Study development +GF+ Piping plastic pipes, fittings and valves

after product groups, market segments, countries

> Special focus on plastic ball, butterfly, diaphragm and pressure valves <

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1. Mission and order

In this elaboration, the +GF+ Piping success story is presented with hard and soft facts.The market for plastic pressure pipe system products in industrial applications has developed very positively in recent years. For all market participants, including manufacturers of metal products, which are partially substituted, it is of particular interest how the market leader +GF+ develops.

Hillinger + Partner (H + P) has worked out several market studies in the last few years in the field of pipes, fittings, valves in various plastics and metals. Et al **Ball, Butterfly, Diaphragm, Coax, Pressure and Solenoid Valves.** To optimize the information in the direction of the customer's wishes, excerpts from these studies are used in this analysis.

With these results and the analysis of the actual - state with the ordering company (not ordered option) about an elevation with the help of answers of the ordering company to specific 160 questions of Hillinger+Partner as a base a marketing concept with chances, risks and ways is compiled and suggested. This concept from a holistic view point to the ordering company from the manufacturer's area or the commercial area like he can reach possible, realistic targets with the turnover / yields and the market shares. Production criteria, up to planning considerations to the production, are not treated in this investigation.

An attempt is made to answer the following questions in the defined analysis:
- What needs do the segments / main customers have on the market?
- Who are the main customers with which concrete potential?
- How big is the market potential regional?
- What is the market potential of the relevant product groups?
- Which product areas do the main competitors offer?

Answers that might provide an actual is-analysis (not ordered option), a tuned Dynamic Optimization Process (DOP) with an extended order:

- How is the competitive situation assessed in the market segments and among the target groups?
- What opportunities and ways can the ordering company use to develop successfully based on its actual situation in this market?

For reasons of the simplification and better legibility only the male form is given in the study with personal names and functional names. The female form is always also meant.

2. Introduction, definitions and demarcations

It’s about a special and limited analysis and research, which is modularly tailored to customers if you see to the different valve constructions / functions..
The marketing of components and systems of the piping construction with valves, automation valves, fittings, pipes and the flow measurement and control in sundry technical plastics on the world market is discussed.

An especial deep analysis of the German market with allusions to the differences in other countries and regions let the customer carry out deductions for the marketing in other regions of the world.
The main customers are demonstrated very diaphanously for the fast and practical sales utilisation. This occurs with name, location, market segment, the separated need for the materials cemented plastics (PVC-C, PVC-U, and ABS), weldable plastics (PP, PE and PB), the fluorine plastics PVDF and PFA as well as the automation valves and the flow measurement and control. (Not ordered option)

Piping systems are piping components, which are planned to fit optimal together in their function, their connection technique and their material compatibility. The fabricator and the user can simply combine, assemble and use them with the system guarantee of the producer.

Plastic-pressure piping products are installed in the building technology, the industry and the utility with the gas and water distribution. Neutral, demanding and aggressive, gaseous and liquid medias are conducted through the components and have to be controlled by them.
As previously explained, in this analysis we restrict to the main market segment industry with the multitude of different applications and the main market segment distribution i.e. the applications in the gas and water distribution, because here are many considerable overlaps and partial similarities.

The growing automation level in every domain, connected with the specific advantages of modern components of plastics let the market grow up worldwide in the trend.

Many new demands of the users and the concentration of the size, both on the side of the producers and of the customers, intensify the competition. Contractors, who want to have success, have to be wary and to act flexible, innovative and operational excellent.

Among the intensive observation of the competitors, it is important to divine the trends and the development of the customers. The neighbourly disciplines electronics, electro-technics, hydraulics, pneumatic and process technique, give, both in use and of the results of development and researches, hints for the conception of plastic-pressure piping products.

The market also shows a qualitative growth. This is caused by the higher claims to the quality, functionality, efficiency and the service kindness of the products. In many cases a modular system is useful for customers and producers. In this connection there is demand for universally constructed products. On the other side there is a demand for very simple products, which barely cover an application optimally.
Good chances, to bridge a gap in the market, to open up new markets and to assure those for yourself to enlarge the own exchange and market shares, arise for all contractors.

A successful expansion by the producers, contractors and the users, an ideal choice of products and performances, premise, however, corresponding efforts, which vary from the common and familiar efforts. The precise knowledge of the market amongst others with specific details, both of the side of the producer and of the user, is the precondition for the initiation of effective marketing actions and the advantages of the best possibility of sourcing.

Because of the limit of the extend of the analysis and due to the fast change of the market, the results show relating to the conclusion, adequate risks.

New materials, new technologies, thedDigitalization and creative ideas with the operations in connection with innovative product developments for the substitution of given products and systems lead in the result to better, more user-friendly components, products and to more economic solutions.

H + P calculates with the fixed price not the result but the necessary working time We provide you with information from the open market as a service. Details and scope were closely matched in the content. A certain result can not be guaranteed.

The market analysis to be created in service is quite complex, consists of many different topics and contains, as already also executed estimated information and values ,.

Our consulting is based on the trust of our customers in our solid and good performance. We always want to live up to this reputation.

MV means market volume in Mio EURO. It contains the whole world market with all market segments,of all producing consolidated competitors. For +GF+ in the Excel file it means the worldwide turnover in Mio EURO.

H+P has followed the development of +GF+ very closely for a long time and has a lot of informations. Statistics with numbers and values are important. But sometimes qualitative assessments and valuation are even more important for decisions. If you disclose the upcoming decisions to us, we may suggest qualitative recommendations

The main information sources of the study are:

- More than 30 years market experience of H+P partners in the piping sector
- Expert discussions with important and typical customers
- Interviews with producers, dealers, plumbers, endusers and subsuppliers
- Exposition visits and discussions with users and suppliers
- Publications of the „Statistik Bundesamt Germany", BFAI, IFO, OECD
- Statistics of INSEE, Federation de la Plasturgie
- Publications and statistics of VDMA, CEIR, VKE, KWD, Global Pipe
- Statistics FIGAWA, KRV, ZVEI, ZVSHK
- Statistics of associations in USA, Japan, UK, F, I, E, CH, Asia, Africa
- Delphi report scientific and Technic
- Exposition catalogs Achema, ISH, IFAT, Water, Interkama
- Plastic piping book, Vulkan-Verlag, Essen, 4. Edition
- Company documentations, Catalogs, Customer journals
- Journal – Articles, Advertising, Press informations
- Press – economic news

2.1 Main product ranges – Ball Valves

A **ball valve** is a valve with a spherical disc, the part of the valve which controls the flow through it. The sphere has a hole, or port, through the middle so that when the port is in line with both ends of the valve, flow will occur. When the valve is closed, the hole is perpendicular to the ends of the valve, and flow is blocked. The handle or lever will be inline with the port position letting you "see" the valve's position. The ball valve, along with the butterfly valve and plug valve, are part of the family of *quarter turn valves*.

Ball valves are durable and usually work to achieve perfect shutoff even after years of disuse. They are therefore an excellent choice for shutoff applications (and are often preferred to globe valves and gate valves for this purpose). They do not offer the fine control that may be necessary in throttling applications but are sometimes used for this purpose.

Ball valves are used extensively in industry because they are very versatile, supporting pressures up to 700 bars and temperatures up to 200°C. Sizes typically range from 4 mm to 1400 mm. They are easy to repair and operate.

The body of ball valves may be made of metal, plastic or metal with a plastic or a ceramic center. The ball is often chrome plated to make it more durable.

There are five general body styles of ball valves: *single body*, *three piece body*, *split body*, *top entry*, and *welded*. The difference is based on how the pieces of the valve—especially the casing that contains the ball itself—are manufactured and assembled. The valve operation is the same in each case.

In addition, there are different styles related to the bore of the ball mechanism itself:

- A *full port* or more commonly known *full bore* ball valve has an over-sized ball so that the hole in the ball is the same size as the pipeline resulting in lower friction loss. Flow is unrestricted but the valve is larger and more expensive so this is only used where free flow is required, for example in pipelines which require pigging.

- In *reduced port* or more commonly known *reduced bore* ball valves, flow through the valve is one pipe size smaller than the valve's pipe size resulting in flow area being smaller than pipe. As the flow discharge remains constant and is equal to area of flow (A) times velocity (V), $A_1V_1 = A_2V_2$ the velocity increases with reduced area of flow.

- A *V port* ball valve has either a 'v' shaped ball or a 'v' shaped seat. This allows the orifice to be opened and closed in a more controlled manner with a closer to linear flow characteristic. When the valve is in the closed position and opening is commenced the small end of the 'v' is opened first allowing stable flow control during this stage. This type of design requires a generally more robust construction due to higher velocities of the fluids, which might damage a standard valve.

- A trunnion ball valve has additional mechanical anchoring of the ball at the top and the bottom, suitable for larger and higher pressure valves (say, above 100 mm and 40 bars).

- Cavity filler Ball Valve. Many industries encounter problem with residues in the ball valve. Where the fluid is meant for human consumption, residues may also be health hazard, and when where the fluid changes from time to time contamination of one fluid with another may occur. Residues arise because in the half open position of the ball valve a gap is created between the ball bore and the body in which fluid can be trapped. To avoid the fluid getting into this cavity, the cavity has to be plugged, which can be done by extending the seats in such a manner that it is always in contact with the ball. This type of ball valve is known as Cavity Filler Ball Valve.

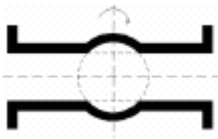
Manually operated ball valves can be closed quickly and thus there is a danger of water hammer. Some ball valves are equipped with an actuator that may be pneumatically or motor operated. These valves can be used either for on/off or flow control. A pneumatic flow control valve is also equipped with a positioner which transforms the control signal into actuator position and valve opening accordingly.

Three-way ball valves have an L- or T-shaped hole through the middle. The different combinations of flow are shown in the figure. It is easy to see that a T valve can connect any pair of ports, or all three, together, but the 45 degree position which might disconnect all three leaves no margin for error. The L valve can connect the center port to either side port, or disconnect all three, but it cannot connect the side ports together.

Multi-port ball valves with 4 ways, or more, are also commercially available, the inlet way often being orthogonal to the plane of the outlets. For special applications, such as driving air-powered motors from forward to reverse, the operation is performed by rotating a single lever 4-way ball valve. The 4-way valve has two L-shaped ports in the ball that do not interconnect, sometimes referred to as an "×" port.

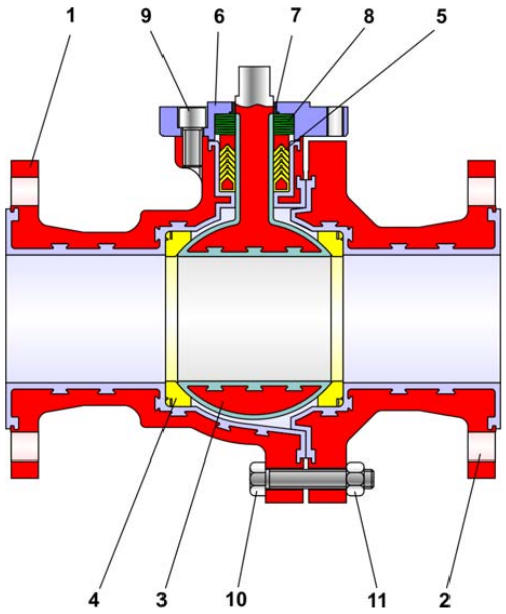
Ball valves in sizes up to 2 inch generally come in single piece, two or three piece designs. One piece ball valves are almost always reduced bore, are relatively inexpensive and generally are throw-away. Two piece ball valves are generally slightly reduced (or standard) bore, they can be either throw-away or repairable. The 3 piece design allows for the center part of the valve containing the ball, stem & seats to be easily removed from the pipeline. This facilitates efficient cleaning of deposited sediments, replacement of seats and gland packings, polishing out of small scratches on the ball, all this without removing the pipes from the valve body. The design concept of a three piece valve is for it to be repairable.

The ball valve is used, primarily, for On and Shut - function, however, also to control. He has a ball with a drilling which has the same nominal diameter like the connected pipe and can be closed with 90 ° set movement



As especially sure and easy in the construction construction count the ball valves with which one reaches the biggest flow values with the smallest dimensions. Beside the 2/2 ways passage functions there are 3/2 ways and Multi-port ball valves with 4 ways multi way functions. With nominal diameters to 150 mm varied variations what concerns body and sealing material can be also selected from the market offer. With the offers and constructions one must pay attention to the fact that, among the rest, a maintenance-free work is guaranteed by continuous adjusting of the ball poetry with behind O - ring, the appearing conduit forces on both sides by the case are taken up and with it ball and plug of additional forces can be relieved and be worked for the whole life span with a constantly low activity torque.

The dosing-ball valve is a control valve with which within his control area any flow rate can be exactly put. The ball shows a V-shaped notch which grows on the circumference of the ball continuously in width and depth, so that the flow opening from closed to open changes if the ball is turned. Dosing ball valve have a scale which registers actuel position in the area of 0 ° to 180 °.



Pos.	Description	Pos.	Description
1	Body and lining	7	Bearing bush
2	Body	8	Set of spring washers
3	Ball with shaft	9	Screw
4	Seatring	10	Screw
5	PTFE - V-ring packing	11	Nut
6	Stuffing box		

PFA-lined Ball Valve -Pfeiffer

In the following examples to the market offer of plastic ball valves:

Aliaxis FIP ball valve hand operated:

ASV-Stübbe ball valve hand operated:

+GF+ Ball Valve system

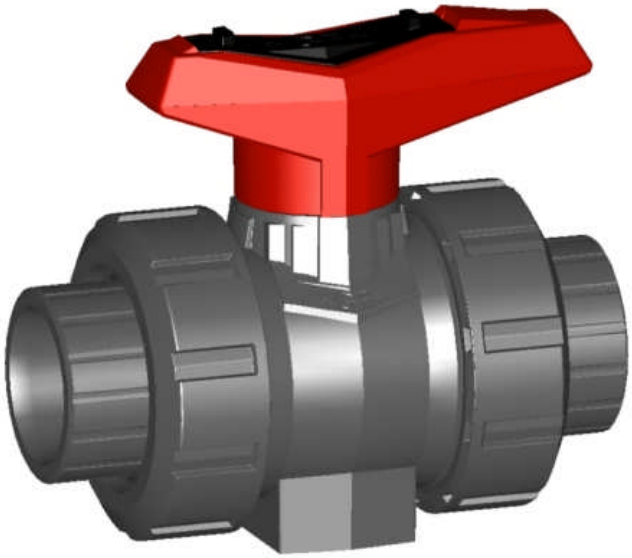
Standard Ball Valve d16/DN10 – d63/DN50

Ball Valve with multifunctional module

Ball Valve with pneumatic actuator and manual override

Ball Valve with electric actuator

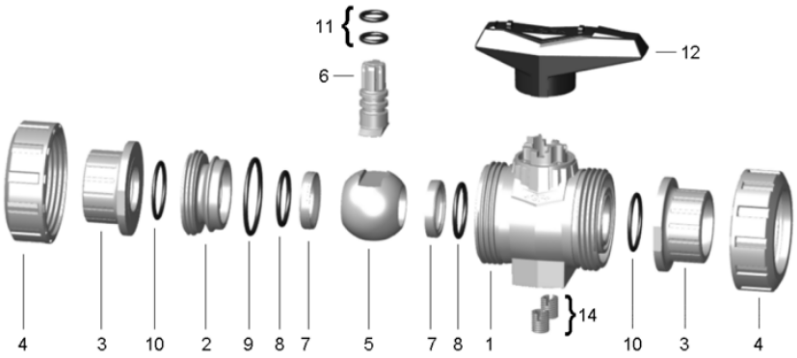
+GF+ ball valve hand operated:



DN10/15 - 50

+GF+ ball valves hand operated, electric and pneumatic operated in divers plastic materials:

+GF+ Spare parts for ball valve type 546 PP-H (DN10/15-50)



1	Body PP	1
2	Union bush PP	1
5	Ball PP	1
6	Stem PP	1
7	Ball seal PTFE	2
8	Backing seal EPDM	1
9	Body seal EPDM	1
10	Face seal EPDM	2
11	Stem seal EPDM	2
12	Lever PP black	1
14	Threaded bush Stainless steel	3

Market Volume World (MV), Turnover +GF+ Piping-Product Groups in Plastic in Mio € for the year 2016
Market Segmments, World Regions, Countries

				Market segments 2016 in % Distribution in % Trend +(P) 0 -																		
Nr	Name Product groups	MV 2012 in Mio €	MV 2016 in Mio €	Chemistry	Trend	Distribution	Steel	Trend	Distribution	Water treatment	Trend	Distribution	Semicon	Trend	Distribution	Building	Trend	Distribution	Water distribution	Trend	Distribution	
1	Fittings in plastics (MV)	XXX	XXX	XX			Xx			XX			XX			XX			XX			
2	Fittings in plastics +GF+	XXX	XXX	XX	P	95	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	
3	Pipes in plastics (MV)	XXX	XXX																			
2	Fittings in plastics +GF+	XXX	XXX																			
5	Valves in plastics (MV)	XXX	XXX																			
6	Valves in plastics +GF+	XXX	XXX																			
7	Valves Ball PE hand operated (MV)	XXX	XXX																			
8	Valves Ball PE hand operated +GF+	XXX	XXX		For allproduct groups values like Fittings!																	
9	Valves Ball Plastic electric (MV)	XXX	XXX																			
10	Valves Ball Plastic electric +GF+	XXX	XXX																			
11	Valves Ball Plastic pneumatic (MV)	XXX	XXX																			
12	Valves Ball Plastic pneumatic +GF+	XXX	XXX																			
13	Valves Ball PP hand operated (MV)	XXX	XXX																			
14	Valves Ball PP hand operated +GF+	XXX	XXX																			
15	Valves Ball PVC-C hand operated (MV)	XXX	XXX																			
16	Valves Ball PVC-C hand operated+GF+	XXX	XXX																			
17	Valves Ball PVC-U hand operated (MV)	XXX	XXX																			
18	Valves Ball PVC-U hand operated +GF+	XXX	XXX																			
19	Valves Ball PVDF hand operated (MV)	XXX	XXX																			
20	Valves Ball PVDF hand operated +GF+	XXX	XXX																			
21	Valves Butterfly Plastic electric (MV)	XXX	XXX																			
22	Valves Butterfly Plastic electric +GF+	XXX	XXX																			
23	Valves Butterfly Plastic pneumatic (MV)	XXX	XXX																			
24	Valves Butterfly Plastic pneumatic +GF+	XXX	XXX																			
25	Valves Butterfly PP hand operated (MV)	XXX	XXX																			
26	Valves Butterfly PP hand operated +GF+	XXX	XXX																			
27	Valves Butterfly PVC hand operated (MV)	XXX	XXX																			
28	Valves Butterfly PVC hand operated +GF+	XXX	XXX																			
29	Valves Butterfly PVDF hand operated (MV)	XXX	XXX																			
30	Valves Butterfly PVDF hand operated +GF+	XXX	XXX																			
31	Valves diaphragm Plastic (MV)	XXX	XXX																			
32	Valves diaphragm Plastic +GF+	XXX	XXX																			
33	Valves Pressure Plastic (MV)	XXX	XXX																			
34	Valves Pressure Plastic +GF+	XXX	XXX																			

Market Volume World (MV), Turnover +GF+ Piping-Product Groups in Plastic in Mio € for the year 2016
Market Segmments, World Regions, Countries

							Regions 2016 in %	Distribution in %	Trend + (P%) 0 -									Countries 2016 in %			
Nr	Name Product groups	MV 2012 in Mio €	MV 2016 in Mio €	Others	Trend	Distribution	Europe	Trend	Distribution	America	Trend	Distribution	Asia	Trend	Distribution	Others	Trend	Distribution	Austria	Belgium	Denmark	Finland
1	Fittings in plastics (MV)	XXX	XXX	XX			XX			XX			XX			XX			X	X	X	X
2	Fittings in plastics +GF+	XXX	XXX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
3	Pipes in plastics (MV)	XXX	XXX																			
2	Fittings in plastics +GF+	XXX	XXX																			
5	Valves in plastics (MV)	XXX	XXX																			
6	Valves in plastics +GF+	XXX	XXX																			
7	Valves Ball PE hand operated (MV)	XXX	XXX																			
8	Valves Ball PE hand operated +GF+	XXX	XXX																			
9	Valves Ball Plastic electric (MV)	XXX	XXX																			
10	Valves Ball Plastic electric +GF+	XXX	XXX																			
11	Valves Ball Plastic pneumatic (MV)	XXX	XXX																			
12	Valves Ball Plastic pneumatic +GF+	XXX	XXX																			
13	Valves Ball PP hand operated (MV)	XXX	XXX																			
14	Valves Ball PP hand operated +GF+	XXX	XXX																			
15	Valves Ball PVC-C hand operated (MV)	XXX	XXX																			
16	Valves Ball PVC-C hand operated+GF+	XXX	XXX																			
17	Valves Ball PVC-U hand operated (MV)	XXX	XXX																			
18	Valves Ball PVC-U hand operated +GF+	XXX	XXX																			
19	Valves Ball PVDF hand operated (MV)	XXX	XXX																			
20	Valves Ball PVDF hand operated +GF+	XXX	XXX																			
21	Valves Butterfly Plastic electric (MV)	XXX	XXX																			
22	Valves Butterfly Plastic electric +GF+	XXX	XXX																			
23	Valves Butterfly Plastic pneumatic (MV)	XXX	XXX																			
24	Valves Butterfly Plastic pneumatic +GF+	XXX	XXX																			
25	Valves Butterfly PP hand operated (MV)	XXX	XXX																			
26	Valves Butterfly PP hand operated +GF+	XXX	XXX																			
27	Valves Butterfly PVC hand operated (MV)	XXX	XXX																			
28	Valves Butterfly PVC hand operated +GF+	XXX	XXX																			
29	Valves Butterfly PVDF hand operated (MV)	XXX	XXX																			
30	Valves Butterfly PVDF hand operated +GF+	XXX	XXX																			
31	Valves diaphragm Plastic (MV)	XXX	XXX																			
32	Valves diaphragm Plastic +GF+	XXX	XXX																			
33	Valves Pressure Plastic (MV)	XXX	XXX																			
34	Valves Pressure Plastic +GF+	XXX	XXX																			

Market Volume World (MV), Turnover +GF+ Piping-Product Groups in Plastic in Mio € for the year 2016
Market Segmments, World Regions, Countries

				Countries 2016 in %																	
Nr	Name Product groups	MV 2012 in Mio €	MV 2016 in Mio €	France	Germany	Indonesia	Italy	Malaysia	Netherlands	Norway	Philippines	Poland	Portugal	Singapore	Spain	Sweden	Switzerland	Thailand	Turkey	Vietnum	Total
1	Fittings in plastics (MV)	XXX	XXX	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2	Fittings in plastics +GF+	XXX	XXX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
3	Pipes in plastics (MV)	XXX	XXX																		
2	Fittings in plastics +GF+	XXX	XXX																		
5	Valves in plastics (MV)	XXX	XXX																		
6	Valves in plastics +GF+	XXX	XXX																		
7	Valves Ball PE hand operated (MV)	XXX	XXX																		
8	Valves Ball PE hand operated +GF+	XXX	XXX																		
9	Valves Ball Plastic electric (MV)	XXX	XXX																		
10	Valves Ball Plastic electric +GF+	XXX	XXX																		
11	Valves Ball Plastic pneumatic (MV)	XXX	XXX																		
12	Valves Ball Plastic pneumatic +GF+	XXX	XXX																		
13	Valves Ball PP hand operated (MV)	XXX	XXX																		
14	Valves Ball PP hand operated +GF+	XXX	XXX																		
15	Valves Ball PVC-C hand operated (MV)	XXX	XXX																		
16	Valves Ball PVC-C hand operated+GF+	XXX	XXX																		
17	Valves Ball PVC-U hand operated (MV)	XXX	XXX																		
18	Valves Ball PVC-U hand operated +GF+	XXX	XXX																		
19	Valves Ball PVDF hand operated (MV)	XXX	XXX																		
20	Valves Ball PVDF hand operated +GF+	XXX	XXX																		
21	Valves Butterfly Plastic electric (MV)	XXX	XXX																		
22	Valves Butterfly Plastic electric +GF+	XXX	XXX																		
23	Valves Butterfly Plastic pneumatic (MV)	XXX	XXX																		
24	Valves Butterfly Plastic pneumatic +GF+	XXX	XXX																		
25	Valves Butterfly PP hand operated (MV)	XXX	XXX																		
26	Valves Butterfly PP hand operated +GF+	XXX	XXX																		
27	Valves Butterfly PVC hand operated (MV)	XXX	XXX																		
28	Valves Butterfly PVC hand operated +GF+	XXX	XXX																		
29	Valves Butterfly PVDF hand operated (MV)	XXX	XXX																		
30	Valves Butterfly PVDF hand operated +GF+	XXX	XXX																		
31	Valves diaphragm Plastic (MV)	XXX	XXX																		
32	Valves diaphragm Plastic +GF+	XXX	XXX																		
33	Valves Pressure Plastic (MV)	XXX	XXX																		
34	Valves Pressure Plastic +GF+	XXX	XXX																		

3.1.1 Piping +GF+ in Schaffhausen CH, Development key figures 1999 - 2017

Year	Number of employees	EBIT +GF+ Piping Mio CHF	Total turnover Mio CHF	Turnover Industry Mio CHF	Increase Industry	Turnover Part Automation of Industry Mio CHF	Turnover Gas and Water Distribution Mio CHF	Turnover Building Technology Mio CHF	1€/CHF
2017	XX	XX	XX	XX	XX	XX	XX	XX	XX
2016	XX	XX	XX	XX	XX		XX	XX	XX
2015	XX	XX	XX	XX	XX		XX	XX	XX
2014	XX	XX	XX	XX	XX		XX	XX	XX
2013	XX	XX	XX	XX	XX		XX	XX	XX
2012	XX	XX	XX	XX	XX		XX	XX	XX
2011	XX	XX	XX	XX	XX		XX	XX	XX
2010	XX	XX	XX	XX	XX		XX	XX	XX
2009	XX	XX	XX	XX	XX		XX	XX	XX
2008	XX	XX	XX	XX	XX		XX	XX	XX
2007	XX	XX	XX	XX	XX		XX	XX	XX
2006	XX	XX	XX	XX	XX		XX	XX	XX
2005	XX	XX	XX	XX	XX		XX	XX	XX
2004	XX	XX	XX	XX	XX		XX	XX	XX
2003	XX	XX	XX	XX	XX		XX	XX	XX
2002	XX	XX	XX	XX	100		XX	XX	XX
2001	XX	XX	XX	XX	XX		XX	XX	XX
2000	XX	XX	XX	XX	XX	XX	XX	XX	XX
1999	Xx	XX	xx						1,60

Automation contents:electrically and pneumatically operated valves and M+C

Germany +GF+ Piping in Mio CHF (1 EUR = 1,95583 DEM)*

2017	XX		XX	Xx		XX	XX	XX	
2011	XX		XX	Xx		XX	XX	XX	
2000*	XX		XX	Xx		XX	XX	XX	

3.2 Price policy +GF+, price structure world, gross margin Sales companies, Price examples

Worldwide, xxxx xxxxxxxx pricing policy is recognizable
A certain xxxxxxx is undeniable.
The sales companies have xxx xxxxxxxx
xxxxxxxx xxxxxxxx, also xxxxxxx from xxx to xxxt.
Variation in supply prices: 100% - xx % (extremely xx%)

The gross margins of the sales companies of + GF + are
at xx% to xx% of sales.

The xxxxxxx xxx xxx worldwide, regardless of the
Currency fluctuations, different xxxx xxxxxxxxx xxxxx
between xx% and xx%.

The sales companies can for projects in the headquarters
in Schaffhausen justified request xxx xxxxxxx xxxx

Type 546 prices: North Europe = xx, America =xx, Asia = xx

Advantageous is the high xxxx, but clearly at the expense of
xxx xxxxxxxxx

3.2.1 Relative price structure +GF+ for Germany, CH, F, South Europe, North Europe, Turkey, List price 100% / net price in % / min net price in %

Region/Country	List price	Butterfly valve net price in %	Butterfly valve min net price in %	Ball valve net price in %	Ball valve min net price in %
Germany	xx	xx	xx	xx	xx
CH	100%	xx	45	50	40
F	xx	xx	xx	xx	xx
South Europe	xx	xx	xx	xx	xx
North Europe	xx	xx	xx	xx	xx
Turkey	xx	xx	xx	xx	xx

All relative prices are based on list price CH 100 %

Similar for diaphragm, pressure, check valves an strainer

and the www, the sales network and other informations

Competitor Research +GF+ H+P Research (2): Regional Market '+GF+

In Europe (15 countries)	Germany	Sweden	Denmark	Norway	Finland	Spain	Italy	Switzerland
Turnover 2017 Mio CHF	xx	xx	xx	xx	xx	xx	xx	xx
Turn Over 2000 or 2001* Mio CHF	xx	xx	xx	xx	xx	xx	xx	xx
Sales Network employees 2018	xx	xx	xx	xx	xx	xx	xx	xx
Sales Network employees 2000	xx	xx	xx	xx	xx	xx	xx	xx

In Europe (15 countries)	Poland	Turkey	France	Austria	Netherland	Belgium	Portugal
Turnover 2017 Mio CHF	xx	xx	xx	xx	xx	xx	xx
Turn Over 2000 or 2001* Mio CHF	xx	xx	xx	xx	xx	xx	xx
Sales Network employees 2018	xx	xx	xx	xx	xx	xx	xx
Sales Network employees 2000	xx	xx	xx	xx	xx	xx	xx

In SE Asia (6 countries)	Singapore	Malaysia	Indonesia	Thailand	Philippines	Vietnam
Turnover 2017 Mio CHF	xx	xx	xx	xx	xx	xx
Turn Over 2000 or 2001* Mio CHF	xx	xx	xx	xx	xx	xx
Sales Network employees 2018	xx	xx	xx	xx	xx	xx
Sales Network employees 2000	xx	xx	xx	xx	xx	xx

3.4 Competition Research +GF+ Typ Turnover in Mio CHF

Year	Type Ball Valves							Butterfly Valves			Check Valves Strainer	Diaphragm Valves	Pressure Valves
	375	346 546 PVC	546 other plastic	353	355	322	BaV Aut	563 / 567 / 578		BuV Aut	561/562 305/306		
2000	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx
2001	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx
2002	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx
2017	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx

BaV Aut * Ball Valve electric, pneumatic actuated

BuV Aut * Butterfly Valve electric, pneumatic actuated

Overview +GF+ Ball Valves: https://www.gfps.com/content/dam/gfps/brochures/gfps-6383-brochure-ball-valves-overview-en.pdf

Overview +GF+ Butterfly Valves: https://www.gfps.com/country_US/en_US/products/valves.html

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567

561

305