Bag-in-Box® or BIB appears as a simple and convenient package for the end user.

The wine consumer appreciates the graphics on the cardboard box, the way the wine pours from the tap and the fact that one does not have to finish the container quickly in order for the wine to stay fresh. For additional benefits, if it accidentally drops from the kitchen shelf, chances are that there will be no cleaning up to do and it makes efficient use of limited space whether this be in the refrigerator or even in the recycle bin as it approaches the end of its product life cycle.

That this all appears so easy helps explain why BIB is probably the fastest growing major wine packaging category in the world.

The BIB industry has everything to gain by offering simplicity even if achieving this goal is often very complicated.

This publication is the second in a series published by the Performance BIB Association. First was the “Guide of Good Practices for the filling of wine in BIB” which provided a number of recommendations for wine preparation, filling and storage.

The second publication, rather than focusing its attention on filling centre practices, turns toward the package and the machines used fill them. After explaining a number of basic concepts or principles which underlie parameter choice, it lists the key parameters for each component of the package and filling process and provides an example measurement unit.

We do not enter into a description of test methods, since these are within the domain of the “Standardisation” work group of Performance BIB.

If the list of key parameters appears very long, this is because identifying the characteristics of the BIB package is not an easy matter. We
realize that even large filling centres and packaging firms may not use all of these parameters in any given situation. However, hopefully now the industry will have a comprehensive resource to draw from when selecting or describing BIB packaging.

As with the case of the “Guide of Good Practices”, the present publication is the work of a large number of individuals who have taken the time to offer the comment and criticism necessary to improve early drafts.

The authors would like to particularly thank Pascal Cletz, Alain Dufrêne, Philippe Gobin, Tony Hoare, Bénédicte Nicolini and Erik Shea for their contribution as well as Philip Bailey, Jennifer Bond, Jean-Claude Boulet, Yves Boussard, Michel Capelle, Paul Caracci, Damien Cartier, Olivier Côme, Christine Dardé, José Fariñas, Margarethe Frankl, Gijs Geerlings, Olivier Haulot, Elena Jover, Cendrine Lallement, André Laville, André Mercier, Paola Montaldi, Frithjof Nicolaysen, Aurélie Peychès, Didier Pontcharraud, Philippe Sapin, Eva Shea, Jean-Claude Vidal and Laura West for their highly pertinent observations.

The authors would also like to underline their appreciation for Annouk Arzoumanian, President of Performance BIB, who has devoted time, energy and passion in moving the BIB industry forward.
PRINCIPLE 1
Understanding how BIB works

To pour wine from a BIB, one requires an opening (a tap), gravity and a flexible film. The bag collapses under the influence of gravity and air does not enter into the package when it is being poured. This is not the case with other forms of wine packaging.

BIB would pour even better on Jupiter (although the resistance of the box would have to be reinforced) but on the Moon, it would require a great deal of patience to pour a glass of wine.

PRINCIPLE 2
Mastering Good Filling Practices

Producing quality BIB wine implies an appropriate package but this is not enough! “Technical Specifications of Wine BIB Packaging” will help one define BIB the package but to fill it well, one should also consult the “Guide of Good Practices for the filling of wine in Bag-in-Box” (published by Performance BIB).
PRINCIPLE 3

Technical specifications are not specific user requirements

So that suppliers of bags and boxes provide appropriate BIB packaging, it is important that the filling centre describes clearly its specific conditions:

➤ type of wine to be filled (including level of CO₂, etc.)
➤ BIB package volumes (2, 3, 5, 10 litre, etc.)
➤ type of machines and other conditions on the filling line
➤ transport distances and conditions
➤ storage temperatures

A statement of “user requirements” incorporates the above conditions and only those technical specifications relevant to the specific filling centre. It often becomes part of the purchase contract (incorporating also non-technical elements) established between the filling centre and the BIB supplier. Key parameters are assigned performance limits deemed to be acceptable to both parties.

PRINCIPLE 4

Co-adaptation of BIB and its environment

BIB package design must take into account the wine, the filling line, distribution channels and consumption habits but this environment must also adapt to the package. The improvement of a part of the system implies often that other actors must also accept change in products and behaviour.
PRINCIPLE 5

International test standards are necessary

Test methods for many key parameters are accepted by the international BIB industry but much work remains so that more tests are standardised, are closer to reality and have a greater predictive value relative to non-quality problems.

PRINCIPLE 6

Conduct proper wine analysis

One should not forget that the primary function of the package is to protect and conserve the product. The filling centre should validate the choice of the package by measuring its performance, associated with the filling line and work methods. For that, the filling centre should analyse the wine periodically at different stages of the supply chain.

Examples of key parameters for the wine:
➤ control of the level of dissolved oxygen
➤ technical analysis (turbidity, acidity, total, free and active SO₂, etc.)
➤ microbiological analysis (bacteria and yeast)
➤ sensory analysis (tasting + appearance).
BIB package production requires coordinating an increasingly complex set of technologies, involving material choices, know-how, process control and machines of great precision. Active, intelligent and nanotechnology packaging applications are rapidly emerging with a constant need to stay abreast of new developments.

Boxes, taps, glands, films and bags, in order to meet severe quality requirements, must be manufactured in ultra-modern facilities involving high plant investment costs.

**PRINCIPLE 7**

**Complex technologies of manufacturing**

Our list includes only technical parameters and does not present economic or aesthetic parameters. Each specification is to be measurable, relevant and preferably accepted by the industry. Parameter selection is guided by primary package functions, for example preserving wine characteristics until final consumption or making sure that the package does not leak.

This implies that we will tend to focus on:

- “oxygen barrier” since the premature oxidation of BIB wine remains an issue.
- “mechanical resistance of films” and “non-abrasive nature of the paper used for the boxes”, in order to minimize the risk of holes and resulting leakers.
PRINCIPLE 9
Parameter choice varies with supply chain level

The selection of relevant parameters depends on which level of the supply chain one is situated (packaging materials, filling centres, retail distribution).

The present document is aimed primarily at the level of the filling centre relative to its package and machine suppliers. However, the constraints imposed by retail distribution have a large influence on the entire supply chain. Among the parameters relevant to retail distribution we find customer complaints, package integrity, shelf-life indication, risk reduction via a HACCP plan and environmental impact.
**PARAMETER 1**

**Box print quality**

Print quality must be perfectly executed relative to colour references and image resolution matched to paper quality.

Example measurement unit: lpi or dpi.

**PARAMETER 2**

**Resistance of the box to internal pressure**

The box must resist the quick and violent introduction of the filled bag during packaging as well as ensuing horizontal pressure on the inner sides of the box during transport, which can be accentuated by rising storage temperatures.

Example measurement unit: kPa.

**PARAMETER 3**

**Resistance of the box to vertical compression**

Boxes situated at the bottom of a pallet must support, at a minimum, the weight of all boxes above it, during palletization and transport. Resistance tests should be conducted with filled bags on the inside of the box.

Example measurement unit: Newton.
PARAMETER 4
Puncture resistance of the box

The box comes in contact with machines and hard surfaces from the time it is manufactured to the time it is consumed. This parameter is a measure of its structural resistance and measures the force necessary to push a pointed probe entirely through the box.

Example measurement unit: kPa.

PARAMETER 5
Non-abrasiveness of paper used inside box

The friction between the inside of the box and the bag must be reduced so as to preserve the oxygen barrier properties of the outside film of the bag and to prevent the formation of pinholes.

Example measurement unit: coefficient of friction (bag/box).

PARAMETER 6
Slide angle

During stacking, stretch-wrapping and transport of pallets, the boxes should not too easily slip off pallets. The parameter measures the angle when the box begins to slip.

Example measurement unit: coefficient of friction (box/box).
PARAMETER 7
Resistance to humidity (vapour or liquid)
Box resistance is influenced by the amount of water it absorbs.

Example measurement unit: absorption of water in g/m² when a given quantity of water is deposited on the surface for a specific length of time.

PARAMETER 8
Protection of surface by overprint varnish (UV, acrylic)
Varnishing the outer surface of boxes reduces the rate of absorption of humidity and protects and enhances the print quality. It also reduces glue adhesion which why no varnish is generally applied to inside flaps.

Example measurement unit: thickness of coating in micrometres (µm), commonly referred to as microns.

PARAMETER 9
Thickness and composition of cardboard and paper components
Corrugated boxes may be described by the type and number of flutes or solidboard used, the weight (g/m²) of the two sheets of paper that frame the flutes, the overall thickness of the box and the % of recycled material.

Example measurement units: g/m² and mm.
PARAMETER 10

Die-cut (design and execution) and folds

Creases should allow for proper erecting of the box so as to run through a filling line. Box sides should be correctly aligned and there should be no sharp edges.

Example measurement unit: descriptive.

PARAMETER 11

Organoleptic neutrality

There should be no taste or odour contamination of the wine by the box (due to inks, solvents, starch, etc.).

Example measurement unit: sensory evaluation.

PARAMETER 12

Dimensions of the boxes

Box dimensions must be defined relative to the bag dimensions and should allow for an extra inside volume in comparison with the nominal volume of the BIB. Too little extra volume can result in box bulging and too much extra volume can increase flex cracking of the bag (because it moves around).

Example measurement unit: inside volume of box \((h \times w \times l)\) relative to nominal volume.
PARAMETER 13
Palletization plan
This includes the number of layers per pallet, the distribution of boxes and outer packaging on each layer as well as the use of layer pad and stretch-wrap when appropriate.

The palletization plan will in turn impact on box design (horizontal resistance and dimensional requirements).

PARAMETER 14
Cut-out holes for handles and taps
Perforations and holes cut in the cardboard allow for handle insertion and tap removal.

Example measurement unit: box design with perforations (in mm).
PARAMETER 15
Perforation strength

Perforation strength must be weak enough to allow separation by the final consumer but strong enough to not break prior to end use.

Example measurement unit: force (daN) to break perforation.
PARAMETER 16
Type of tap and gland
In general, each tap is designed to fit its own gland. A gland, in some countries is referred to as a spout or flange.

Example measurement unit: Name of manufacturer and product references.

PARAMETER 17
Tap and gland dimensions
The diameter of the gland must be well matched to the diameter of the insertion barrel of the tap.

Example measurement unit: mm.

PARAMETER 18
Force necessary to remove and insert the tap in its gland
The tap and gland is generally made with different polymers. As temperature changes, these tap and gland materials may dilate, soften or deform differently. For this reason, it is important to measure extraction and insertion force at different temperature levels. This is measured both at the partial insertion (preset) level and the full insertion level.

Example measurement unit: daN at various temperature levels.
PARAMETER 19
Tamper resistance
Example measurement unit: descriptive.

PARAMETER 20
Stress-crack resistance of glands
Stress cracks in polyethylene glands will appear more quickly when the glands are bent, in contact with aggressive liquids (including alcohol) and subject to very high temperatures (for example, hot filled Sangria).

Example measurement unit: duration (in days) before cracks appear.

PARAMETER 21
Description of the tap and gland materials
Example measurement unit: descriptive.

PARAMETER 22
Depth of tap in gland
Bags are generally supplied with the tap partially inserted (preset) into the gland at a specific height so that the filling machine can operate correctly.

Example measurement unit: mm.
PARAMETER 23  
**Recommended storage temperature of taps and glands**

Example measurement unit: range of temperature in °C.

PARAMETER 24  
**Rate of oxygen permeation**

Example measurement unit: Rate = $x \text{ cm}^3 / \text{tap-gland unit} / \text{day}$, $y$ °C, $z$ % RH at 21% O₂ either with the tap filled with water (gas/water measurements) or not filled with water (gas/gas measurements).

PARAMETER 25  
**Volume of air trapped in tap**

Example measurement unit: cm³ of water required to fill tap up to the brim.

PARAMETER 26  
**Tap integrity**

Generally a tightness test is performed on each tap during the production process.

Example measurement unit: Number of taps (in %) which remain tight at a pressure of $x$ bar without having ever opened the valve mechanism.
PARAMETER 27
Tap/gland interface integrity
After filling, the tap/gland unit is fully inserted. The tap/gland interface is to remain tight at various temperature levels.

Example measurement unit: Number of tap/gland interfaces (in %) which remain tight at a pressure of $x$ bar. The tap is totally sealed off so that only the air through the interface is measured.

PARAMETER 28
Tap valve resistance
A resistance test on the tap valve mechanism is often carried out periodically.

Example measurement unit: Number of taps (in %) which remain tight at a pressure of $x$ bar after opening and closing of the valve mechanism $y$ times.

PARAMETER 29
Shelf life recommended for taps and glands
Example measurement unit: between the date of manufacture of the taps and glands and its conversion into BIB bags, the period should not exceed $x$ months.
PARAMETER 30
Rate of gas permeation of the barrier film
Although CO₂ permeation can also be measured, it is oxygen transmission rate (OTR) that receives the most attention for oxygen sensitive products such as wine. Although its usefulness for forecasting wine self-life has not yet been demonstrated, OTR remains important for quality control. There is a strong positive correlation between temperature and OTR.

Example measurement unit: \( x \) cm³ / m² / day, \( y \) °C, \( z \) % RH, expressed in 21% or 100% O₂.

PARAMETER 31
Water vapour transmission
There is a strong positive correlation between temperature and the water vapour permeation rate.

Example measurement unit: \( x \) cm³ / m² / day, \( y \) °C, \( z \) % RH, expressed in 100% H₂O.

PARAMETER 32
Description of film materials and thicknesses
Example measurement unit: material identification and thickness in μm.
**PARAMETER 33**

**Flexibility of the film**

Film flexibility can influence flex-crack resistance, filling line performance and the emptying of the last glasses of wine by the consumer.

Example measurement unit: Stiffness units using a high-precision stiffness tester.

**PARAMETER 34**

**Recommended shelf life of film**

Example measurement unit: between the date of manufacture of the film and its conversion into BIB bags, the period should not exceed $x$ months.

**PARAMETER 35**

**Coefficient of friction**

Friction generated by the sliding of the inner and external surface of the film (both wet and dry) against the surface of another film, the box or metal. Generally, one adds a slip agent for the layer of film in contact with the outside environment to reduce friction.

Example measurement unit: static and kinetic coefficients of friction (COF) calculated when sliding film at $x$ cm/min.
PARAMETER 36
Resistance to major flexing (Flexcrack)
Example measurement unit: Number of pinholes per m² after x flexions.

PARAMETER 37
Puncture resistance
Often measured by the resistance of the film to penetration by a dart.
Example measurement unit: in Newtons/mm² or kgf/mm².

PARAMETER 38
Tensile strength of film
The measure of the stress applied to the film (by pulling on it) before rupture or permanent deformation.
Example measurement unit: in Newtons/mm²
PARAMETER 39

Elongation

Example measurement unit: the % increase in film length before failure, pulled both in the direction of the machine and cross machine direction.

PARAMETER 40

Delamination resistance

The force necessary to separate two layers of a laminated film.

Example measurement unit: Newton.
PARAMETER 41
Storage temperature and humidity
Recommended storage conditions for empty bags.
Example measurement unit: °C.

PARAMETER 42
Recommended shelf life of empty bags
Oxygen transmission rates, weld resistance and other parameters can be affected by long storage of empty bags.
Example measurement unit: years.

PARAMETER 43
Bag dimensions
Example of the dimensions of a single, un-webbed bag (see drawing):
A: Inside Length, between the inside edges of the welds
B: Inside Width, between the inside edges of the welds
C: Distance between the centre of the gland and the inside edge of the weld (along the length)
D: Length between the centre of the gland and the inside edge of the weld (along the width)
Example measurement unit: mm.
PARAMETER 44
Orientation of the tap
The tap must be pointed in the right direction for the final consumer and sometimes also for the filling machine. The correct orientation is often expressed as handles of a clock indicating where the pouring tap should be pointed: generally 6 o’clock or 12 o’clock.

Example measurement unit: Clock handle position.

PARAMETER 45
Single or multiple webbed bags
For webbed bags, the force necessary to separate bag perforations should also be cited.

Example measurement unit: descriptive.

PARAMETER 46
Rate of oxygen permeation (gas/liquid)
Measure of total package gas permeation through filled bag based upon observed changes in the level of dissolved oxygen, conducted with deoxygenated water (+ sometimes alcohol) using chemical or optical sensors.

Example measurement unit: \( x \) ppm/day.
PARAMETER 47
Weld resistance
Example measurement unit: in g/mm (peeling resistance) or in kPa (when burst test is conducted with compressed air).

PARAMETER 48
Burst resistance of the bag filled with water
Example measurement unit: number of bags (filled with water) that burst after a drop of $x$ meters, $y$ times, with or without its box.

PARAMETER 49
Resistance to vibrations during transport
Example measurement unit: number of bags (filled with water) that burst $x$ hours on vibrating table with a specified vibration amplitude and frequency.

PARAMETER 50
Packing of empty bags
Number of bags per box and per pallet. Recommendations as to not stacking one pallet on top of another.
Example measurement unit: descriptive
PARAMETER 51
Microbiological hygiene of empty bags
Empty wine bags (like the wine itself or the filling environment) are generally not 100% sterile but the important notion is to have potentially harmful yeasts or bacteria below acceptable risk levels for wine.
Example measurement unit: number of specific micro-organisms/cm² of film.

PARAMETER 52
Particulate hygiene
Absence of foreign material in bag, other than micro-organisms.
Example measurement unit: visual or foreign material count/cm².

PARAMETER 53
Organoleptic neutrality
Level of change in the taste or odour imparted to the wine as a result of being filled and stored in the bag.
Example measurement unit: sensory evaluation using scale.
**PARAMETER 54**

**Contamination avoidance**

Filled bags should not be stored or transported close to potential sources of contamination.

Example measurement unit: ppb of contaminate.

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**PARAMETER 55**

**Food contact certification**

Food contact certification for taps and film, meeting European Union and FDA requirements.

Example measurement unit: migration less than $x$ mg per dm$^2$.

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**PARAMETER 56**

**Quality assurance certification**

**PARAMETER 57**  
**Traceability system**

Traceability from the bag producer to the end consumer is generally possible because of a code printed on each individual bag.

Example measurement unit: the code.

**PARAMETER 58**  
**Environmental impact**

One environmental impact indicator might be the total energy consumed over the product’s life cycle. Another might be its "carbon footprint", which is the amount of greenhouse gases produced (measured in equivalent units of CO₂) for any human activity. Calculating the carbon footprint or energy requirements requires a careful life cycle analysis of all materials used. BIB package results can then be compared to alternative forms of wine packaging.

Example measurement units: Kj of energy or kg of carbon dioxide equivalent units, per litre of packaging.
** PARAMETER 59  
**Type of connector**
This identifies the type of connection between the tap and the system of liquid distribution used by bars and restaurants.

Example measurement unit: descriptive.

** PARAMETER 60  
**Cleaning requirements**
Example measurement unit: minutes to clean connector.

** PARAMETER 61  
**Recommended cleaning products**
Example measurement unit: descriptive.
**PARAMETER 62**

**Connection requirements**

Example measurement unit: number of seconds to position connector on tap.

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**PARAMETER 63**

**Impact resistance**

Example measurement unit: $x$ kg weight dropped on connector $y$ times at height of $z$ cm.

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**PARAMETER 64**

**Diameter of connection tube linked to the distribution system**

Example measurement unit: mm.
PARAMETER 65
Type of handle
Example measurement unit: descriptive.

PARAMETER 66
Materials (polymer, additives) used
Example measurement unit: descriptive.

PARAMETER 67
Handle dimensions
Example measurement unit: design in mm.

PARAMETER 68
Ease of carrying
Example measurement unit: visual inspection of stress to fingers after carrying for $x$ meters.
PARAMETER 69
Weight resistance
The capacity of the handle to support the weight of a filled BIB is a function of handle and box design as well as resistance of materials.

Example measurement unit: Number of times the handle becomes detached after picking up and setting down the BIB x times.

PARAMETER 70
Removal resistance at several angles
When the consumer grabs the handle at various angles, it should remain in the box. This is a function of both handle and box design.

Example measurement unit: number of failures at different grab angles.

PARAMETER 71
Handle Insertion means
Manual or mechanical insertion or integrated into the box to begin with.

Example measurement unit: descriptive.
PARAMETER 72
Level of final filtration
Example measurement unit: µm.

PARAMETER 73
Buffer tank
The volume of the buffer tank and transfer method for the wine is generally described (simple gravity or with a pump, with or without inert gases, the amount of pressure, etc.).

Example measurement unit: descriptive.
**PARAMETER 74**  
**Cleaning cycle**  
Automatic machine operations and human intervention  
Example measurement unit: minutes.

**PARAMETER 75**  
**Recommended cleaning products**  
Example measurement unit: descriptive.
PARAMETER 76
Dissolved oxygen (DO) levels

This involves many other factors than the filling machine, including package components and the wine itself but machine adjustments and rate of fill can also influence DO levels.

Example measurement unit: DO in wine in mg/litre or ppm before and after filling.

PARAMETER 77
Size of the air cone

Like DO levels, the size of the air cone involves many non-machine factors but the angle of the filling table and machine settings can also have an influence.

Example measurement unit: cm.

PARAMETER 78
Amount of foam

Example measurement unit: visual inspection to check for excess foam in bag.

PARAMETER 79
Fill Volume control

Example measurement unit: litres (reminder: weight = volume/density).
PARAMETER 80
Vacuum pack cycle
Example measurement unit: descriptive.

PARAMETER 81
Injection of inert gas
Example measurement unit: descriptive (type of gas, pressure, etc.).

PARAMETER 82
Consumption of inert gas
Example measurement unit: litres of inert gas (nitrogen) per hl of wine filled.

PARAMETER 83
Rate of fill
- Number of filling heads
- Filling speed per head
The rate of fill also depends on the flow rate for the arrival of the wine and therefore of the pump or the pressure of the inert gas pushing the wine towards the filling machine.

Example measurement unit: \( x \) BIB/hour for each BIB bag size which corresponds to a flow rate of \( y \) litres/hour.
**PARAMETER 84**

**Degree of mechanization**

Depending upon the degree of mechanization (for the introduction of the bag, the filling, box forming and closing and palletization) the line is generally described as fully automatic, semi-automatic or manual.

Example measurement unit: descriptive.

**PARAMETER 85**

**Machine operators**

This parameter involves the number of the persons who operate or maintain the machines as well as their qualification.

Example measurement unit: Number of BIB produced per hour of labour, per category of employee.

**PARAMETER 86**

**Package appearance**

This identifies the damage to the package (tap, film, bag and box) as a result of the entire packing process.

Example measurement unit: visual.

**PARAMETER 87**

**Wastage**

Example measurement unit: the % of wasted materials and wine as a result of the entire packing process.
**PARAMETER 88**  
**Bag to box transfer**  
This describes the means by which the bag is dropped into the box (funnel, manual operations, etc), the height of the drop and the variance in the way the bag positions itself in the box.  
Example measurement unit: descriptive.

**PARAMETER 89**  
**Security**  
Safety guarding, alarms, automatic line-stops and other devices employed to protect machine operators.  
Measure unit (example): descriptive.

**PARAMETER 90**  
**Noise levels**  
Example measurement unit: dBA.

**PARAMETER 91**  
**Box erector and closer**  
Described in terms of speed, loading system, closure means (glue or tape), etc.  
Example measurement unit: descriptive.

**PARAMETER 92**  
**Handle insertion method**  
Example measurement unit: descriptive.
PARAMETER 93
Palletization process
Example measurement unit: descriptive.

PARAMETER 94
Automatic detection of defects
Non-conformities can be signalled by alarm or automatically rejected.
Example measurement unit: descriptive.

PARAMETER 95
Line stoppage
When possible, there is a differentiation made between machine related and materials related downtime.
Example measurement unit: unintentional down time in % of total hours of line run time.

PARAMETER 96
Electric requirements
Example measurement unit: descriptive.

PARAMETER 97
Compressed air requirements
Example measurement unit: descriptive.
Performance BIB is an Association having, as its main focus, the improvement in the quality of the wines packed in Bag-in-Box® or BIB.

More than 60 firms, leaders in the industry for the filling and packaging of wine in BIB, are members of Performance BIB. Member firms come from 20 countries (Argentina, Australia, Austria, Canada, Chile, Denmark, France, Germany, Greece, Israel, Italy, Netherlands, New Zealand, Norway, Singapore, South Africa, Spain, Sweden, United Kingdom and the United States) distributed over 5 continents. For an updated list, please visit the “Members” page of the web site www.b-i-b.com.

This non-profit making Association is financed by its Members as well as by French government grants from the Languedoc-Roussillon Region and the Drire (Regional Department of Industry, Research and Environment).

Performance BIB Activities

- **Work Groups**
  - Guide of Good Filling Practices
  - Technical Specifications
  - Test Standardisation
  - Transport

- **Communication**
  - Web site
  - Technical Exchange
  - General Meetings
  - Publications

- **Research**
  - Doctoral Thesis “Wine/Package/Environment interactions: Analytical Methods and Bag-in-Box applications”
  - + other research programs
Performance BIB activities fall into three major themes: Work Groups, Communications and Research.

- **Work Groups**
  - The “Guide of Good Practices” work group published its conclusions in January 2007 under the auspices of Performance BIB. The principal objective of this “Guide of Good Practices for the Filling of wine in BIB” is to improve the quality of BIB wines through improved filling practices.
  - The “Technical Specifications” work group has determined the key parameters used to define BIB filling and packaging systems, described in the present document.
  - The “Tests Standardisation” work group takes some of the key parameters developed by the “Technical Specifications” group and then describes the methods used to conduct tests. It contributes to the standardisation of these test methods at an international level.
  - The “Transport” Group examines quality problems and solutions linked to transport systems, whether they are for small BIB packages or 24 000 litre Flexitanks.

- **Communications**
  In addition to our publications and our website, the Association organizes meetings for its members all over the world.

- **Research**
  In collaboration with the INRA (French Ministry of Agriculture), the Association sponsors research, including the financing of a BIB related Doctoral Thesis, carried out by Aurélie Peychès.

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Example of a current project:

*On the road towards improved BIB transport systems...*

Source: Hannelore Shea
These Technical Specifications for BIB Packaging have been divided into two major parts: Principles and Key Parameters.

In the Principles section, we put forth some basic concepts:
➤ Explaining how BIB works
➤ The need to also master Good Filling Practices
➤ How technical specifications differ from specific user requirements
➤ The mutual adjustment between BIB and its environment
➤ Developing international test standards
➤ The role of proper wine analysis in package evaluation
➤ The complexity of BIB manufacturing technologies
➤ Rendering explicit parameter selection criteria
➤ How parameter choice varies with supply chain level

We then set out to list Key Parameters that best define BIB package performance for:
➤ Boxes
➤ Taps
➤ Films
➤ Bags
➤ Connectors
➤ Handles
➤ BIB filling lines.

This work has been conducted under the auspices of the Performance BIB Association and the authors have benefited from the comments and reviews of a large proportion of the BIB industry worldwide in defining and describing these key parameters.

It is hoped that this publication will make a modest contribution to the improvement in the quality of the wines packed in BIB through a more clear expression of package performance indicators.

The fact that BIB packaging is complex adds to its allure for the BIB professional and explains why the industry attracts so many motivated and highly qualified technical practitioners, intent on transforming a set of very complex technologies into a simple, easy to use product for the end consumer.