



Making the simple complicated is commonplace; making the complicated awesomely simple, that's creativity.

Market and technology	4
Miteco process expertise	
Storage / Conveying / Distribution	12
Handling / Dosing	14
Treatment / Conditioning / Sanitisation	16
Dissolving / Blending	18
Automation / Control	20
Miteco plant systems	
Storage / Conveying / Distribution	
Silos	23
Mechanical conveying systems	23
Hydraulic conveying systems	24
Pneumatic conveying systems	24
Manual and automatic distribution systems	25
Handling / Dosing	
Unloading stations	25
Emptying systems	26
Concentrate agitator	26
Treatment / Conditioning / Sanitisation	
Filtration units	27
Contiflot®	27
Ion exchanger and activated carbon units	28
Pasteurisation	28
Water deaeration	29
Universal carbonation units	29
Automatic CIP modules	30
Dissolving / Blending	
Powder dissolver	30
Contisolv®-C	31
Contisolv®-H	31
Radial Jet Mixer®	32
Continew®	32
Multimix®/ Multiblender®	33
Simultmix®	33
Beverage production equipment	34
Automation / Control	
Automation – PLC and SCADA	34





As natural as possible. Or as unusual. It's your choice.

Tasting, smelling, seeing - this complex trio of senses is the key to market success in the food and drink industry. In modern food design, combining these three senses gives rise to an almost endless variety of possibilities for development and differentiation. In addition to classic ingredients such as sugar, minerals, fruit, these are often refined compositions comprising new taste sensations, textures and targeted health and performance-enhancing effects.

A culture comprises a host of sensuous pleasures.

 $Marshall\ McLuhan$





On the consumer side, this enormous offer is matched by a not insignificant range of preferences in terms of nutrition, taste and also lifestyle. When it comes to the manufacture of drinks, there are three factors above all that govern their sensory quality: the quality and characteristics of the ingredients, the recipe profile and the precision and consistency of the process technology used. Together, all three determine the actual quality of the end produce in terms of its appearance, smell, taste and texture. This makes the processing aspect of drinks manufacture one of the most important elements when it comes to making quality drinks. Miteco has occupied the top spot in the core component of drinks technology since the early 1980s, helping to manufacture everything from soft drinks and fruit juices to liquid food. And this applies to all phases of production - from conveying, distribution, preparing and conditioning to the metering, dissolving and blending of solid, liquid and gaseous ingredients. Standards that Miteco applies to every manufacturing strategy regardless of whether our customers want to produce in batches or continuously.





The product is king. For decision-makers who decide.

In terms of consumer goods, the food and drink industry is one of the most competitive segments, and this is particularly true for global and international manufacturers and suppliers. Heavy demands are also placed on management teams in their traditional function. R&D, Marketing and Sales departments not only need to focus on innovation, but also on the future and maintenance of their existing products and product line brands.

You can't overtake someone while treading in their footsteps.

François Truffaut





Whether or not a product idea is technically feasible should only be discussed these core business activities have been clarified and mastered, or at least only once the process technology for existing plants and products has been optimised. This focus on the specific interests and targets of our customers has always dominated the ethos of Miteco, firstly, in its role as a leading technical 'enabler' that can implement any type and quality of product recipe or drink type and secondly, as a provider of ideas that uses process technology to help solve the project aims of its customers in an improved way with far-reaching effects. Regardless of whether they are using new or old plants. At Miteco, this special customer promise hasn't just been pulled out of thin air. On the contrary - the processing innovations that Miteco creates always have been and continue to be instrumental in making continuous production in drinks manufacture the new global standard. And it is this technological progress that has made today's production paradigm - an increase in variety of products and types while reducing costs - possible. True to the company's maxim that our customers should be free to focus on their core business activities.





Between complex and complicated. Simplifying the solution.

There is just one way of ensuring the technical superiority of a drinks plant to maximise the use of the scientific principles of process technology. Only those who understand its logic as a transparent system can derive the best, most precise and most elegant technical engineering solutions from the complexity of physical and chemical processes. This method promises our customers the highest level of added value for each of their investments.

The shortest words, 'yes' and 'no', are the ones that require the most thought.

Pythagoras of Samos



The reason for this mindset is simple: the companies for which Miteco plans, develops and installs both whole and partial plants are quality leaders in their markets. This is a challenge and responsibility alike. And this is why - almost out of principle - Miteco's ambition goes beyond fulfilling 'standard requirements'. It goes without saying that Miteco always ensures that the agreed product and process quality is achieved in the respective project, and also that it guarantees smooth and transparent integration with all pre-production and post-production processes. It is more important to us that we go beyond the respective customer expectations. This approach automatically leads us to the question of which model is best suited to the customer's drinks production process. And this is where Miteco's solutions are particularly impressive: we champion the importance of process technology even in plant management. This contrasts with concepts that 'correct' an inherent lack of process technology with the aid of over-proportioned software. These have to constantly and painstakingly correct the 'target' and 'actual' values during operation. This makes automation an auxiliary that primarily glosses over system-inherent technical deficits. In contrast, Miteco employs software to fully exploit its superior process technology.





The truth about a black box. And the power behind it.

In the shortest time, in the smallest space, with the highest level of homogeneity and as part of a continuous process that has no equal. No other company has introduced more process-changing innovations than Miteco - and ones that enable its customers to produce soft drinks, fruit juices and liquid food more quickly, better and more economically than ever before. And this quite literally from the first day it was founded.

You don't just need to have more ideas than other people, you also need the ability to decide which of them are good. Linus Pauling





Miteco occupies the top market spot within an industry that is characterised by permanent change and new developments. For our customers, we pursue a unique strategy: we tell them that reduction is the only way to push the boundaries of what is technically possible. The reason for this lies in the increasing complexity of the food and drink market, something that has a direct effect on production issues. To counter this market reality, Miteco has found the most technically advanced answers to date - such as the radial jet mixer and the coaxial injector for introducing powders into liquids. Both are ground-breaking elements of Miteco processing and plant technology that could help to make continuous dissolving and blending the new industry standard. The services that Miteco offers are just as intelligent: we do not offer customers one of many solutions, but the best and most appropriate solution for them. And not just in terms of the technical or logistics aspects either: each of our customer solutions must also make perfect economic sense. Visual proof of the Miteco approach can be found in the design of our plants. In contrast to the competition, it is puristic and strict, with few component groups, minimal use of moving parts and a clear layout, including for peripheral equipment.



The lifelines. The storage of raw materials and ingredients, the conveying equipment and distribution lines might not require the highest degree of technological sophistication, nonetheless they are crucial for the smooth functioning of a high capacity, high quality production plant. That's why Miteco pays maximum attention to even the smallest detail.

Storage, Conveying, Distribution

- stainless steel and aluminium alloy silos according to ATEX regulations
- mechanic, hydraulic and pneumatic conveying systems
- manual and fully automated distribution systems
- food grade, leak proof design and material
- low maintenance and optimum reliability







Force and sensitivity. Miteco handling stations make unloading and emptying of small and big containers an easy task even with heavy IBCs. In many cases, metering and dosing equipment using state-of-the-art weighing or mass flow sensors is located directly at the unloading stations. Forceful handling devices meet precision measuring – and this is, too, typical of Miteco.

- handling equipment for all types of containers, including IBC and FIBC
- food grade design and materials
- high precision volumetric or gravimetric dosing devices









The refining touches. Refining and conditioning processes are integral parts of beverage production. Decolourisation, demineralisation, deaeration, filtration, pasteurisation and carbonation, to name the most important ones, need a perfect upstream and downstream integration. Miteco conditioning and CIP equipment delivers excellent performance in their fields.

- refining and conditioning equipment for every application in the beverage and liquid food production
- highly efficient technology
- scalable up to very high capacity units
- grade of precision and production tolerances to customer specifications

Treatment, Conditioning, Sanitisation







The superior concept. The core processes in beverage and liquid food production need a technologically sound and highly efficient design. At Miteco, R&D has always been aiming at a triad: as little moving parts as possible, as much conversion of a given amount of energy in the desired effects as achievable, as limited controlling interventions as necessary.

Dissolving, Blending

- unique performance thanks to key technologies like the Radial Jet Mixer and the Coaxial Injector
- extremely efficient cold and hot sugar dissolving units, blending and mixing units
- high capacity inline-production as well as batch processes
- excellent process stability, high accuracy, unrivalled short mixing times







The organizing power. Automation is the number one factor in ensuring transparent control of all information and technical production processes. Miteco plants and modules are controlled by PLC systems manufactured by leading companies and, depending on their complexity, can be integrated into SCADA systems.

- PLC and SCADA systems to the customer's choice
- integration into existing automation and control systems
- scalable to virtually any plant capacity and complexity
- semi-automatic and manual operation sections can be integrated as well





Automation, Control



Miteco plant systems



Miteco segment expertise

Industry

/ beverages

/ sugar industry

/ speciality sugar, confectionery

/ oils, fats

Products

carbonated beverages, non-carbonated beverages, fruit juices / nectars

sugar solutions, mixed syrups

candied sugar (white / brown), highly / very highly concentrated sugar syrup

oil/water emulsions

Storage / Conveying / Distribution

SILOS

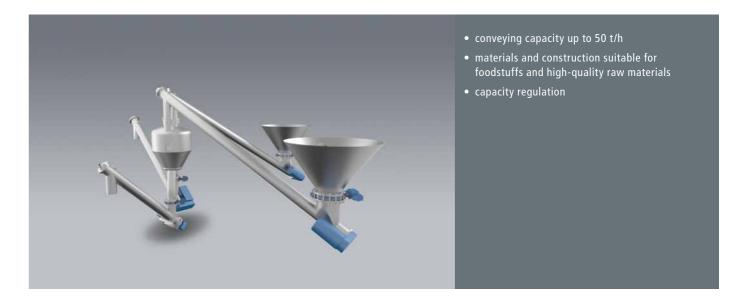
Miteco silos for large volumes of free-flowing raw materials – primarily sugar in drinks manufacture – are manufactured from food-grade, durable and low maintenance stainless steel and aluminium alloy. Their design and layout is optimised to ensure secure filling and storage and reliable discharge.



Storage / Conveying / Distribution

MECHANICAL CONVEYING SYSTEMS

Miteco mechanical inclined and horizontal conveying systems reliably transport granulate and powders over short distances directly into dissolving or blending units. These systems are fully compliant with legal requirements and hygiene regulations for the production of foodstuffs, right down to the sanitisation of the units.





Storage / Conveying / Distribution

HYDRAULIC CONVEYING SYSTEMS

Hydraulic conveying systems rely on dissolving powders and granulates directly at the feeding point. They thus avoid the operational problems of mechanical and pneumatic conveying systems. Firstly, the energy required is not just used for conveying but also initiates a pre-dissolving process, which means that this energy ist not lost. Secondly, the expensive measures required by ATEX guidelines do not apply to the construction and operation of hydraulic conveying systems.



Storage / Conveying / Distribution

PNEUMATIC CONVEYING SYSTEMS

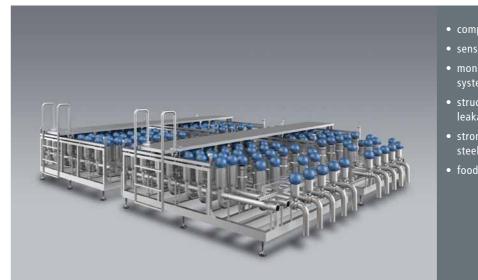
The components of Miteco's pneumatic conveying system fulfil all foodstuff industry requirements. They have an integrated design, right down to the outlet valves; this ensures low energy consumption and careful handling of the material to be conveyed, even over long distances. The pipework is arranged to suit the location and optimised according to the conveying distance and raw materials to be conveyed.



Storage / Conveying / Distribution

MANUAL AND AUTOMATIC DISTRIBUTION SYSTEMS

Manual multi-centre distribution systems and automatic distribution systems are interfaces in the product handling process that require high-quality technical solutions. Thanks to ergonomic operating elements, sensor-supported handling and leak-proof design, Miteco manual systems are extremely reliable. The high-quality finish of the fully automatic systems is evident in their secure valves, which are made from solid stainless steel and have an integrated drainage duct for leakages.



- compact construction, simple installation
- sensor-supported handling in manual systems
- monitoring of valve positions in fully automatic
- structural design prevents leakages or ensures leakages are safely collected
- strong valve bodies made from solid stainless steel with no welded seams
- food-grade design, CIP

Handling / Dosing

UNLOADING STATIONS FOR BAGGED GOODS / BIG BAGS

Miteco offers unloading and feeding stations for bagged goods which enable feeding of both small and large amounts of free-flowing ingredients. The stations are suitable for standard container sizes of 25 kg and 50 kg or for Big Bags (FIBC) up to 1000 kg.





Handling / Dosing

EMPTYING SYSTEMS FOR CONCENTRATE CONTAINERS

Miteco emptying systems for concentrate containers are designed to be easy to operate and enable clean and waste-free handling. There are inlets for current concentrate containers and vats with corresponding suction or lance pumps. The water added to rinse the containers is automatically and precisely measured in order to keep to the exact formula required in subsequent process stages. The pump mechanism is robust and reliable.



Handling / Dosing

CONCENTRATE AGITATOR, TYPE AGISTIR

These agitators have been specially designed for the usage with IBC containers. They are placed and removed from the containers via a forklift. The design of the agitators is as such, that independently from the filling level of the containers, the mixing effect is constant. Thus, the surface of the liquid is not 'broken' and there is no entry of oxygen into the product.



Treatment / Conditioning / Sanitisation

FILTRATION UNITS

Filters are ancillary units that Miteco carefully integrates into its plants as a matter of course. The range comprises simple bag and cartridge filters, as well as more demanding processes such as horizontal plate precoat filters. The design and integration of filtration units depends on each individual plant.



- application-oriented filter techniques and
- partially-automated operation when possible
- recuperation of filtrates, no or minimal product
- food-grade design
- sterile filtration possible where required

Treatment / Conditioning / Sanitisation

CONTIFLOT® CONTINUOUS FLOCCULATION AND FLOTATION UNIT

Contiflot® is a very effective way of pre-processing coloured sugar solutions that contain a high proportion of colloids at very low operating costs. It removes the colloids, leaving a clear sugar solution with up to 70% reduced colour content. There is minimal impact on downstream ion exchangers and activated carbon units, the operation time of ion exchangers is considerably increased and the use of activated carbon is reduced by up to 90 %.



- suitable for sugar syrups with very high proportion of colloids and an initial colour content of up to 1200 ICUMSA
- capacity 2 40 m³/h or higher
- decolourisation performance of up to 70 %
- hot process
- all-in-one process: measuring of reagents, flocculation, flotation
- efficient heat recovery saves energy costs
- minimal product losses thanks to recovery of sludge and sediment



Treatment / Conditioning / Sanitisation

ION EXCHANGER AND ACTIVATED CARBON UNITS

Ion exchanger and activated carbon units are particularly suitable for the decolourisation and demineralization of sugar solutions without colloids or turbidity. Miteco integrates ion exchangers and continuous activated carbon treatments into plant concepts in a manner that provides efficient and highly profitable technical solutions.



- capacity 2 40 m³/h or higher
- Decolouration
- suitable for clear sugar solutions with an initial colour content of up to 350 ICUMSA
- end colour content 35 ICUMSA
- can be combined with Contiflot® for initial colour contents up to 1000 ICUMSA
- Demineralisation
- suitable for treat sugar solutions with an initial ashes content of up to 2500 ppm
- end ashes content 500 ppm

Treatment / Conditioning / Sanitisation

PASTEURISATION

Miteco integrates pasteurisation units as self-contained modules in plants for sugar and final syrups. For beverages, Miteco offers hot filling pasteurisation units or pasteurisation units for cold aseptic filling. The design of a pasteurisation unit always depends on its application. We are utilising the well known competence of the Tetra Pak Group.



- application-specific technology and design
- capacity 50 m³/h or higher
- energy recovery using heat exchangers with efficiency level of up to more than 90 %
- gentle indirect heating via intermediate hot water circuit or product to product
- fully automatic PLC-based operation
- low media consumption
- low product losses

Treatment / Conditioning / Sanitisation

WATER DEAERATION

Achieving the lowest possible level of oxygen in water is a mark of quality in drinks manufacture. Water is thus essentially deaerated. Deaerated water is also used as processing water, e.g. for rinsing processes, because it is less corrosive. Miteco deaeration units are low maintenance and reliable thanks to a very efficient and reduced design with few moving parts. The output can be adjusted to match the speed of production.



Treatment / Conditioning / Sanitisation

UNIVERSAL CARBONATION UNITS

Miteco carbonation units maintain constant CO₂ concentration and product temperature independently of the operating mode of the filling unit; stand-by or stop-and-go production does not influence product quality. The mass flow measurement systems ensure CO₂ flow is precisely measured and kept constant. The design of the unit means that CO₂ venting is not required during production, which allows the expensive raw material to be completely preserved in every situation.



- capacity 5 80 m³/h
- carbonation rate 2 12 g/l
- 100 % CO₂ dissolution in product independent
- independent of product temperature
- fully automatic and flexibly controlled PLC-based operation in all operating modes including CIP



Treatment / Conditioning / Sanitisation

AUTOMATIC CIP MODULES

Hygiene is one of the most important fundamentals when it comes to working with sensitive products such as foodstuffs, cosmetics and medicines. Miteco designs CIP modules individually for each plant and assembles all the components on one frame. The modules are fully automatic, from the heating stage to the measuring of cleaning fluids and disinfectants, and from the cleaning cycle to the rinsing and removal of reagents. There are various cleaning programmes, which can be selected using a keyboard and display.



- assembled as a compact unit on one frame
- various cleaning programmes can be selected
- fully automatic PLC-controlled operation
- SCADA connection including process visualisation

Dissolving / Blending

POWDER DISSOLVER WITH COAXIAL INJECTOR®

To introduce hard-to-wet powders into liquids is technically very demanding. This is exactly where the strengths of the Miteco Coaxial Injector® lie. Even with tricky combinations of materials, the injector can eliminate unwanted agglomeration that can be difficult to remove. Wetting with the Coaxial Injector® is an ideal pre-mixing process for the Radial Jet Mixer®.



Dissolving / Blending

CONTISOLV®-C COLD DISSOLVING UNIT

If powders or granulates need to be completely dissolved in liquids using a cold dissolving process, mixing and dissolving technology play an important role. Contisolv®-C works using a combination of Coaxial Injector® and Radial Jet Mixer® and dissolves continuously at temperatures close to saturation. Contisolv®-C can manufacture sugar solutions of 60 °Brix at just 20 °C. Compared to other 'cold' dissolving processes, the working temperature is significantly lower which means reduced energy and investment costs.



- capacity 3 50 t sugar/h or higher
- reduced space requirements as batch dissolving tanks no longer required
- excellent dissolving performance thanks to Coaxial Injector® and Radial Jet Mixer®
- high accuracy of ± 0.1 °Brix
- maximum concentration around 67.5 °Brix
- reduced energy consumption thanks to low working temperature
- fully automatic and flexibly controlled PLC-based operation in all operating modes including CIP
- elegant construction with few moving parts

Dissolving / Blending

CONTISOLV®-H HOT DISSOLVING UNITS

Particularly high concentrations require hot dissolving processes. Contisolv®-H benefits from the two key Miteco technologies: the Coaxial Injector® and the Radial Jet Mixer®. Compared to other processes, this process can achieve either the same Brix value with lower temperatures or a higher Brix value at the same temperature; this saves energy and investment costs. Further characteristics include fully automatic continuous operation and high accuracy and excellent process stability.



- capacity 3 50 t sugar/h or higher
- excellent dissolving performance thanks to Coaxial Injector® and Radial Jet Mixer®
- reduced space requirements as batch dissolving tanks no longer required
- considerably reduced energy consumption thanks to low working temperatures
- maximum concentration of around 84 °Brix, high accuracy of ± 0.1 °Brix
- fully automatic and flexibly controlled PLC-based operation in all operating modes including CIP
- optimised, compact tubular heat exchanger with recirculation and own control loop



Dissolving / Blending

RADIAL JET MIXER®, AN EXCLUSIVE TECHNOLOGY FROM MITECO

The core points of Miteco plant technology are blending and dissolving. One of our key technologies for these processes is the Radial Jet Mixer® which differs fundamentally from other processes to blend liquid and solid starter materials. The Radial Jet Mixer® has a very simple and exceptionally reliable design which ensures increased homogeneity of the mix compared to other techniques. It is a quick technique, has shorter mixing times and places no mechanical stress on the mix.



- very high homogeneity of final mix
- very short mixing stroke, interruptions to the process or changes in formula results in almost
- very low level of mechanical stress on the mix, suitable even for sensitive products such as fruit
- very easy to control mixing process
- excellent process performance and stability
- can be scaled up from laboratory level to very high-capacity industrial usage
- very short mixing times

Dissolving / Blending

CONTINEW® CONTINUOUS IN-LINE BLENDING UNIT

Accuracy and reliability are two of the most important characteristics of this continuous in-line large-capacity blending unit. Continew[®] sets new standards in both these areas. Up to ten independently mass metered ingredients can be precisely blended using a Radial Jet Mixer® in a highly efficient and homogenous manner. During production, the unit separates between an production and operation mode using a patented recirculation system and keeps all production parameters constant, independently of stop-and-go upstream and downstream units.



- capacity 5 200 m³/h
- 2 10 inlet components
- excellent blending performance thanks to Radial
- high accuracy: fruit juices and syrups ± 0.05 °Brix, beverages ± 0.03 °Brix
- high tolerance in the inlet: simple syrup and HFCS ± 2 °Brix
- individual mass meter for all components
- constant pressure before and after dosing section
- fully automatic and flexibly controlled PLC-based operation in all operating modes including CIP

Dissolving / Blending

MULTIMIX® AND MULTIBLENDER®

Blending units that are capable of blending many end products continuously and simultaneously are particularly economical. Multimix® and Multiblender® can process 2-10 ingredients for up to 2-5 end products with different formulations. Multiblender® processes final syrups and water, and Multimix® can additionally process basic products such as concentrates, HFCS and simple syrup. The number of inlets, technical periphery and space requirements are reduced to a minimum compared to many other individual units, and the blending and accuracy are of the highest quality.



- capacity 20 200 m³/h
- 2 10 inlet components, 2 5 end products
- high accuracy: beverages ± 0.03 °Brix
- high tolerance in inlet: simple syrup, final syrup and HFCS ± 2 °Brix
- excellent blending thanks to Radial Jet Mixer®
- individual mass meter for all components
- no losses during production, minimal losses at end of production
- constant pressure before and after measuring
- fully automatic and flexibly controlled PLC-based operation in all operating modes including CIP

Dissolving / Blending

SIMULTMIX® BLENDING AND CARBONATION

Water deaeration, blending, carbonation, cooling - combining all these essential stages into one unit considerably simplifies the production process. Simultmix® is a production centre for carbonated and, if required, non-carbonated drinks. A Continew® blending unit forms the core of the Simultmix® and is complemented by water deaeration modules, carbonation and cooling. During production, the unit operates using a patented recirculation system and keeps all production parameters constant, independently of stop-and-go upstream and downstream devices.



- capacity 5 80 m³/h
- adjustable output
- inlet components for final syrup, water, CO₂, expandable
- high accuracy: beverages ± 0.03 °Brix, CO₂ content ± 0.05 Vol.-%
- excellent blending performance thanks to Radial
- carbonation rate 2 12 g/l, no loss of CO₂
- operates independently of product temperature
- fully automatic and flexibly controlled PLC-based operation in all operating modes including CIP



Dissolving / Blending

BEVERAGE PRODUCTION EQUIPMENT BUILT AS AN 'ISLAND' UNIT

It is a beverage production system dedicated for only for one filling line, which consists of:

- 2 Mixing tanks for final and quasi syrup
- Concentrate handling unit
- Blending unit Continew® (2 or 3 inlet components)
- Water deaeration unit
- With additionally the Universal Carbonation unit



- capacity 5 80 m³/h
- adjustable output
- inlet components for final syrup, water, CO₂, expandable
- high accuracy: beverages ± 0.03 °Brix,
 CO₂ content ± 0.05 Vol.-%
- excellent blending performance thanks to Radial let Mixer®
- carbonation rate 2 12 g/l, no loss of CO₂
- operates independently of product temperature
- fully automatic and flexibly controlled PLC-based operation in all operating modes including CIP

Automation / Conrol

AUTOMATION - PLC AND SCADA

Automation is the number one factor in ensuring transparent control of all information and technical production processes. Miteco plants and modules are controlled by PLC systems manufactured by leading companies and, depending on their complexity, can be integrated into SCADA systems. From measuring and regulation technology to the precise documentation of all operating processes, Miteco units always represent state-of-the-art automation technology.



- PLC Siemens S7, Rockwell Automation / Allen-Bradley and others
- SCADA Wonderware / InTouch and others
- scalable solutions
- continuous automation for economical and secure production
- operated using local control panels and central monitoring stations





Miteco AG

P.O. Box / Frikartstrasse 5 / 4800 Zofingen / Switzerland phone +41 62 746 9494 / fax +41 62 746 9470 / info.miteco@tetrapak.com

www.miteco.com www.tetrapak.com