männer
SOLUTIONS FOR PLASTICS

moldMIND®

moldMIND®: "black box" for injection mold

Know what is going on inside the mold.

Why is there still burned resin inside the mold? What is causing the production time to be exceeded? Is the number of completed cycles really accurate? Has the mold or a component been damaged due to an error made by the manufacturer or due to incorrect handling of the mold?

Up to now, process controllability within the injection mold has been limited. Eliminating errors is a time-consuming procedure that frequently results in production delays. This, in turn, leads to a lengthy and drawn-out effort to find the source of the problem, determine who is at fault, and – finally – establish the validity of specific guarantee claims.

moldMIND®: Never miss a thing.

"Black box" devices have long been used successfully in aircraft and vehicles for recording events. **With moldMIND®, you can now integrate a "black box" of your own into your injection mold** to record vital process data. Using a PC, you can review and evaluate the collected data at any time. The original data, however, remains safely stored in the black box. Modification of the data is not possible.

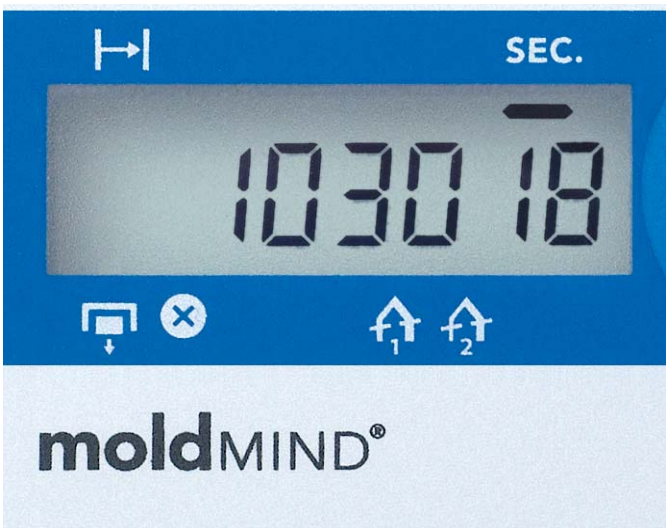
moldMIND® records and stores not only the actual number of shots and the cycle times (min./max.), but also the daily temperature peaks and downtime of the injection mold. Any removal of moldMIND® is also logged. This allows moldMIND® to provide a clear-cut picture of the facts in the event of a dispute while, at the same time, creating a database that can be utilized for production process optimization.

moldMIND®
is a tamper-proof instrument for mold owners, injection molders, and moldmakers that can be used to document and control key parameters in the production process.

Benefits:

- Provides factual evidence in the event of a dispute
- Can be used for process optimization and quality control
- Enables the creation of a tool database
- Makes it possible to monitor maintenance intervals

Information provided directly on the injection mold



moldMIND® display

Direct information display.

A liquid crystal display shows you both the total number of shots and the current status. Sources of error such as defective or incorrectly connected thermocouples are shown directly on the display. Also shown is information documenting any removal of moldMIND® as well as injection mold downtime.

Status displays:

- Number of cycles
- Seconds
- PC connection
- Removal of moldMIND®
- Injection mold downtime
- Thermocouple 1 – broken
- Thermocouple 2 – broken

Connection to PC / Notebook

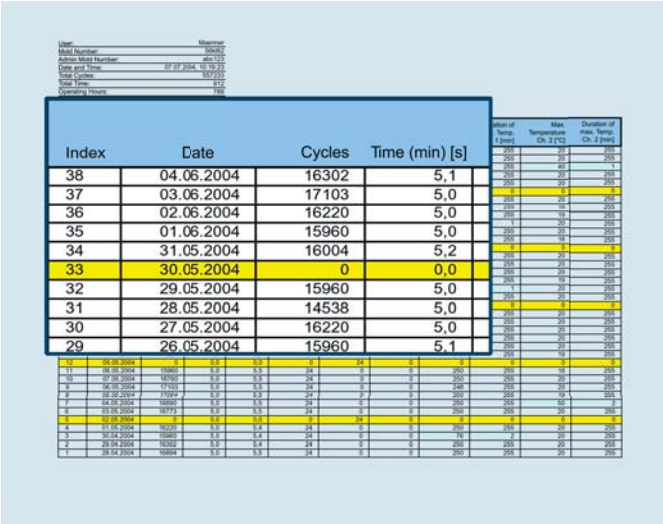
Reading out day-to-day data to PC / Notebook

Recorded daily.

Day-to-day data statistics provide you with current information about the parameter data collected so far that day. Thermal sensors are used to measure the temperature at up to two different points that can be specified individually. It is possible to measure the temperature of both the mold and the hot runner.

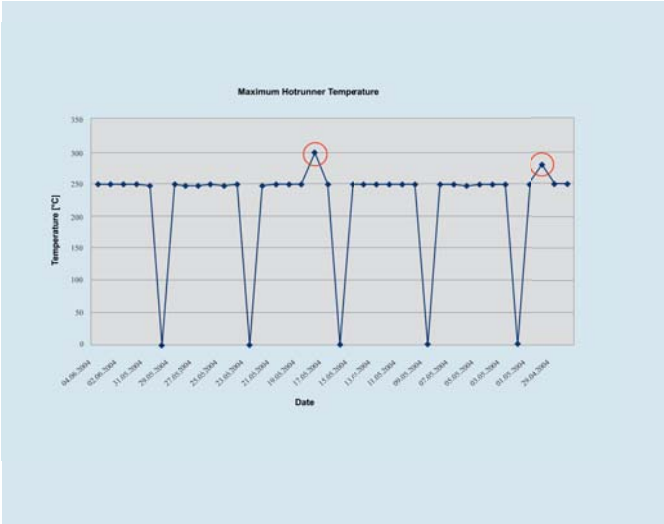
Day-to-day data:

- Number of daily cycles and accumulated number of cycles completed since activation
- Minimum and maximum cycle time and time of day
- Operation hours, downtime hours, disassembly hours
- Maximum temperature and temperature duration as measured at two individually specifiable measuring points



Index	Date	Cycles	Time (min) [s]
38	04.06.2004	16302	5,1
37	03.06.2004	17103	5,0
36	02.06.2004	16220	5,0
35	01.06.2004	15960	5,0
34	31.05.2004	16004	5,2
33	30.05.2004	0	0,0
32	29.05.2004	15960	5,0
31	28.05.2004	14538	5,0
30	27.05.2004	16220	5,0
29	26.05.2004	15960	5,1

Long-term statistics



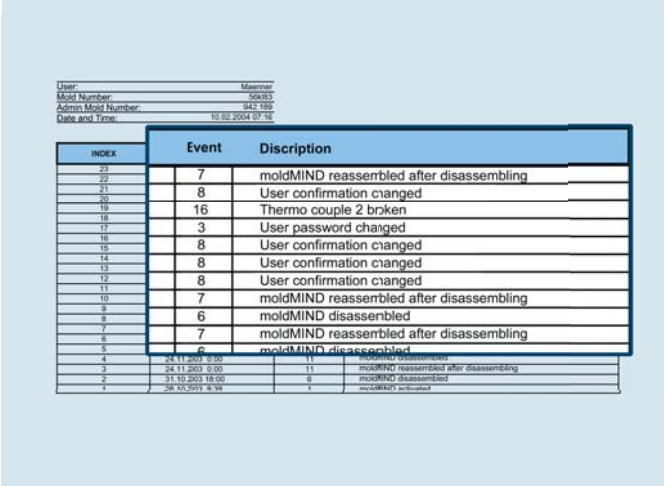
Temperatur profile: Identify irregularities quickly and effectively

Seamless evaluation.

The long-term statistics comprise all of the data gathered in the daily statistics. The data is maintained in an Excel® table that can be used to create a variety of different diagrams for further analysis. This allows you to track down inconsistencies or possible sources of error quickly and effectively.

Ensuring seamless process documentation makes it possible to lay the foundations for long-term process optimization. If multiple molds have been equipped with moldMIND®, the data from each mold can be consolidated into a single tool database.

moldMIND® back: connection for two thermocouples



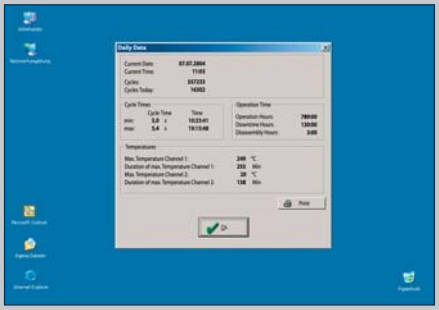
INDEX	Event	Discription
23	7	moldMIND reassembled after disassembling
22	8	User confirmation changed
21	16	Thermo couple 2 broken
20	3	User password changed
19	8	User confirmation changed
18	8	User confirmation changed
17	8	User confirmation changed
16	7	moldMIND reassembled after disassembling
15	6	moldMIND disassembled
14	7	moldMIND reassembled after disassembling
13	6	moldMIND disassembled

Logging event data

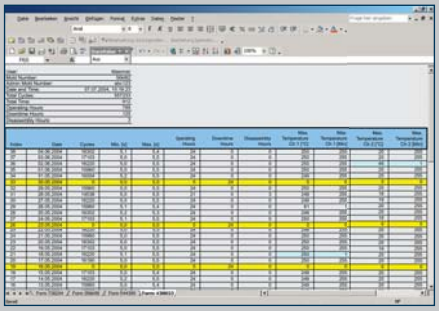
Unchangeable.

moldMIND® is operated using a battery with a life corresponding to the average lifespan of an injection mold. No additional power sources are required. Relying solely on the power it obtains from its battery, moldMIND® records all configuration modifications and error messages occurring since activation and stores this information for use in its own event data statistics. Errors include e.g. thermocouple breaks, downtime and device removal.
The seamless logging of events excludes all possibility of data tampering.

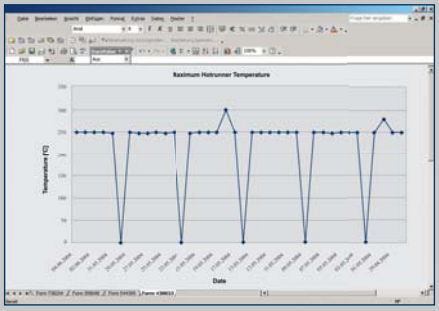
moldMIND®: At a glance



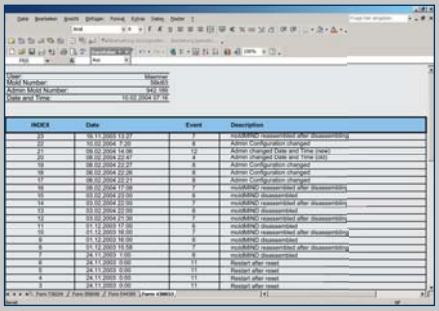
Daily data
Information recorded daily by moldMIND® includes: number of cycles, minimum and maximum cycle time, maximum temperature and temperature duration as measured by two temperature sensors, and operating time.



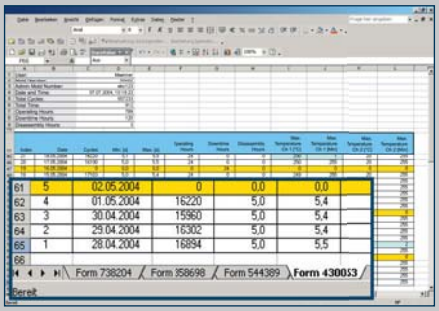
Long-term statistics
All data collected on a day-to-day basis is logged in an Excel® sheet to enable long-term statistical analysis.



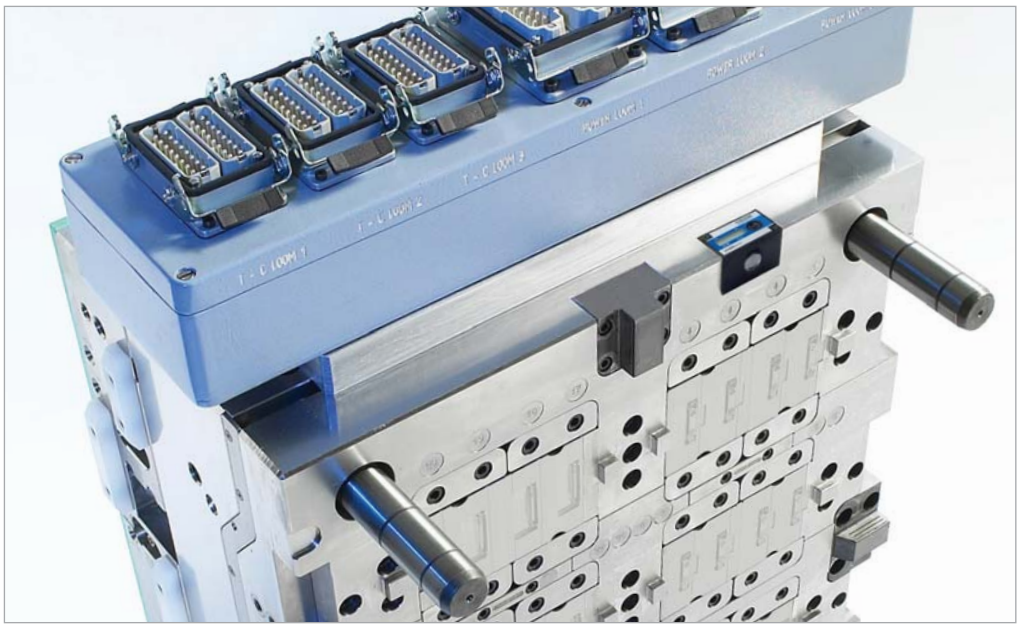
Evaluating data using Excel® or similar application
A variety of easy-to-read diagrams can be created on the basis of the long-term statistics to facilitate analysis.



Event data statistics
moldMIND® records all configuration modifications and error messages occurring since activation and stores this information for use in its own event data statistics. This seamless logging of events excludes all possibility of changing the database.



Tool database
If multiple injection molds have been equipped with moldMIND®, the data from each mold can be consolidated into a single tool database.



Possible installation position

Standard installation or retrofit.

moldMIND® can be either integrated into the injection mold or mounted on the mold. A tappet installed opposite the piezo contact is used to record the number of shots. The temperature of the hot runner (and injection mold) is measured using one or, optionally, two thermocouples.
Collected data can be transferred over an integrated RS 232 interface to a PC or notebook for analysis.

moldMIND® TECHNICAL DATA	
Dimensions	70.0 x 51.5 x 43.0 mm
Weight	~185 g
Power supply	Battery (life approx. 5 years)
Contact	Piezo-actuated counter
Thermocouples	2 sensors (type J) – IEC 60584
Measurable temperature range	Internal temperature (moldMIND®) of up to 512°C (950°F)
Display	8-digit display; heat resistant up to 120° C depending on installation position
Protection class	IP 65
Interface	1 x RS 232
Data cable	Length: 1.50 m + extension cable 1.80 m
Applied guidelines	CE
Included in delivery	moldMIND®, data cable + extension cable, CD-ROM containing software,
	tappet unit, magnet unit, 2 thermocouples (type J)

SYSTEM REQUIREMENTS	
Operating system	Microsoft Windows® (98®, 2000®, NT4®, XP®, ME®)
Processor	300 MHz (min.)
Hard disk space	5 MB (additional space is required for storing recorded data)
Drive	CD-ROM
Interface	Serial
Program	Microsoft Excel® or similar application

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