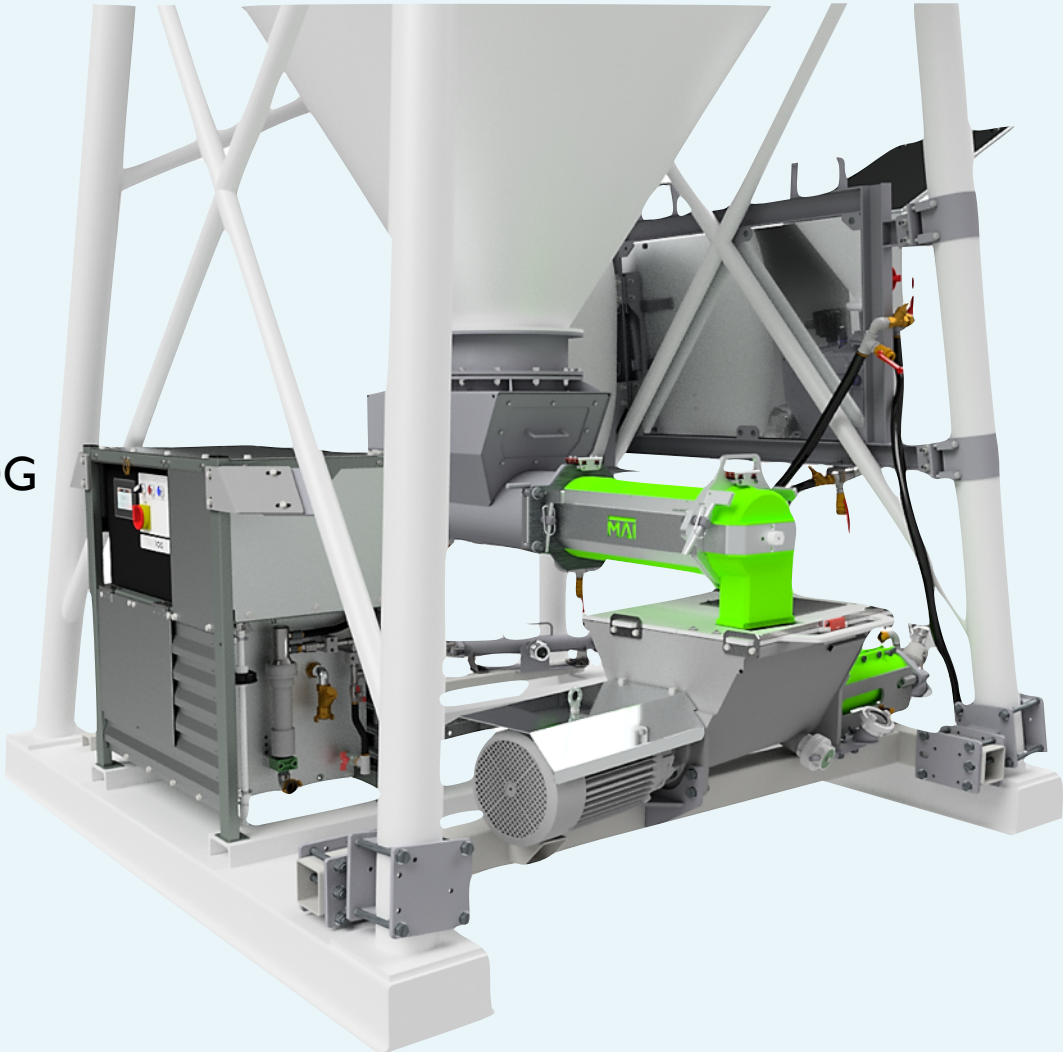


# MAI® FOAM CONCRETE SYSTEMS



MAI®HICOMP-FC



MAI®FOG

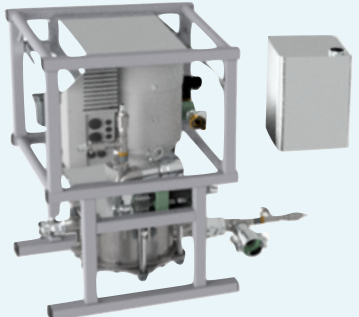
MAI®FOG



MAI®MULTIMIX-FC



MAI®MIX



MAI®DOS



# ADVANTAGES OF FOAM CONCRETE

- Reduction of dead load. ...
- Considerably lower weight. ...
- Thermal insulation. ...
- Fire protection. ...
- Sound insulation. ...
- Self-leveling/self-compacting. ...
- Easily recyclable. ....



Lighter than water!



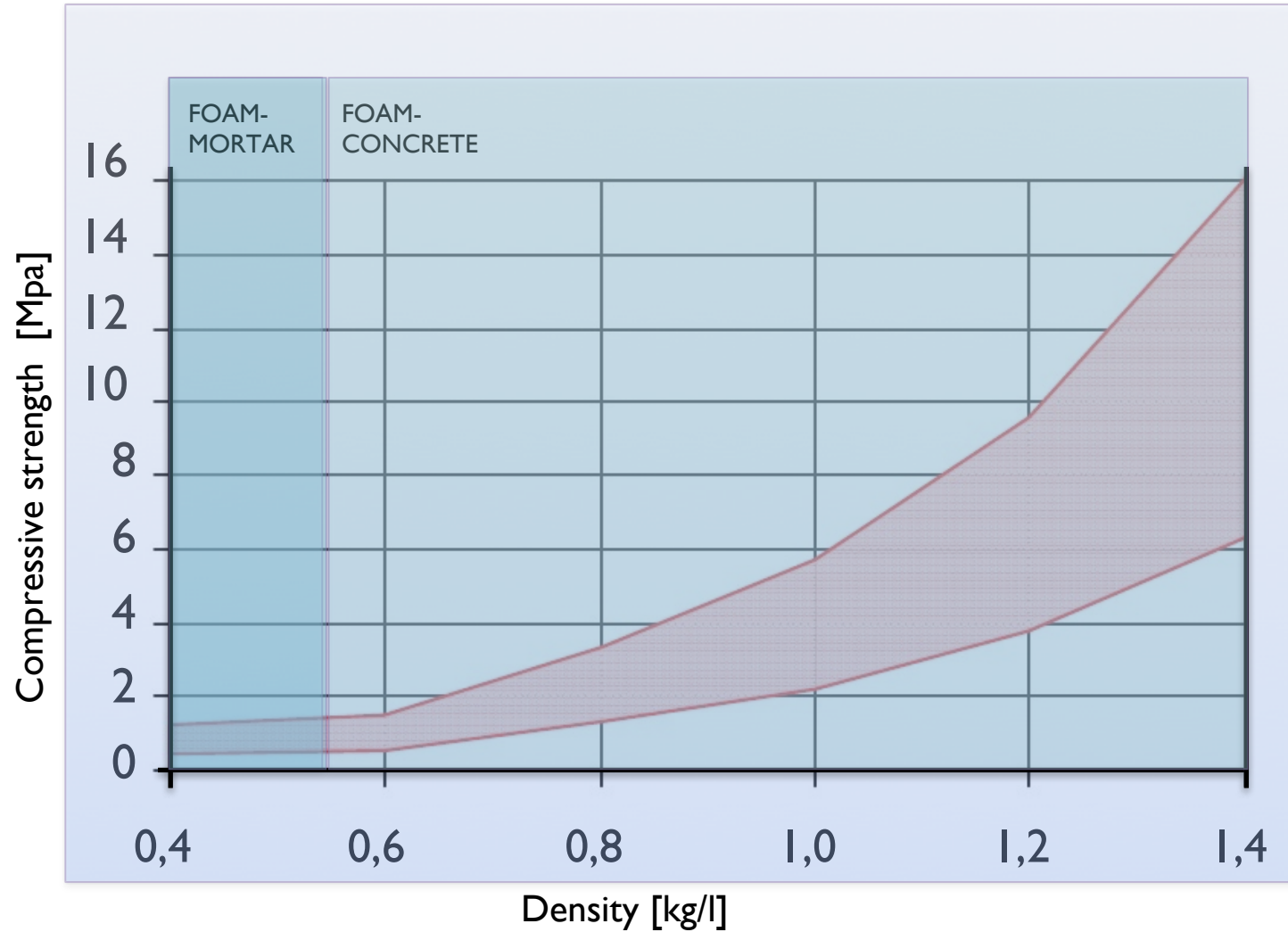
Foam!

# FOAM CONCRETE / LIGHTWEIGHT CELLULAR CONCRETE

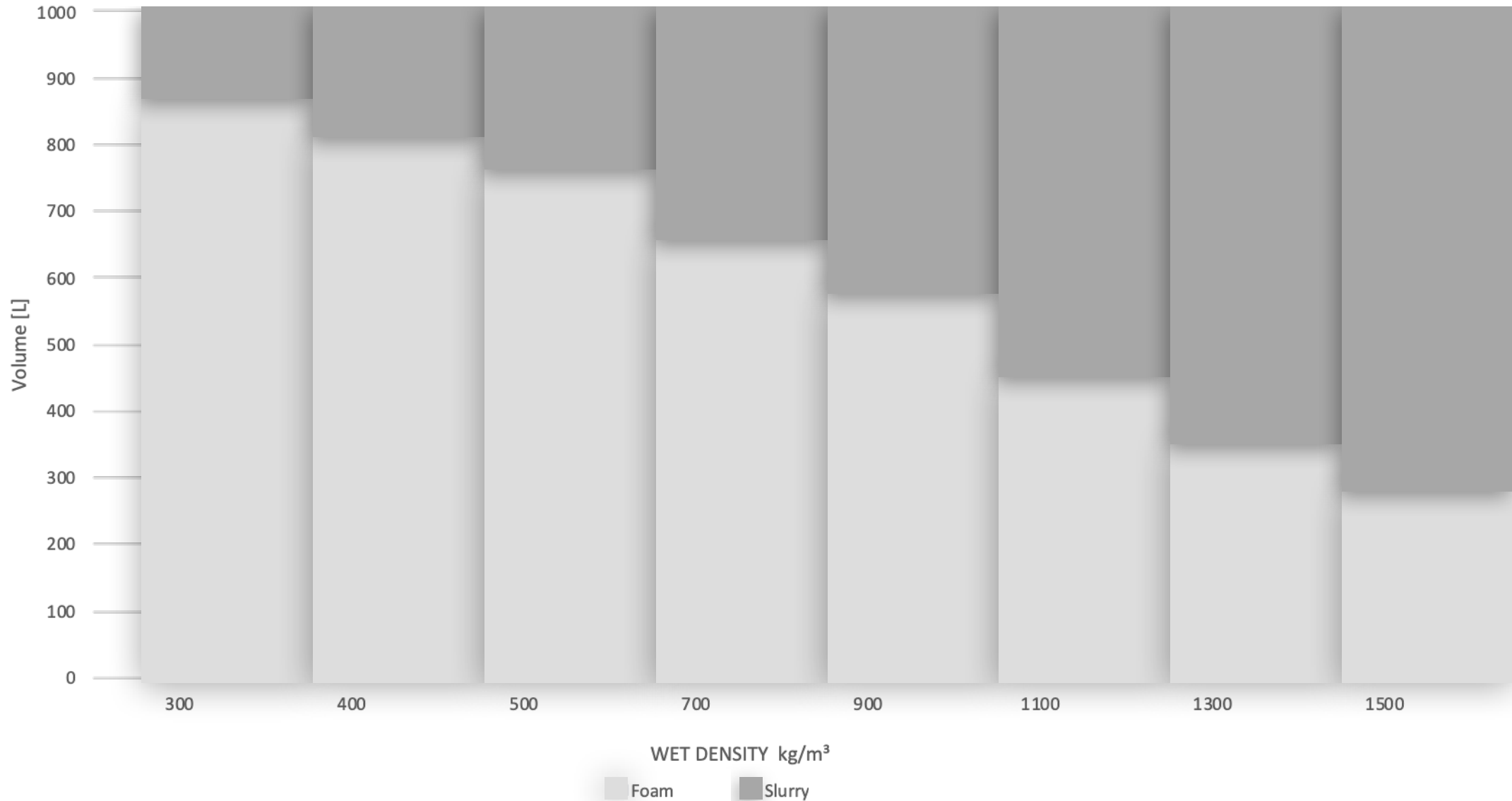


<b>Fresh Foam Concrete</b>	<b>Hardened Foam Concrete</b>
Flowable Pumpable Easily workable No compaction necessary	Adjustable in density and strength Durable and dimensionally stable Thermal insulating Higher fireresistance compared to Styrodur, etc. Not compressable

# FOAM MORTAR / FOAM CONCRETE



# FOAM - SLURRY RATIO



# MAI® FOAM CONCRETE SYSTEM COMPONENTS



## MIXING PUMPS



MAI®HICOMP-FC



MAI®MULTIMIX-FC

MAI®NET

## OTHER EQUIPMENT



MAI®FOG Foam Generator  
Output 40-120 l/min , 70-400 l/min



MAI®DOS Dosing Pump  
Customer-specific output



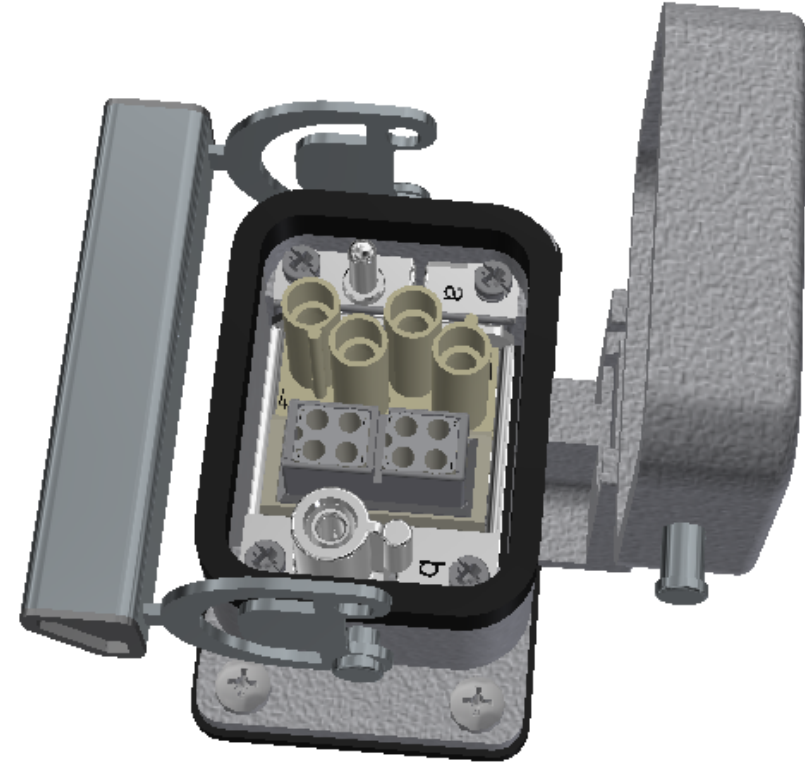
MAI®MIX Electric Agitator  
DN 35 and DN50



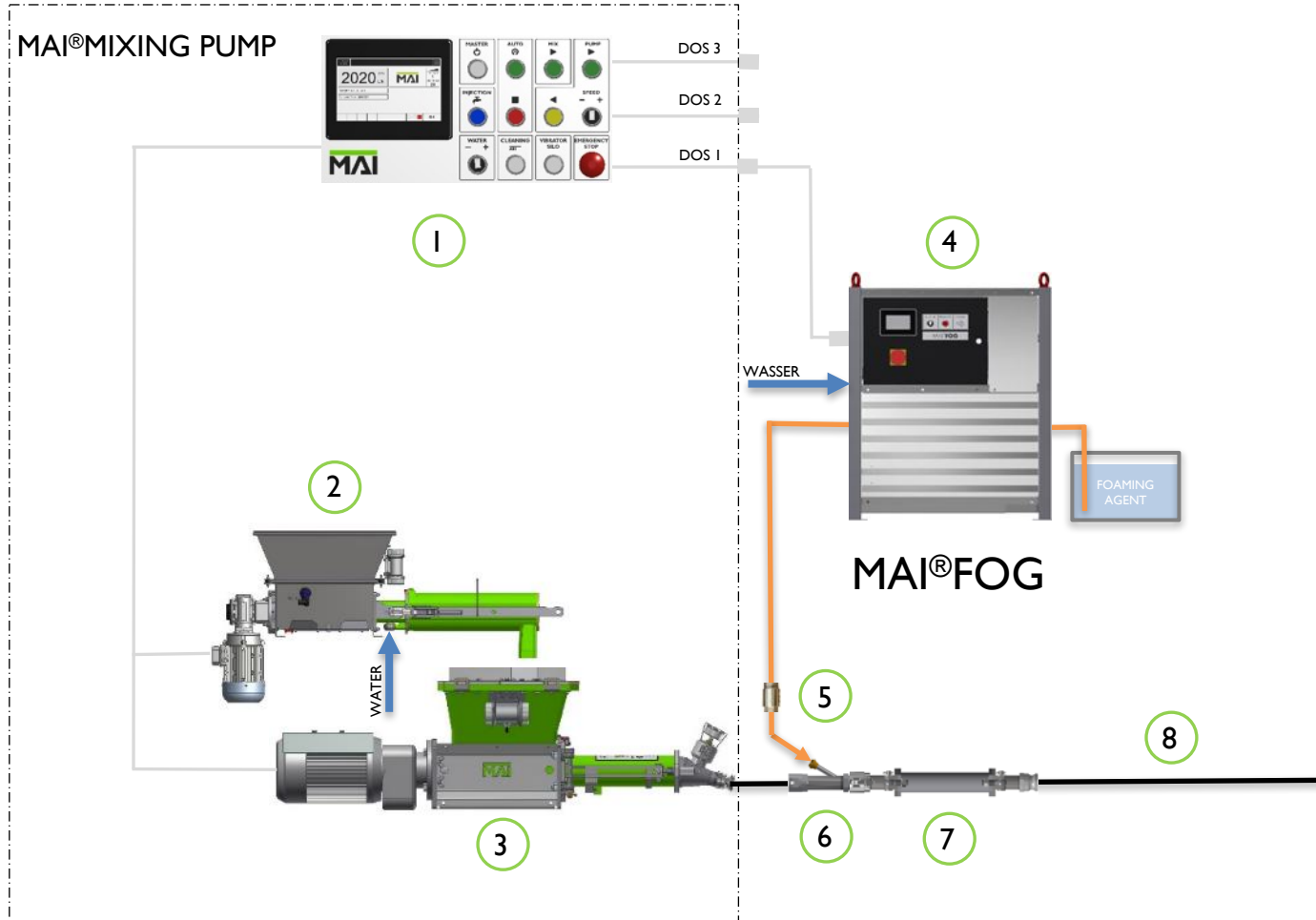
Static Mixer  
DN 35 und DN50

# MAI<sup>®</sup> NET - HARDWARE

- Universal sockets to connect different equipment to mixing pump
- Single connector and cable for power supply and control



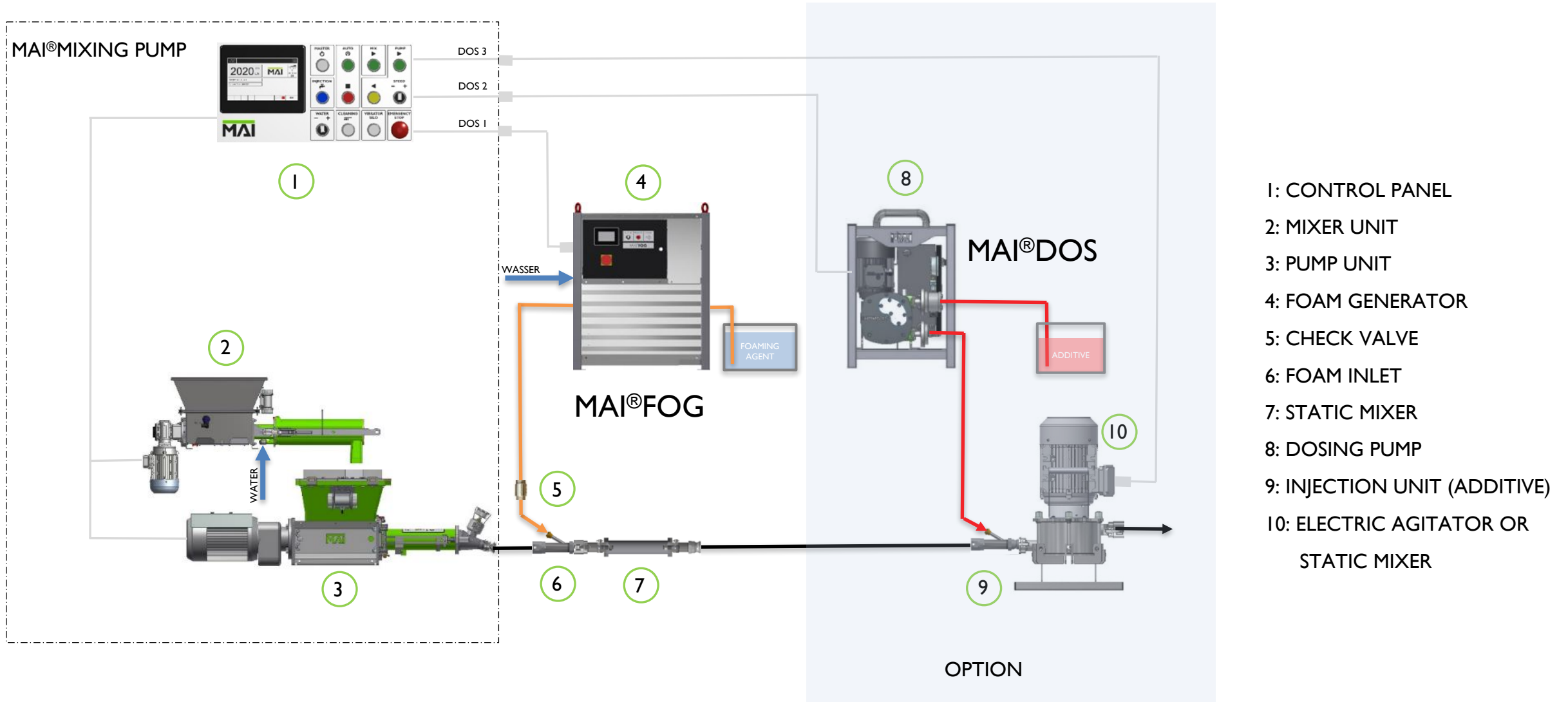
# STANDARD FC-SYSTEM



- 1: CONTROL PANEL
- 2: MIXER UNIT
- 3: PUMP UNIT
- 4: FOAM GENERATOR
- 5: CHECK VALVE
- 6: FOAM INLET
- 7: STATIC MIXER
- 8: MORTAR HOSE

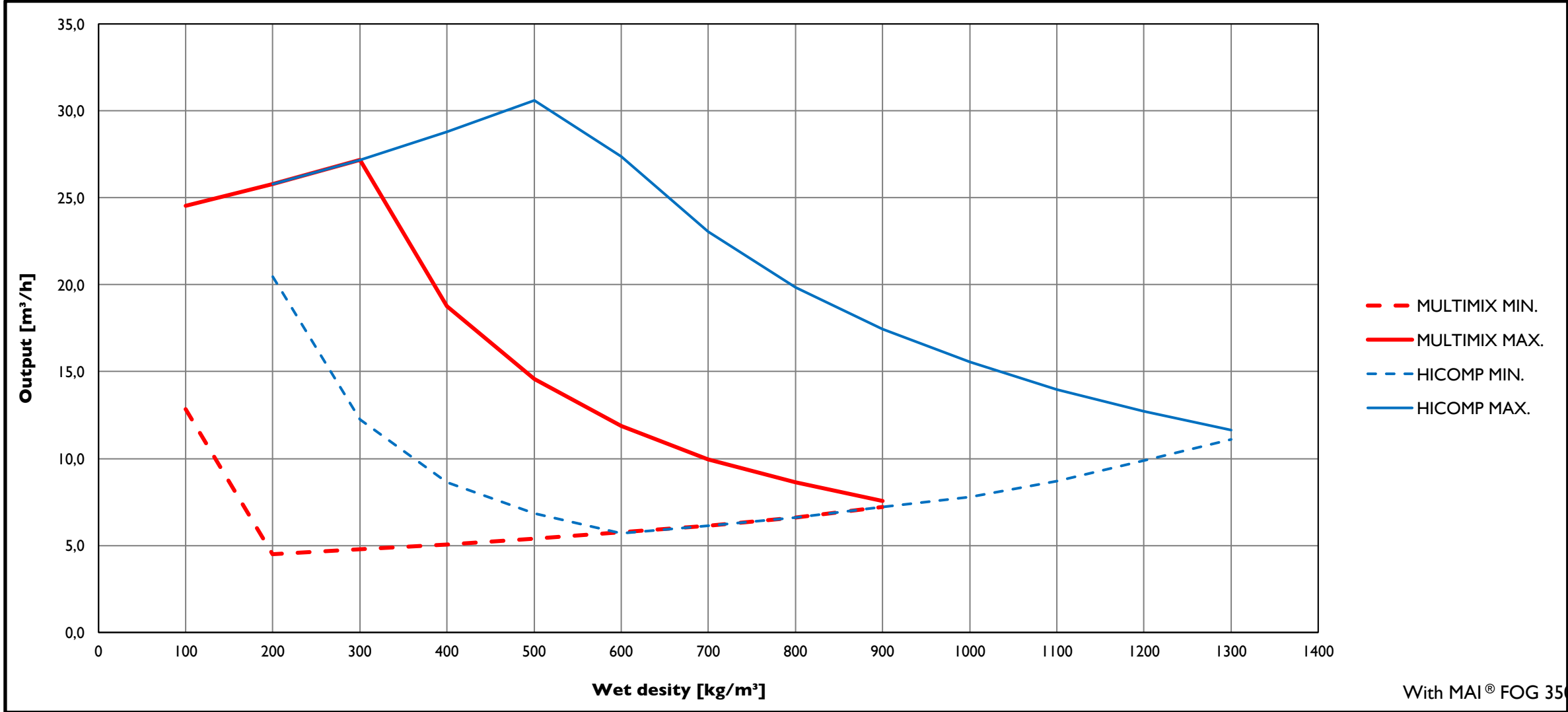


# FC-SYSTEM WITH ADDITIVE

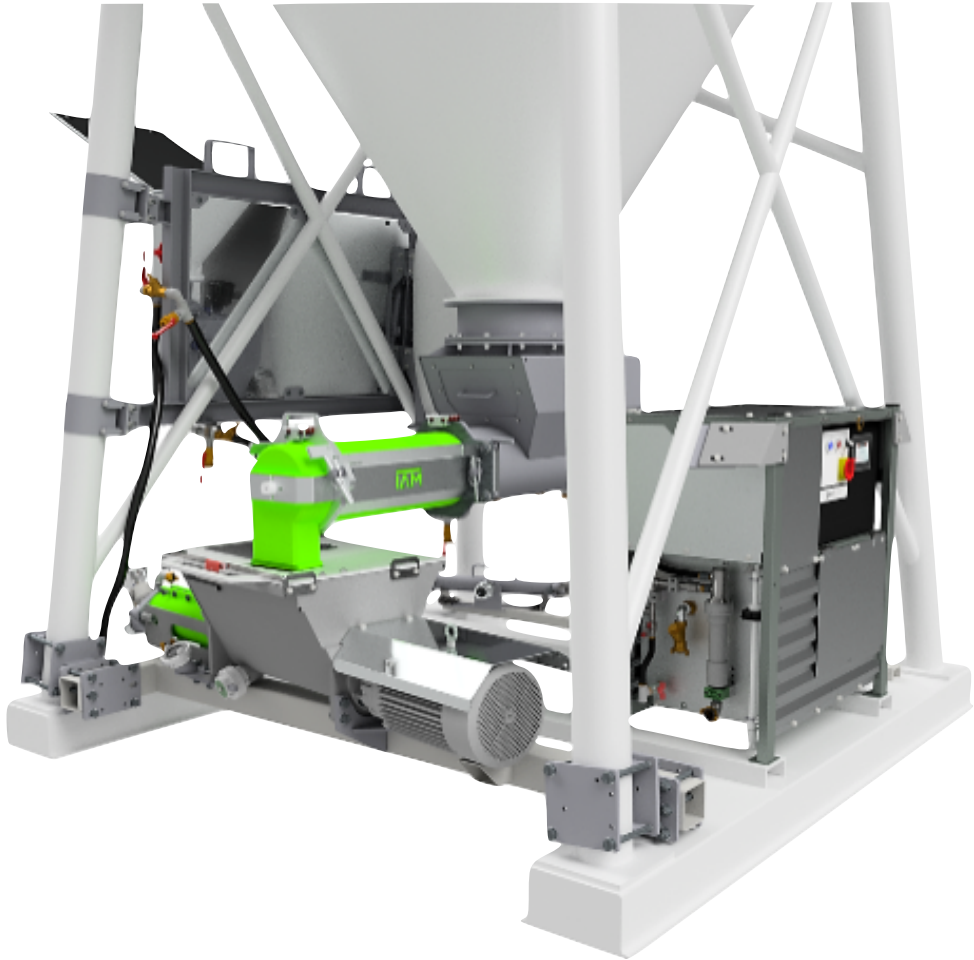


- 1: CONTROL PANEL
- 2: MIXER UNIT
- 3: PUMP UNIT
- 4: FOAM GENERATOR
- 5: CHECK VALVE
- 6: FOAM INLET
- 7: STATIC MIXER
- 8: DOSING PUMP
- 9: INJECTION UNIT (ADDITIVE)
- 10: ELECTRIC AGITATOR OR STATIC MIXER

# WIDE RANGE OF PRODUCABLE DENSITIES AND OUTPUT RATES



# MIXING PUMPS



Dry material in silo



Dry material in bags

# MAI<sup>®</sup>FOG



- Controlled by mixing pump over MAI<sup>®</sup> NET
- Variable foam quantity von 40-120 l/min, 70-400 l/min
- Variable foam density von 40-75 g/dm<sup>3</sup>
- Variable foaming agent percentage of 1-6%
- User friendly display of diagnostics and operating status

## For standalone use

- Foam quantity and density can be set easily on the display
- Parameters for up to 4 foam densities can be saved (recipes)
- Weight ca. 203 kg
- Dimensions LxBxH 885 x 525 x 985 mm



# MAI<sup>®</sup>DOS



- Controlled by mixing pump over MAI<sup>®</sup> NET
- Variable output of 15-160 l/h ( different types available)
- Hose pump – resistant to chemicals
- Pressure switch for pump protection
- Additive level sensor (Option)

## For standalone use

- Delivery rate can be set via a potentiometer
- Weight ca.45 kg
- Dimensions LxBxH 824 x 524 x 995mm



# MAI<sup>®</sup>MIX



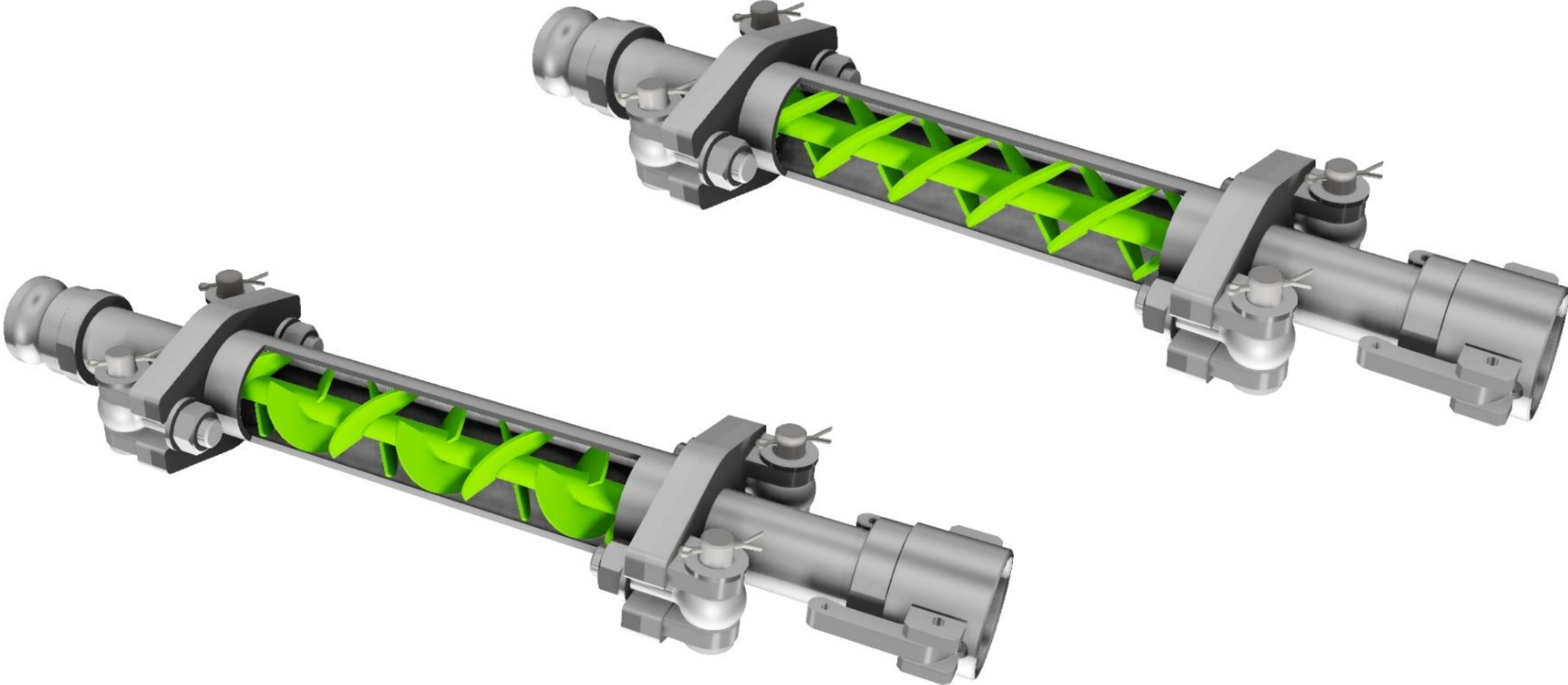
- Controlled by mixing pump over MAI<sup>®</sup> NET
- Variable speed
- Stainless steel mixing chamber
- Integrated cleaning system for the additive injection nozzle (Option)

## For standalone use

- Speed can be set via a potentiometer
- Weight ca.75 kg
- Dimension LxBxH 470 x 450 x 705 mm



# STATIC MIXER



# MAI® NET - SOFTWARE



20.08.2019  
12:51:35
☰

<div style="font-size: 48px; font-weight: bold;">2200</div> <div style="text-align: right; margin-top: 10px;">             0                800 - 2300              L/h           </div>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">Wet </td> <td style="width: 33%;">Dry </td> <td style="width: 33%;">Water </td> </tr> <tr> <td colspan="3">27.0°C 64.0%</td> </tr> </table> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <tr> <td style="width: 50%;">1 Step 3</td> <td style="width: 50%; font-size: 24px; font-weight: bold;">3</td> </tr> <tr> <td>40 Hz 60</td> <td style="font-size: 24px; font-weight: bold;">60</td> </tr> </table>	Wet 	Dry 	Water 	27.0°C 64.0%			1 Step 3	3	40 Hz 60	60
Wet 	Dry 	Water 									
27.0°C 64.0%											
1 Step 3	3										
40 Hz 60	60										
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 70%;">Receipe: <b>Schaum1</b></td> <td style="width: 30%;">ND: <b>200</b></td> </tr> <tr> <td colspan="2">Pump Type: <b>XP351</b></td> </tr> <tr> <td colspan="2">Foam: <b>300</b> [L/min] / <b>40</b> [g/L] / <b>5.0</b> [%]</td> </tr> <tr> <td>Correction mortar density:</td> <td style="text-align: center; font-size: 24px; font-weight: bold;">0</td> [%]</tr></table>		Receipe: <b>Schaum1</b>	ND: <b>200</b>	Pump Type: <b>XP351</b>		Foam: <b>300</b> [L/min] / <b>40</b> [g/L] / <b>5.0</b> [%]		Correction mortar density:	0		
Receipe: <b>Schaum1</b>	ND: <b>200</b>										
Pump Type: <b>XP351</b>											
Foam: <b>300</b> [L/min] / <b>40</b> [g/L] / <b>5.0</b> [%]											
Correction mortar density:	0										

| Sample | |
| |     |      |      |     |     |  |  |  |  |  |  | |-----|------|------|-----|-----|--|--|--|--|--|--| | FOG | DOS1 | DOS2 | MIX | LOG |  |  |  |  |  |  | | ○   |      |      |     |     |  |  |  |  |  |  | | |

- Central control of connected MAI® NET equipment
- All errors of system components are shown at the display of the mixing pump
- Both mixing pump MAI®MULTIMIX-FC and MAI®HICOMP-FC has the same software and operation panel



# MAI<sup>®</sup>FC-SYSTEM RECIPE MANAGEMENT



## PARAMETER SETS FOR MIXING PUMP AND CONNECTED

### EQUIPMENT

13.09.2019 05:30:32		RECIPE 1/2		▶	✕
<b>RECIPE:</b>		ND 400	ND 400		
Wet density [kg/m <sup>3</sup> ]:		400	Edit Recipe		
<b>PUMP:</b>		<b>MAI FOG :</b> PUMP			
Frequency min. [Hz]:	60	Foam flowrate [l/min]:	79		
Frequency max. [Hz]:	70	Foam density [g/l]:	50		
Speed number of steps:	2	Foaming agent [%]:	3.0		
Pump type:	XP210	Airflow factor [%]:	100		
Flowrate at 50Hz [l/min]:	22.4	On-delay [s]:	0.0		
<b>MIXER:</b>		<b>MAI DOS 1 :</b> PUMP			
Waterflow min. [l/h]:	1200	MAI DOS Type:	2350		
Waterflow max. [l/h]:	1800	Flowrate [ml/min]:	1500		
Waterflow standard [l/h]:	1600				

13.09.2019 05:30:56		RECIPE 2/2		◀	✕
<b>MATERIAL DETAILS:</b>		<b>MAI MIX:</b>		DISABLED	
Tolerance wet density +/- [kg/m <sup>3</sup> ]:		30			
W/D factor [kg/kg]:		0.48			
Foam loss factor [%]:		48			
Dry mortar type:		CEMI35R			
Foam agent type:		AIRC			
Additive MAI DOS 1:		SB 42			
Additive MAI DOS 2 :		none			
<b>MATERIAL DATA:</b>		<b>MAI DOS 2 :</b>		PUMP	
Samples required:		ON		MAI DOS Type:	
More samples after each [m <sup>3</sup> finished product]:		10		0	
		<b>MIXER CONFIGURATION:</b>		Flowrate [ml/min]:	
		Mixer speed at 50Hz [rpm]		0	
		560		Delivery screw:	
		Delivery screw:		40mm	
		Dosing zone:		71,5mm	

# APPLICATION: LEVELLING FILL

FILLING BETWEEN FLOOR TIMBERS

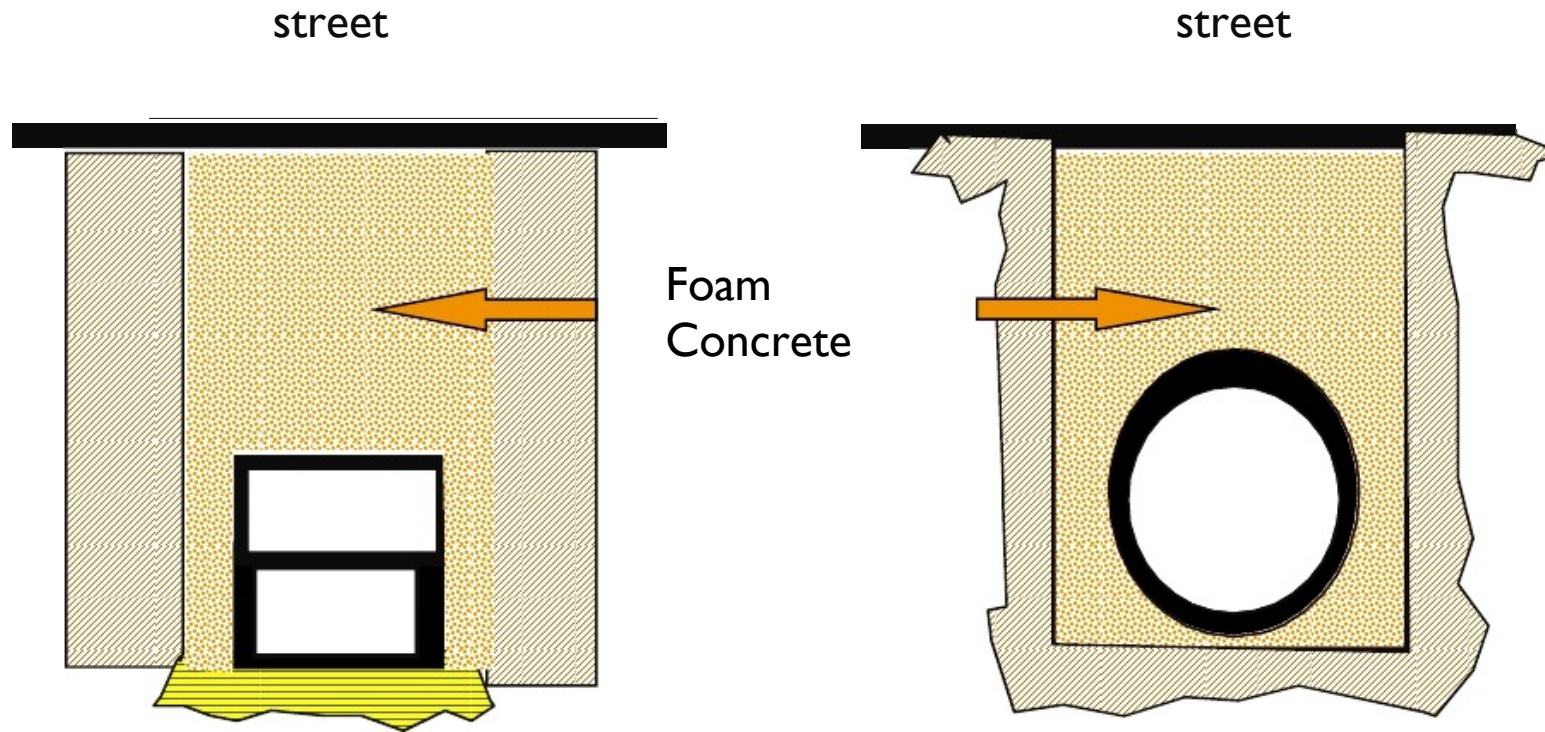


# APPLICATION: LEVELLING FILL

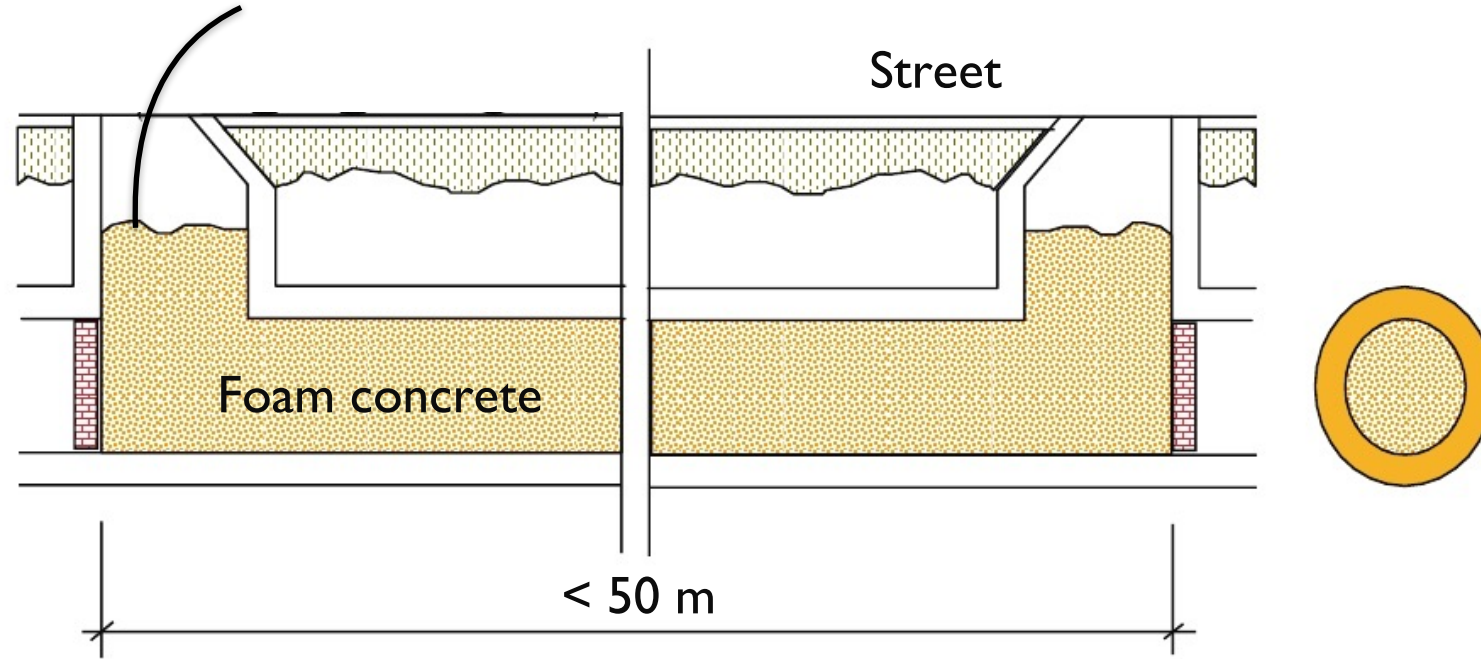
## COMPENSATION OF HEIGHT DIFFERENCES



# APPLICATION: RE-FILLING OF TRENCHES & EXCAVATIONS



# APPLICATION: FILLING UNDER SEWAGE PIPES



Pouring directly in the shaft  
Complete filling of the cross-section

# APPLICATION: THERMAL INSULATION

BACKFILLING OF POOL



# APPLICATION: THERMAL INSULATION

UNDER BASEMENT SLAB



# APPLICATION: THERMAL INSULATION

GARAGE



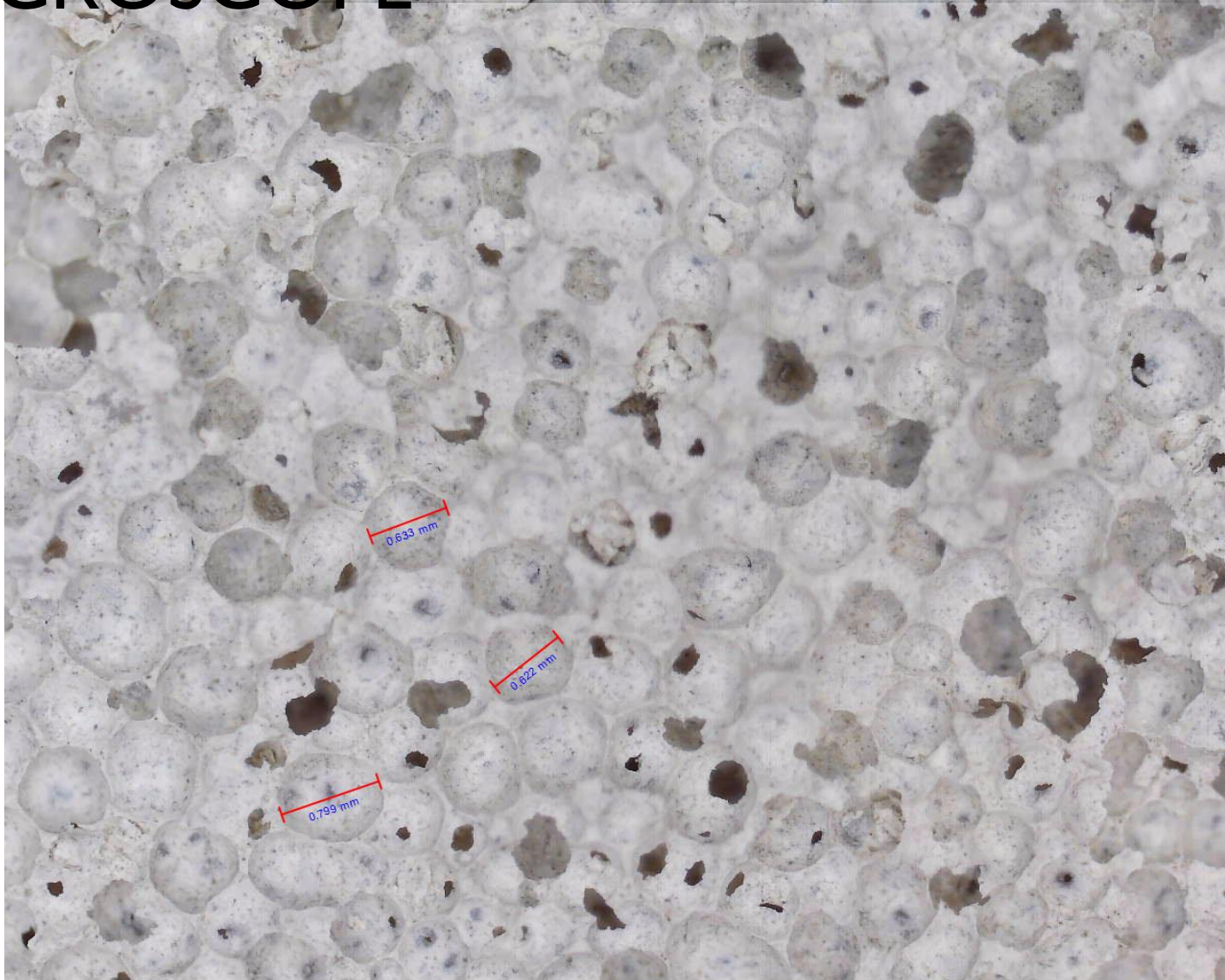


# APPLICATION: THERMAL INSULATION

ROOF



# FOAM CONCRETE UNDER THE MICROSCOPE

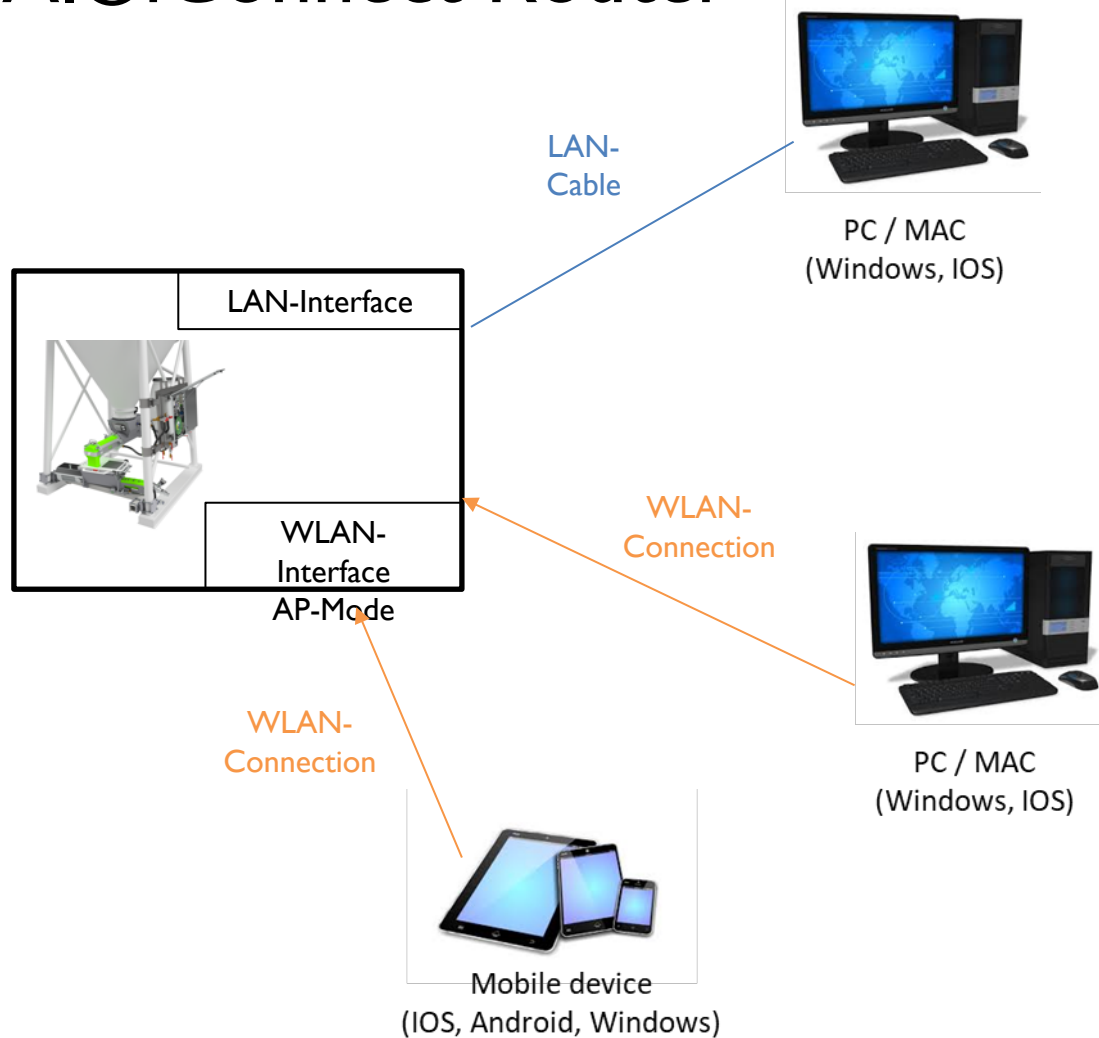


# MAI®iTec Solutions

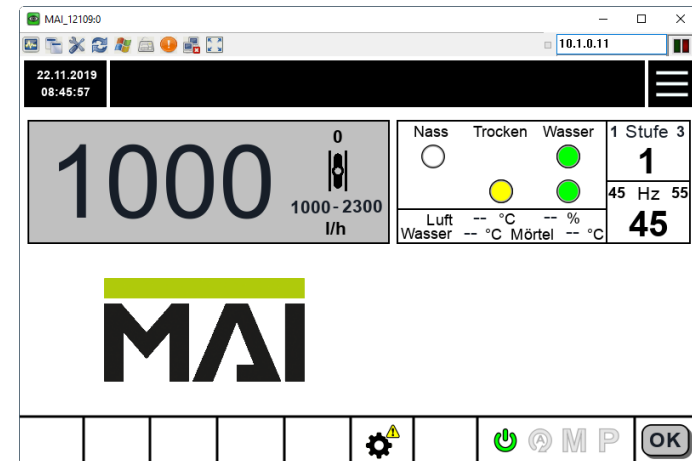


- MAI®iConnect Router
- MAI®iConnect VPN
- MAI®iTec Server
- MAI®iConnect External Control

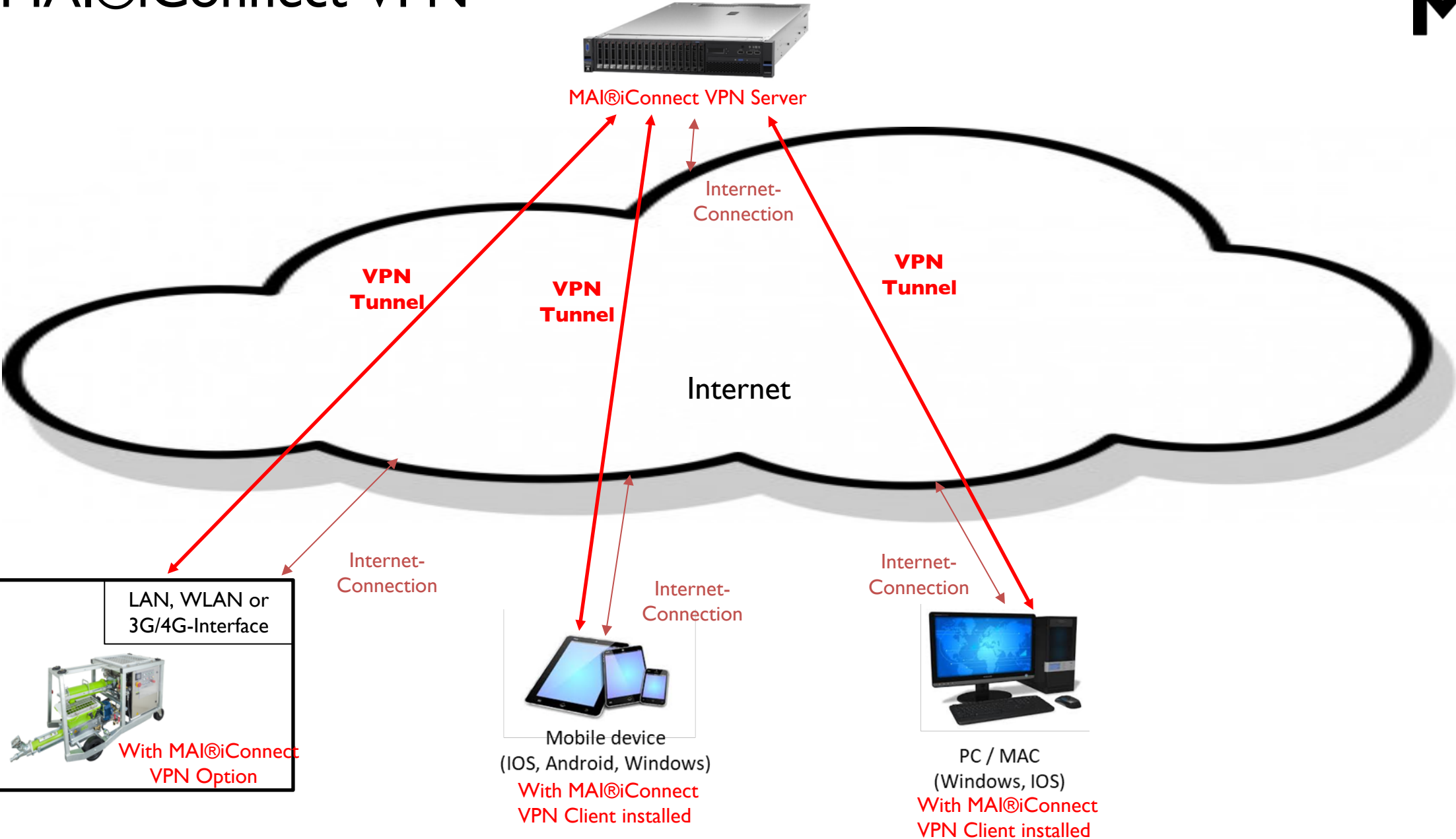
# MAI®iConnect Router



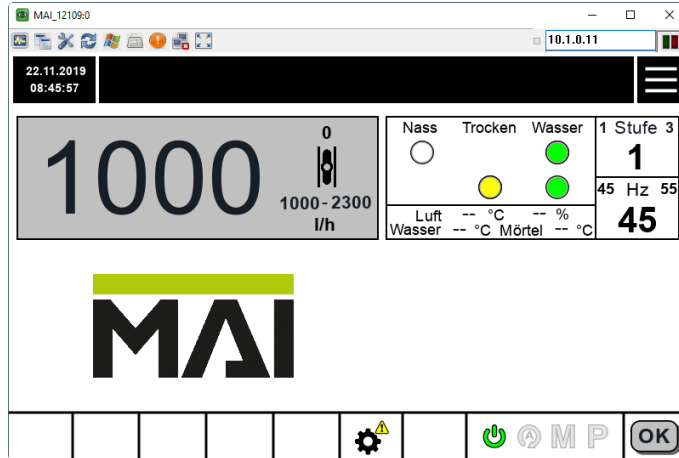
## “Local remote control”



# MAI®iConnect VPN



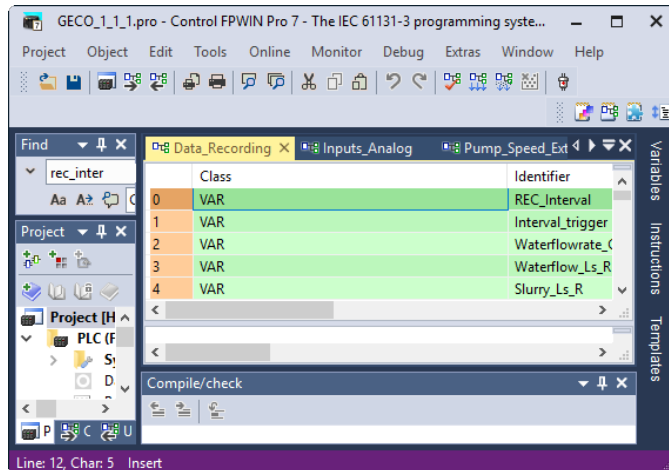
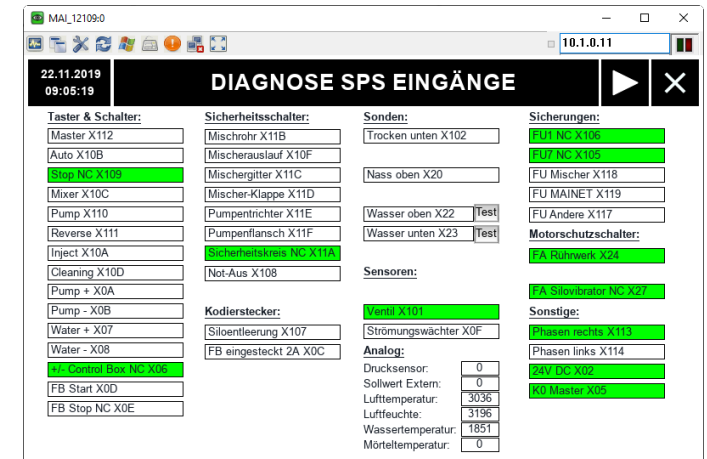
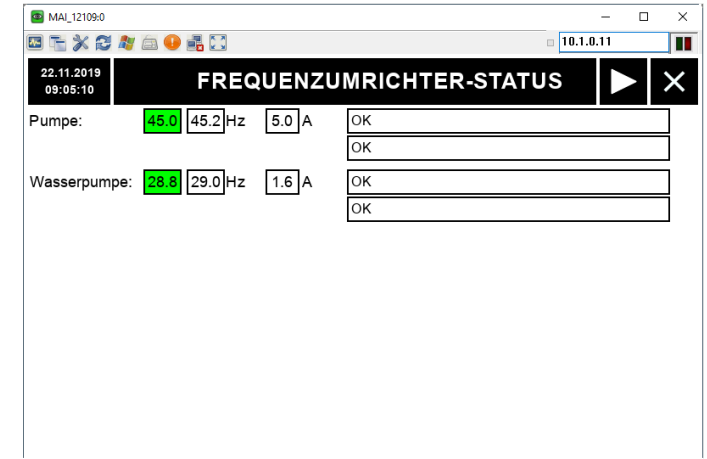
# MAI®iConnect VPN



Remote monitoring / control

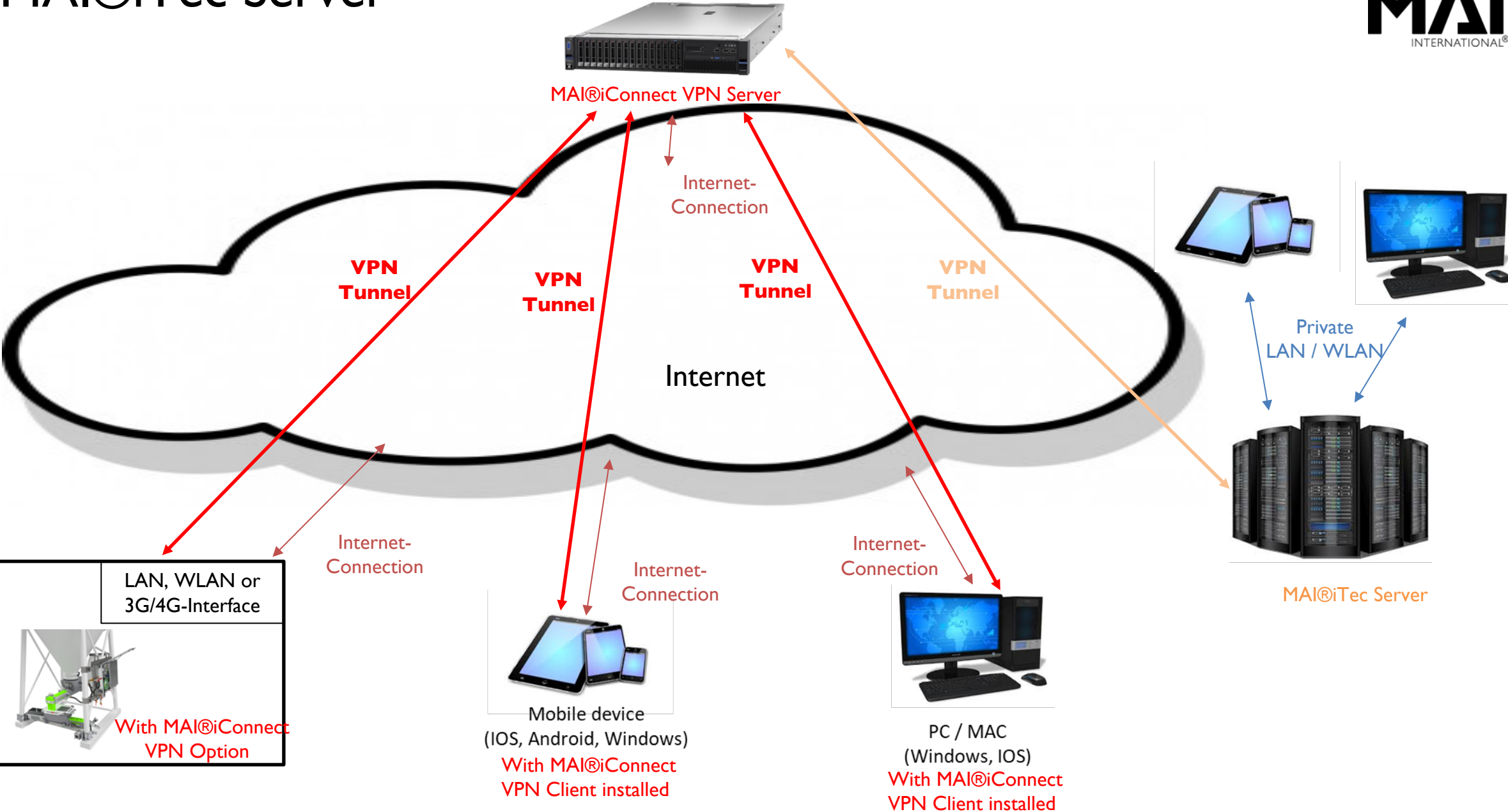


Remote support / Troubleshooting

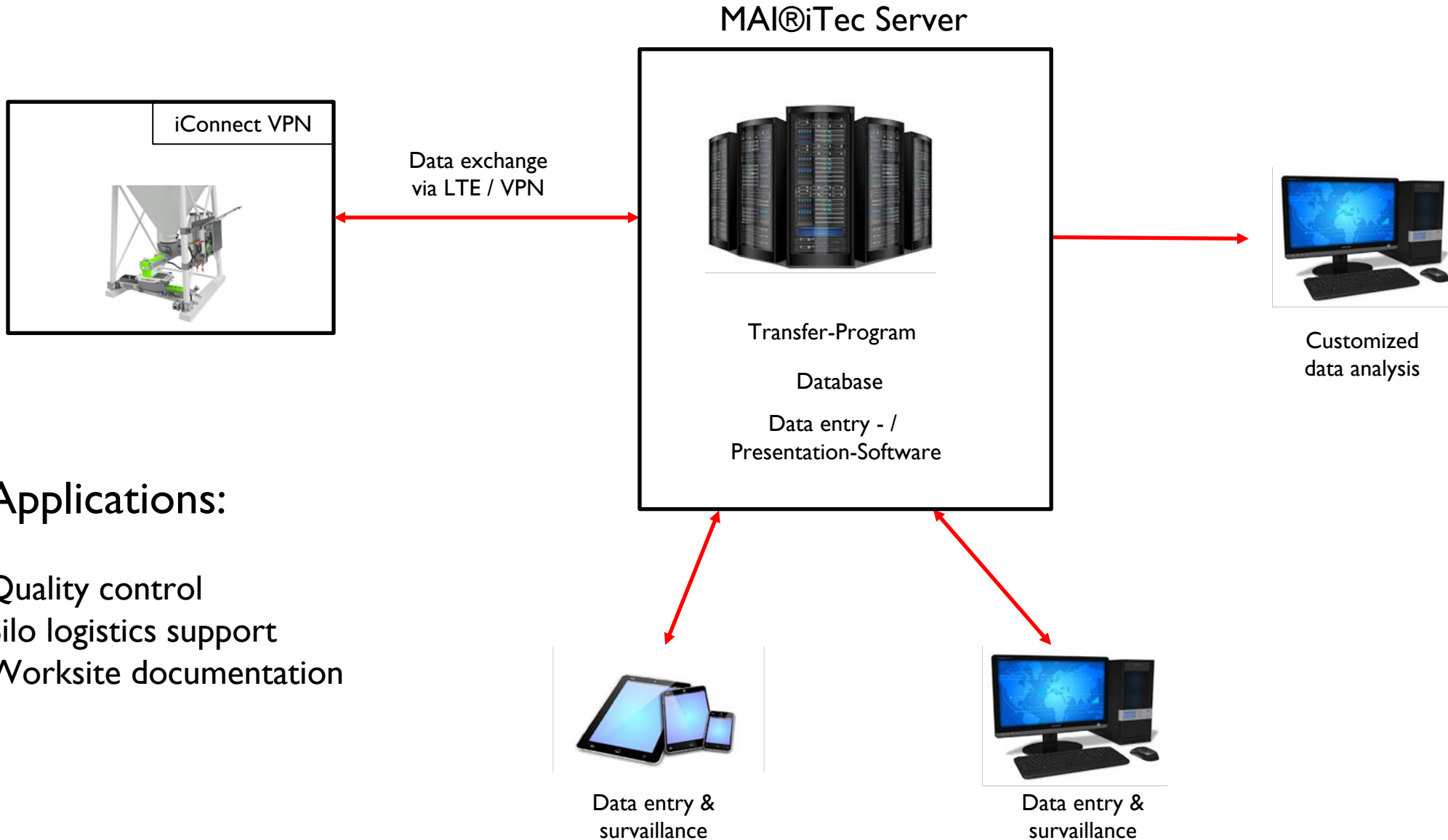


Software-Updates

# MAI®iTec Server



# MAI®iTec Server



## Applications:

- Quality control
- Silo logistics support
- Worksite documentation





# MAI®iTec Server – Web Interface



22.11.2019  
09:26:26

MAI®iTec

	<a href="#"><u>Control / Manage Devices</u></a>
	<a href="#"><u>Control / Manage Sites</u></a>

# MAI®iTec Server – Enter site data & assign sites to devices



 22.11.2019 09:42:37 MAI®iTec Add / Edit Section

Worksite	Baustelle 1
Section	Sektion 2
Recipe	ND 300 ▼
Qty m3	20

Save

 22.11.2019 11:25:32 MAI®iTec Sites assignment for device 12109

Assign	Site	# Sects.
<input type="checkbox"/>	Baustelle 1	2
<input type="checkbox"/>	Baustelle 2	1
<input type="checkbox"/>	Baustelle 3	1

Send assignment

# MAI®iTec Server – Enter silo weighing & on-site refills



 22.11.2019  
10:18:53 MAI®iTec Silo weight for device 12109

Silo no.	Silo1
Dry Material	Material A ▾
Net Weight [kg]	10250

Save Weight

 22.11.2019  
10:21:30 MAI®iTec Silo refill for device 12109

Silo no.	Silo1
Dry Material	Material A
Net Weight added [kg]	

Save Refill

# MAI®iTec Server – Site selection



MAI\_12109:0 10.1.0.11

22.11.2019 09:17:15 **BAUSTELLE** X

Baustelle 1	Sektion 2
Rezept:	ND 300
Bediener:	Huber
Schlauchlänge [m]:	80 max. [m]: 100
Einbauhöhe [mm]:	200
Bodentemperatur [°C]::	0
GPS Daten Baustelle:	0.000000 0.000000
GPS Daten Maschine:	0.000000 0.000000
Distanz:	0.000

Select site and section at the machine  
Enter additional site data

# MAI®iTec Server – Recipe



MAI\_12109:0 10.1.0.11

22.11.2019 09:18:53 **REZEPT 1/2**

REZEPT: ND 300 ND 300

Nassdichte [kg/m<sup>3</sup>]: 300

<b>PUMPE:</b>	<b>MAI FOG:</b>
Frequenz min. [Hz]: 65	Schaumleistung [l/min]: 117
Frequenz max. [Hz]: 75	Schaumdichte [g/l]: 50
Geschwindigkeitsstufen: 2	Schaummittel / Wasser [%]: 3.0
Schneckenpumpe: XP210	Luftmengenfaktor [%]: 100
Förderleistung bei 50Hz [l/min]: 21.0	Einschaltverzögerung [s]: 2.0

<b>WASSER:</b>	<b>MAI DOS 1:</b>
Wasserdurchfluss min. [l/h]: 1000	INAKTIV
Wasserdurchfluss max. [l/h]: 2300	
Wasserdurchfluss Standard [l/h]: 1600	

MAI\_12109:0 10.1.0.11

22.11.2019 09:19:11 **REZEPT 2/2**

**MATERIALDATEN:**

Toleranz Nassdichte +/- [kg/m<sup>3</sup>]: 30

W/T Faktor [kg/kg]: 0.48

Schaumverlustfaktor [%]: 48

Trockenmaterial: none

Schaummittel: AIRC

Additiv MAI DOS 1: none

Additiv MAI DOS 2: none

**MAI MIX :** INAKTIV

**MAI DOS 2:** INAKTIV

**MISCHERKONFIGURATION:**

Mischerdrehzahl bei 50Hz [Upm]: 560

Förderschnecke: 40mm

Dosierzone: 71,5mm

**PROBEN:**

Proben erforderlich:  ON

Weitere Proben jeweils nach [m<sup>3</sup>] Fertigmateriale: 10


System parameters automatically loaded from “recipes”

# MAI®iTec Server – Quality control



MAI\_12109:0 10.1.0.11

22.11.2019 10:26:29 **PROBE MATERIALDICHTE** X





Gewicht Messgefäß [kg]:	10.00
Volumen Messgefäß [l]:	12.00
Messgewicht (inkl. Gefäß) [kg]:	13.50
Einwaage Netto [kg]:	3.50
<b>IST Dichte [kg/m³]:</b>	<b>292</b> 
SOLL Dichte Rezept [kg/m³]:	300
Toleranz Dichte [kg/m³]:	30
Proben Nr.:	12109-3

Recording of on-site quality checks

# MAI®iTec Server – Support for silo logistics



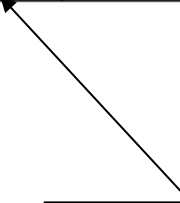

22.11.2019 10:22:17
**MAI®iTec Device list**

Serial	Type	# Sites	Latest Info / Status / Site			Latest Position		Time Auto 24h	# Errors 24h	Silo No.	Dry Mat. level [to]	Material	Silo Weight	Silo Refill	Assign sites	Err. Log. Diag.
<a href="#">12109</a>	440/Multimix	<a href="#">0</a>	22.11.2019 10:22:03	Auto On	<a href="#">Baustelle 1</a>	<a href="#">0</a>	<a href="#">0</a>	0	3	Silo1	<a href="#">10.09</a>	Material A				


22.11.2019 10:22:48
**MAI®iTec Device log**

Serial	Timestamp	Status	Site	Sect	Recipe Sect.	Recipe Actual	W-I/h	FC-F	Auto [s]	Pump [s]	PumpxF [s]	Slurry l	Foam l	Water l	Dry kg
12109	22.11.2019 10:22:33	Auto On	Baustelle 1	Sektion 2	ND 300	ND 300	1600	0	30	30	39	14	113	13	27
12109	22.11.2019 10:22:03	Auto On	Baustelle 1	Sektion 2	ND 300	ND 300	1600	0	30	30	39	14	113	13	27
12109	22.11.2019 10:21:33	Auto On	Baustelle 1	Sektion 2	ND 300	ND 300	1600	0	30	30	39	14	113	13	27
12109	22.11.2019 10:21:03	Auto On	Baustelle 1	Sektion 2	ND 300	ND 300	1600	0	30	30	39	14	113	13	27
12109	22.11.2019 10:20:33	Auto On	Baustelle 1	Sektion 2	ND 300	ND 300	1600	0	30	30	39	14	113	13	27
12109	22.11.2019 10:19:33	Auto On	Baustelle 1	Sektion 2	ND 300	ND 300	1600	0	30	30	39	14	113	13	27
12109	22.11.2019 10:19:03	Auto On	Baustelle 1	Sektion 2	ND 300	ND 300	1600	0	30	30	39	14	113	13	27
12109	22.11.2019 10:18:33	Auto On	Baustelle 1	Sektion 2	ND 300	ND 300	1600	0	30	30	39	14	113	13	27
12109	22.11.2019 10:18:03	Auto On	Baustelle 1	Sektion 2	ND 300	ND 300	1600	0	30	30	39	14	113	13	27
12109	22.11.2019 10:17:33	Auto On	Baustelle 1	Sektion 2	ND 300	ND 300	1600	0	30	30	39	14	113	13	27
12109	22.11.2019 08:37:53	Auto Off / Error	Baustelle 1	Sektion 1	Estrich	ND 160	1000	0	18	18	16	2	126	5	10
12109	22.11.2019 08:33:39	Auto Off	Baustelle 1	Sektion 1	Estrich	ND 160	1600	0	2	2	1	0	8	0	0
12109	22.11.2019 08:32:04	Auto Off / Error	Baustelle 1	Sektion 1	Estrich	ND 160	1600	0	0	0	0	0	0	0	0
12109	22.11.2019 08:31:42	Auto Off / Error	Baustelle 1	Sektion 1	Estrich	ND 160	1600	0	0	0	0	0	0	0	0
12109	20.11.2019 15:16:35	Auto Off / Error	Baustelle 1	Sektion 1	Estrich	Estrich	800	0	0	0	0	0	0	0	0
12109	20.11.2019 14:53:10	Auto Off / Error	Baustelle 1	Sektion 1	Estrich	Estrich	800	0	0	0	0	0	0	0	0
12109	20.11.2019 14:53:05	Auto Off / Error	Baustelle 1	Sektion 1	Estrich	Estrich	800	0	0	0	0	0	0	0	0

Silo filling level



# MAI®iTec Server – Worksite documentation



 22.11.2019  
10:33:06 MAI®iTec Site report

Click [here](#) to request a PDF site report.

Site Baustelle 1

Operator(s): Huber

Section	Recipe	Qty [m³] Plan / Actual	
Sektion 1	Estrich	10,0	136,0

Log Data														
Date	Machine	Recipe	Start	End	Output Qty [m³]	Drymat Usage [to]	Temp. °C min/max		Rel. Humidity % min/max		Ground Temp. °C min/max		Max. Hose Length	Max. Install Height
<a href="#">2019-11-20</a>	12109	Estrich	14:53	15:16	0,0	0,00	-30,0	-30,0	5	5	0	0	0	0
<a href="#">2019-11-22</a>	12109	ND 160	08:31	08:37	0,1	0,01	-30,0	-30,0	5	5	0	0	0	0

Tests				
Date	Device	Recipe	Density	Sample-ID
	12109	ND 300	292	12109-3



# MAI®iTec Server – Worksite documentation



## SITE REPORT

Created by MAI®iCMS



---

Site: Baustelle\_1

Customer:

Address:

---

Section: Sektion 1

Date	Machine	Recipe	Volume [m3]	Dry Material [kg]
20.11.2019	12109	Estrich	0,0	0,0

Report created on: 21.11.2019

---

Customer's signature

Data Access View    Event View

#	Server	Node Id	Display Name	Value	Datatype	Source Timestamp	Server Timestamp	Statuscode
1	OpcUaServer@...	NS2 String Tags...	MP_Auto_On	false	Boolean	12:18:56.042	12:18:56.488	Good
2	OpcUaServer@...	NS2 String Tags...	MP_Error_Any_Active	true	Boolean	12:18:58.512	12:18:58.599	Good
3	OpcUaServer@...	NS2 String Tags...	MPRX_EXT_Pump_Run	false	Boolean	12:19:15.196	12:19:15.511	Good
4	OpcUaServer@...	NS2 String Tags...	MPRX_EXT_Pump_Speed_cHz_I	0	Int16	12:19:17.737	12:19:17.767	Good
5	OpcUaServer@...	NS2 String Tags...	MPRX_DI_Water_Flowrate_Set_Ih_I	600	Int16	12:21:49.333	12:21:49.333	Good
6	OpcUaServer@...	NS2 String Tags...	MPRX_DI_DOS1_Flowrate_50Hz_ml...	0	Int16	12:19:38.702	12:19:38.776	Good
7	OpcUaServer@...	NS2 String Tags...	MPRX_EXT_DOS1_Run	false	Boolean	12:19:45.175	12:19:45.431	Good
8	OpcUaServer@...	NS2 String Tags...	MPTX_DI_Air_Temperature_C_R	19.1133	Float	12:42:50.690	12:42:50.690	Good
9	OpcUaServer@...	NS2 String Tags...	MPTX_DI_Air_Humidity_%_R	53.3539	Float	12:42:59.229	12:42:59.229	Good
10	OpcUaServer@...	NS2 String Tags...	MPTX_DI_Water_Temperature_C_R	17.9297	Float	12:42:59.229	12:42:59.229	Good
11	OpcUaServer@...	NS2 String Tags...	MPTX_DI_Mortar_Temperature_C_R	50	Float	12:20:09.221	12:20:09.390	Good

Events

Events    Alarms    Event History

A	C	Time	Severity	Server/Object	SourceName	Message	ConditionName	Active
		13:19:26.867	1	OpcUaServer@...	Alarms	Drucksensor - kein Signal	... Alarms.HA09	Active

OPC-UA Interface to allow remote control & monitoring of the machine