

# Ecoflac<sup>®</sup> plus

The right solution every step of the way



Basic Care

**B | BRAUN**  
SHARING EXPERTISE

## Has everything been said about IV containers?

Infusion therapy is a fundamental and irreplaceable part of patient care. Because of its nature, infusion therapy bears different risks for both the patient and the healthcare professional. The consequences of those risks on the health of the individual are often underestimated and can represent heavy costs for the hospital.

Based on clinical evidence, B. Braun has identified the major risks that can occur during the main steps of the infusion therapy process. B. Braun's integrated product system contributes to safe and efficient workflows, improving patients' quality of life and the safety of healthcare professionals.

Ecoflac® plus is B. Braun's IV container solution for safe infusion therapy. With an extensive portfolio of standard solutions, plasma volume replacement, premixed solutions and ready-to-use drugs, Ecoflac® plus stands as the state-of-the-art IV container system that offers safe and convenient application of all IV procedures. Based on its ergonomic design, it contributes to the prevention of some of the most common risks throughout the whole infusion therapy.



For more information about risk prevention in infusion therapy, visit:

[www.safeinfusiontherapy.com](http://www.safeinfusiontherapy.com)

# Your partner in every step

## Delivery & storage



Delivery & storage

## Prior drug admixture

- solution identification
- compatibility check



Prior drug admixture

## Drug admixture

- with transfer devices
- with dispensing pins



Drug admixture

## Prior drug delivery



Prior drug delivery

## Drug delivery



Drug delivery

## Disposal

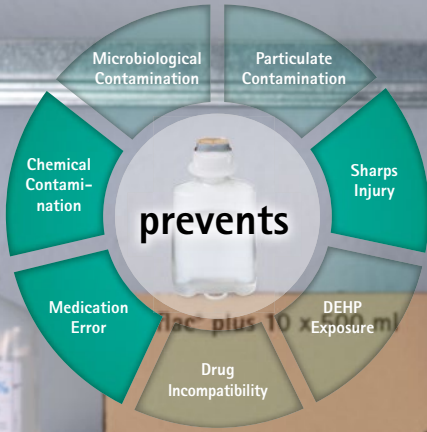


Disposal

## Portfolio

Portfolio





Ecoflac® plus 10 x 500 ml

10 x 500 ml



Dreikant  
Three  
Poche  
Bolsa de

NaCl

# Delivery and storage



## Easy to identify

The clear labelling on the Ecoflac® plus transport boxes allows an easy and fast identification of the solution. The use of a color code, which is consistent with the single unit labels, helps preventing medication errors caused by incorrect drug selection.<sup>1,2</sup>



## Easy to open and access

The Ecoflac® plus carton box has an integrated dispenser feature which allows easy opening without scissors or sharp instruments, reducing the risk of injury and of damaging the contents.



## Easy to store and count

The Ecoflac® plus IV containers are easy to count and store, either standing upright or laying on their side. This also allows you to optimize the space in the storage area.



## Ergonomic design

The container is light and has an ergonomic design to optimize its handling. With its oval shape, Ecoflac® plus lies securely in your hand. Unlike glass bottles, it is virtually unbreakable, so that even if dropped by accident no glass splinters are created and no spillage occur.

## User benefits

- Clear labelling allows easy identification of solution
- Dispenser feature facilitates opening and access
- Single units are easy to count and store
- Light and ergonomic design to optimize handling
- Virtually unbreakable to avoid any risk of spillage or contamination





# Prior drug admixture – solution identification

## Medication error: causes and consequences

Medication errors are errors in prescribing, dispensing or administering of a drug, irrespective of whether such errors lead to adverse consequences or not.<sup>3,6</sup> Depending on the drug in use and the specific factors of each individual case, errors and irregularities in IV drug preparation and administration can have a broad range of consequences ranging from harmless to fatal.<sup>4</sup>

The National Patient Safety Agency Report 2004 (UK) and the IOM report 2000 (USA) highlighted that medication errors are responsible for a wide number of deaths every year.<sup>3</sup> In 2010, the World Alliance for Patient Safety estimated that globally, the cost of medication errors would amount to € 4.5 to € 21.8 billion.<sup>6</sup>

Resulting in higher patient morbidity, increased length of hospital stay and healthcare costs medication errors are therefore a recognized and well documented worldwide problem.

## B. Braun safety labels

Incorrect drug selection is a common dispensing error which may be caused by similar drug labels/packaging.<sup>3</sup>

Research showed that clear labels, based on a strong visual differentiation between high alert medications and standard solutions help reduce medication error.<sup>1,2</sup>

Based on these findings, B. Braun's unique safety labelling concept helps reduce the risk of medication errors caused by look-alike labels. Developed together with clinical experts, the concept enables a strong visual differentiation between different solutions, by the use of: color codes, large sized text, geometric designs and contrasting backgrounds.

EAN barcode and/or data matrix codes are also used to allow easy scanning and the accurate recording of the variable information on the labels.



### Color and large text

The use of color eases distinguishing the different solutions names. Large size text helps in identifying the critical information at a glance.



### Contrasting backgrounds

Contrasting backgrounds are also used for a better differentiation of concentrated solutions.



### Geometric design

Geometric shapes, such as triangles, are used to create a differentiating element between high alert medication and standard solutions which have linear design labels.

A prospective study in 35 community pharmacies in the United Kingdom identified the incidence, nature and root causes for medication errors.<sup>5</sup>

The results of this study showed that a large range of medication errors occur in community pharmacies. The most common types of incidents were: selection errors (60.3%), followed by labelling (33.0%) and bagging errors (6.6%). Most of the incidents were caused either by mis-reading prescription (24.5%), similar drug names (16.8%), selecting previous drug or dose from the patient's medication record or the pharmacy computer (11.4%) or similar packaging (7.6%).

## User benefits

- Easy product differentiation, even from a distance
- Safety labels help reducing medication errors and increase patient safety
- Barcode and/or data matrix codes allow easy and accurate recording







# Prior drug admixture – compatibility check

## The risk of PVC in IV containers

IV containers made with Polyvinyl Chloride (PVC) can have negative effects on IV medication delivery and compromise the patient receiving the required amount of IV medication due to a sorption effect.

Some drugs tend to interact and sorb to PVC infusion containers, leading to a loss of pharmacologically active compounds. As a result, the medication is not evenly distributed, preventing the patient from getting the full or correct dose.<sup>7</sup>

Examples of drugs lost from aqueous solutions during infusion from a flexible PVC container include: Calcitriol, Carmustine, Diazepam, Heparin sodium, Isosorbide dinitrate, Nitroglycerin, Warfarin sodium.<sup>7</sup> Other materials such as Polyethylene (PE) show no or a significantly lower sorption effect compared to PVC.



## High drug compatibility

Ecoflac® plus is made of a pure medical grade polyethylene (PE) which is chemically inert and toxicologically safe. Polyethylene is a flexible and resistant material which provides an excellent compatibility with a maximum number of pharmaceuticals, reducing the risk of interactions.



## ConComp database

ConComp is a comprehensive information source for all your compatibility questions on IV drugs, container materials and IV solutions. The database is easy to use and accessible for free to all registered medical professionals. All data is supplied as abstracts taken from hundreds of original publications and internal research. It is updated continually in response to customer's needs.



## PVC free container

Ecoflac® plus is free of PVC to avoid errors in dosage due to adsorption of the drug to the container material. It is also free of latex, in order to prevent any allergic reactions for both the user and the patient.



For more details, do not hesitate to contact your local B. Braun representative or visit our website at [www.concomp-partner.com](http://www.concomp-partner.com)

## User and patient benefits

- Container material compatible with most drugs
- DEHP-free, PVC-free and latex-free
- Reduces the risk of medication errors thanks to chemically inert material
- Support for all compatibility questions through the free ConComp database



# Drug admixture – with transfer devices

## A complete product system for safe and convenient drug admixture

Pharmacies and wards need to admix numerous drugs quickly with simple and cost effective products. Healthcare management pays particular attention to safety for patients and hospital care workers as they may be exposed to various risks during drug admixture.

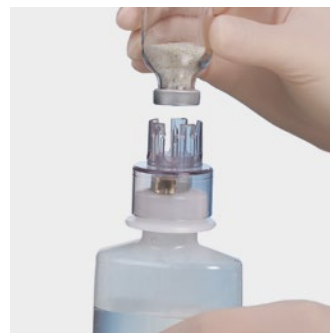
Using a safety device helps prevent the risks of sharps injuries, chemical, microbiological and particulate contamination.<sup>8</sup> Ecoflac® plus is compatible with a variety of needle-free admixture devices, to make the drug admixture simpler, quicker and safer. Dedicated needle-free transfer devices such as Ecoflac® Mix or Ecoflac® Connect have been designed specifically to be used in combination with Ecoflac® plus.

**CLOSED  
SYSTEM**

according to NIOSH definition<sup>19,20</sup>

### Ecoflac® Connect

Ecoflac® Connect is a needle-free closed system<sup>9</sup> admixture device for single-dose medication vials. As a closed system, it aims at reducing contamination of medication and healthcare professional exposure to potentially toxic medication.



### Ecoflac® Mix

Ecoflac® Mix is a transfer cap for transferring fluids between an Ecoflac® plus container and a single dose medication vial. It provides a stable connection between the container and the vial and is especially designed to be used with Ecoflac® plus.



The fact that the vial remains connected with the system all along the infusion reduces the risk of medication error. The ergonomic design of Ecoflac® Connect also allows a convenient manipulation and a secure connection with the Ecoflac plus.



### Transofix®

Transofix® is a transfer spike for large containers. Thanks to its wide internal diameter, it allows excellent flow even with non-evacuated glass vials. It is needle-free in order to prevent any risk of needlestick injuries. The broad grip flanges provide a good grip for easy handling.

## User and patient benefits

- High compatibility with needle-free admixture devices to prevent sharp injuries
- Standing container facilitates drug transfer
- Closed system transfer devices minimize the risk of microbiological and chemical contamination
- Reduced steps needed for drug admixtures

For more information about our complete admixture devices portfolio, please contact your local B. Braun representative.



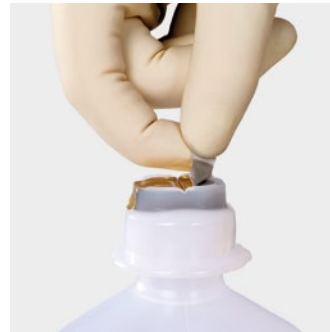


# Drug admixture – with dispensing pins



## Two separate ports

The two separated and identical ports can be used for either drug admixture or delivery. No additional step is needed to identify the points for injection and infusion.



## No disinfection needed

The two ports are kept germ-free until removal of the two sealant aluminum foils, so that disinfection of the ports is not required before use. Once removed, the absence of the protective foils becomes a tamper evidence of the used port.



## Large neck ring

The large neck ring area around the port is made of a puncture-resistant plastic to help prevent needlestick injuries or inadvertent piercing of the container, in case a needle is used. The port material is chemically inert to avoid any interaction with drugs.



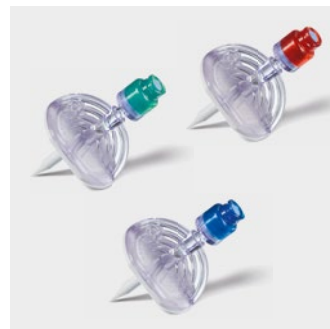
## Good resealability

The elastomer of the port automatically reseals, reducing any risk of uncontrolled leakage, even with larger plastic spikes. During admixture, no particles are created when the port of Ecoflac® plus is pierced.



## Latex-free ports

The port membrane on Ecoflac® plus is made of thermoplastic elastomere which is free of latex. The complete absence of latex eliminates the risk of allergic reactions for both the patient and the user.



## Mini-Spike® 2

Mini-Spike® 2 is a needle-free vented dispensing pin for injecting and withdrawing fluids from vials or semi-rigid containers. It integrates a swabbable valve which automatically closes upon syringe disconnection.

## User benefits

- Two identical ports - no additional step to identify the ports
- Large neck ring helps prevent sharps injuries
- Good resealability after admixture to reduce contamination risks
- The absence of sealant on the used port provides tamper evidence and prevents further manipulation.

For more information about our complete admixture devices portfolio, please contact your local B. Braun representative.





# Prior drug delivery

## The risks of DEHP in PVC containers

IV containers made with PVC can have negative effects on IV medication delivery due to plasticizer leaching.<sup>11</sup> Leaching is the release of DEHP from PVC containers into the medication contained in the IV container, when in contact with certain drugs. DEHP has been shown to produce a wide range of toxic effects, particularly in male neonates where the infant's reproductive system can be compromised. In fact, the European Union classified DEHP as a Category 2 reproductive toxicant for both fertility and developmental effects.<sup>10,11</sup>

Amongst others, the following products are known to exacerbate leaching of DEHP from PVC Containers:  
Docetaxel, Etoposide, Cyclosporine, Paclitaxel, Teniposide<sup>7</sup>



### DEHP-free container

Ecoflac® plus is free of DEHP as well as other additives and compounds that may potentially migrate into the finished preparation. It therefore helps improving the safety of high-risk populations.



### Easy and safe spiking

The container standability allows an easy and safe spiking, preventing sharps injuries during insertion. The superior properties of the resealable port membrane also prevent coring of elastomeric particles when pierced.



### Compatible IV sets

The Ecoflac® plus port is universally compatible with all common IV administration set spikes. Intrafix® SafeSet is B. Braun's IV set for safe, convenient and economical administration of infusion therapy. It is also free of DEHP.



### Tight connection

Thanks to its good holding force Ecoflac® plus can be used safely with siliconized spikes. Once inserted, the spike stays firmly connected to the container, avoiding any risks of accidental disconnection.

## User and patient benefits

- DEHP-free
- Universal compatibility with all common IV sets
- Easy and safe spiking of the port
- Good holding force prevents risk of disconnection



# Drug delivery

## The risks of open system containers

Intravenous fluid containers can be separated into two different types: open system containers and closed system containers.<sup>12</sup> Open system containers must be externally vented in order to allow the container to empty, providing an opportunity for bacterial entry.<sup>12</sup> This is the case for example with glass bottles or non-fully collapsible semi-rigid containers.<sup>13</sup> Closed infusion containers are fully collapsible plastic containers which do not require external venting to empty.<sup>12,13,14</sup>

Closed systems have been shown to significantly reduce the incidence of Central Line-associated Bloodstream Infection (CLABSIs) resulting from the ingress of external air into the container.<sup>12,13,14</sup> Rosenthal et al. showed that switching from an open to a closed system container resulted in an overall reduction of CLABSI rates by 67%.<sup>13</sup> The introduction of closed infusion systems not only reduces CLABSIs but also reduce attributable hospital costs and mortality.<sup>14</sup>



**CLOSED SYSTEM**

## Closed system container

The design of the Ecoflac® plus allows complete emptying of the bottle without venting, which helps reduce the risk of contamination of the solution. With Ecoflac® plus, a constant flow rate is delivered to the patient over time, improving infusion monitoring and patient safety.



## Accurate infusion monitoring

The graduation scale on the Ecoflac® plus label is easy to read, even when the container is collapsing. It is designed for unvented use and accurately shows the delivered volume, taking into account the collapsibility of the container during the infusion.



## Integrated hanger

Ecoflac® plus can support itself during infusion thanks to its large integrated hanger.

## User and patient benefits

- Closed system improves patient safety by reducing the risk of microbiological contamination
- Easy to read graduation marks on label allow for accurate infusion monitoring
- Constant flow rate increases patient safety
- Integrated hanger at the bottom of the container





# Disposal

## Environmental impact of PVC incineration

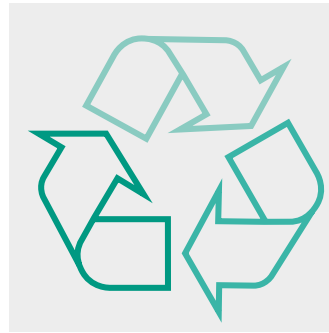
Most of the medical waste is subject to incineration. Disposal of PVC via incineration is associated with the formation and release of dioxin, a group of persistent and very toxic chemicals that are released in the air.<sup>15</sup> Dioxins persist in the environment and accumulate in the food chain, resulting in measurable levels in animals and in human tissues.<sup>11,15,16</sup>

PVC therefore creates a number of environmental health risks. By choosing PVC-free products such as Ecoflac® plus, you can help eliminate potential toxins and other safety hazards that could affect your staff, your patients and the environment.



### No toxic emissions

Ecoflac® plus container is made of polyethylene which, like all hydrocarbons burns cleanly. When incinerated, the container biodegrades completely and residue-free into the natural elements of our environment, water (H<sub>2</sub>O) and carbon dioxide (CO<sub>2</sub>).



### 100% recyclable

Ecoflac® plus can be easily recycled, as no additives are added for the production of the container.



### Low amount of waste

Unlike most flexible bags, Ecoflac® plus containers have no outer packaging and thereby produce a lower amount of waste. It is also much lighter than glass containers.

## User benefits

- Ecoflac® plus is easy to dispose off and only produces a low amount of waste
- It is 100% recyclable
- When incinerated, it only generates CO<sub>2</sub> and H<sub>2</sub>O – no toxic emissions





# Portfolio

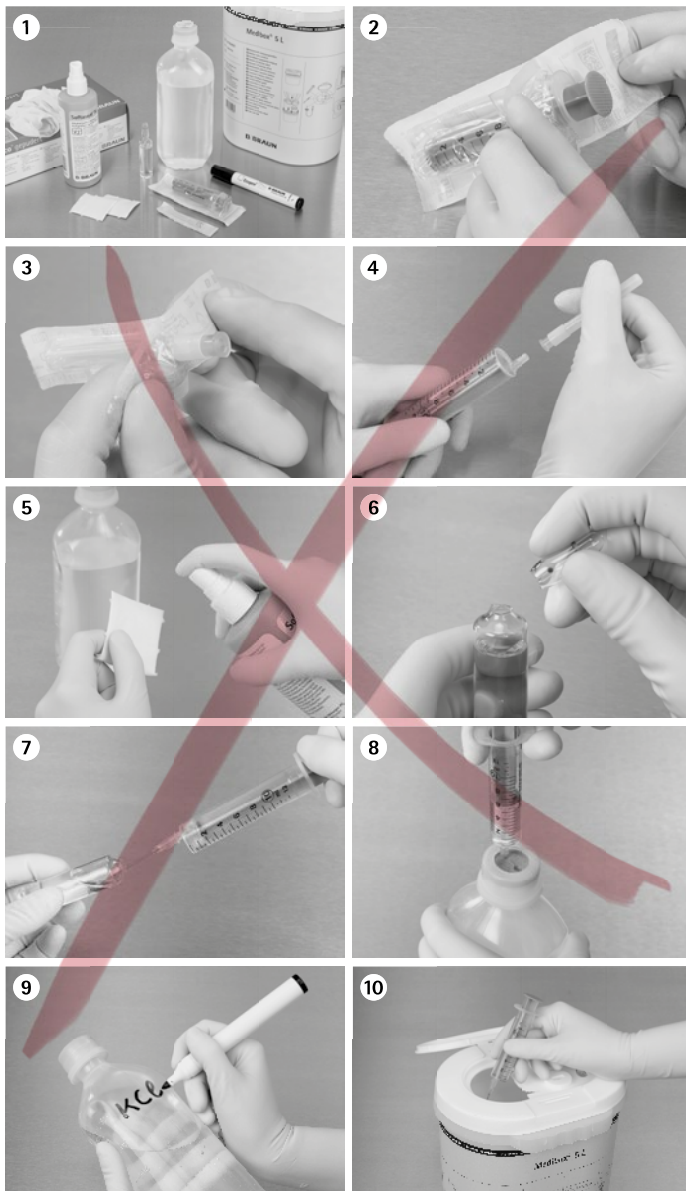
## Ready-to-use drugs

The Council of Europe recommends that ready to use formats be used instead of pharmacy preparations, if a suitable pharmaceutical equivalent with a marketing authorization is available.<sup>17</sup> Before preparation, the pharmacist should verify whether a pharmaceutical equivalent is available on the national market, taking into consideration the pharmaceutical form and strength.<sup>17</sup>

The use of ready to use solutions increases patient and healthcare professional safety by:

- providing higher accuracy of dosing and contributing to the prevention of medication errors.
- reducing the risk of particle infiltration and contamination of the solution during preparation.
- reducing the risk of sharp injuries thanks to the elimination of the use of needles.

In addition, ready-to-use solutions help reduce medication preparation steps and time.



## Extensive solutions portfolio

Besides its extensive portfolio of standard IV and plasma volume replacement solutions, a large portfolio of ready-to-use (RTU) injectable drugs are available in Ecoflac® plus. These include analgesic, anti-infective, as well as pre-mixed potassium solutions.



## Ready to use in a single step

By reducing the overall preparation time and material costs required for admixing drugs, ready-to-use solutions provide you with a good cost-efficacy ratio administering drugs.<sup>18</sup>

## User and patient benefits

- Extensive range of ready-to-use drugs available
- Increases patient safety by reducing the risk of medication and dosage errors
- Less manipulation reduces the risks of contamination
- Reduced admixture steps, time and overall material costs


# Literature

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# Ordering information



	50 ml	100 ml	250 ml	500 ml	1,000 ml
Standard IV solutions					
Plasma volume replacement					
Ready-to-use anti-infective					
Ready-to-use analgesic					
Ready-to-use sedative					
Ready-to-use potassium					

For more information about the products available in Ecoflac® plus in your country, please contact your local B. Braun representative.

Safety is not given until all components of a process chain have been cross-matched and synergized to create an integrally reliable system. This is always the case with infusion systems from

B. Braun, and just one of the reasons why Ecoflac® plus offers you intuitively safe and reliable handling. We set standards with Ecoflac® plus and all of our products for safe infusion therapy!



For more information about risk prevention in infusion therapy, visit:



[www.safeinfusiontherapy.com](http://www.safeinfusiontherapy.com)