

Vacuum cups: Holding forces



Calculation

The force exerted by a vacuum cup holding or lifting a workpiece depends on many factors. These include the acceleration, the safety factor, turning and tilting moments, the elasticity of the material and even the design of the vacuum cup.

Regardless of such factors, the holding power of a vacuum cup can easily be identified by the following formula:

$$\text{Holding power in N} = \frac{\text{active suction surface in cm}^2 \times \text{vacuum available in \%}}{10}$$

In short form:

$$F = \frac{A \times P}{10}$$

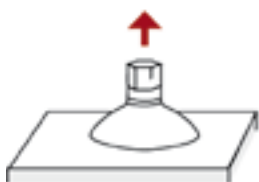
The following applies: The holding power of a vacuum cup is proportional to the active suction surface.

To determine the necessary vacuum cup diameter or the required active suction surface, the following formula helps:

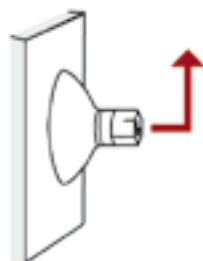
$$\text{Vacuum cup diameter in mm} = 113 \times \sqrt{\frac{\text{Weight in kg} \times \text{Safety factor}}{\text{Underpressure in \%} \times \text{Number of vacuum cups}}}$$

Important: The safety factor (dependent on the lifting direction)

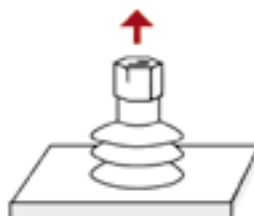
min. 2x safety factor



min. 4x safety factor



min. 2x safety factor



Average values for vacuum cups in standard applications

Vacuum cup diameter [mm]	Effective diameter approx. [mm]	Effective suction surface approx. [cm ²]	Theoretical holding force 20 % vacuum [N]	Theoretical holding force 60 % vacuum [N]	Theoretical holding force 80 % vacuum [N]	Volume flat approx. [cm ³]	Volume below approx. [cm ³]	Recommended internal tubing diameter approx. [mm]
1	0.80	0.0050	0.01	0.03	0.04	0.001	0.05	2
2	1.60	0.0201	0.04	0.12	0.16	0.001	0.05	2
3	2.40	0.0452	0.09	0.27	0.36	0.002	0.05	2
4	3.20	0.0804	0.16	0.48	0.64	0.003	0.05	2
5	4.00	0.1257	0.25	0.75	1.01	0.005	0.1	2
6	5.17	0.2101	0.42	1.26	1.68	0.008	0.1	2
7	6.03	0.2860	0.57	1.72	2.29	0.015	0.1	2
8	6.90	0.3736	0.75	2.24	2.99	0.03	0.2	2
9	7.76	0.4728	0.95	2.84	3.78	0.05	0.2	2
10	8.62	0.5837	1.17	3.50	4.67	0.07	0.5	4
11	9.48	0.7063	1.41	4.24	5.65	0.1	0.5	4
12	10.34	0.8405	1.68	5.04	6.72	0.1	1	4
13	11.21	0.9864	1.97	5.92	7.89	0.2	1	4
14	12.07	1.1440	2.29	6.86	9.15	0.3	1	4
15	12.93	1.3133	2.63	7.88	10.51	0.4	3	4
16	13.79	1.4942	2.99	8.97	11.95	0.5	3	4
17	14.66	1.6868	3.37	10.12	13.49	0.5	3	4
18	15.52	1.8911	3.78	11.35	15.13	0.6	3	4
19	16.38	2.1071	4.21	12.64	16.86	0.7	5	4
20	17.24	2.3347	4.67	14.01	18.68	0.8	5	4
25	21.55	3.6480	7.30	21.89	29.18	1.3	5	4
30	25.86	5.2531	10.51	31.52	42.02	1.3	5	4
35	30.17	7.1501	14.30	42.90	57.20	2.7	10	4
40	34.48	9.3389	18.68	56.03	74.71	3.8	10	4
45	38.79	11.8195	23.64	70.92	94.56	5	20	4
50	43.10	14.5920	29.18	87.55	116.74	7	20	6
60	51.72	21.0124	42.02	126.07	168.10	10	30	6
70	60.34	28.6003	57.20	171.60	228.80	20	50	6
80	68.97	37.3554	74.71	224.13	298.84	25	60	6
90	77.59	47.2780	94.56	283.67	378.22	30	100	6
100	86.21	58.3679	116.74	350.21	466.94	40	200	9
125	107.76	91.1998	182.40	547.20	729.60	80	300	9
150	129.31	131.3277	262.66	787.97	1,050.62	180	500	9
175	150.86	178.7516	357.50	1,072.51	1,430.01	250	650	12
200	172.41	233.4715	466.94	1,400.83	1,867.77	430	800	12
250	215.52	364.7992	729.60	2,188.80	2,918.39	500	1,600	12
300	258.62	525.3109	1,050.62	3,151.87	4,202.49	600	2,000	12
350	301.72	715.0065	1,430.01	4,290.04	5,720.05	1,500	3,000	12
400	344.83	933.8860	1,867.77	5,603.32	7,471.09	2,000	5,000	12
500	431.03	1,459.1969	2,918.39	8,755.18	11,673.58	4,000	x	16
600	517.24	2,101.2436	4,202.49	12,607.46	16,809.95	6,500	x	16

The information provided above consists of average values for smooth, dry product surfaces without a safety factor.
The application, shape of the vacuum cup and product qualities (e.g. surface texture or air permeability) may result in deviations.

General technical information

Air volume to be evacuated per meter of tubing, dependent on the internal tubing diameter

Internal tubing diameter [mm]	Cross section [mm ²]	Air volume per meter [cm ³]	Air volume per meter [l]
2	3.14	3.1	0.003
3	7.07	7.1	0.007
4	12.56	12.6	0.013
6	28.26	28.3	0.028
7	38.47	38.5	0.038
8	50.24	50.2	0.050
9	63.59	63.6	0.064
10	78.50	78.5	0.079
11	94.99	95.0	0.095
12	113.04	113.0	0.113
14	153.86	153.9	0.154
16	200.96	201.0	0.201
18	253.34	254.3	0.254
20	314.00	314.0	0.314
25	490.63	490.6	0.491
32	803.84	803.8	0.804
35	961.63	961.6	0.962
38	1,133.54	1,133.5	1.134
40	1,256.00	1,256.0	1.256

Required inner diameter D in the case of the branching of tubing

Number of tubing	Calculation [diameter D x factor]
1	D x 1
2	D x 0.71
4	D x 0.50
8	D x 0.36
16	D x 0.25
32	D x 0.18

Example calculation

If tubing with an inner diameter of 40 mm branches out to become 4 tubes, each of these tubes requires an internal diameter of 20 mm.

If tubing with an inner diameter of 40 mm branches out to become 16 tubes, each of these tubes requires an internal diameter of 10 mm.

Required internal diameter for compressed air tubing lines

Air flow rate [liters/min.]	Tubing length [m]																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
100	3	4	4	4	4	5	5	5	5	5	5	5	5	5	5	6	6	6	6	6
200	4	5	5	5	5	6	6	6	6	6	7	7	7	7	7	7	7	7	7	7
300	5	5	6	6	7	7	7	7	7	8	8	8	8	8	8	8	8	9	9	9
400	5	6	7	7	7	8	8	8	8	8	9	9	9	9	9	9	9	9	10	10
500	6	7	7	8	8	8	9	9	9	9	9	9	10	10	10	10	10	10	10	11
600	6	7	8	8	9	9	9	9	10	10	10	10	10	10	11	11	11	11	11	11
700	7	8	8	9	9	9	10	10	10	10	11	11	11	11	11	11	11	12	12	12
800	7	8	9	9	9	10	10	10	11	11	11	11	11	12	12	12	12	12	12	13
900	7	8	9	9	10	10	11	11	11	11	12	12	12	12	12	12	13	13	13	13
1,000	7	9	9	10	10	11	11	11	12	12	12	12	12	13	13	13	13	13	13	14
1,100	8	9	10	10	11	11	11	12	12	12	12	13	13	13	13	13	14	14	14	14
1,200	8	9	10	11	11	11	12	12	12	13	13	13	13	14	14	14	14	14	14	15
1,300	8	9	10	11	11	12	12	12	13	13	13	14	14	14	14	14	14	15	15	15
1,400	8	10	11	11	12	12	12	13	13	13	14	14	14	14	15	15	15	15	15	15
1,500	9	10	11	11	12	12	13	13	13	14	14	14	14	15	15	15	15	15	16	16
1,600	9	10	11	12	12	13	13	13	14	14	14	15	15	15	15	15	16	16	16	16
1,700	9	10	11	12	13	13	13	14	14	14	15	15	15	15	16	16	16	16	16	17
1,800	9	11	12	12	13	13	14	14	14	15	15	15	15	16	16	16	16	17	17	17
1,900	9	11	12	12	13	14	14	14	15	15	15	16	16	16	16	16	17	17	17	17
2,000	10	11	12	13	13	14	14	15	15	15	16	16	16	16	17	17	17	17	17	18
2,100	10	11	12	13	14	14	14	15	15	16	16	16	16	17	17	17	17	17	18	18
2,200	10	11	12	13	14	14	15	15	15	16	16	16	17	17	17	17	18	18	18	18
2,300	10	12	13	13	14	15	15	15	16	16	16	17	17	17	17	18	18	18	18	18
2,400	10	12	13	14	14	15	15	16	16	16	17	17	17	17	18	18	18	18	19	19
2,500	10	12	13	14	14	15	15	16	16	17	17	17	17	18	18	18	18	19	19	19
2,600	11	12	13	14	15	15	16	16	16	17	17	17	18	18	18	18	19	19	19	19
2,700	11	12	13	14	15	15	16	16	17	17	17	18	18	18	19	19	19	19	19	20
2,800	11	13	14	14	15	16	16	17	17	17	18	18	18	19	19	19	19	19	20	20
2,900	11	13	14	15	15	16	16	17	17	18	18	18	18	19	19	19	19	20	20	20
3,000	11	13	14	15	15	16	17	17	17	18	18	18	19	19	19	20	20	20	20	20
3,100	11	13	14	15	16	16	17	17	18	18	18	19	19	19	19	20	20	20	20	21
3,200	11	13	14	15	16	16	17	17	18	18	19	19	19	19	20	20	20	20	21	21
3,300	12	13	14	15	16	17	17	18	18	18	19	19	19	20	20	20	20	21	21	21
3,400	12	13	15	15	16	17	17	18	18	19	19	19	20	20	20	20	21	21	21	21
3,500	12	14	15	16	16	17	18	18	18	19	19	19	20	20	20	21	21	21	21	22
3,600	12	14	15	16	17	17	18	18	19	19	19	20	20	20	21	21	21	21	22	22
3,700	12	14	15	16	17	17	18	18	19	19	20	20	20	20	21	21	21	21	22	22
3,800	12	14	15	16	17	17	18	19	19	19	20	20	20	21	21	21	22	22	22	22
3,900	12	14	15	16	17	18	18	19	19	20	20	20	21	21	21	21	22	22	22	22
4,000	12	14	16	16	17	18	18	19	19	20	20	20	21	21	21	22	22	22	22	23
4,100	13	14	16	17	17	18	19	19	20	20	20	21	21	21	22	22	22	22	23	23
4,200	13	15	16	17	18	18	19	19	20	20	20	21	21	21	22	22	22	23	23	23
4,300	13	15	16	17	18	18	19	19	20	20	21	21	21	21	22	22	22	23	23	23
4,400	13	15	16	17	18	18	19	20	20	20	21	21	21	22	22	22	23	23	23	23
4,500	13	15	16	17	18	19	19	20	20	21	21	21	22	22	22	23	23	23	23	24
4,600	13	15	16	17	18	19	19	20	20	21	21	22	22	22	22	23	23	23	24	24
4,700	13	15	16	17	18	19	20	20	21	21	21	22	22	22	22	23	23	23	24	24
4,800	13	15	17	18	18	19	20	20	21	21	22	22	22	22	23	23	23	24	24	24
4,900	13	15	17	18	19	19	20	20	21	21	22	22	22	22	23	23	23	24	24	24
5,000	14	16	17	18	19	19	20	21	21	21	22	22	23	23	23	24	24	24	24	25
5,500	14	16	17	18	19	20	21	21	22	22	23	23	23	24	24	24	25	25	25	26
6,000	14	17	18	19	20	21	21	22	22	23	23	24	24	25	25	25	26	26	26	26
6,500	15	17	19	20	21	21	22	23	23	24	24	25	25	25	26	26	26	27	27	27
7,000	15	18	19	20	21	22	23	23	24	24	25	25	26	26	26	27	27	27	28	28
7,500	16	18	20	21	22	22	23	24	24	25	25	26	26	27	27	27	28	28	28	29
8,000	16	18	20	21	22	23	24	24	25	26	26	26	27	27	28	28	28	29	29	29
8,500	16	19	21	22	23	24	24	25	26	26	27	27	28	28	28	29	29	29	30	30
9,000	17	19	21	22	23	24	25	25	26	27	27	28	28	29	29	29	30	30	30	31
9,500	17	20	21	23	24	25	25	26	27	27	28	28	29	29	29	30	30	31	31	31
10,000	17	20	22	23	24	25	26	27	27	28	28	29	29	30	30	30	31	31	32	32

Values at an operating pressure of 6 bar and a pressure drop of 0.5 bar

Design example: At a required air flow rate of 2,000 liters per minute and a tubing length of 10 meters, the required internal diameter is 15 mm.

Questionnaire F 350 | FIPA Gripper assembly

To:

FIPA GmbH

Freisinger Str. 30
85737 Ismaning / Germany

Fax +49 (0) 89 / 96 24 89 - 11
info@fipa.com

Company

Name

Street

City, State, Zip Code

Phone/Fax

Gripper assembly

Please complete the following questionnaire carefully, so that we can select the optimal product for you.

Please help us to offer you the best service:

- > Please send us 3D-CAD Data of your part, tool and sprue (in STEP or IGES file format)
- > If you have no 3D-CAD Data available, please send us 2D-Drawings with measure details
- > If possible, please send us a photo or a sample
- > Please send us drawings of the robot adapter (2D, AutoCAD or PDF)

We will contact you if important information is missing. Please note, only if all information is completely available, we can ensure the optimal choice for you.

Handling

1. Robot type

- ☐ Linear
- ☐ Swivel axes _____ No. of axes
- ☐ Model name _____

Robot Entry ☐ Top ☐ Side
Robot Wrist Flip ☐ Yes ☐ No
Robot Wrist Rotation ☐ Yes ☐ No
Robot Payload Capacity _____ kg

Existing Quick Change System

☐ Yes ☐ No

Manufacturer / Type:

2. Media supply

Number of vacuum circuits _____

Number of compressed air circuits

_____ bar

Hose diameter _____ mm ☐ OD ☐ ID

Hose length _____ mm

3. Vacuum generation

- ☐ By FIPA
- ☐ By the customer
- ☐ Number of ejectors _____ Type _____
- ☐ Pump
- ☐ Side channel blower
- ☐ Other: _____

4. Field bus connection:

☐ ASI

☐ Profibus

☐ Other: _____

5. Electric gripper system interface - continued on the next page

Sensor type ☐ PNP ☐ NPN

Electrical connector type (Robot side):

☐ M8 connector (3 pins) (Female connector at robot)

☐ M12 connector (4 pins) (Female connector at robot)

☐ SUB-D connector (25 pins) (Female connector at robot, please attach specification incl. pin-out!)

5. Electric gripper system interface - continuation

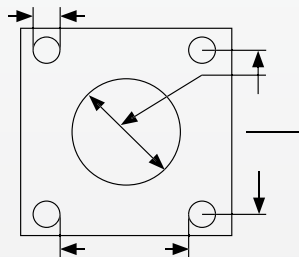
☐ Electrical contacts at quick-change system (please attach specification incl. pin-out!)

☐ Other (please specify) _____

In order to keep the wiring simple and to save digital inputs at the controller unit, sensors can be AND-combined to supply a common output signal. This common output signal will be positive as long as all sensors supply a positive output signal. Please specify which sensors shall be AND-combined (e.g. "all part detection sensors"); _____

Gripper Mounting

1. Sketch - robot adapter plate



2. Robot adapter plate

Size _____ mm

Spring loaded ☐ Lift _____ mm

Type: _____

Name: _____

3. Gripper base plate

Size _____ mm

Spring loaded ☐ Lift _____ mm

Type: _____

Name: _____

4. Comments: _____

Tool

1. Tool opening size _____ mm

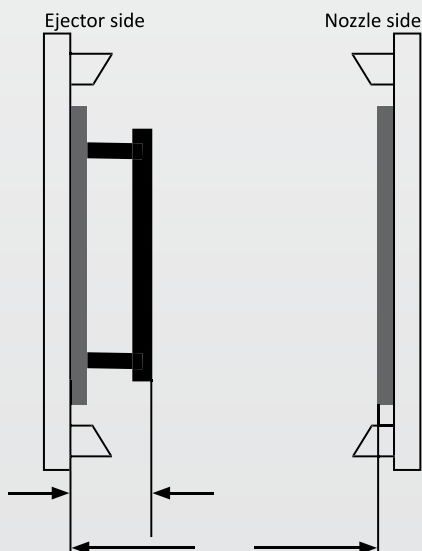
2. Robot space requirement in x-direction _____ mm

Robot space requirement in y-direction _____ mm

Robot space requirement in z-direction _____ mm

Die-Casting Machine

1. Sketch



Tie-bar thickness: _____ mm

Tie-bar spacing - horizontal: _____ mm

Tie-bar spacing - vertical: _____ mm

Type of Mold: ☐ Hot Runner ☐ 3-Plate Mold

☐ Vertical Corepull ☐ Subgated

☐ Other Explain Below

Ejection: ☐ Moving Half ☐ Fixed Half

Do parts fall or sag during or after ejection? ☐ Yes ☐ No

Is any force, twisting, bending, lifting required to remove parts?

☐ Yes ☐ No

Double lift? ☐ Yes ☐ No

Description _____

Continued on the next page →

Questionnaire F 350 | FIPA Gripper assembly

Component

1. Material

- ☐ Fabric
- ☐ Film
- ☐ Metal
- ☐ Magnetic material
- ☐ Silicone
- ☐ Plastic _____ Type
- ☐ Other: _____

2. Surface

- ☐ Non-marking
- ☐ Matt
- ☐ Shiny
- ☐ Textured
- ☐ Grained
- ☐ Other: _____

3. Subsequent process stages

- ☐ Cutting station
- ☐ Other: _____

4. Feeding of injection-mold

- ☐ Roll
- ☐ Magazine
- ☐ Provisioning
- ☐ Vibrating conveyor

5. Further Information

Part Name / I.D. _____

Part temperature during ejection: _____ °C

Total shot weight: _____

Number of cavities: _____

Application

1. Item Insert

- ☐ Ejector side
 - ☐ Nozzle side
- Technical specifications available
- ☐ Yes ☐ No

2. Item placed on:

- ☐ Conveyor belt
- ☐ Pallet
- ☐ Container
- ☐ Tray
- ☐ Fixture
- ☐ Other: _____

3. Cycle time:

Withdrawal time _____ seconds

Feeding time _____ seconds

Total cycle time _____ seconds

4. Description of process

Gripper Design

1. Gripper elements

- | | | | | |
|---|--------------------------------|--|---|--|
| ☐ Vacuum cups _____ (quantity) | ☐ Fixed | ☐ Spring loaded | ☐ Lifting cylinder | |
| ☐ Gripper fingers _____ (quantity) | ☐ Fixed | ☐ Spring loaded | ☐ Lifting cylinder | With monitoring ☐ Yes ☐ No |
| ☐ Parallel grippers _____ (quantity) | ☐ Fixed | ☐ Spring loaded | ☐ Lifting cylinder | With monitoring ☐ Yes ☐ No |
| ☐ Sprue grippers _____ (quantity) | ☐ Fixed | ☐ Spring loaded | ☐ Lifting cylinder | With monitoring ☐ Yes ☐ No |
| ☐ Magnetic grippers _____ (quantity) | ☐ Fixed | ☐ Spring loaded | ☐ Lifting cylinder | |
| ☐ Air nippers _____ (quantity) | ☐ Fixed | ☐ Spring loaded | ☐ Lifting cylinder | |
| ☐ Needle grippers _____ (quantity) | ☐ Fixed | ☐ Spring loaded | ☐ Lifting cylinder | |

2. Part inspection

- ☐ Vacuum _____ (quantity)
- ☐ Optical _____ (quantity)

3. Degating Required

- ☐ N/A
- ☐ On EOAT
- ☐ Separate degate station

4. Further information

Gripper dimensions (LxWxH in mm) _____

Dimensions of inserted parts (preferably supply drawing or sample part) _____

- ☐ Functional/requirement specification ☐ Yes ☐ No of _____ to be used
- ☐ Relevant factory standards ☐ Yes ☐ No of _____ to be used

5. Comments: _____

Online forms and
downloads: www.fipa.com

Questionnaire F 400 | Customised grippers

To:

FIPA GmbH

Freisinger Str. 30
85737 Ismaning / Germany

Fax +49 (0) 89 / 96 24 89 - 11
info@fipa.com

Company

Name

Street

City, State, Zip Code

Phone/Fax

Customised grippers

Please complete the following questionnaire carefully, so that we can select the optimal product for you.

Robot-Gripper Interface

1. Robot type: _____		
2. Handling type ☐ Linear ☐ Swivel axes _____ No. of axes ☐ Delta robot (3-leg); FlexPicker Model name: _____ _____ ☐ Other _____	3. Media supply Number of vacuum circuits _____ Number of compressed air circuits _____ bar Tubing diameter _____ mm Tubing length _____ mm	4. Vacuum generation ☐ by FIPA ☐ by the customer ☐ Number of ejectors _____ Model name: _____ ☐ Pump Model name: _____ ☐ Side channel blower Model name: _____ ☐ Other: _____
5. Comments: _____ _____ _____		

Application

1. Type of product to be handled: _____ Product weight: _____ g Product dimensions (LxWxH): _____ mm CAD available: ☐ yes ☐ no		
2. Item picked from: ☐ Conveyor belt ☐ Pallet ☐ Container ☐ Tray ☐ Fixture ☐ Other	3. Item placed on: ☐ Conveyor belt ☐ Pallet ☐ Container ☐ Tray ☐ Fixture ☐ Other	4. Cycle time Pick-up _____ seconds Placement _____ seconds

5. Description of application:

Gripper Design

Integrated vacuum generation required: ☐ yes ☐ no

Media feed-through required: ☐ yes ☐ no

Interference contours (e.g. gripping space between products):

Labelling:

Colouring:

Special cleaning regulations:

Description of process:

Current solution:

Improvements required:

Online forms and
downloads: www.fipa.com

Questionnaire F 300 | Vacuum grippers

To:

FIPA GmbH

Freisinger Str. 30
85737 Ismaning / Germany

Fax +49 (0) 89 / 96 24 89 - 11
info@fipa.com

Company

Name

Street

City, State, Zip Code

Phone/Fax

Vacuum Grippers

Please answer the following questions carefully, so we can select the vacuum gripper best suited for your purpose.

Product Information

1. What kind of parts are you handling (product, material)?

2. The objects are:

- ☐ round
- ☐ oval
- ☐ square
- ☐ rectangular
- ☐ curved
- ☐ inherent stable
- ☐ deformable

3. Surface:

- ☐ smooth
- ☐ rough
- ☐ textured
- ☐ rippled
- ☐ oily
- ☐ wet
- ☐ dry
- ☐ porous
- ☐ airtight

4. Dimensions, weight:

Length _____ mm

Width _____ mm

Height / Thickness
_____ mm

Ø _____ mm

Weight _____ g

5. Available surface for gripping:

Length _____ mm

Width _____ mm

Ø _____ mm

6. Is the height of the product greater than the width? ☐ no ☐ yes [mm / cm]: _____

7. Do you have to evacuate a volume of air? ☐ no ☐ yes [m³]: _____

8. Kind of packaging (strength, elasticity etc.)?

9. Remarks:

Information on product layers

1. Do you transport single products or layers of products? ☐ single ☐ layers
2. Number of cycles? _____
3. Measurements of layers

Length _____ mm Height / Thickness _____ mm

Width _____ mm Ø _____ mm

Weight _____ g

4. Amount of products / layers _____ units
5. Minimum depth of coverage of a single layer? [%]: _____
6. Maximum level difference of a single layer? _____
7. Is there a progressive deformation? ☐ no ☐ yes
8. Remarks:

Application Information

1. Please describe your application:
2. Number of cycles per minute: _____
3. Max. available time to pick & place the product: _____
4. Product acceleration: _____
5. Max. carrying capacity : _____
6. Utilisation [operating hours / day / week]: _____
7. Housing required? ☐ no ☐ yes _____
8. Can parts get inside the gripper (e.g. dust, parts of the product or similar) ☐ no ☐ yes _____
9. Remarks:

Online forms and
downloads: www.fipa.com

Questionnaire F 200 | Cutting Test

To:

FIPA GmbH

Freisinger Str. 30
85737 Ismaning / Germany

Fax +49 (0) 89 / 96 24 89 - 11
info@fipa.com

Company

Name

Street

City, State, Zip Code

Phone/Fax

Cutting Test

Please complete the following questionnaire carefully, so that we can select the optimal product for you.

1. Material

- ☐ Copper (specification e.g. CuZn) _____ annealed
- ☐ Steel (specification e.g. St 37) _____ hardened
- ☐ Plastic (specification e.g. PA, PP, POM) _____
- ☐ Other _____

Glass fibre reinforced _____ %

Temperature of workpiece when cut _____ °C

2. Dimensions

diam. _____ mm

Height x Width x Depth _____ x _____ x _____ mm

☐ Sample of workpiece attached

Online forms and
downloads: www.fipa.com

Questionnaire F 100 | Vacuum Technology

To:

FIPA GmbH

Freisinger Str. 30

85737 Ismaning / Germany

Fax +49 (0) 89 / 96 24 89 - 11

info@fipa.com

Company

Name

Street

City, State, Zip Code

Phone/Fax

Vacuum Unit

Please answer the following questions carefully, so we can select the vacuum unit best suited for your purpose.

1. Please quote the following application:

2. What kind of parts are you handling?

3. The objects are:

- ☐ round
☐ oval
☐ square
☐ rectangular
☐ curved
☐ unstable

4. Dimensions / Weight:

Length _____ mm

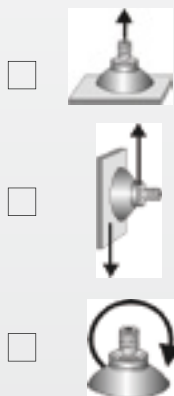
Width _____ mm

Height / Thickness
 _____ mm

Ø _____ mm

Weight _____ g

5. Lifting direction:



6. Surface:

- ☐ smooth
☐ rough
☐ textured
☐ rippled
☐ oily
☐ scaled
☐ wet
☐ dry
☐ porous

7. Temperature:

briefly
 _____ °C
 continuously
 + _____ °C
 - _____ °C

8. Use:

- ☐ indoor
☐ outdoor

3a. Material:

9. Vacuum generation:

- ☐ Vacuum pump ☐ Vacuum ejector ☐ existing ☐ not existing

Power capacity _____

Vacuum cups

16. In use?

- ☐ no ☐ yes, following type _____

17. Annual requirement? approx. _____ pieces

10. Duty cycle _____

11. Distance _____

12. Suction-in time _____

13. Positioning accuracy _____

14. Acceleration _____

15. Environment _____

FIPA will gladly perform individual handling tests free of charge on samples of the objects to be carried. Alternatively please feel free to request sample cups for your own tests.

Online forms and
 downloads: www.fipa.com

Questionnaire F 150 | Vacuum pumps

To:

FIPA GmbH

Freisinger Str. 30

85737 Ismaning / Germany

Fax +49 (0) 89 / 96 24 89 - 11

info@fipa.com

Company

Name

Street

City, State, Zip Code

Phone/Fax

Vacuum Pumps

Please answer the following questions carefully, so we can select the vacuum pump best suited for your purpose.

1. Please specify the branch of industry in which the pump will be used

- ☐ Packaging ☐ Food & Beverage ☐ Glass
☐ Graphic arts ☐ Wood-working ☐ Plastic
☐ Marble / Stone ☐ Sheet metal
☐ _____

2. What will the pump be used for?

- ☐ Handling ☐ Degasification of silicon mixture
☐ Vacuum clamping ☐ Degasification of synthetic resin
☐ Degasification of laminated materials
☐ Evacuating tanks: Liters: _____ / Time: _____

3. Location of pump

- ☐ Indoor ☐ Outdoor ☐ Mobile
☐ Temperature range: _____ to _____ °C
☐ Relative humidity (e.g. tropical areas) _____ %

4. Medium to be sucked

- ☐ Dry air ☐ Humid air ☐ Oily air
☐ Water vapor ☐ Water ☐ Grinding sludge
☐ Aggressive gases (which): _____
Temperature of medium: _____ °C

5. Suction capacity: _____ m³/h or _____ l/min

6. Vacuum Level (in continuous operation):

_____ mbar or _____ % vacuum

7. Duty cycle

- Continuous operation ☐ 8-10 h/day ☐ 16-18 h/day
Intermittent operation:
Operating interval of pump? _____

8. Back diffusion

- Does leakage of the medium have to be prevented when the pump is switched off? (Check valve for oil-lubricated vacuum pump)
☐ Yes ☐ No

9. Maintenance of vacuum

- Does the vacuum have to be maintained for a certain period (e.g. for putting down loads in case of power failure)?
☐ Yes ☐ No

10. Vacuum tank

- ☐ available (_____ liters) ☐ desired (_____ liters)
☐ Capacity suggested by FIPA

11. Maintenance

- Is the pump accessible for maintenance? ☐ Yes ☐ No
Is sufficient cooling available for the pump? ☐ Yes ☐ No
Is remote monitoring of pump condition possible? (e.g. oil level)
☐ Yes ☐ No

12. General information if new pump is desired:

- ☐ Only one pump is required
☐ Number of pumps needed per year: _____
☐ Delivery desired within: _____
☐ Replacement

13. In case of replacement please fill out

- ☐ Brand until now _____ ☐ Suction capacity _____
☐ Vacuum level _____ ☐ Electricity supply _____

Online forms and
downloads: www.fipa.com

Item no.	Page	Item no.	Page	Item no.	Page
20.007	345	21.007.147.*	127	23.063.244.*	125
20.016.145.*	129	21.008.094.*	122	23.075.151.*	119
20.016.146.*	129	21.009.002.*	112, 122	30.000	414
20.021	347	21.009.148.*	127	30.001	414
20.021.147.*	129	21.010.119.*	122	30.002	414
20.022	347	21.012.135.*	112, 122	30.002-G	414
20.023	348	21.012.149.*	127	30.003	414
20.026.148.*	129	21.014.007.*	122	30.003-G	414
20.037.149.*	129	21.014.053.*	112	30.004	414
20.037.150.*	129	21.014.133.*	122	30.005	414
20.040	346	21.014.150.*	127	30.006	414
20.041	346	21.016.175.*	129	30.006-G	414
20.053.151.*	129	21.018.010.*	112, 122	30.007	414
20.053.152.*	129	21.018.151.*	127	30.007-G	414
20.053.153.*	129	21.020.016.*	112, 122	30.008	414
20.077.154.*	129	21.020.152.*	127	30.008-G	414
20.077.155.*	129	21.021.176.*	129	30.009	414
20.088.123.*	122	21.025.060.*	122	30.010	414
20.088.124.*	122	21.025.153.*	127	30.011	414
20.501	380	21.026.177.*	129	30.011-G	414
20.502	380	21.032.075.*	112, 122	30.012	414
20.503	380	21.032.154.*	127	30.012-G	414
20.504	380	21.037.177.*	129	30.013	414
20.507	380	21.042.155.*	127	30.013-G	414
20.508	380	21.043.049.*	112, 122	30.014	414
20.509	380	21.052.156.*	127	30.014-G	414
20.511	349	21.053.178.*	129	30.015	414
20.514	350	21.060.051.*	112	30.015-G	414
20.515	350	21.062.055.*	122	30.016	414
20.518	380	21.062.157.*	127	30.016-G	414
20.519	380	22.088.158.*	119	30.017	414
20.520	351	22.088.159.*	119	30.017-G	414
20.522	349	23.005.178.*	110	30.018	414
20.523	349	23.005.181.*	119	30.018-G	414
20.524	390	23.008.166.*	110	30.019	414
20.525	390	23.011.008.*	110, 119	30.019-G	414
20.525/NPN	390	23.011.234.*	125	30.020	414
20.526	390	23.013.120.*	119	30.020-G	414
20.527	381	23.014.235.*	125	30.021-G	414
20.528	381	23.015.122.*	110	30.050	416
20.530	392	23.016.016.*	110, 119	30.051	416
20.531	392	23.016.236.*	125	30.052	416
20.535	38	23.018.237.*	125	30.053	416
20.536	38	23.019.119.*	119	30.054	416
20.537	38	23.020.124.*	110	30.055	416
20.538	38	23.020.238.*	125	30.056	416
20.540	388	23.022.028.*	119	30.056-G	416
20.541	388	23.022.239.*	125	30.057	416
20.542	388	23.025.137.*	119	30.057-G	416
20.550	380	23.025.240.*	125	30.058	416
20.570	380	23.030.125.*	110	30.058-G	416
21.004.083.*	122	23.033.039.*	119	30.059	416
21.005.057.*	112, 122	23.033.241.*	125	30.059-G	416
21.005.146.*	127	23.043.096.*	110, 119	30.060	416
21.006.087.*	122	23.043.242.*	125	30.060-G	416
21.006.093.*	122	23.053.033.*	119	30.062	416
21.007.089.*	112	23.053.243.*	125	30.063	416

Item no.	Page	Item no.	Page	Item no.	Page
30.075	417	30.179-G	421	30.306	424
30.076	417	30.180	421	30.307	424
30.077	417	30.180-G	421	30.308	424
30.078	417	30.181	421	30.309	424
30.080	417	30.181-G	421	30.310	424
30.100	419	30.182	421	30.311	424
30.101	419	30.182-G	421	30.312	424
30.102	419	30.183	421	30.313	424
30.102-G	419	30.183-G	421	30.332	425
30.103	419	30.184	421	30.333	425
30.103-G	419	30.200	415	30.334	425
30.104	419	30.201	415	30.335	425
30.105	419	30.202	415	30.336	425
30.106	419	30.203	415	30.337	425
30.106-G	419	30.204	415	30.338	425
30.107	419	30.205	415	30.339	425
30.107-G	419	30.206	415	30.340	425
30.108	419	30.207	415	30.341	425
30.108-G	419	30.208	415	30.342	425
30.109	419	30.209	415	30.343	425
30.109-G	419	30.210	415	30.344	425
30.110	419	30.211	415	30.345	425
30.110-G	419	30.212	415	30.346	425
30.111	419	30.213	415	30.347	425
30.111-G	419	30.214	415	30.348	425
30.112	419	30.223	416	30.349	425
30.112-G	419	30.224	416	30.350	425
30.113	419	30.225	416	30.351	425
30.113-G	419	30.226	416	30.390	425
30.114	419	30.227	416	30.391	425
30.114-G	419	30.228	416	30.392	425
30.115	419	30.270	422	30.393	425
30.115-G	419	30.271	422	30.394	425
30.116	419	30.272	422	30.395	425
30.116-G	419	30.273	422	30.399	426
30.117	419	30.274	422	30.400	426
30.117-G	419	30.275	422	30.401	426
30.118	419	30.279	420	30.402	426
30.118-G	419	30.280	420	30.403	427
30.119	419	30.281	420	30.404	427
30.119-G	419	30.282	420	30.405	427
30.120	419	30.283	420	30.406	427
30.120-G	419	30.284	420	30.407	427
30.170	421	30.285	420	30.408	427
30.171	421	30.286	420	30.409	427
30.172	421	30.287	420	30.410	427
30.172-G	421	30.288	420	30.411	427
30.173	421	30.289	420	30.412	427
30.173-G	421	30.290	420	30.413	427
30.174	421	30.291	420	30.414	427
30.175	421	30.292	420	30.415	427
30.176	421	30.300	424	30.416	427
30.176-G	421	30.301	424	30.417	427
30.177	421	30.302	424	30.418	427
30.178	421	30.303	424	30.419	427
30.178-G	421	30.304	424	30.420	427
30.179	421	30.305	424	30.421	427

Item no.	Page	Item no.	Page	Item no.	Page
30.431	426	30.610	429	30.810	417
30.432	426	30.611	429	30.811	417
30.433	426	30.612	429	30.812	417
30.434	426	30.613	429	30.813	417
30.435	426	30.614	429	30.814	417
30.436	426	30.649	429	30.815	417
30.440	426	30.650	429	30.816	413
30.441	426	30.651	429	30.817	413
30.442	426	30.652	429	30.818	413
30.443	426	30.653	429	30.819	413
30.490	430	30.654	429	30.823	423
30.491	430	30.655	429	30.824	423
30.492	430	30.656	429	30.825	423
30.493	430	30.657	429	30.826	423
30.494	430	30.658	429	30.827	423
30.495	430	30.659	429	30.828	423
30.496	430	30.660	429	30.829	423
30.497	430	30.661	429	30.830	423
30.498	430	30.662	429	30.831	423
30.499	430	30.663	429	30.832	423
30.500	430	30.664	429	30.833	423
30.501	430	30.674	430	30.834	423
30.502	430	30.675	430	30.835	423
30.503	430	30.676	430	30.836	423
30.504	430	30.677	430	30.837	423
30.505	430	30.678	430	30.838	423
30.506	430	30.679	430	30.846	418
30.507	430	30.680	430	30.847	418
30.518	428	30.681	430	30.848	418
30.519	428	30.682	430	30.849	418
30.520	428	30.683	430	30.850	418
30.521	428	30.684	430	30.851	418
30.522	428	30.685	430	30.852	418
30.523	428	30.686	430	30.853	418
30.524	428	30.687	430	30.854	418
30.525	428	30.688	430	30.855	418
30.526	428	30.689	430	30.856	418
30.527	428	30.761	415	30.863	423
30.528	428	30.762	415	30.864	423
30.529	428	30.763	415	30.865	423
30.530	428	30.764	415	30.866	423
30.531	428	30.765	415	30.867	423
30.532	428	30.774	422	30.868	423
30.533	428	30.775	422	30.869	423
30.534	428	30.776	422	30.870	423
30.535	428	30.777	422	30.871	423
30.599	429	30.778	422	30.872	423
30.600	429	30.800	417	30.873	423
30.601	429	30.801	417	30.900	434
30.602	429	30.802	417	30.901	434
30.603	429	30.803	417	30.902	434
30.604	429	30.804	417	30.903	434
30.605	429	30.805	417	30.904	434
30.606	429	30.806	417	30.905	434
30.607	429	30.807	417	30.906	434
30.608	429	30.808	417	30.906-G	434
30.609	429	30.809	417	30.907	434

Item no.	Page	Item no.	Page	Item no.	Page
30.908	434	32.002	431	32.059	431
30.910-G	434	32.003	431	32.060	433
30.914	435	32.004	431	32.061	433
30.915	435	32.005	431	32.062	433
30.916	435	32.006	431	32.063	433
30.917	435	32.007	431	32.064	433
30.920	434	32.008	431	32.577	331
30.921	434	32.009	431	32.578	331
30.922	434	32.010	431	32.579	331
30.923	434	32.011	431	32.580	331
30.924	434	32.012	431	32.581	331
30.925	434	32.013	431	32.582	330
30.926	434	32.014	431	32.583	330
30.927	434	32.015	431	32.584	330
30.928	434	32.016	431	32.585	330
30.932	435	32.017	433	32.586	330
30.933	435	32.018	433	33.105	332
30.934	435	32.019	433	33.120	332
30.935	435	32.020	433	36.003	340
30.949	437	32.021	433	36.004-24VDC	338
30.950	437	32.022	433	36.004-230VAC	338
30.951	437	32.023	433	36.060	336
30.952	437	32.024	433	36.061	336
30.953	437	32.025	433	36.210	342
30.954	437	32.026	433	36.211	342
30.955	437	32.027	433	36.515	342
30.956	437	32.028	433	36.520	342
30.957	437	32.029	433	36.525	342
30.958	437	32.030	433	36.900	252
30.963	436	32.031	433	36.901	252
30.964	436	32.032	433	55.000	306
30.965	436	32.033	432	55.001	306
30.966	436	32.034	432	55.002	306
30.967	436	32.035	432	55.004	306
30.968	436	32.036	432	55.005	304
30.969	436	32.037	432	61.005S	401
30.970	436	32.038	432	61.006S	401
30.977	435	32.039	432	61.007S	401
30.978	435	32.040	432	61.008S	401
30.979	435	32.041	432	61.009S	401
30.980	435	32.042	432	61.010S	401
30.981	435	32.043	432	61.011S	401
30.982	435	32.044	432	61.020	400
30.993	437	32.045	432	61.021	400
30.994	437	32.046	432	61.022	400
30.995	437	32.047	432	61.023	400
30.996	437	32.048	432	61.024	400
30.997	437	32.049	432	61.025	400
30.998	437	32.050	432	61.026	400
30.999	437	32.051	432	61.027	400
31.000	437	32.052	432	61.028	400
31.001	437	32.053	432	61.029	400
31.002	437	32.054	432	61.030	400
31.025	436	32.055	431	61.031	400
31.026	436	32.056	431	61.033	400
32.000	431	32.057	431	61.034	400
32.001	431	32.058	431	61.035	400

Item no.	Page	Item no.	Page	Item no.	Page
61.036	400	61.125	403	63.038	335
61.037	400	61.126	403	63.055	335
61.038	400	61.127	403	65.102A	362
61.039	400	61.128	403	65.111	362
61.040	400	61.129	403	65.120	362
61.043	400	61.130	403	65.130	362
61.056	397	61.131	403	65.510	220
61.057	397	61.132	403	65.510-PK	222
61.058	397	61.133	403	65.520	220
61.059	397	61.135	403	65.520-PK	222
61.060	397	61.160	399	65.530	220
61.061	397	61.161	399	65.530-PK	222
61.062	397	61.162	399	65.540	220
61.063	398	61.163	399	65.540-PK	222
61.064	398	61.164	399	66.010	406
61.065	398	61.165	399	66.011	406
61.066	398	61.166	399	66.015	406
61.067	398	61.167	399	66.017	406
61.068	398	61.168	399	66.019	406
61.069	398	61.169	399	66.020	406
61.070	398	61.211	402	67.010	247
61.071	398	61.212	402	67.011	247
61.072	398	61.213	402	71.000	333
61.073	398	61.214	402	71.001	333
61.083	407	61.215	402	71.002	333
61.090	396	62.019	405	71.003	333
61.091	396	62.020	405	71.004	333
61.092	396	62.021	405	71.035	334
61.093	396	62.022	405	71.036	334
61.094	396	62.023	405	71.037	334
61.095	396	62.024	405	71.038	334
61.096	396	62.025	405	71.039	334
61.100	403	62.026	405	71.070	333
61.101	403	62.027	405	71.071	333
61.102	403	62.028	405	72.000	369
61.103	403	62.029	405	72.001	369
61.104	403	62.030	405	72.002	369
61.105	403	62.031	405	72.003	369
61.106	403	62.033	405	72.007	369
61.107	403	62.034	405	72.008	369
61.108	403	62.035	405	72.009	369
61.109	403	62.036	405	72.015	370
61.110	403	62.037	405	72.016	370
61.111	403	62.038	405	72.017	370
61.112	403	62.040	405	72.018	370
61.113	403	62.041	405	72.019	370
61.114	403	62.042	405	72.020	370
61.115	403	62.045	405	72.021	370
61.116	403	62.046	405	72.022	370
61.117	403	62.047	405	72.022-1*	370
61.118	403	62.048	405	72.023	370
61.119	403	62.060	405	72.024	370
61.120	403	62.061	405	72.025	370
61.121	403	62.062	405	72.026	370
61.122	403	62.063	405	72.027	370
61.123	403	63.036	335	72.028	368
61.124	403	63.037	335	72.029	368

Item no.	Page	Item no.	Page	Item no.	Page
72.030	368	112.015.022._*	116	270.343	443
72.031	368	112.018.024._*	116	270.395	444
72.032	368	112.020.031._*	116	270.396	444
72.033	368	112.022.037._*	116	270.397	444
72.045	369	112.025.042._*	116	270.420	440
77.000	443	112.030.052._*	116	270.423	442
77.007	443	112.035.060._*	116	270.518	444
77.008	443	112.040.071._*	116	270.519	444
77.009	443	112.045.077._*	116	270.560	442
77.010	443	112.060.091._*	116	270.561	440
78.051	445	112.085.102._*	116	270.562	440
78.052	445	132.4x2.031._*	114	270.563	440
78.053	445	132.7x4.034._*	114	270.564	440
78.054	445	132.15x5.067._*	114	270.565	440
78.055	445	132.24x8.066._*	114	270.566	440
78.056	445	132.36x12.068._*	114	270.567	442
79.000	410	132.45x15.064._*	114	270.576	442
79.001	410	270.059	440	270.577	442
79.002	410	270.078	442	270.579	443
79.003	410	270.079	442	270.600	442
79.004	410	270.088	442	270.601	442
79.005	410	270.089	443	270.604	442
79.006	410	270.090	442	270.605	442
79.007	410	270.102	442	ASR48-A	39
79.008	410	270.107	441	ASR48-A-ME	41
79.009	410	270.108	441	ASR48-B	39
79.010	410	270.120	440	ASR48-B-ME	41
79.011	410	270.121	440	ASR60-A	39
79.012	410	270.122	440	ASR60-A-ME	41
79.013	410	270.123	440	ASR60-B	39
79.014	410	270.124	440	ASR60-B-ME	41
79.015	411	270.125	440	CPP20-6W	438
79.016	411	270.126	440	CPP20-8W	438
79.017	411	270.127	440	CPP20-10W	438
79.018	411	270.130.O	443	CPP20-12W	438
79.019	411	270.131	441	CPP20L-6W	439
79.020	411	270.138	441	CPP20L-8W	439
79.023	411	270.148	441	CPP20L-10W	439
79.024	411	270.181	441	CPP20L-12W	439
79.025	412	270.182.O	443	CPS20-02W	438
79.026	412	270.227	441	CPS20-03W	438
79.027	412	270.228	443	CPS20-04W	438
79.028	412	270.229	442	CPS20-6W	438
79.029	412	270.230	442	CPS20-8W	438
79.030	412	270.245	442	CPS20-10W	438
79.031	412	270.279	441	CPS20-12W	438
79.032	412	270.280	441	EBA.08H.2-A	360
79.033	412	270.297	441	EIL.05H.1	357
79.034	412	270.302	442	EIL.05H.2	357
79.035	412	270.303	442	EIL.05H.4	357
79.036	412	270.304	442	EIL.05L.1	357
112.004.001._*	116	270.306	443	EIL.05L.2	357
112.005.002._*	116	270.307	443	EIL.05L.4	357
112.006.003._*	116	270.308	443	EIL.07H.1	357
112.008.007._*	116	270.320	441	EIL.07H.2	357
112.010.011._*	116	270.323	441	EIL.07H.4	357
112.012.015._*	116	270.334	442	EIL.07L.1	357

Item no.	Page	Item no.	Page	Item no.	Page
EIL.07L.2	357	GR01.070	52	GR02.038	73
EIL.07L.4	357	GR01.071	52	GR02.040	78
EIL.07P.1	357	GR01.080	52	GR02.041	78
EIL.07P.4	357	GR01.081	52	GR02.043	78
EMA.90x14	364	GR01.082	52	GR02.050	80
GR01.001.2000	46	GR01.083	52	GR02.051	80
GR01.002.2000	46	GR01.084	52	GR02.052	80
GR01.003.2000	46	GR01.085	52	GR02.053	80
GR01.004.2000	46	GR01.086	52	GR02.060	81
GR01.006.2000	46	GR01.088A	50	GR02.061	81
GR01.007.2000	46	GR01.089A	50	GR02.063	81
GR01.008.2000	48	GR01.090A	50	GR02.070A	95
GR01.009.2000	48	GR01.091A	50	GR02.071A	95
GR01.010	53	GR01.092A	50	GR02.072A	95
GR01.011	53	GR01.093A	50	GR02.083	95
GR01.012	53	GR01.094A	50	GR02.084	95
GR01.013	53	GR01.095A	50	GR02.085	95
GR01.015	53	GR01.096A	50	GR02.100	95
GR01.016	53	GR01.097A	50	GR02.101A	95
GR01.017	53	GR01.098A	50	GR02.102A	95
GR01.018	53	GR01.100	62	GR02.104	95
GR01.020A	54	GR01.101A	50	GR02.105	95
GR01.021	54	GR01.102A	50	GR02.106	95
GR01.022	54	GR01.103	50	GR02.107	95
GR01.023	55	GR01.104	50	GR02.140	96
GR01.024	55	GR01.105	50	GR02.141	96
GR01.025	55	GR01.110	68	GR02.142	96
GR01.026	54	GR01.111	68	GR02.153	96
GR01.027	54	GR01.112	68	GR02.154	96
GR01.030	56	GR01.120	63	GR02.155	96
GR01.031	56	GR01.121	63	GR02.170	96
GR01.032	56	GR01.122	63	GR02.171	96
GR01.034	66	GR01.123	63	GR02.172	96
GR01.035	66	GR02.001A	69	GR02.180	96
GR01.036	66	GR02.003A	69	GR02.181	96
GR01.037	66	GR02.004	69	GR02.182	96
GR01.040	56	GR02.005	69	GR02.220	75
GR01.041	56	GR02.006	76	GR02.221	75
GR01.042	56	GR02.010A	70	GR02.222	75
GR01.046	65	GR02.011A	70	GR02.227	213
GR01.047	65	GR02.013A	70	GR02.228	213
GR01.048	65	GR02.014	71	GR02.229	213
GR01.050	58	GR02.015	71	GR02.230	79
GR01.051	58	GR02.016	70	GR02.231	79
GR01.052	58	GR02.020	74	GR02.232	79, 213
GR01.053	58	GR02.022	74	GR02.233	213
GR01.054	64	GR02.023	74	GR02.240	97
GR01.055	64	GR02.024	74	GR02.241	97
GR01.056	64	GR02.026	72	GR02.242	97
GR01.060	59	GR02.027	72	GR02.250	97
GR01.061	59	GR02.028	72	GR02.251	97
GR01.062	61	GR02.029	72	GR02.252	97
GR01.063	60	GR02.030A	77	GR02.260	97
GR01.064	60	GR02.031A	77	GR02.261	97
GR01.065	67	GR02.035	73	GR02.262	97
GR01.066	67	GR02.036	73	GR02.270	98
GR01.069	52	GR02.037	73	GR02.273	98

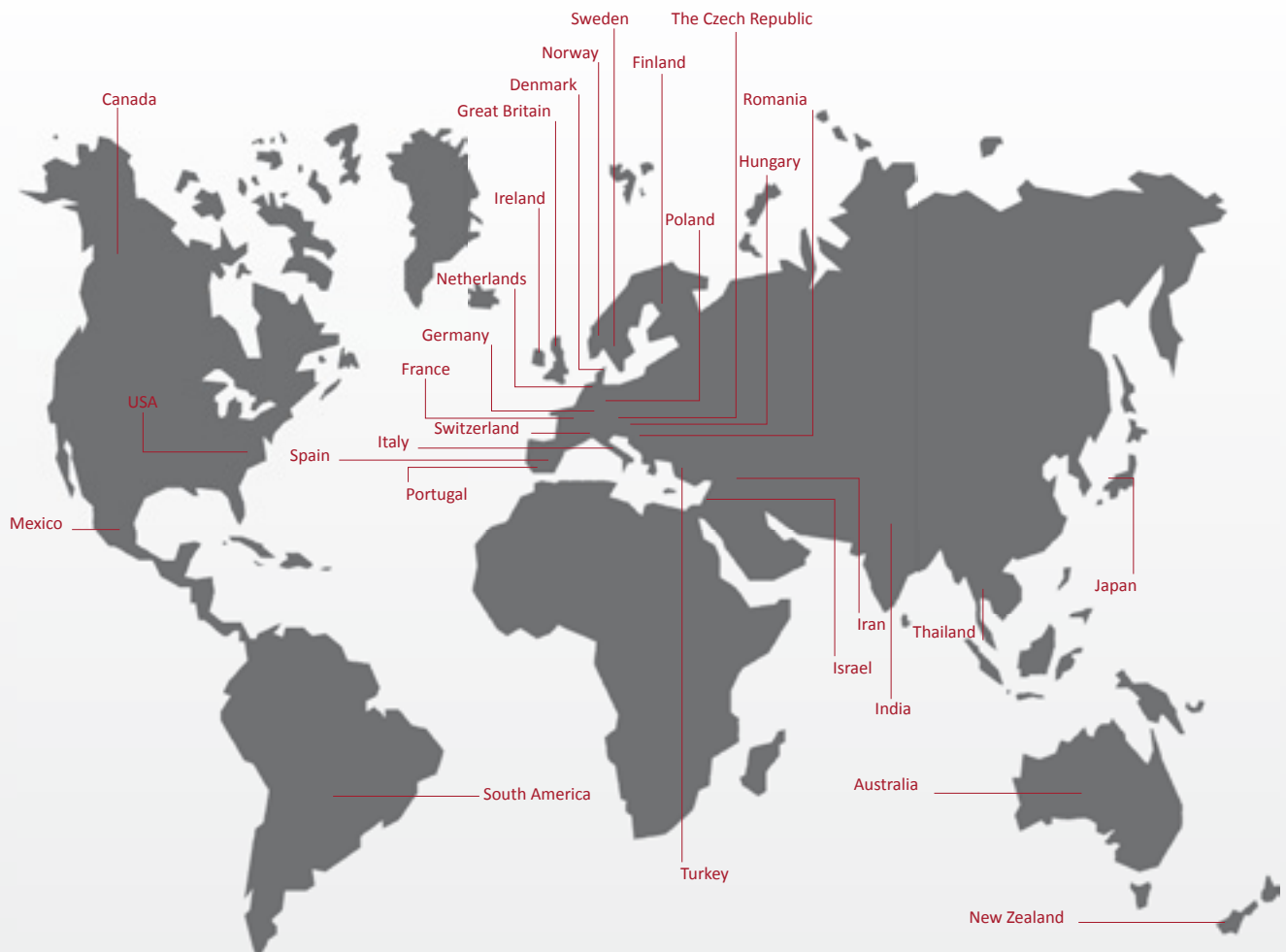
Item no.	Page	Item no.	Page	Item no.	Page
GR02.280	212	GR03.260	103	GR04.122-25-1	180
GR02.281	212	GR03.261	103	GR04.122-25-4	180
GR02.282	212	GR03.262	103	GR04.122-25S	175
GR02.283	212	GR04.034	164	GR04.122-32	175
GR02.284	212	GR04.034-H	170	GR04.122-32-1	180
GR02.285	212	GR04.035	166	GR04.122-32-4	180
GR02.286	212	GR04.036	170	GR04.122-32S	175
GR02.287	212	GR04.037	169	GR04.122-40	175
GR02.300	87	GR04.038S	168	GR04.122-40-1	180
GR03.001A	101	GR04.040	164	GR04.122-40-4	180
GR03.002A	101	GR04.041	166	GR04.122-40S	175
GR03.003A	101	GR04.044	164	GR04.123-10	197
GR03.010A	101	GR04.044-H	170	GR04.123-10-1	200
GR03.011A	101	GR04.045	166	GR04.123-16	197
GR03.012A	101	GR04.046	170	GR04.123-16-1	200
GR03.036	101	GR04.047	169	GR04.123-20	197
GR03.037	101	GR04.080	138	GR04.123-20-1	200
GR03.038	101	GR04.090	139	GR04.123-25	197
GR03.039	101	GR04.091	139	GR04.123-25-1	200
GR03.040	102	GR04.100	140	GR04.123-32	197
GR03.041A	102	GR04.100-HNBR	144	GR04.123-32-1	200
GR03.042A	102	GR04.101A	141	GR04.125-16	191
GR03.050A	102	GR04.101A/NPN	141	GR04.125-16L	194
GR03.051A	102	GR04.102A	140	GR04.125-25	191
GR03.052A	102	GR04.103	143	GR04.125-25L	194
GR03.070A	102	GR04.103-1	145	GR04.125-32	191
GR03.071A	102	GR04.103-2	145	GR04.125-32L	194
GR03.072A	102	GR04.103-3	145	GR04.125-40	191
GR03.073A	102	GR04.103-4	145	GR04.125-40L	194
GR03.074A	102	GR04.104	141	GR04.125-50	191
GR03.075A	102	GR04.104/NPN	141	GR04.125-50L	194
GR03.080A	104	GR04.110	161	GR04.125-60	191
GR03.081A	104	GR04.110A	159	GR04.125-80	191
GR03.090A	104	GR04.110A/NPN	159	GR04.130F	151
GR03.091A	104	GR04.110B	159	GR04.130C-1	152
GR03.114	104	GR04.111A	158	GR04.130C-2	152
GR03.115	104	GR04.111A/NPN	158	GR04.130C-3	152
GR03.120B	105	GR04.114	172	GR04.130C-4	152
GR03.121B	105	GR04.115	172	GR04.131D	149
GR03.130B	105	GR04.116	172	GR04.131A	146
GR03.131B	105	GR04.121-10	201	GR04.131B	146
GR03.152B	105	GR04.121-16	201	GR04.131C	148
GR03.153B	105	GR04.121-20	201	GR04.131E	149
GR03.160	99	GR04.121-25	201	GR04.131E/NPN	149
GR03.161	99	GR04.122-10	175	GR04.131D/NPN	149
GR03.162	99	GR04.122-10-1	180	GR04.131-S1	378
GR03.163	99	GR04.122-10-4	180	GR04.131-S2	378
GR03.164	99	GR04.122-10S	175	GR04.140A	153
GR03.165	99	GR04.122-16	175	GR04.140B	153
GR03.200	100	GR04.122-16-1	180	GR04.140B/NPN	153
GR03.201	100	GR04.122-16-4	180	GR04.189	174
GR03.240	103	GR04.122-16S	175	GR04.190	174
GR03.241	103	GR04.122-20	175	GR04.191	174
GR03.242	103	GR04.122-20-1	180	GR04.193N	378
GR03.250	103	GR04.122-20-4	180	GR04.193P	378
GR03.251	103	GR04.122-20S	175	GR04.196A	163
GR03.252	103	GR04.122-25	175	GR04.197A	162

Item no.	Page	Item no.	Page	Item no.	Page
GR04.197B	162	GR04.840B-20-10	155	GR05.101	36
GR04.198	374	GR04.840B-20-10/NPN	155	GR05.102	36
GR04.198/NPN	374	GR04.840B-20-20	155	GR05.201-X	254
GR04.199	374	GR04.840B-20-20/NPN	155	GR05.202-X	254
GR04.199/NPN	374	GR04.840B-20-30	155	GR05.203-X	254
GR04.202N	374	GR04.840B-20-30/NPN	155	GR05.204-X	254
GR04.202P	374	GR04.840B-20/NPN	155	GR05.205-X	254
GR04.203N	374	GR04.840B-30	155	GR06.001	90
GR04.203P	374	GR04.840B-30/NPN	155	GR06.002A	90
GR04.280N	374	GR04.F01-35	206	GR06.003	90
GR04.280P	374	GR04.F01-40	206	GR06.020	91
GR04.300	389	GR04.F01-45	206	GR06.021A	91
GR04.304	389	GR04.F02-50	206	GR06.022	91
GR04.308	389	GR04.F02-55	206	GR06.034	211
GR04.312	389	GR04.F02-60	206	GR06.035	211
GR04.510	185	GR04.F02-65	206	GR06.036	211
GR04.510-1	185	GR04.F02-70	206	GR06.037	211
GR04.510-2	185	GR04.F02-75	206	GR06.045S	387
GR04.516	185	GR04.F02-80	206	GR06.050	204
GR04.516-1	185	GR04.F02-85	206	GR06.050S-M8	386
GR04.516-2	185	GR04.F02-90	206	GR06.050S-M12	386
GR04.520	185	GR04.F02-95	206	GR06.051	204
GR04.520-1	185	GR04.F02-100	206	GR06.051S-M18	386
GR04.520-2	185	GR04.F208	208	GR06.052	204
GR04.525	188	GR04.F210	208	GR06.053	204
GR04.525-1	188	GR04.F212	208	GR06.054	204
GR04.525-2	188	GR04.F214	208	GR06.055	204
GR04.532	188	GR04.F218	208	GR06.060	92
GR04.532-1	188	GR04.F222	208	GR06.061	92
GR04.532-2	188	GR04.F227	208	GR06.062	92
GR04.600-12	182	GR04.F233	208	GR06.063	92
GR04.600-16	182	GR04.F241	208	GR06.125-16	205
GR04.600-20	182	GR04.F251	208	GR06.125-20	205
GR04.600-26	182	GR04.F263	208	GR06.125-25	205
GR04.600-32	182	GR05.001	84	GR06.125-32	205
GR04.700-20	228	GR05.001A	83	GR06.125-40	205
GR04.700-25	228	GR05.002	85	GR06.125-50	205
GR04.710-25	230	GR05.003	86	GR06.125-60	205
GR04.710-50	230	GR05.021	13	GR06.125-80	205
GR04.710-75	230	GR05.022	14	GR07.001	321
GR04.710-100	230	GR05.022-W	17	GR07.002	321
GR04.715-70	232	GR05.022-X	14	GR07.010	322, 444
GR04.720-25	230	GR05.023	16	GR07.011	322, 444
GR04.720-50	230	GR05.024	16	GR07.012	322, 444
GR04.725-60	234	GR05.031	13	GR07.012-5	308
GR04.725-90	234	GR05.032	14	GR07.012-10	308
GR04.730-20	228	GR05.032-W	17	GR07.013	322
GR04.740B	226	GR05.032-X	14	GR07.016-5	308
GR04.840A-10	155	GR05.041	13	GR07.016-10	308
GR04.840A-20	155	GR05.042	14	GR07.016-20	308
GR04.840A-20-10	155	GR05.042-W	17	GR07.016-30	308
GR04.840A-20-20	155	GR05.042-X	14	GR07.020	82
GR04.840A-20-30	155	GR05.051	13	GR07.020-5	308
GR04.840A-30	155	GR05.052	14	GR07.020-10	308
GR04.840B-10	155	GR05.052-W	17	GR07.020-20	308
GR04.840B-10/NPN	155	GR05.052-X	14	GR07.020-30	308
GR04.840B-20	155	GR05.100	36	GR07.020-50	308

Item no.	Page	Item no.	Page	Item no.	Page
GR07.021	325	GR09.xx3	215	GT-NR10H	296
GR07.022	324	GR-XL01.003.2000	49	GT-NR10L	263
GR07.024	324	GR-XL01.004.2000	49	GT-NR10S	297
GR07.025-5	308	GR-XL01.005.2000	49	GT-NR10ST2	298
GR07.025-10	308	GR-XL01.012	53	GT-NR20	263
GR07.025-20	308	GR-XL01.013	53	GT-NR20GR	299
GR07.025-30	308	GR-XL01.020	54	GT-NR20H	296
GR07.025-50	308	GR-XL01.021	54	GT-NR20S	297
GR07.026	326	GR-XL01.022	54	GT-NR20ST2	298
GR07.028	326	GR-XL01.025	63	GT-NR30	263
GR07.030	323	GR-XL01.026	63	GT-NR30GR	299
GR07.032-5	308	GR-XL01.028	64	GT-NR30H	296
GR07.032-10	308	GR-XL01.029	65	GT-NR30S	297
GR07.032-20	308	GR-XL01.035	66	GT-NR30ST2	298
GR07.032-30	308	GR-XL01.062	61	GT-NR50	263
GR07.032-50	308	GR-XL01.063	60	GT-NR50H	296
GR07.040	236	GR-XL01.100	50	GT-NR50ST2	298
GR07.041	236	GR-XL01.101	50	GT-NS2	263
GR07.042	237	GR-XL01.102	50	GT-NS3	263
GR07.112-25	311	GR-XL01.103	50	GT-NS5	263
GR07.112-50	311	GR-XL01.104	50	GT-NS7	263
GR07.112-75	311	GR-XL01.105	52	GT-NS10L	263
GR07.116-25	311	GR-XL01.106	50	GT-NS20	263
GR07.116-50	311	GR-XL02.003	69	GT-NS20H-1	263
GR07.116-75	311	GR-XL02.005	69	GT-NS30	263
GR07.116-100	311	GR-XL02.013	70	GT-NT03	287
GR07.196	320	GR-XL02.016	70	GT-NT03-4	287
GR07.197	320	GR-XL02.022	74	GT-NT03R	287
GR07.198	320	GR-XL02.024	74	GT-NT03R-4	287
GR07.199	320	GR-XL02.029	72	GT-NT05	287
GR07.208-30	313	GR-XL02.033	77	GT-NT05-4	287
GR07.208-50	313	GR-XL02.038	73	GT-NT05R	287
GR07.208-75	313	GR-XL05.032	14	GT-NT05R-4	287
GR07.216-30	313	GR-XL05.052	14	GT-NT10	287
GR07.216-50	313	GT-H12K	292	GT-NT10-6	287
GR07.216-75	313	GT-H30	292	GT-NT10R	287
GR07.216-100	313	GT-H120K	292	GT-NT10R-6	287
GR07.220-30	313	GT-HS30	292	GT-NT20	287
GR07.220-50	313	GT-HWR1	294	GT-NT20-6	287
GR07.220-75	313	GT-HWR10	294	GT-NT20R	287
GR07.220-100	313	GT-HWS1	294	GT-NT20R-6	287
GR07.220-125	313	GT-HWS10	294	GT-NY05	279
GR07.220-150	313	GT-N3	262	GT-NY05-4	279
GR07.506-10	317	GT-N5	262	GT-NY05R	279
GR07.506-20	317	GT-N7	262	GT-NY05R-4	279
GR07.506-30	317	GT-N10	262	GT-NY10	279
GR07.510-10	317	GT-N12	262	GT-NY10-4	279
GR07.510-20	317	GT-N20	262	GT-NY10R	279
GR07.510-30	317	GT-N30	262	GT-NY10R-4	279
GR07.516-10	317	GT-N50	262	GT-NY15	279
GR07.516-20	317	GT-NF05	278	GT-NY15-4	279
GR07.516-30	317	GT-NF10	278	GT-NY15R	279
GR07.520	88	GT-NF15	278	GT-NY15R-4	279
GR07.520S	89	GT-NR3	263	GT-NY25	279
GR07.521	88	GT-NR5	263	GT-NY25-6	279
GR09.xx1	225	GT-NR7	263	GT-NY25R	279
GR09.xx2	215	GT-NR10GR	299	GT-NY25R-6	279

Item no.	Page	Item no.	Page	Item no.	Page
H12ME30K	293	N20AS	276	NY10RAJ	281
H30ME	293	N20BFB	274	NY15AH	284
H120SK	293	N20HS	276	NY15AJ	281
HW1J	295	N20PF	268	NY15AJB	281
HW10J	295	N30AA114	268	NY15AJL	281
LT10	384	N30AE	273	NY15AJT	281
LT10/NPN	384	N30AH	272	NY15RAH	284
LT18OHT	382	N30AJ	266	NY15RAJ	281
LT18OHT/NPN	382	N30AJL	266	NY25AH	284
LT19	382	N30AL525	271	NY25AJ	281
LT19/NPN	382	N30AML	270	NY25AJB	281
M8B3 / M8S4	381	N30AMR	270	NY25AJL	281
M8B4 / M8S3	381	N30AP	268	NY25RAH	284
MG35	219	N30AS	276	NY25RAJ	281
MG55	219	N30BBB	276	P-10L	265
MG70	219	N30PF	268	P-20	265
N3AE	273	N50AB	268	P-30	265
N3AJ	266	N50ABH41	268	P-50	265
N3AP	268	N50AE	273	PPF120.230-P20	250
N3AS	276	N50AJL	266	PPF120.230-P40	250
N3BJ	274	N50AS	274	PPF120.400-P20	250
N3HS	276	N50BBB	276	PPF120.400-P40	250
N5AE	273	NE05AJ	289	PPF160.600-P20	250
N5AP	268	NE10AJ	289	PPF160.600-P40	250
N5AS	276	NT03AJ	289	PPF200.400-P20	250
N5BJ	274	NT03AJT	289	PPF200.400-P40	250
N5HS	276	NT05AE	291	PPF-600x400-20	250
N7AE	273	NT05AJ	289	PPF-600x400-28	250
N7AP	268	NT05AJB	289	PPF-600x400-40	250
N7AS	276	NT05AJH	289	PPF-1300x260-20	250
N7BJ	274	NT05AJL	289	PPF-1300x260-28	250
N7HS	276	NT05AJT	289	PPF-1300x260-40	250
N7PF	268	NT10AE	291	PPF-1300x500-20	250
N10AE	273	NT10AJ	289	PPF-1300x500-28	250
N10AP	268	NT10AJB	289	PPF-1300x500-40	250
N10AS	276	NT10AJH	289	PPF-TL-100x250x12	250
N10HS	276	NT10AJL	289	PPF-TL-100x250x24	250
N10LAB2	266	NT10AJT	289	PPF-TL-150x300x12	250
N10LAB152	268	NT20AJ	289	PPF-TL-150x300x24	250
N10LAP	268	NT20AJB	289	PPF-TL-200x350x12	250
N10LAS	276	NT20AJH	289	PPF-TL-200x350x24	250
N10LPF	268	NT20AJL	289	PPF-TL-250x400x12	250
N12AP	268	NY05AH	284	PPF-TL-250x400x24	250
N12AS	276	NY05AJ	281	QC3-3M	428
N12HS	276	NY05AJB	281	QC3-4M	428
N20AA27	268	NY05AJL	281	QC3-6M	428
N20AA239	268	NY05AJT	281	QC4-3M	428
N20AB39	266	NY05BJ	286	QC4-4M	428
N20AB360	268	NY05RAH	284	QC4-6M	428
N20AE	273	NY05RAJ	281	QC6-3M	428
N20AH	272	NY05RBJ	286	QC6-4M	428
N20AJ	266	NY10AH	284	QC6-6	428
N20AJL	266	NY10AJ	281	QC6-6M	428
N20AL	271	NY10AJB	281	QC6-8	428
N20AML	270	NY10AJL	281	QC8-6	428
N20AMR	270	NY10AJT	281	QC8-8	428
N20AP	268	NY10RAH	284	SR50-A	18

Item no.	Page
SR50-A-SL	20
SR50-B	22
SR50-C	36
SR90-A	24
SR90-A-MV	24
SR90-A-SL	26
SR90-B	28
SR90-C	36
SR90-W	37
SR150-A	30
SR150-A-SL	32
SR150-B	34
SR150-C	36
SR150-W	37
TC120x230-P20	240
TC120x230-P40	240
TC120x400-P20	240
TC120x400-P40	240
TC200x400-P20	240
TC200x400-P40	240
TC600x400-P20-OV*	240
TC600x400-P28-OV*	240
TC600x400-P40-OV*	240
TC1300x260-P20-OV*	240
TC1300x260-P28-OV*	240
TC1300x260-P40-OV*	240
TC1300x500-P20-OV*	240
TC1300x500-P28-OV*	240
TC1300x500-P40-OV*	240
TG100x250	248
TG150x300	248
TG200x350	248
TG250x400	248
TG300x500	248
TG400x600	248
TL100x250	244
TL150x300	244
TL200x350	244
TL250x400	244
VTA-Set	224
VTA-Set-1 *	224
VTB-Set	224
WR 0425	407
WR 0640	407
WR 0850	407
WR 0860	407
WR 1065	407
WR 1075	407
WR 1280	407
WR 1290	407
WR 1613	407



Imprint

Our General Terms and Conditions apply; they can be viewed at our website www.fipa.com or requested by calling +49 (0) 89 24 89 - 0.

Copyrights

All pages and their contents are copyright protected (all rights reserved). All names, trademarks, logos, text and images are the property of the respective owners and must be treated as such.

Realization: FIPA GmbH, Ismaning / Germany

Printed by: Concordia Druckerei, Mannheim / Germany

Production of environmentally friendly prints using green power and development of chemical-free printing plates.

Exclusion of liability

This catalogue was compiled with the greatest possible care. Nevertheless, FIPA provides no warranty that the information contained herein will be accurate and free of errors. FIPA rules out any liability for damages that result directly or indirectly from the use of the FIPA catalogue to the extent that these damages were not caused by premeditation or gross negligence on behalf of FIPA.

FIPA shall not be held liable for any damage resulting from ready-made modules preassembled by FIPA if a check as to their suitability for the particular application has not been made prior to them being put into operation by the customer.

Created in January 2015

FIPA GmbH

Freisinger Straße 30

85737 Ismaning

Phone +49 (0)89/96 24 89 – 0

Fax +49 (0)89/96 24 89 – 11

info@fipa.com

www.fipa.com

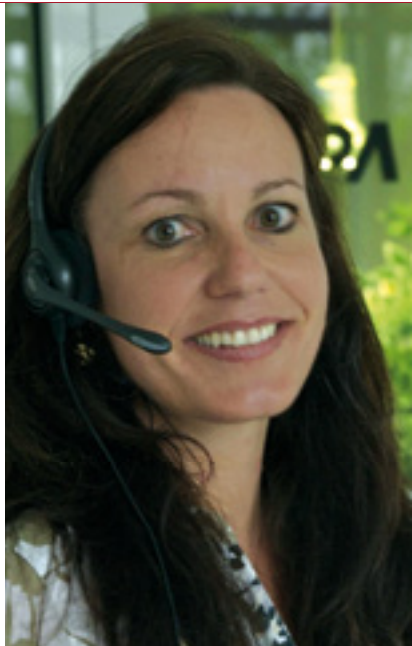
Executive Manager: Rainer Mehrer

Company headquarters: Ismaning

Commercial register: München, HRB 104 684

Sales tax ID No.: DE161864784

Stay up-to-date on everything related to
material flow with the free FIPA newsletter.
Subscribe now at www.fipa.com!



- > Do you have a technical question about our products?
- > Would you like a quote?
- > Or are you interested in CAD data or datasheets of our products?

You will get what you need quickly by calling us at **+49 (0) 89 / 96 24 89-0**,
by sending us an email at info@fipa.com or just by visiting
our website www.fipa.com.



Contact information
for your smartphone

FIPA worldwide

FIPA GmbH

Freisinger Straße 30
85737 Ismaning / Germany
Phone +49 (0)89 / 96 24 89 – 0
Fax +49 (0)89 / 96 24 89 – 11
info@fipa.com | www.fipa.com

FIPA Inc.

1855 Evans Road
Cary, NC 27513 / USA
Phone +1 (919) 651 9888
Fax +1 (919) 573 0871
sales.us@fipa.com | www.fipa.com

FIPA Ltd.

The Trendy Plaza, 10/30 1A Floor
Sukhumvit 13 Klong Toey Nua, Wattana
10110 Bangkok / Thailand
Phone +66 (0) 2 168 7036
Fax +66 (0) 2 168 7037
sales.th@fipa.com | www.fipa.com

FIPA
Material in Motion