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Bartholet Maschinenbau AG

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The story of the Flums company Bartholet Maschinenbau AG reads like a sequence of «easily lined up» successes. However, when contemplating, it becomes apparent what forms the basis of this success story: a family business, deep-rooted in the region, which is always committed to the collective and in face of all successes has never lost the ability to concentrate on the essentials, quality, customer satisfaction and sustainability. Thus it is not amazing, when the Chairman of the Supervisory Board, Roland Bartholet, explains: «Even today we do not have any problems to recruit qualified personnel. We do this ourselves. Currently we have more than 30 young persons in the apprenticeship training in our company», which corresponds to approx. 12 % of the whole staff.

And there is one more feature, which attracts attention: The one, who up to now believed that Suisse Mechanical Engineering – art of engineering – was uninspired, deadpan and brittle, has to change his mind after reading the BMF chronicle and has to admit: «I must have been wrong!»

1 • *Flums, viewed from Kleinberg in the direction of Churfirsten*
2 • *Flums, viewed from the perspective of the Gräpplang Castle*
3 • *Mechanical workshop next to the town hall square of Flums, 1962*
4 • *Bartholet in its early days, in the village centre of Flums, 1966*
5 • *1970*
6 • *1978*
7 • *1997*

Surroundings

Company histories start with the foundation, with an idea, with a person or with a comprehensible event. The further progress and development, however, are not only dependent on the company management or individual persons. In fact it is also the staff, the team and not least the surroundings, too, which decide on success or failure. The collective and the radius within which it moves indeed do not bear responsibility but is consistently and significantly involved in the success. If one wants to include these surroundings, let's call them the home country, in the closer examinations of a company's history, the history, in which the surroundings are settled, is in the focus and therefore this book starts with goat farmers and day labourers, who were accustomed to work hard and honest.

In former times the population in the Sarganserland was very poor and had to live frugally, as wealthy big farmers could not settle broadly. In the narrow valley alongside the prominent Churfirsten mountain range and the Alvier mountain group there was not enough farmland available. But already very long ago the connection Zurich–Weesen–Walenstadt–Chur was one of the most important transport links of Eastern Switzerland. On this route a considerable part of the North-South traffic from Germany to Italy was handled. Before the year 1859 (opening of the railway line) all transports from Weesen to Walenstadt had to be done «seaborne» across lake Walensee – there was no trafficable route.

The Lord of Gräpplang was the house owner of 22 residential houses in Flums and neighbourhood. According to an oath taken «on God and all Saints» his subjects had to be ever sub-serving, obedient and ready for action to him or his reeve. But not all inhabitants of Flums village were Gräpplang people. There also lived a lot of free people in Flums: farmers, fishermen and craftsmen, who were not subjects to any lord.

In the course of the 20th century Flums and the Flumser Mountains developed to a spa area, ski-region and hiking area; in addition to farming, industry and craft/trade, at the beginning of the 21st century tourism established an important line of business. Only about eighty years ago Flums experienced an industrial upturn. Many factories resulted from this. Up to now the people from Sarganserland and especially the ones from Flums are said to possess a sound independency combined with a remarkable work enthusiasm.

How everything started – change as a constant

Actually he wanted to become a cook or a waiter, however, Anton Bartholet, born in 1938 in Flums, took another path and in 1956 he started to work at company Städeli, machine and ropeway construction, in Oetwil. This was a path-breaking decision as already during his apprenticeship it became apparent that he had good pre-conditions for the ropeway construction: pleasure in and comprehension of mechanics, free from giddiness, sure-footed, agile, initiative, proactive – and, the apprentice was exemplary when dealing with the staff members, as it was certified for him already at that time.

In November 1962 already Anton Bartholet opened a one-man business nearby the town hall square in Flums, a small mechanical workshop. It started with knife grinding and mower repairing and continually developed to an agricultural machine and machine construction company. All was repaired: from the leaf rake over old radios up to the bakery kneading machine. The revision of the clamps for the Chrüz-Maschgenkamm ropeway in 1962 was the first order for the company from Romeo Joly, Member of the Supervisory Board of Maschgenkamm Ropeway.

In the period between 1960 and 1970 the world became more technical, more colourful and more (auto-)mobile. The stock of passenger vehicles experienced nearly a triplication to 1.4 million automobiles. The mechanisation also did not stop at the agriculture. In this environment the «Budeli», nearby the town hall square in Flums, developed very well. Proprietary developments and small mechanical engineering and machine construction orders supplemented the repair works. The breakthrough, however, could be realized with the mountain hay rake and tedder, which in the course of the time was developed and constructed for the use with different motor mowers, ride-on mowers and tractors. Till this day the agricultural machinery company Bartholet & Co. has manufactured far more than 20,000 mountain hay rake and tedder units.

In 1963 three staff members had to be employed for the production of the first series of mountain hay rake and tedder units. At that time the office work was done by Anton Bartholet's girlfriend Lisbeth Klauser, who soon became his spouse. In addition to the housekeeping she worked actively in the company and as trucker, too. Starting a family with the two sons Roland and Marcel then led to a solid foundation of the nowadays successful company, but they did not know this at that time. Whenever they found the time beside instruction, the

two boys favoured to spend their time in their father's business and at an early stage already they wanted and were allowed to work with him. In 1970 the development from the repair workshop to the production plant led to the establishment of Bartholet Metallbau AG. In the same year ropeway specialist Niklaus Wildhaber – who also like Anton Bartholet had passed a mechanician apprenticeship at ropeway company Städeli – joined the growing enterprise. At the same time the young Flums company got the first major orders for revisions and reconstructions of ropeway installations. Then, in Flums-Kleinberg, the hour of birth for the first self-construction ropeway: The group gondola lift between Saxli and Schönhalden surmounts a vertical height of 900 m at a longitudinal length of 2.5 km and transports eight persons in a good 12 min. ride – the lift is still in operation today.

This creation also impressed the Chairman of the Supervisory Board of the former Prodkamm Ropeway (Flumserberg), Karl Mätzler. Immediately he asked for a quotation for the reconstruction of the ski-lift Prodalp–Prodkamm and the order followed soon. Thereupon Bartholet Metallbau AG constructed a completely new facility on the existing towers: the countrywide longest ski-lift with the highest passenger capacity at that time. From there it was only a small step to the first completely self-constructed ropeway installations: the first own installations Bergheim, Weisstannen and Schönhalden were put into operation and in the course of time further ropeways in Switzerland followed (a look into the order books between 1977 and 1992 reveals a real arsenal of ropeways and gondola lifts in Switzerland, in the local Flums mountains, in the Valais, in the Waadt and in Berne).

At that time the construction of a ropeway installation was not a simple run-of-the-mill business. A lot of aspects were new, no installation was equal to the other and the responsibility was always with the constructor. The latter, however, did not only have to built the installation but first had to design it and calculate the capacities, performance and frequencies. Therefore, in a first step an evaluation of the territory was done and on the basis of order related data gathered, customer impressions and requirements the performance of the ropeway was determined. Niklaus Wildhaber remembers very well, when he travelled together with Anton Bartholet to the Grisons mountains instead of going on holiday. On the occasion of a first site inspection the slope was examined, thus – when they «returned from their holidays» – they were able to start the planning and design work. The technical and static calculations were carried out by an external engineer. Subsequently the complete approval process had to be passed through and submitted to the authorities. Only after that the construction could be started.

The ropeway construction was and still is not risk-less. The working in the steeply mountain area and on sky-high

8 • *Anton Bartholet on the way with the motor mower*
9 • *Automatic clamp with gearwheel, 1962*
10 • *The limited space conditions forced the workers to perform assembly work outdoors again and again.*
11 • *Mountain hay rake and tedder units are loaded for dispatch.*
12 • *Family as a solid foundation: Lisbeth and Anton Bartholet with their two sons Roland (left) and Marcel*
13 • *Whenever they found the time beside instruction, the two boys favoured to spend their time in their father's business: Marcel (left) and Roland Bartholet.*
14 • *Single rope aerial tramway of Schönhalden*
15 • *Anton Bartholet with Reverend Fidel Scherrer and Karl Mätzler, Chairman of the Board of Directors*
16 • *Spina, Heiligkreuz, single rope aerial tramway*
17 • *Älplibahn Malans, double rope aerial tramway*
18 • *Älplibahn Malans: Anton Bartholet and Niklaus Wildhaber*
19 • *2-seat chair lift Seeben–Zigerboden*
20 • *Four generations (standing, from left to right): Roland with son Robin, Anton and Johann Bartholet together with (seated, from left to right) Hermine, Flavia, Lisbeth and Marcel Bartholet*
21 • *1995: Relocation to the new premises at Lochriet in Flums*

onto the towers require a high degree of occupational skill and concentration. Nevertheless, accidents cannot always be avoided. In spite of all safety measures, which had always been observed, the Flums company had to lament two serious accidents during its 50 years history: 1978 the geodesist slipped off in pathless territory and died from the injuries caused by this accident. And during the reconstruction of the Älpli Ropeway (1982) an anchoring cracked, while pre-tensioning provisionally, and thus injured a staff member seriously. This employee, however, was lucky, it could have been worse, as after a certain time of convalescence he was able to restart his job.

The award of contract for the first cam-operated gondola lift on the Sanetsch pass was a real success. In this case the Flums company was able to defy the competition (domestic, Berne), although this order was assigned by the Berne generating plants. Nonetheless, Bartholet Metallbau AG passed this order, too, with flying colours and up to this day maintains business relations to the Berne generating plants; quite recently (2010) a follow-up order could be executed.

The first own brand chair was mounted in 1984 for the first time in the Flums mountains on the 2-seats chair lift Seeben–Zigerboden. From this date only self-manufactured chairs have been used. Thus the company became less dependent from the ancillary industry. By the contract award for the chair lift Seeben–Zigerboden it became once more apparent that the persons of Maschgenkamm Ropeway responsible for the placement of orders repeatedly had full confidence in the Flums company and thus enabled innovations and increase.

The company chronicle, however, shows again and again that the Flums company always knew how to have a good way with business partners and partner companies, and here and there contracted a partnership. For example the realization of the first 4-seats chair lift (Prodalp–Prodkamm) in the Flums mountains was carried out in cooperation with Poma. Thanks to this partnership it was possible to build a detachable system, which involved a considerable increase in comfort for the entrance area (also see below). Also in cooperation with Poma the first 12-passenger gondola lift, the Prodalp Express to the Flums mountain, was constructed, an installation, which – like many others, too – is still in operation up to now.

Ski carousels, pivot mountings for skier beginners, who could be dragged, moving in a circle across the snow to make their first skiing attempts by this means, brought the first foreign order. The customer was located in Sweden and a complete series had to be supplied. Shortly after (1992) the first ski-lift was installed abroad, in the faraway Argentina, but before investments in the working technique were done and another big step forward was under consideration.

Safety, comfort for the passengers and a high quality standard were and still are in the focus of the Bartholet undertakings. The basis for this is machinery, which is continuously adapted to the new production technologies. Thus it was a chain of reasoning that in the eighties the computer found its way into the mechanical production (1987 the first CNC drilling machine and one year later the first CNC turning centre had been acquired). Today the machinery is equipped with makes of up-to-date technology and CAD systems. The consistently harmonized machines allow a high flexibility, high availability and short production times to the benefit of the customer.

In the nineties style and sensitivities changed permanently. The change, switching, how it is called in Neo-German, is popular. What counted yesterday is over by tomorrow already. The motto is: flexibility, blended family and chat on the internet. Flat hierarchical structures are in, hierarchical pyramids are out. Tough liberalism dominates: companies merge or close. Time has become more hectic. What once had been handcraft now needed up-to-date technology. In order to remain competitive planning, production and assembly times had to be shortened, and this without influencing quality and safety. Therefore, especially in the area of assembling more and more modern auxiliary means were required. Thus for the ropeway construction big helicopters or heavy truck-mounted cranes were increasingly used.

But also in these changeful, ever faster rotating times company Bartholet remains true to itself, strongly connected with the Sarganserland and the home country. Ropeway after ropeway has been realized, in Argentina the first affiliate has been established and the transport and fastening equipment technologies have been continuously developed. One example for this is the first hydraulically tensioned ski-lift (Fideris, Grisons). This was in 1994. In the same year the first heavy material ropeway with an actual load of 6 tons could be taken into operation in the canton of Glarus.

Before gaining a deeper insight into modern times, we have a retrospective again. The development from the mere repair workshop to a production plant led to a successive growth in staff and operation of the company, which resulted in the foundation of the Bartholet Metallbau AG in the year 1970. The wide product range continuously being supplemented finally called for an organizational and operational diversification. Whereas the business unit agricultural machinery and wood splitters remained under the direction of the company's founder at the location Laxstrasse (Bartholet & Co.), the Head of the Management for the business domain ropeways as well as further newly added lines of business with the well-established company logo BMF now became graduate engineer Roland Bartholet (since 1997 head office in the industrial area Lochriet).

22 • Johann Bartholet working with the wood splitter «Superstar» at the age of 98: safe and easy operation

23 • Self-propelled platform wagon with an emergency generator for the former Swissair

Breakthrough product wood splitters

At the end of the eighties, at the beginning of the nineties Anton Bartholet designed and worked meticulously on the basis of a hydraulic press to create a simple but effective wood splitter. After a first limited-lot production of ten pieces this wood splitter proved to be a real «bestseller», as it could even be handled by tender hands of a woman. Under the brand name «Superstar» a second series of 200 units was produced, which also was sold «like hot cakes». In the year 1994 in fact 365 wood splitters were manufactured and sold, which means one wood splitter on average per day. Apart from the hay rake and tedder and the wood splitter there were also other innovative inventions: like for example an efficient reverse gear for snow blowers, or for the former Swissair a self-propelled platform wagon with an emergency generator in the body, which was used on the airport Zurich-Kloten. However, it was the wood splitter and the hay rake and tedder, which guaranteed the necessary basic capacity utilization and work load for the company. They established a firm base and provided the required time and economic resources for invention work, which was not always crowned with success and therefore was not suitable for large-scale production.

Ropeways

In the eighties catastrophes (Chernobyl, climate change, forest dieback) made clear that the human being does not have a substitute world on hand in his cellar. In spite of that or just because of that amusement and relaxation are most wanted. The mountains call, regardless of summer or winter time. People want to be transported comfortably up to the heights and the technology offers the corresponding possibilities. Also important in these years: after periods of nearly unlimited individual mobility the change to public transport is becoming an issue. A trend, which later is to be lead to new growth markets for BMF.

Indeed, in the ropeway domain Bartholet Metallbau AG did not yet reach the important market leaders but with each order, which the Flums company realized in the eighties and beginning of the nineties, the constructors from Sarganserland have been increasingly appreciated. The continuous rise from an unknown small-scale business to an accepted and respected competitor has begun. This is also reflected in the ISO certification ISO9001, which has been obtained in 1997. The certificate was strived for in order to be able to secure the quality but also to get the authorization from the Federal Office for Transport to realize ropeways.

Apart from the construction of mountain ropeways and with the expansion to Argentina (foundation of an affiliate) a new production line started to open, amusement park facilities. Although, at first view, externally visible, rarely common characteristics between ropeways and individual passenger transport installations for amusement parks may be identifiable, anyhow a very similar technology is behind both of them: Whether one hauls a cabin attached to a cable up to a mountain or a huge tree trunk up to dizzy height does not really make a great difference. The technical know-how may be used on different markets in an optimal way. The first submarine ropeway, which was put in operation in the year 1995 in Egypt, is an impressive example for this.

The amusement park installations immediately drew international interest. In combination with the BMF know-how and in cooperation with company BEAR, which was one of the leading suppliers in this branch, spectacular installations were built all over the world, like for exam-ple the first white-water ride in South Korea. End of 2002 already, on the occasion of the 40th company anniversary, about 20 installations were in operation. Some years before an important step towards another mainstay had been performed with the take-over of

24 • *First detachable BMF chair lift as own product, built in Val d'Isère 2008, installation «Les Marmottes»*
25 • *Valley station, detachable 6-seat chair lift, Les Marmottes in Val d'Isère*
26 • *Big Splash E-DA World in Taiwan*
27 • *Block step formworks*
28 • *Vario formworks*
29 • *Detachable chair lift, Crans-Montana*
30 • *Cable splicing work in the field, a handicraft*
31 • *Detachable 4-seat chair lift in Crans-Montana, «Bellalui»*
32 • *Compact driving unit of the chair lift «Bellalui»*
33 • *Vehicle with open clamp in the station passage*
34 • *Detachable 4-seat gondola lift, Kulm, Arosa*
35 • *Proud employees after completion of a 5 meter drive disk*
36 • *Detachable chair lift «Mont Blanc» in Les Arcs, France. In 2012 the second detachable 6-seat chair lift will be built in Val d'Isère, «Fontaine Froide».*
37 • *Aerial tramway of Vetruse, Czech Republic*
38 • *Chair lift «Bellalui» in Crans-Montana*
39 • *Aerial tramway of Vetruse, Czech Republic*
40 • *Aerial tramway of Durango, Mexico*
41 • *Fix 4-seat chair lift «Telegraf» in Kielce, Poland*
42 • *Aerial tramway of Chur–Brambrüesch with 45-person cabins*
43 • *Aerial tramway of Dallenwil with 25-person cabins*
44 • *Aerial tramway of Moléson, running gear with safety brake and 60-person cabins*
45 • *Mountain station, detachable 6-seat chair lift in Serre Chevalier*
46 • *Workshop assembly work of the aerial tramway of Moléson, driving unit and station rope saddles*

the CKU workshops in Unterterzen, as in the course of this expansion the company takeover of the Metaschal AG in Schmerikon resulted from. The former client of CKU disposed of excellent skilled workers, who step by step could be integrated in the BMF staff and thus cleared the way for a continuous, profitable growth on the base of well-trained qualified employees. Under the brand name Metaschal today high precision metal formworks for concrete members as for example angle plate formworks, Vario formworks, light well formworks etc. are manufactured.

Metaschal products mean mechanical art in its purest form. Because nowhere it is required to weld such precisely like during production of metal formworks for concrete members. From the technical point of view it is essential to reduce the inevitable distortion of the metal during the welding work to an absolute minimum, as the tolerances are extremely small. Moreover, the metal frame has to be hermetically sealed. This requires extremely clean working. Especially the root-run welding is finical. In this process the angle sections have to be welded together from the outside in a way that there is no distortion caused. This working process is facilitated by the use of metal cutters, which are operated with laser or water and leave particularly precise cutting edges.

In the matter of innovations the anniversary year 2002 was a successful one: Manufacturing start of handling systems for the production of PET bottles, in Chile (Osorno) the first two-section 2-seat chair lift went into service and further installations were delivered to Chile and Argentina. Part of them were installations which had to be dismantled in Switzerland and after a comprehensive revision, then could be re-erected overseas. It is one speciality of BMF to prepare installations, which are replaced by new ones, for another use in such a way that all security relevant components comply again with the state of the art. In-house they are resolved in their constituent parts, completely checked up and upgraded for perfect operation. Instead of ending up on the scrap yard they can be used again. Such budget-priced and reconditioned used installations are also particularly in great demand abroad. Before they leave the works, they are assembled for a test run and put to the acid test. This competitive concept permits the acquisition of perfect working installations at interesting conditions.

With the detachable systems a new era in the ropeway construction began. On the one hand it was the technical challenge to construct properly functioning couplings, on the other hand these implied an enormous advantage in comfort for the customers, which have been transported. But what means detachable system? On a conventional ropeway the bar, chair or cabin are attached by a fix clamp to the cable and move forward with constant speed. In order that the passengers may de-board safely at their destination, the cruising speed

is limited accordingly: 1.5 m/sec. for pedestrians and 2.6 m/sec. for skiers. Unlike the fix system, the detachable system achieves considerably higher capacities, as the cable speed is two to three times higher. To assure all the same a safe boarding and de-boarding of the passengers, the speed of the ride has to be decelerated in the stations. This is enabled by means of a clamp, which is not fixed but can be released flexibly from the cable or grip on it.

Thus it became possible to allow senior people as well as children a safe boarding without reducing the transport capacity. The decision to join this technology implied a substantial risk for BMF as well as considerable investments but in retrospect one may justifiably so affirm that the former faith in this technology and the company's own know-how have paid off. In the year 2006 the strategic decision was made to join the detachable systems and one year later already the first client was found in Val d'Isère, who was ready to order a detachable system. The patent for the clamp, the alpha and omega of a detachable system, had been adopted previously by the BMF engineers from an Austrian company, which went bankrupt. This system, a so called knee lever clamp, worked perfectly and also had been successfully in service at different places. However, the new European Standards for transport systems, which came into effect exactly at that time, upset the plans of BMF. To get the authorization for a passenger transport system in Switzerland a certification is required, whereas in Europe an accreditation is necessary. The company faced up the accreditation procedure for the European Standard (CEN) with complex tests. Indeed the basic principle of the clamp could be adopted, the clamp itself, however, had to be completely new designed and calculated. Here the outstanding in-house engineering, design and development capacity was shown. The special construction of the BMF clamp does essentially differ from the ones of the competitors. Compared to most of the other clamping techniques, which are permanently under spring tension, the BMF clamp does only cover half distance. The clamp goes away from the cable and then back to the cable again. Thus the mechanical wear and stress are considerably reduced and there are less maintenance and service costs resulting. Moreover, the BMF clamp is standardized, which means an economic benefit, as this offers an enormously enlarged range of applications. Independent of the design size the clamp always consists of the same basic module, only the spring varies.

In October 2007 the sale contract for the first detachable chair lift to be built in Val d'Isère has been signed. By the way, this ropeway has been installed on that mountain, where in February 2009 the Ski World Cup took place. Therefore, it was a necessity that it runs at the beginning of the winter season 2008. When signing the contract, however, only the drawings were available.

47 • Cable transport in a pathless area in Moléson
48 • Tower assembly of the aerial tramway of Moléson by means of an assembly needle
49 • Steeply sloping area of the 60-person aerial tramway in Moléson which was inaugurated in December 2011
50 • First Funitel in the history of BMF in Val Thorens, France
51 • Single rope aerial tramway of Rodi–Tremorgio TI
52 • Inclined lift of Zermatt
53 • Misiones, Argentina
54 • Limon, Costa Rica
55 • Indoor ski resort, Lithuania
56 • Group single cable ropeway of Monteverde, Costa Rica
57 • Limon, Costa Rica

Not one screw, not even the smallest component had been produced. Accordingly the installation had to be developed and realized within one year only, in such a way that it met the CEN standard and could be operated reliably and safely.

The undertaking Val d'Isère turned out to be a success and punctually at the beginning of the winter season 2008 the installation at 2,500 m a.s.l. ran with 6 seat chairs and a capacity of 3,600 persons per hour. Thanks to this achievement BMF advanced to No. 3 after the two big competitors Doppelmayr (Austria) and Leitner (Italy), both expanded mainly by acquisitions in the past. Previously having been a small niche player in the ropeway construction, since then the Flums company with its continuously growing market share does have a middle ranking between the real big ones and the small ones but still is far away from the two big competitors.

With the realization of the ropeway in Val d'Isère the Flums company put a milestone suitable for further building-up. Subsequently three installations have been built in France: 2009 a detachable lift with 6 seat chairs in Les Arcs, 2010 also a detachable 6 seats chair lift in Serre Chevalier and 2011 a second one in Les Arcs «Mont Blanc», with the speciality of a 90° access.

In the year 2010 the market entrance to the Swiss market for detachable systems succeeded with the project of a high-performance chair lift for 4 persons in Crans-Montana. Now in La Berra, Canton of Fribourg, the first combined ropeway, a combination between gondola lift and chair lift, is being realized with the same system. Thanks to this mixed operation an energy-efficient minimum operation with gondolas according to the timetable may be started in the summer season.

In the anniversary year a detachable BMF system with completely new developed vehicles will be accomplished in Laax. These vehicles are designed to render the ride experience with a travelling speed of 6 m/sec. for every passenger particularly intensive and to offer children a comfortable entry. The installation is meant to become a superb attraction for Laax. Also in the anniversary year the cabins with hangers and air condition for the big wheel attraction in New Jersey (USA) will be supplied. But in the field of aerial tramways, too, the Flums engineers are putting milestones. Aerial tramways move at two track cables in opposing, two-way direction, one vehicle upwards and the other one downwards. Previously the «power» of the down-ride has been gained with a water tank – or in case of the city ropeway Fribourg with a septic tank – and then has been used for the upwards ride. Aerial tramways are energy-efficient as the energy gained during the brake application is directly fed into the electric supply network by connecting of frequency converters.

Statement

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BMF with its complete range of products and services does impress with customer-oriented and practicable solutions, especially in the ropeway sector, where they have developed to a reliable force thanks to a consistent developing of know-how. BMF stands for technological ability and competitive solutions.
Apart from the technical maturation BMF is particularly characterized by a business culture, which is shaped by a sane and innovative sense, a reliable customer service quality, (usually) an advantageous price-performance ratio as well as an uncomplicated project handling.

In this case, too, the market entry has been effected with a standard technology. The initial order was awarded from Chur for an aerial tramway to Brambrüesch. The 45 passenger aerial tramway Chur–Känzeli (year of construction: 2006), which – due to constricted space available in the valley station – on its way does move and displace the entry platform, is attached to a track cable with a core, where fibre optics secure the data communication. Till then this was unprecedented! Up to that time separate cables for fibre optics were necessary, which during the winter period, however, carried with them considerable risks because of ice hangings. By the integration in one cable the risk of icefall on an urban area is considerably reduced.

To get the authorization for the Chur installation several expert's reports and certificates were required. Not the track cable itself has been the central issue but the joint at the end of the cable. The consolidation of cable and duct finally could be accomplished by means of a two-component adhesive. This was the first major aerial tramway for BMF, with the effect that the company has been appreciated on the international market in this segment, too. Since that time every year an aerial tramway of this size or even bigger has been built. 2008 the aerial tramway in Dallenwil has been realized, followed in 2010 by the aerial tramway in Durango (Mexico) used for urban mobility, with a difference in elevation of only 72 m, and the aerial tramway in Vetruse (Czech Republic) with a difference in elevation of 56 m.

Using the example of Moléson (Switzerland) the capability of the BMF staff in the production, assembly and logistics is impressively shown. The installation has a length of 1,095 m and runs over one single tower of 40 m height, made of 80 tons steel. The weight of the rope saddles on the tower is 8.5 tons. These rope saddles have been assembled in Flums, then disassembled, transported by low-loading trucks and mounted and erected on site by means of helicopters. For other installation works in steep and pathless area the so called needle or log-boat method is applied. A tower is guided by three cable-controls like a needle stuck into the ground and the loads can be placed dead on target in the pathless area.

A very special project is the one in Leukerbad, where the existing Gemmibahn is to be replaced. The spectacular section with a mountain station at 2,344 m a.s.l. is equipped with one tower only. The travelling speed is up to 10 m/sec.

In territories, where high wind stability is important, the Funitel type is suited. The Funitel is a detachable aerial tramway with gondolas, which are guided very close alongside the cable. This technology was invented by the French engineer Denis Creissel. BMF also is acting in

this special sector. By the end of 2011 a Funitel with a fix BMF clamp for a capacity of 1,700 passengers per hour has been accomplished in Val Thorens (France). Apart from the technology also a lot of feeling has been necessary for this project. Val Thorens is one of the highest located skiing areas worldwide. Thus the installation covering an elevation from 2,790 m up to 3,001 m a.s.l. is exposed to high wind forces.

This wind became perceptible during the installation works already. Because of considerable snow banks in the months of July and August 2010 the foundation works were delayed. In view of the date of the opening of the Funitel, however, the lost time of four weeks had to be made up in some way. This requires team work and logistics. Special feeling is also necessary for the handling of the cable. The Funitel runs on one cable only, which is guided by two wheels at the valley station and by three wheels at the mountain station, at two levels per wheel. Head and end section of the cable with a diameter of 49 mm have to be connected, «braided», spliced. The length of the spliced cable section of this installation is about 60 m. For this 30 tons drag force are required. The most important factor is: at the splice segment the cable must not become more than five percent thicker. Also the re-tensioning of the cable, when it «lengthens», calls for a considerable degree of special knowledge and calculation.

Today the objective target regarding ropeways is clear: 10 percent market share of a world market, which comprises about 1 billion euro. One may act on the assumption that the volume will remain – plus or minus – quite solid as the snow market segment does not seem to grow noticeably in the future. The topics are rather: increase in comfort, replacement infrastructure business and maintenance. In the urban and special transport segment, however, the situation is different.

Especially in the urban segment, where the ropeway is used instead of subways, trams and busses, it is more and more considered as a comfortable transport system, easily to be realized, with a capacity up to 5,000 passengers per hour.

As far as the detachable systems are concerned the period of consolidation has been completed and now the motto is «to keep at it» as the first installations are already being replaced by new ones. In this segment, too, BMF could record an important success. A five years contract with one of the biggest operating companies in the field of skiing areas and amusement parks, Compagnie des Alpes, could be signed. Furthermore, a 10 passenger gondola lift with four sections to be installed in Saas-Fee, starting from the parking garage, is in process. The realization of this lift will be in the year 2013.

Statement

Jean-Francois Blas

In the years 2005 and 2006, the STVI (ropeway association of Val d'Isère) contacted BMF for two reasons:

1. *We looked for a manufacturer that enables us to escape the «duopoly» of Leitner-Pomagalski on the one hand and Doppelmayr on the other hand, whose existence prevents real competition and caused a significant price increase for the installations.*
2. *We wanted to establish a partnership between a manufacturer and our subsidiary MONTAVAL to which each of the parties contributes its know-how for the implementation of a detachable 6-seat chair lift at the best possible price:*

** complete stations + chairs + rockers: BMF,*
** towers + extension arms + ropes + gears + control cabinet + construction engineering and assembly: MONTAVAL.*

In 2007, this partnership was reflected in the implementation of the SBK6 «Des Marmottes» in Val d'Isère.
As a result, the CDA ordered further installations which were installed ready for use in Les Arcs and Serre Chevalier.
These are robust and reliable installations with an excellent price/performance ratio which were delivered in a timely manner.
The relationships with the on-site teams were excellent, especially in Les Arcs where they were responsible for two SBK6.
We are very glad that BMF is «gaining more and more ground» in the French stations and that they plan to establish a branch office and a service team in the valley of the Tarentaise.

Engineering

After completion of their studies at the Evening Technical College in Chur, Roland Bartholet, Placi Wenzin and Mario Cadisch decided to establish an engineering company. This idea led to Bartholet Engineering in Flums. Placi Wenzin was appointed Managing Director of that company. First orders in the field of ropeway and mechanical engineering were received. Within a very short period of time, the company was able to execute major orders. That was why the number of staff was increased to six employees within a short period of time. Today Placi Wenzin is member of the company management as Head of Technology and Engineering with 25 employees in his department.

Amusement Parks

Amusement parks become more and more crazy and outperform each other continuously with new attractions. Steeper, higher, faster is the motto, while the safety of the passengers must not be endangered. As already mentioned the difference between a ropeway for passenger transportation and an amusement park installation operated with a rope is not wide. Whether persons are transported by means of a cable, on a rail or in the water, is subject to the same principles.

As so often in the segment of amusement park installations everything started with an unimposing inquiry. Company BEAR Rides GmbH asked whether the Flums company would be able to build a submarine ropeway. In 1998 the business relation, which resulted there from, led to the foundation of the BEAR Rides AG (today's Swiss Rides AG). The first order was an underwater installed wire rope in an amusement park in Cairo (Egypt). This wire rope moves the boats with a cable, which is nearly invisible, thus gives the passengers the impression that they would have been hauled by ghost hand over the water. Further submarine ropeways of this type followed and with their technical innovations delight the visitors in diverse amusement parks. For the Tow Boat Ride, realized in 2003 in Belantis (Germany) and Drayton Manor (Great Britain) for example the route is preset by an underwater cable, which is dragged upwards by chains, but only with exactly as much force as required to move the boats, which are hooked to the chains, quasi an underwater ski lift.

White-water rides are the actual stars among the water rides. They are called Flume Ride, Grand Flume or Big Splash. The highlight of the ride is an enormous cascade with the boat from a mountain. The boats dash down in the lake underneath and are decelerated by the water. This produces a giant spume, which is exciting for the audience and the passengers as well. The height of the lift is between 11.7 and 25 m.

The largest white-water ride throughout the world, a Grand Flume, is located in Shenzhen (China), the neighbour city of Hong Kong. With a length of 1,040 m it is the longest one of this kind worldwide and amongst others leads through a steep, narrow valley with several breathtaking cascades. As a curiosity the ride goes through the administration building of the park, which from a certain point of view resembles to a giant dam with a waterfall. Each of the 29 boats accommodates 6 persons. BEAR Rides AG designed the installation,

58 • Drop Tower in Fraispertuis, France
59 • Tow Boat Ride, Drayton Manor, England
60 • Tow Boat Ride, Belantis, Germany
61 • Big Splash, Flamingoland, England
62 • Big Splash, E-DA World, Taiwan
63 • Flume Ride, Skara Sommarland, Sweden
64 • Junior Rafting Ride, Al-Hokair Land, Riyadh, Saudi Arabia
65 • Grand Flume Ride, Shenzhen, China
66 • Grand Flume Ride, Beijing, China
67 • Dark Ride, Zaragoza, Spain
68 • Federal councillor Micheline Calmy-Rey at the world exhibition in Shanghai 2010
69 • Chair Ride, Swiss Pavilion, world exhibition in Shanghai, China
70 • Drop Tower, BonBon-Land, Denmark
71 • Drop Tower, Tripsdrill, Germany
72 • Drop Tower, Fraispertuis, France
73 • Project Big Wave
74 • Project Deep-Sea, Underwater Ride
75 • Rafting Ride, Hellendoorn, the Netherlands
76 • Rafting Ride, Hunderfossen, Norway

supplied the electro-mechanical components and the workshop drawings. Thus the client could contract the steel construction locally and put the ride in operation in 2008. System analogue installations are operated in Drayton Manor (Great Britain) and in Beijng (China). The semi-mobile water ride for New York (USA) attracted great interest. Even the test run in Flums, which was carried out on the occasion of the 40th anniversary, was an attraction.

Water was the central theme at the world fair Expo 2008 in Zaragoza (Spain). There were three theme pavilions to the guiding theme water: the bridge pavilion across the river Ebro, the water tower as well as Europe's largest river-aquarium. In the form of the Dark Boat Ride a system for passenger transportation as water ride with floating vehicles has been designed. The attention has been turned to a calm ride on free floating rafts. The boats had to suggestive the movement of flowing water, the ride must not be felt «like travelling on rails» and the passengers in comfortable position, quasi semi-horizontal, could drift across a multimedia show.

At the world fair Expo 2010 in Shanghai (China) BMF was also represented with an installation, the Chair Ride. «Better City, Better Life» was the theme of this Expo. Switzerland presented a pavilion to the subtheme «rural-urban interaction», where a journey with the Chair Ride connected the different worlds. The Chair Ride resembles a combination of chair lift and monorail. Only the rail adhesion guided on tracks permitted the winding routing. During the exhibition period of six months 1.1 million happy passengers were transported through the pavilion with a calm and relaxed ride.

But also with the drop tower «Thunder Beam» Swiss Rides AG produced a masterpiece in the segment of amusement park installations. This shooting high-tilt free-fall tower like it is called in the trade language is located in the adventure theme park Tripsdrill in Germany. Its speciality: apart from the ambience of a wilderness-like environment the passengers, quasi sitting on a log, are exposed to extreme accelerations. The ride does not only go up and down at high speed but in addition the platform at the very high point is tilted overhead. The ride height is 15 m and the max. acceleration downwards is 8 m/sec^2, which corresponds to 0.2 g approx. The capacity is 450 passengers per hour. The installation in Tripsdrill was realized in 2003/2004, further Drop Towers followed in 2006 in BonBon-Land (Denmark) and in 2008 in Fraispertuis (France).

From the beginning water has been an important theme for the amusement park installations. But what to do, when this theme seems to be exhausted? Particularly in this sector innovations are pivotal, if one intends to continue the construction of rides for which the clients

are ready to invest high amounts and which enthuse masses of audience and attracts them to visit the amusement park. Thus BMF does not only go from the air into the water (as e. g. with the white-water ride) but also takes her guests under the water. With Deep Sea, a big simulated underwater world currently the first submarine ride is in project; kind of a suspension ride, which makes the underwater world accessible to the passengers. Deep See is a remarkable project and proves that Swiss art of engineering is not uninspired, deadpan and brittle. On the contrary: The developers of Bartholet Maschinenbau AG in cooperation with company KaGo & Hammerschmidt GmbH (Germany) also in future will make a name for themselves and draw attention to one or the other invention and continuously try to realize new ideas with sophisticated technology and a big load of inventive talent.

The progress in developments and the consolidation of the application range is explicitly shown by the monorail. The monorail is a means of transportation and sightseeing, suitable for low to medium capacities. The cabins are equipped with automatic doors. As a driverless point-to-point connection the monorail can be used in amusement parks (2006 Bahrain and 2010 E-DA World, Taiwan) as well as in public transport. According to the further development it is envisaged to design the cabins of the Urban Solar Train for the Monorail in order to be able to utilize the internal space capacities of the Urban Trains also in the Monorail sector.

77 • Assembly of a split 6 meter deflection pulley
78 • Efficient production planning, lean management by means of CAD-CAM system
79 • Newly built assembly shop, 2009
80 • Workpiece clamping operation in large-scale machining
81 • Mechanical production by means of a machining centre during 24 hours
82 • Stone cutter for Truffer, Vals
83 • Lowering axle assembly, PET-Handling, Netstal
84 • Machining of the driving chassis for a ropeway in large-scale machining
85 • Bymatec machining centre
86 • Mechanical engineering project for NEAT
87 • 2010: Investment in sheet metal processing, with the new Lasertech AG

Mechanical Engineering

When constructing installations for passenger transport the highest requirements have to be fulfilled, not only in Switzerland but all over the world. In order to be successful know-how, experience and competent, reliable staff is essential. Engineer capacity and its realization with uncompromising quality and competent customer service are abilities, which are available in closest proximity within a highly developed country like Switzerland. For many years now BMF cultivates a markedly culture of quality and innovation. This is embodied in the SQS certified quality and management system with integrated continuous improvement process as well as lived Lean Management. BMF took not only advantage of these requirements for the ropeway and amusement park construction. The partly spectacular installations have carried the name BMF out in all the world. Even so the Flums company has always remained true to its roots, the mechanical engineering and the metal processing.

The «technical revolution» began with the start-up of the first CNC machine, the separation of the agricultural machinery production and the mechanical engineering and the entrance of Roland Bartholet in the company. Since then at an average one new computer-controlled metal-processing facility has been put into operation; the largest one up to now has been started-up in the anniversary year. The state-of-the-art production centre of Switzerland, type Bimatec Soraluce FR 14000, now is located in an air-conditioned working space in Flums.

The dimensions 14 m x 3.6 m x 1.9 m which can be processed and the ten axis make possible a fully automatic construction of deflection pulleys included their gear teeth. In autumn 2010 BMF had been invested in the establishment of Lasertech AG in the modern sheet metal processing. May now be cut with a laser beam sheets up to 25 mm thickness.

Thanks to this continuous modernisation BMF disposes of a high-level production for the mechanical engineering in drilling, milling, lathing and sawing. The complete machinery is equipped with brands of up-to-date technology, which results in high flexibility, continuous high quality and short production time. Meanwhile the machinery of the mechanical department comprises more than 40 machines, which are operated round the clock in 3 shifts. Shop assemblies of challenging units or installations of complete rope-

ways and steel constructions are executed according to the principles of professionalism and reliability.

Thus BMF also in the sector of mechanical engineering and metal processing is considered as reliable business partner and constructor. In the course of the last 20 years nameable and constant business relationships could be established and cultivated, which guarantee the basic capacity utilization with their orders. Among them are orders, which have to be processed with tolerances of one thousandth of a millimetre and are subject to high requirements regarding the processing, as the products also find their way into the high-tech production.

Some of the most important companies maintaining a long lasting business relationship with BMF in the sector of the mechanical engineering are:

– VAT, Haag (high tech products for vacuum technology):
  production of stainless and aluminium products; in large part can be covered by high-speed cutting.

– Netstal-Maschinen AG (one of the leading suppliers worldwide for high-precision, high-speed synthetic injection moulding machines with closing forces of 500 to 8,000 kN):
  assembly groups and complete installations developed and built, e. g. handling systems for the production of PET bottles. Currently prototypes of the next generation of these systems are already in process.

– Truffer, Vals (the leading company in Switzerland in the sector of winning and processing high-quality natural stone):
  development and construction of heavy machines for operating and in-house structures, e.g. stone cutter, which cleaves in a fully automatic process blocks of stone with dimensions of 2 m x 30 cm with an accuracy and precision of few millimetres.

– Flumroc AG, Flums (countrywide leading manufacturer of thermal insulation products made of mineral wool):
  manufacturing of production facilities, e.g. longitudinal material conveyor for finished Flumroc mat pallets.

– MM Mannhart AG (construction company and sectional construction):
  manufacturing of plant equipment for mechanical and plant engineering and for two decades manhole coverings as well as special solutions for the road construction plus steel formworks and semi-automatic tools to fabricate concrete members.

Evatec Ltd., Flums, absolutely must be included in this list. In the meantime Evatec Ltd., which developed from a management buy-out of Oerlikon in the year 2004

Statement

Andreas Wälti
CEO
Evatec Ltd.
Lochriet 14
CH-8890 Flums

BMF is our partner because the Flums company is able to produce for us extensively processed parts and sub-assemblies.
Moreover, BMF proves to be a first choice partner thanks to their continuous efforts to optimize quality and prices.
Proximity to their customers as well as the necessary flexibility distinguishes BMF as a business partner.

and was financially attended for three years by BMF, also offering the infrastructure during that time, has expanded to a staff of 54 people in Flums and further 80 employees worldwide.

The company's field of activity is in the physical vaporization industry. They construct vacuum vaporization units and process systems for thin coating for the electronic and optical industry. Evatec has become an important customer for BMF and is securing a significant part of the basic capacity utilization. The enthusiasm for innovations, which BMF has shown in the ropeway and amusement park sectors, already earlier in the company's history had been a characteristic in the mechanical engineering, too.

Christian Stettler
Director Production & Logistics
NETSTAL-Maschinen AG
CH-8752 Näfels

We favour BMF as a business partner with comprehensive production know-how and state-of-the-art production facilities.
The company provides a complete system solution combined with a very high flexibility in supply.

88 • *Urban means of transportation by means of monorail*
89 • *Monorail 8x8 persons in the E-DA-Park, Taiwan*
90 • *2009: Factory assembly of the Skymetro trains for the Zurich Airport, cable-drawn on air cushions*
91 • *Aerial tramway as urban means of transportation in Durango, Mexico*
92 • *One of five VIP urban trains in Baku, Azerbaijan*

Urban Transport

Experts estimate that the ropeway technology, which up to now mainly has been used in the field of tourism, will have excellent future prospects in many cities. Specialists agree that ropeways operated as shuttle to exhibitions or amusement parks also have certain chances in the urban area.

Aerial passenger tramways manage with less operating personnel, they are more competitive than e.g. tramlines or underground railways, they can be adapted to areas covered densely with buildings and they smoothly overcome steeply sloping sections and water courses. But there are reservations, too: Aerial tramways cannot travel during storms, the opening of intermediate stations is complicated, the routing considering curves is very complex and the traversing of houses is often prohibited due to fire protection reasons. These problems do not exist for a funicular railway, instead of that the construction is more expensive and requires more time.

The acceptance of an aerial tramway as a means of urban transport in many cases depends on the local cultural and social conditions. Whereas cabins, hovering in the air are less welcome within European cities, aerial tramways used as means of urban transport are successful somewhere else.

In fast growing cities the ropeway as a shuttle to so called connection points (metro stations) becomes more and more important. In the city of Durango (Mexico) this concept has already been realized since 2010. In the Czech Republic the public connection has been effected with the urban aerial tramway with 15 passenger cabins and at Zurich airport the shuttle at dock E has been extended by the Skymetro.

Statement

Pius Truffer
Truffer AG
Natural Stone Production
Balma
CH-7132 Vals

There are business relationships, which one maintains just because the business requires it.
I call this force majeure and consider it as an obligatory act.
And I know business relationships, which in many cases involve interesting discussions often exceeding the practical part.
And then there is company Bartholet!
I am proud of numbering among their customers.
My world would be much poorer without this relationship.

93 • Single-axle solar farm 650 kWP in Waldshut, Germany, based on a cable winch system of the ropeway technology

94 • Solar urban road train below the double-axle solar system at Flumroc in Flums

95 • Below the solar system, more than 100 trucks are loaded with insulation material each day: dual benefit.

96 • Anton Bartholet fuelling his vehicle at the solar charging station

97 • Worldwide first solar ski lift, Tenna, Switzerland, 2011

98 • The solar panels generate approximately 90,000 kilowatt hours annually. The ski lift system requires approximately 22,000 kilowatt hours during one season. The remaining solar energy is fed into the network.

99 • Assembly of solar panels in lofty heights, by means of special installation equipment

100 • Flight for the installation of a ski lift support, by means of a heavy duty transport helicopter KA-32 in Tenna

Solar Energy

Regardless of the sector, which one analyses, it stands out consistently that BMF impresses as a collective, which has been formed and found itself during the last 50 years. A collective, which is always ready to approach something new and also does not close the eyes, if the idea at the beginning seems to be hardly feasible and a little bit crazy. In the course of the last years this faith in innovations has been explicitly shown in energy management. Thus BMF has expanded into a new field of activity: photovoltaics. The motto, which already the company's founder Anton Bartholet with his inventive talent exemplified successfully, has also been stuck to during the management of his son Roland Bartholet: «Innovation is our motivation!» Exemplary visible, this is evident in the new highly modern 45° positionable 6-seat chairs, solar panels for seat heating and carbon fibre construction for Weisse Arena AG Laax. As well as in projects with the detachable clamp and a new type of solar system, based on a cable pull system from the cable car technology, and the solar modules for optimal energy production depend on the position of the sun.

Within the framework of the partnership with Solarwings AG the first solar farm in Waldshut (Germany) and a further one on the stockyard of Flumroc AG, Flums, have been realized. As to the combination of solar energy (photovoltaic) and passenger transport, BMF may justifiably be called a pioneer. After the company take-over of Road Trains Tschu-Tschu GmbH in 2007, the Solar Urban Train has been developed. Thanks to its consolidated dimensions (suitable for bottlenecks because of 1.98 m width only), its ample passenger-compartment space and good manoeuvrability this train is a multifunctional, with solar energy assisted mobile miracle. Owing to the hybrid technology and the all-axle steering system, in addition to the variable capacity from 40 to 60 passengers, the Urban Solar Train is absolutely local public transport conform. These up-do-date road trains are developed and constructed in the Swiss Road Trains AG, a partner company of Road Trains Tschu-Tschu GmbH. For more than 35 years Road Trains Tschu-Tschu GmbH offers nostalgically designed road trains and busses for excursions, which inspire the young and the young at heart all over the world and guarantee a special leisure experience.

About 35 years ago, 1976, when Heimke and Wolfgang Sichler set the roots for the Tschu-Tschu trains, they began their triumphant success into all the world. In their function as operators of a nostalgic local railway

in Northern Germany they specialized in production, maintenance and repair. The proprietor has promoted his idea passionately and on the occasion of individual customer calls he presented the Tschu-Tschu trains Europe-wide. In order to keep the company going after a serious fire, it was consolidated in 2007 with the Bartholet Maschinenbau AG. From now on the Road Trains Tschu-Tschu GmbH as an independent company with location in Germany benefits from the group's synergies. Approximately 30 trains per year are shipped from the factory. Assuming a length of 18 m per train, this means 540 m train yearly. In other words: Each of the 30 staff members manufactures one train per year – handcraft. More than 800 Tschu-Tschu trains, double-decker busses and urban systems have already been placed on the market. The aftermath of the major fire has been amortized and the company has been placed on a sound base again. Today by the new product range, the production in Germany in the new premises competes well in the international competition.

To come back to solar energy: If the motto «For new projects we always try to rely on 50 % of the estab-li-shed and existing» is valid, this particularly applies in case of the solar ski lift in Tenna, which has been opened in the winter season 2011. On 8th August 2011 the ground-breaking for the construction works of the worldwide first solar ski lift in the Safien valley (Canton of Grisons) has been done. The new installation replaces an existing ski lift of the last century. The new solar ski lift has been put into operation at the beginning of the winter season 2011/12. The principle is perplexingly simple. At the upper end of the ski lift tower a supporting construction is attached. Across this supporting structure two track cables are clamped from the valley station up to the mountain station. On these cables, the solar panels are aligned according to the position of the sun, in order to achieve maximum energy efficiency. In case of snowfall the solar panels are positioned vertically. The supply of the ski lift drive is done conventionally from the existing network. The produced solar energy is fed into the network and sold. The solar energy produced in the course of one year corresponds to the triple amount of what the ski lift requires during the winter season. The power necessary for the next winter will be re-purchased as green energy.

101 • Two generations: Anton Bartholet with his son Roland

… and it will continue!

New products for Weisse Arena AG, Laax
… and it will continue!
– 6-seat chairs with weather protection cover
– Solar panels for seat heating
– Carbon fibre construction
– Child lock
– Individual seats have a modular design
– 45° positionable 6-seat chairs

Perspectives

We are future-oriented and continue to answer with a first-rate infrastructure to the latest state of technology. Thanks to our future-oriented training program we raise the awareness of professional competence and the possibility to generate profitable added value in Switzerland. This is the precondition for the assurance of the new innovations, which we intend to develop in our company in the fields of passenger transportations and mechanical engineering.
The surrounding conditions in Switzerland for the development of innovative products more and more feature future orientation. Thanks to the support of our domestic universities and universities of applied sciences we continuously have access to the state-of-the-art. We benefit from this advantage to generate new products for the global market. Not only new, but also established technologies in connection with innovations and the label «Swiss Made» already today allow us to realize a considerable value creation on the international market.
In our capacity as plant engineering and construction company we are used to implement and realize the ideas and proposals of clients as well as our own new creations.
In order to achieve an optimum customer's benefit in case of innovations we always carry out a trend analysis. To launch new products as contemporarily as possible on the market, in case of revolutionary ideas we usually effect advance performances together with our client.
Today – and certainly increased in the future – the use of «green energy» forms part of our growth markets. By means of cable based solutions we intend to max out the efficiency of the photovoltaic modules as much as possible.
Thanks to our continuously growing international distribution network, currently with branches in 10 countries, also in future the customer proximity and focus as well as the after sales service will be the most important provisions of services.
The past 50 years have shown us the path through the market: with the continuous improvement process and the awareness that we constantly have to adapt to the market with a lot of patience and persistency.
I am convinced that the next generation will succeed in revolutionizing the autonomous passenger transportation and BMF will play a decisive role on the world market.

With my best wishes to the BMF team for a continuous success in a promising future.

Chairman of the Supervisory Board
Roland Bartholet

102 • *CEO Thomas Spiegelberg, company founder Anton Bartholet, and Roland Bartholet, Chairman of the Board of Directors*

Facts and Figures

Production plant Lochriet, Flums:
Surface area: 30,000 m²
Production area: 13,500 m²
Assembly shops: 5,000 m²
Production hours yearly: 390,000 h/year
Engineering hours yearly: 43,600 h/year
Staff Switzerland: 200
Staff worldwide: 250
Apprentices: 34

Certificates
SQS Quality Management System: ISO 9001
International Association for Welding Technology GSI
SLV: DIN 18800
International Association of Amusement Parks and Attractions (IAAPA)

Business areas
Bartholet Maschinenbau AG, CH-8890 Flums
BMF International AG, FL-9494 Schaan
Grossbearbeitungs AG, CH-8890 Flums
Swiss Rides AG, CH-8890 Flums
BMF Lasertech AG, CH-8890 Flums
BMF Ropeways Germany GmbH, D-92318 Neumarkt i.d.OPf.
BMF France SA, F-73800 Montmélian/Savoie
Swiss Rides, Tsimshatsui Centre Kowloon, CN-Hongkong

Ropeways: Gondola lifts, chair lifts, aerial tramways, material ropeways, inclined lifts, ski lifts.
Amusement park rides: Water rides, magic carpets, «thunder beams», drop towers, special constructions.
Road trains: Amusement park trains, urban trains, exhibition trains.
Metaschal products: Concrete formworks for bridge and tunnel constructions, special constructions, sectional construction.
Large scale machining: Mechanical processing of huge high-precision parts.

Further fields of activity: Steel constructions, special steel processing, hydraulics service, mechanical processing of high-precision parts, laser bending and chamfering technology up to 25 mm sheet thickness.

Chronology

1962 Company foundation by Anton Bartholet

1970 Foundation of the stock company

1972 Dismantling and revision of an installation in Flims

1974 reconstruction of ski lift in Samedan

1976 first aerial tramway in Schönhalden

1977 first new ski lift constructions in the Sarganserland: ski lift Bergheim, ski lift Weisstannen, ski lift Schönhalden

1978 first bigger installations: ski lift Saas-Balen (Valais), ski lift Prodkamm

1979 construction of workshop Lax; aerial tramway Frümsen with intermediate station

1980 test run for cement production

1981 first 2-seat chair lift (Crappa–Twärchamm, St. Gall). This was the first chair lift, which had to be approved by the Federal Office for Transport.

1982 first 2-cable-aerial tramway (Malans–Älpli, Grisons)
development of self-propelled generator platform wagon for Swissair

1983 first curve ski lift (La Lécherette, Vaud)

1984 first 2-seat chair lift completely made by BMF (Seeben–Zigerboden)
development of first own chair

1986 reconstruction of gondola lift (Tannenboden–Maschgenkamm); first 4-seat chair lift (Prodalp–Prodkamm) in cooperation with Poma

1987 first CNC drilling machine

1988 first CNC lathe

1989 first curve gondola lift (Sanetsch Pass, Berne)
first foreign order: ski carrousel (Sweden)

1990 first curve chair lift (Pontresina, Grisons) in cooperation with Poma

1991 first chair lift with underfloor drive (St. Peter, Grisons)

1992 first 12-passenger gondola lift (Prodalp-Express) in cooperation with Poma
first ski lift delivered to Argentina (Parque Caviahue)
foundation of BMF Engineering

1993 foundation of subsidiary in Argentina
first chair lift delivered to Argentina (Bariloche)

1994 first ski lift hydraulically tensioned (Fideris, Grisons)
first heavy material ropeway, 6 tons actual load (Glarus)

1995 company take-over of CKU in Unterterzen; first underwater ropeway (Egypt)

1996 first white-water ride (South Korea)

1997 take-over of operation area Lochriet with office building and workshop
ISO9001 certification
first 3-seat chair lift delivered to Chillàn (Chile)
construction of assembly shop 2

1998 take-over of real estate from brothers Hermann
first 3-seat chair lift (Axalp, Berne)
reconstruction and new construction of 4-passenger gondola lift (Brambrüesch, Grisons)
first 2-cable-aerial tramway (Rodi, Ticino)

1999 construction of assembly shop 3

2000 first semi-mobile water ride (New York, USA)
Pedestrian bridge Luegwies, 90 m (Widnau, St.Gall)
first funicular (Fräkmünt, Nidwalden)

2001 take-over of company Metaschal AG
construction of locksmithery, welding shop, sand blasting, paint shop

2002 first two-section 2-seat chair lift in Osorno (Chile)
start of production for PET-Handling Netstal
first composition of boats for white-water ride (Saudi Arabia)

2003 water rides (Tow Boat Ride) in Belantis (Germany) and Drayton Manor (Great Britain)
Drop Tower, Tripsdrill (Germany)

2005 development of the first large aerial tramway of Chur–Känzeli according to CEN and EN standards

2006 first Monorail (Bahrain)
first large aerial tramway with 45 persons in Chur
take-over of company Road Trains Tschu-Tschu in Neumarkt, Germany

2007 first detachable system realized (Val d'Isère, France)
foundation of Grossbearbeitungs AG
take-over of company Road Trains Tschu-Tschu Germany

2008 worldwide largest white-water ride in Shenzhen (China)
Boat Dark Ride at Expo in Zaragoza (Spain)
construction of assembly shop number 8

2010 Chair Ride, World Exhibition in Shanghai (China)

2011 second installation in Les Arcs (France), «Mont Blanc», with the speciality of a 90° entry
first Funitel in Val Thorens

2012 start of operation of the state-of-the-art production centre in Switzerland with a cutting diameter of 6 metres and a machining length of 14 metres
foundation of BMF Ropeways Germany GmbH
foundation of BMF France SA
first 6-seat chairs with weather protection covers in Laax (Grisons)

Sources

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