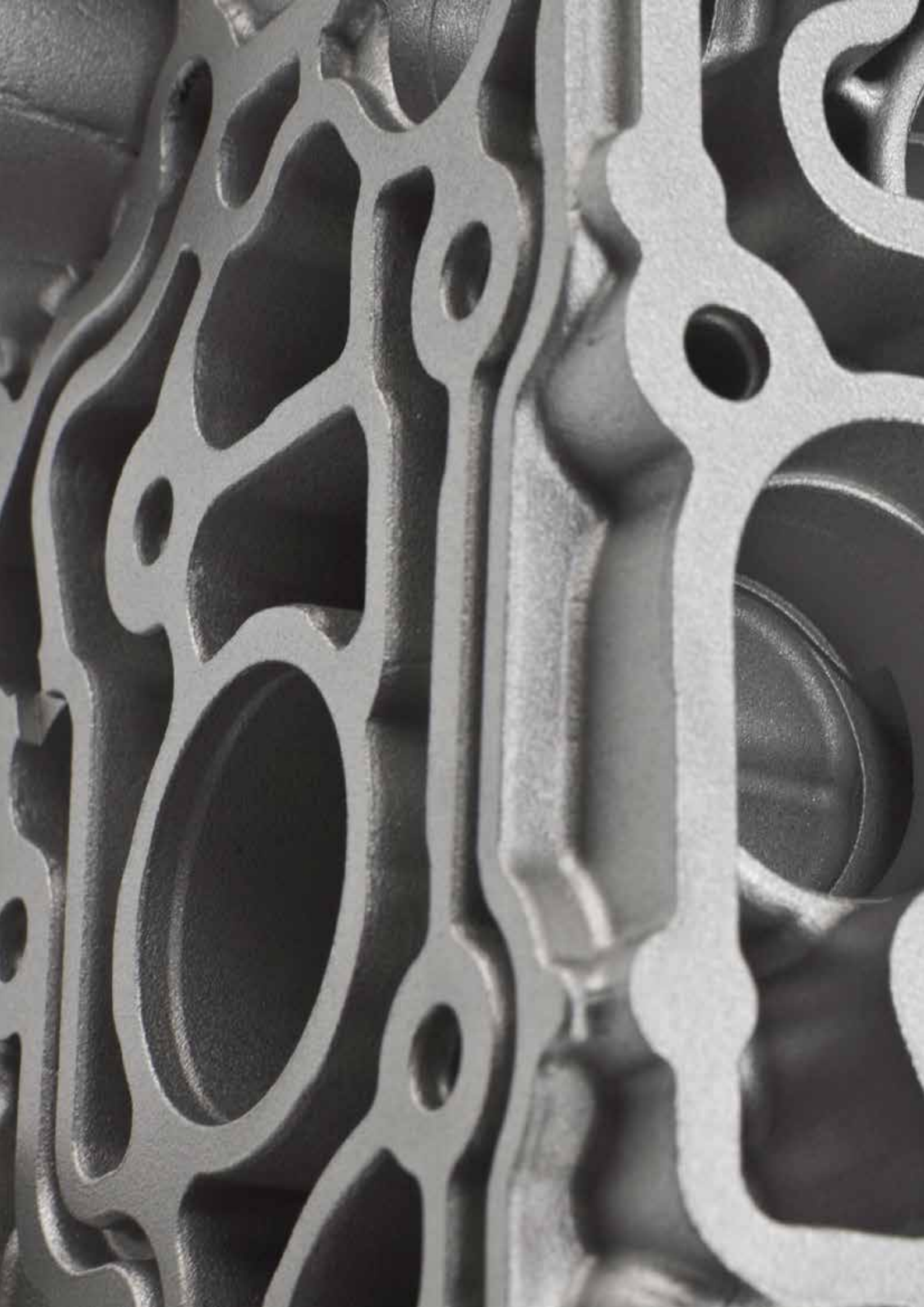
BuhlLadle.

Technical data.

		Model 1_12	Model 2_23
Ladling volume per cycle	kg (Al)	0.5–12	2–23
Horizontal travel	mm	2100	2550
Bath level descent	mm	750	770
Connected power	kW	3.7	5.0
Dimensions of ladling unit (LWH)	mm	1200 × 664 × 1291	1400 × 640 × 1700
Weight of ladling unit	kg	650	800
Height adjustment of casting cell	mm	350	420
Ladling accuracy	%	+/- 1.5	+/- 2
Control system		DataView	DataView
Suitable for Evolution*		42–90	66–90
Suitable for Evolution under certain conditions*		–	42–53

* Data based on type Evolution compact

Subject to change without notice.



Evolution.

Technical data / dimensions.

Injection unit.

Machine type	Injection force, dynamic (90% injection stroke)	Injection force, intensified	Plunger diameter (min./max.)	Shot position	Plunger stroke	Shot weight (Al) (min./max.) filling rate 60%	Projected area, plunger diameter (min./max.)	Projected area at 400 bar	Specific injection pressure (min./max.)
	kN	kN	mm	mm		kg	cm ²		
26 compact	137	373	50/85	0/-210	500	1.3/3.8	137/396	650	657/1900
26 extended	192	530	60/100	0/-210	600	2.3/6.4	139/385	650	675/1874
34 compact	137	373	50/85	0/-210	500	1.3/3.8	179/517	850	657/1900
34 extended	192	530	60/100	0/-210	600	2.3/6.4	181/504	850	675/1874
42 lean	137	373	50/85	-40/-250	500	1.3/3.8	221/639	1050	657/1900
42 compact	192	530	60/100	0/-250	600	2.3/6.4	224/622	1050	675/1874
42 extended	288	760	70/120	0/-250	700	3.6/10.7	213/625	1050	672/1975
53 lean	137	373	50/85	-40/-250	500	1.3/3.8	279/806	1325	657/1900
53 compact	192	530	60/100	0/-250	600	2.3/6.4	283/785	1325	675/1874
53 extended	288	760	70/120	0/-250	700	3.6/10.7	268/789	1325	672/1975
66 lean	192	530	60/100	-50/-300	600	2.3/6.4	352/978	1650	675/1874
66 compact	288	760	70/120	0/-300	700	3.6/10.7	334/982	1650	672/1975
66 extended	409	1096	80/140	0/-300	850	5.8/17.7	303/927	1650	712/2180
84 lean	192	530	60/100	-50/-300	600	2.3/6.4	448/1245	2100	675/1874
84 compact	288	760	70/120	0/-300	700	3.6/10.7	425/1250	2100	672/1975
84 extended	409	1096	80/140	0/-300	850	5.8/17.7	385/1180	2100	712/2180
90 lean	192	530	60/100	-50/-300	600	2.3/6.4	480/1334	2250	675/1874
90 compact	288	760	70/120	0/-300	700	3.6/10.7	456/1339	2250	672/1975
90 extended	409	1096	80/140	0/-300	850	5.8/17.7	413/1264	2250	712/2180

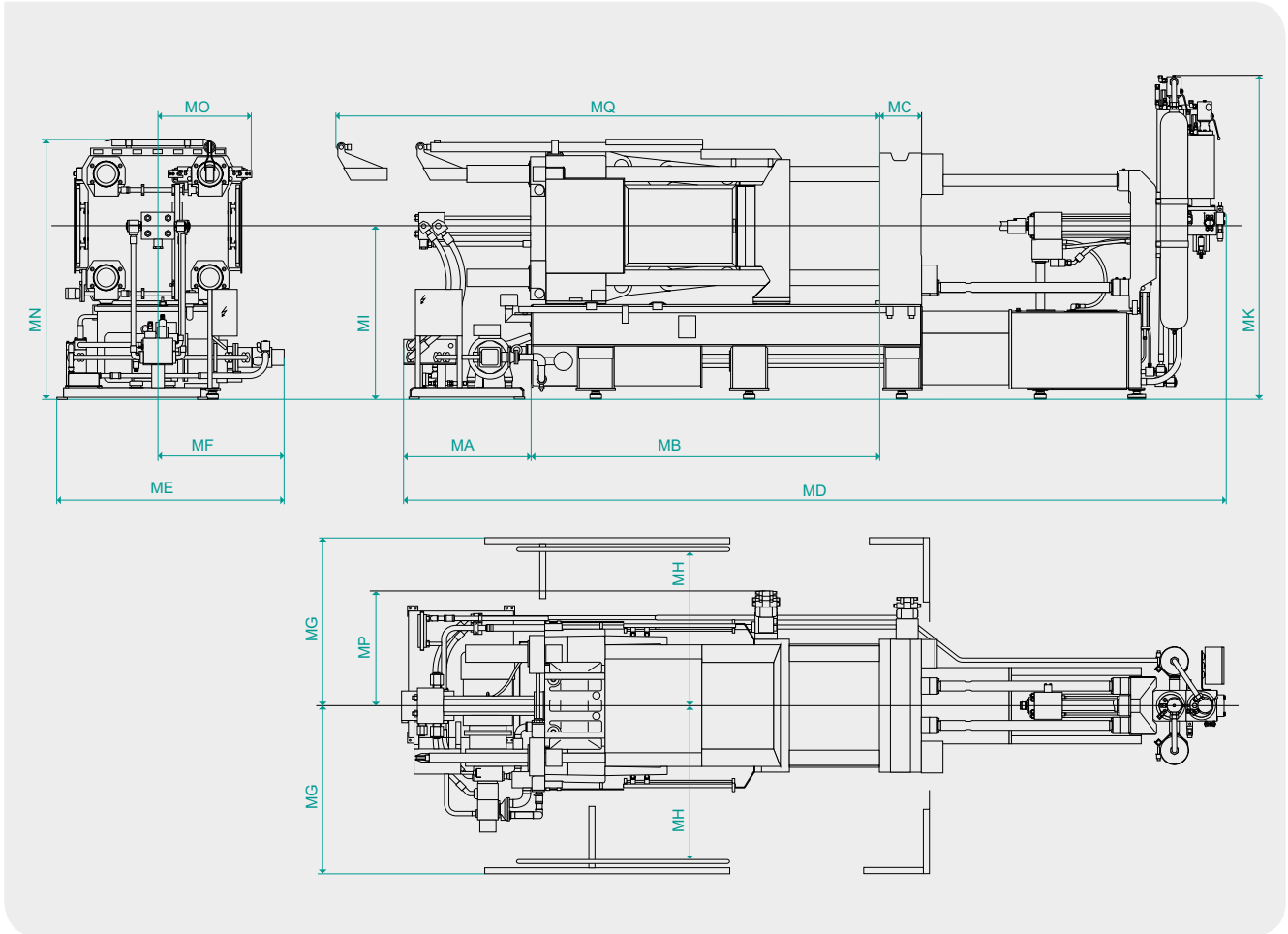
Closing unit.

Maximum locking force	Platen size (height x width)	Distance between tie bars	Die height (min./max.)	Die opening stroke	Ejector force	Ejector stroke	Machine weight	Machine dims. incl. safety gates (l x w x h)
kN	mm	mm	mm	mm	kN	mm	kg	m
2600	830 x 830	510 x 510	250 / 620	510	100.150	120.110	10 000	6.2 x 2.4 x 3.0
2600	830 x 830	510 x 510	250 / 620	510	100.150	120.110	11 500	6.4 x 2.4 x 3.0
3400	890 x 890	570 x 570	275 / 680	510	100.150	120.110	11 000	6.2 x 2.4 x 3.0
3400	890 x 890	570 x 570	275 / 680	510	100.150	120.110	12 500	6.4 x 2.4 x 3.0
4200	1000 x 1000	640 x 640	300 / 750	640	150.225	145.130	15 500	6.8 x 2.6 x 3.1
4200	1000 x 1000	640 x 640	300 / 750	640	150.225	145.130	16 000	7.0 x 2.6 x 3.1
4200	1000 x 1000	640 x 640	300 / 750	640	150.225	145.130	16 500	7.3 x 2.6 x 3.3
5300	1080 x 1080	720 x 720	330 / 810	640	150.225	145.130	17 000	6.8 x 2.9 x 3.1
5300	1080 x 1080	720 x 720	330 / 810	640	150.225	145.130	18 000	7.0 x 2.9 x 3.1
5300	1080 x 1080	720 x 720	330 / 810	640	150.225	145.130	18 500	7.3 x 2.9 x 3.3
6600	1220 x 1220	780 x 780	360 / 900	800	225.350	175.165	25 500	7.8 x 3.1 x 3.2
6600	1220 x 1220	780 x 780	360 / 900	800	225.350	175.165	26 500	8.1 x 3.1 x 3.5
6600	1220 x 1220	780 x 780	360 / 900	800	225.350	175.165	27 500	8.6 x 3.1 x 3.6
8400	1390 x 1390	900 x 900	400 / 1000	800	225.350	175.165	31 000	7.8 x 3.5 x 3.3
8400	1390 x 1390	900 x 900	400 / 1000	800	225.350	175.165	32 500	8.1 x 3.5 x 3.5
8400	1390 x 1390	900 x 900	400 / 1000	800	225.350	175.165	33 000	8.6 x 3.5 x 3.6
9000	1390 x 1390	900 x 900	400 / 1000	800	225.350	175.165	31 000	7.8 x 3.5 x 3.3
9000	1390 x 1390	900 x 900	400 / 1000	800	225.350	175.165	32 500	8.1 x 3.5 x 3.5
9000	1390 x 1390	900 x 900	400 / 1000	800	225.350	175.165	33 000	8.6 x 3.5 x 3.6

Subject to change without notice.

Evolution.

Technical data / dimensions.



Machine type*	MA	MB	MC	MD	ME	MF	MG	MH	MI
26	1137	2337	245	6232	1900	1060	1164	1000	1285
34	1137	2337	275	6232	1900	1060	1164	1000	1300
42	1137	2842	305	7011	1950	1110	1314	1150	1397
53	1137	2842	340	7011	1950	1110	1434	1270	1417
66	1222	3472	360	8070	2165	1200	1554	1390	1563
84	1222	3472	410	8070	2165	1200	1765	1600	1625
90	1222	3472	410	8070	2165	1200	1764	1600	1625

Machine type*	MJ min.	MJ max.	MK	ML	MN	MO	MP	MQ
26	1075	1285	2988	775	1918	587	815-935	4420
34	1090	1300	3003	775	1896	617	815-935	5030
42	1147	1397	3093	775	2072	687	932-1052	5550
53	1167	1417	3113	775	2121	735	932-1052	5800
66	1263	1563	3479	788	2393	800	1060-1260	6750
84	1325	1625	3541	788	2515	911	1080-1280	7100
90	1325	1625	3541	788	2515	911	1080-1280	7100

* Data based on type Evolution compact; Units in mm

Subject to change without notice.

A man with a mustache, wearing a bright blue work jacket, stands in a factory setting. He is leaning on a large, horizontal metal pipe that is part of a complex industrial machine. The machine has multiple levels of metal plates and pipes. The background shows a large industrial facility with high ceilings and various pieces of equipment. The lighting is bright, highlighting the metallic surfaces and the man's jacket.

**We make the
Evolution your
solution – tailored
to your part and
your individual
requirements.**

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