

Lunch workshop at European Parliament:

„Towards non toxic healthcare: phasing out phthalates in medical devices“

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„Towards non toxic healthcare: phasing out phthalates in medical devices“



Content

- Fresenius Group
- Fresenius Medical Care
- Fresenius Kabi
 - Nutrition
 - Infusion
 - Transfusion

Fresenius Group






- **Dialysis Products**
- **Dialysis Care**
- **Extracorporeal Therapies**




- **Clinical Nutrition**
- **IV Drugs**
- **Infusion Therapy**
- **Medical Devices / Transfusion Technology**




- **Operation and management of acute clinics and rehabilitation centers**




- **Planning, constructing and managing health care facilities**

- 169,324 employees (as of December 31, 2012)
- Business activities in more than 150 countries worldwide
- Subsidiaries in more than 70 countries
- Sales of €19.3 billion
- Operating income (EBIT) of €3.1 billion

Fresenius Medical Care North America

164,554	patients
2,082	clinics
24.4m	treatments

Fresenius Medical Care International

Europe, Africa, Middle East, Latin America, Asia Pacific

93,362	patients
1,078	clinics
14.2m	treatments

**Fresenius Medical Care has subsidiaries
in more than 60 countries worldwide**

Fresenius Medical Care Worldwide

257,916	patients
3,160	clinics
38.6m	treatments

Status as of Q4 2012

Haemodialysis

- Dialysis machines
- Dialysers
- **Bloodlines & needles**
- Dialysis concentrates
- Dialysis fluid filters
- Catheters
- Auxiliary products

Peritoneal Dialysis

- **CAPD solutions**
- **APD solutions**
- APD cyclers
- Auxiliary products

Acute Dialysis

- CRRT Systems enabling all CRRT treatment modes

Renal pharmaceuticals

- Partially in cooperation with leading pharmaceutical companies
- EPO
- Iron
- Phosphate Binder
- Vitamin D
- Calcimimetics
- Heparin and other Anticoagulants

Therapeutic apheresis

- Lipidapheresis
- Immunadsorption

Technical services

- Planning of dialysis clinics
- Installation
- Maintenance
- Repair

Water technology

- Reverse osmosis
- Concentrate preparation systems
- Media supply interface

Data transfer systems

- Monitoring system
- Clinical management system
- Quality assurance

- Bloodlines & needles
 - More than 50% of all blood tube systems are DEHP free
 - In pediatric field 100% of all blood tube systems are DEHP free (excl. needle)
 - As alternative material TOTM plasticizer is used

 - But: TOTM is more expensive and we use a different sterilisation technology

- CAPD and APD solutions
 - The CAPD and APD systems are made up of Biofine. This is a non PVC material which is free from plasticisers and upon waste combustion returns to CO₂ and H₂O. Environmentally and patient protective.

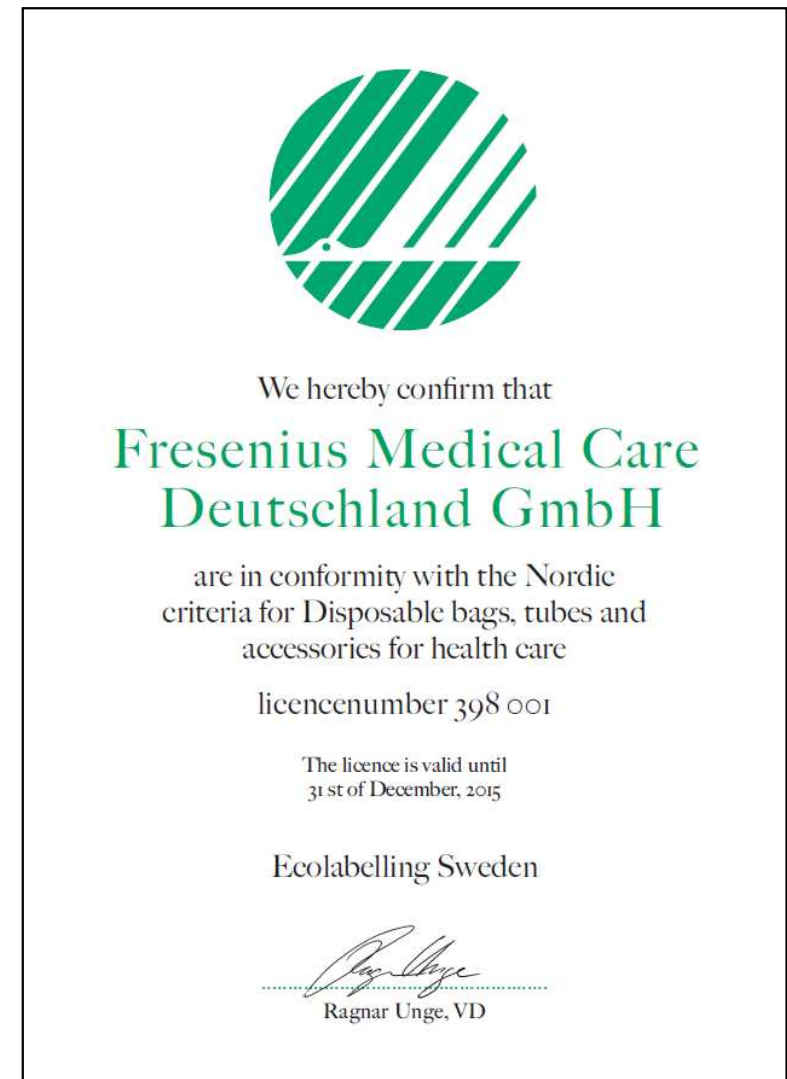


**The innovative
material for PD**

Fresenius Medical Care

Nordic Ecolabel (SWAN)

- Fresenius Medical Care first health care company certified by Nordic Ecolabel (SWAN)
- Nordic Ecolabel states that the certified products fulfil several requirements such as:
 - No PVC plastic
 - Virtually total ban on environmentally unsafe additives
 - Ban on additives shown to have or suspected of having hormonal impact
 - Ban on cancerogenic and mutagenic substances that affect reproduction
 - Ban on allergenic additives etc.



Field of application	Products
Clinical Nutrition	Parenteral & Enteral Nutrition Products
I.V. Drugs	Intravenously administered generic drugs: oncology drugs, anesthetics & analgesics, anti-infectives, critical care drugs
Infusion Therapy	Infusion solutions, colloids
Medical Devices / Transfusion Technology	Pumps, disposables, infusion management systems, products for whole blood collection and processing

- Products:
 - Compounding systems, giving sets, transnasal/percutaneous tubes



3-Chamber bag

&



Easybag

Both bag types are free from PVC and plasticizers

- Products:
 - Infusion solutions, colloids, giving sets, infusion sets, ports



freeflex bag

&

KabiPac

Both bag types are free from PVC and plasticizers

- Products:
 - I.V. sets, filters, ports and needles, transnasal/percutaneous tubes, pump tubes
- Fresenius Kabi has taken the decision to convert all its set portfolios into being DEHP free and phase out all sets containing DEHP
- For most of the lines TOTM will replace DEHP because it is
 - Unique low leaching and extraction resistance properties
 - High flexibility, elasticity and resilience
 - Respects all required standards for migration rate, cytotoxicity, toxicity on reproduction, phthalate content

- Products:
 - Blood bag systems, leukodepletion filter systems, apheresis sets, etc.
 - Devices for blood component preparation



- All supplier of blood bag systems use PVC/DEHP foil as basic material
- DEHP has a protective effect on erythrocytes leading to prolonged storage time of red cell concentrates (RCC). To date alternative plasticizers have shown only limited storage properties for red cells.
- Therefore other plasticizers (e. g. TOTM or Citrate) or other materials (e.g. polyolefin, EVA, Kapton/Teflon) are used only for special applications

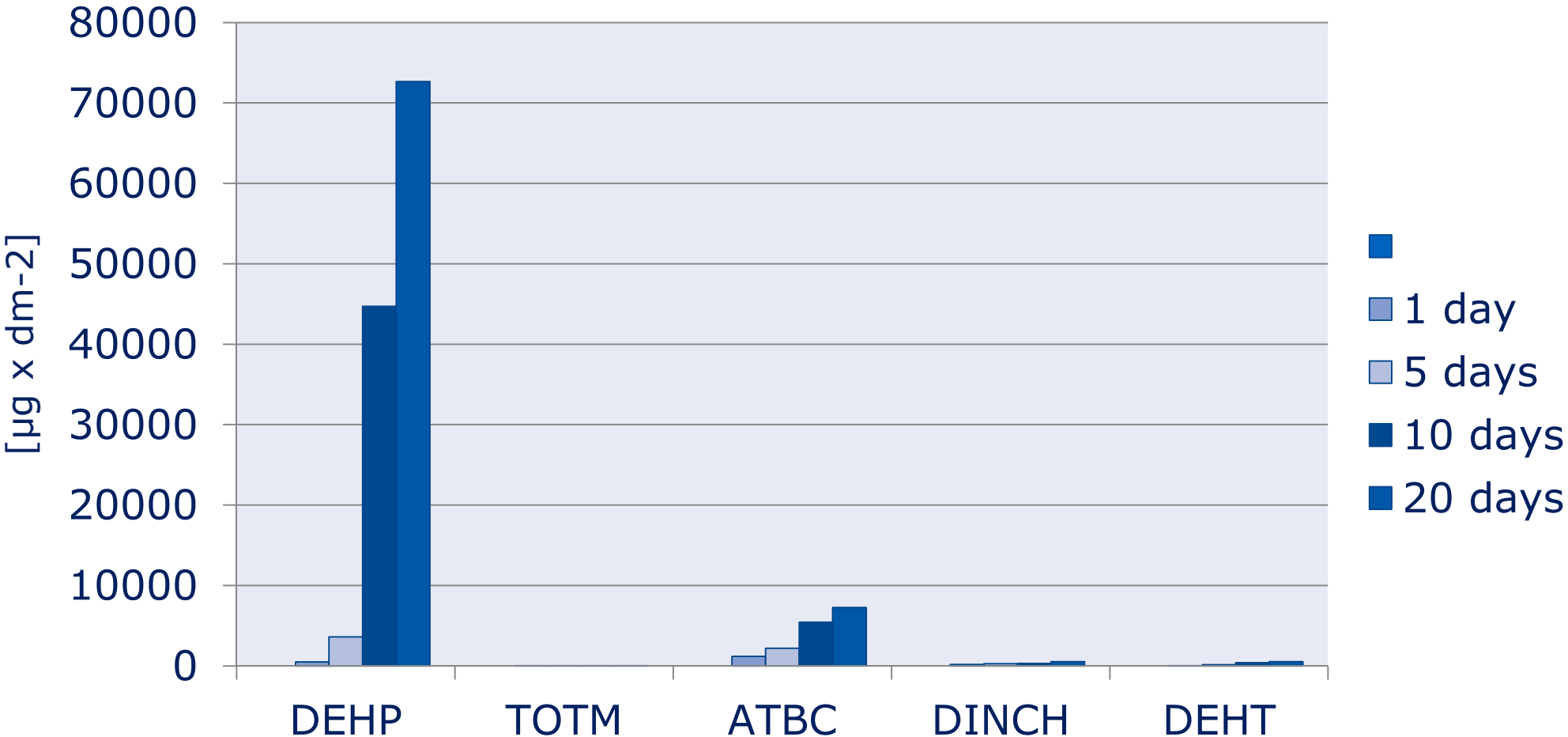
Foil / plasticizer	Applications
PVC / DEHP	Standard blood component preparation
PVC / TOTM	Storage of single/pooled platelet concentrates
PVC / BTHC	Storage of pooled platelet concentrates
PO / No	Storage of pooled platelet concentrates
Kapton-Teflon / no	Cryopreservation
EVA / No	Cryopreservation

- Main requirements for the blood bag foil:
 - High flexibility (for efficient separation)
 - High resistance (against mechanical stress, e.g. during centrifugation)
 - High temperature stability (+121°C steam sterilisation & -80°C plasma freezing)
 - High gas permeability (for long term cell storage)
 - High bio- and haemocompatibility (to avoid cell damage or cell activation)

The right choice for the foil should guarantee the optimal conditions for preparation and storage of blood components

BUT

Migration from tube into soja bean oil

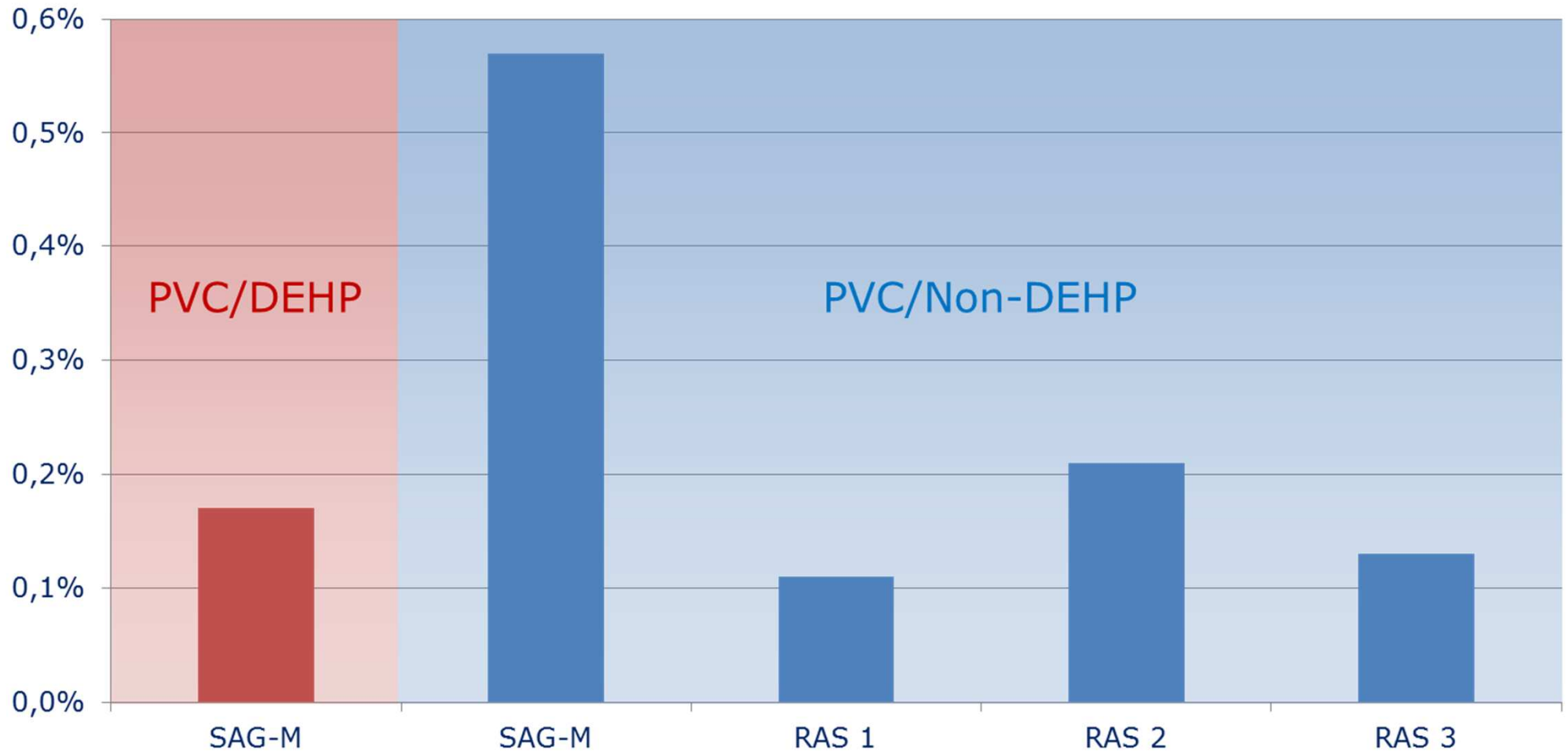


What are the alternatives to PVC/DEHP?

Foil / plasticizer	Applications
PVC / DEHP	Standard blood component preparation
PVC / TOTM	Storage of single/pooled platelet concentrates
PVC / BTHC	Storage of pooled platelet concentrates

**Feasibility studies are running with other plasticizers like Hexamoll®
DINCH, BTHC, etc. for the preparation of all blood components**

Hemolysis rate day 42



And the customers?

Fresenius Kabi

Transfusion Technology - Market research „DEHP“


Target group and qualification criteria

→ Hospitals: anaesthesiologists + paediatricians

- work at least since 5 years in their operational area
- ward transfuses at least 50 blood components per year
- hospital has at least 400 beds

→ Blood banks: head of blood bank, head of production, deputy of head of production, head of quality control

- medical-based educational background
- work at least since 5 years in blood bank business
- blood service processes at least 20.000 blood donations per year

The CATI-survey was carried out by  **LINK Institut**

Fieldwork took place:

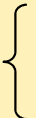


7th of December to 18th of December 2009



7th of December to 18th of December 2009

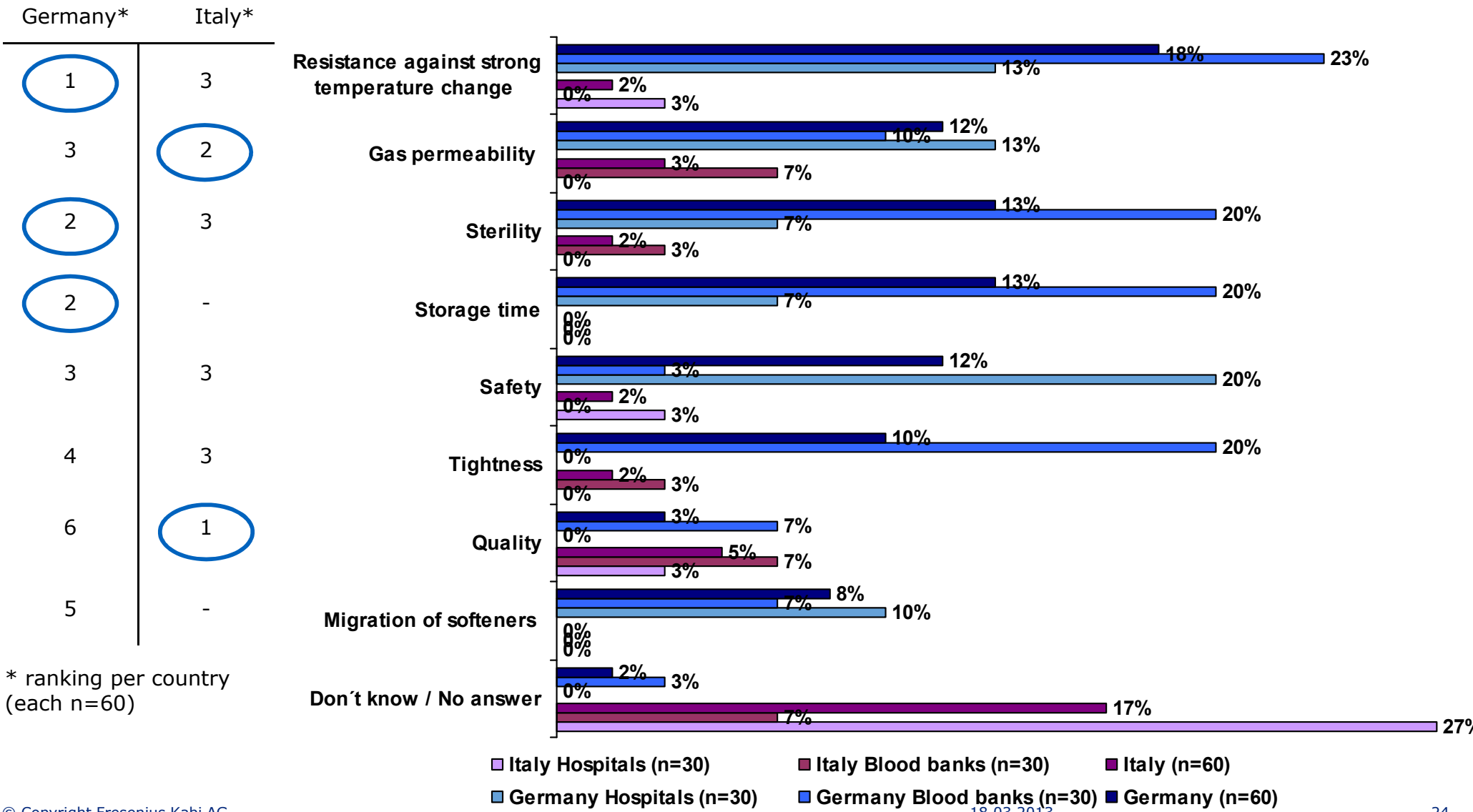
Sample Size n=120; n=60 per country



n=30 Blood banks

n=30 Hospitals (n=20 anaesthesiologists + n=10 paediatricians)

Which material features of the blood bag foil are most important for you? (Diagram: Ranking per total n=120)



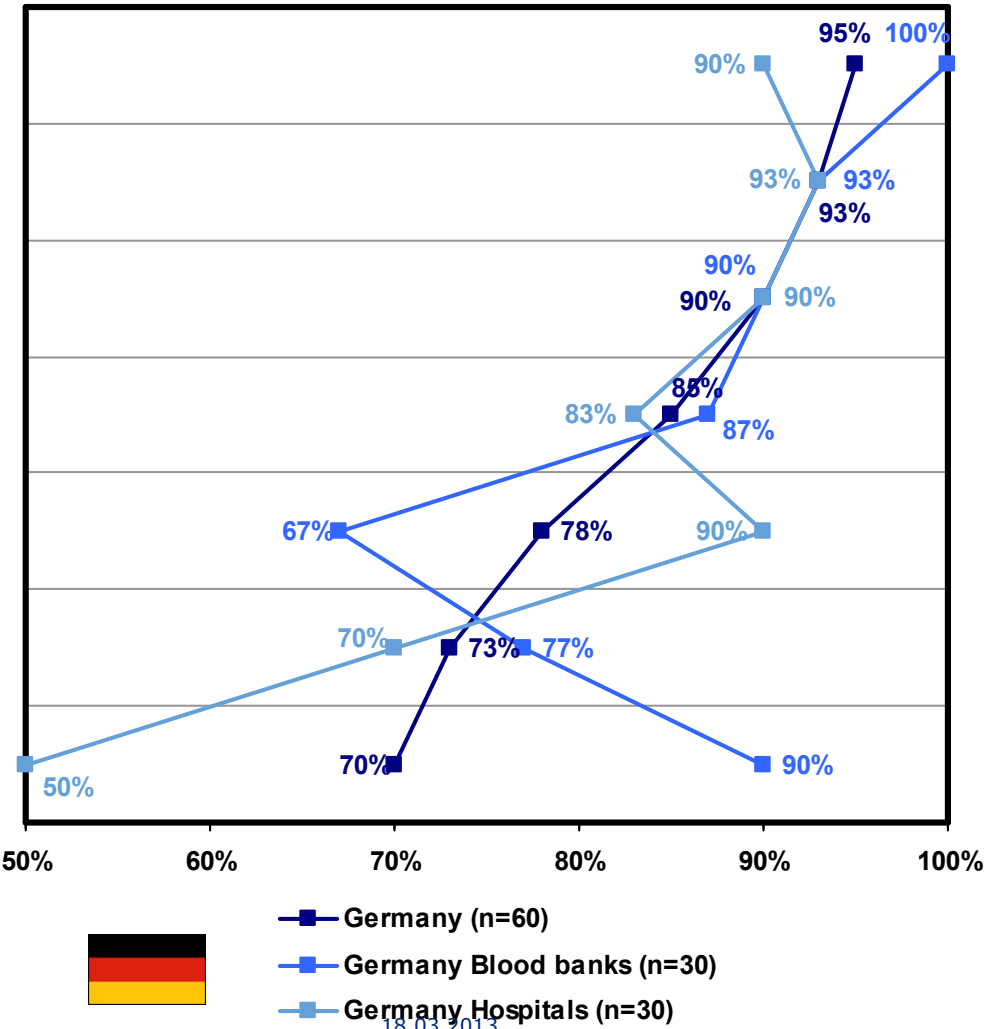
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Now I will read out some material features of the blood bag foil. Please tell me how important these aspects are to you using a scale from 1 to 5. 1 meaning "very important" and 5 meaning "not at all important". (Top-2-Boxes; Diagram: Ranking per total n=60 for Germany)

Blood banks*	Hosp.*	
1	2	Resistance against mechanical stress
2	1	Cell Protection
3	2	Resistance against strong temperature change
4	3	Resistance against external pressure
6	2	Migration of softeners
5	4	Flexibility
3	5	Gas permeability

* ranking per target group (each n=30)



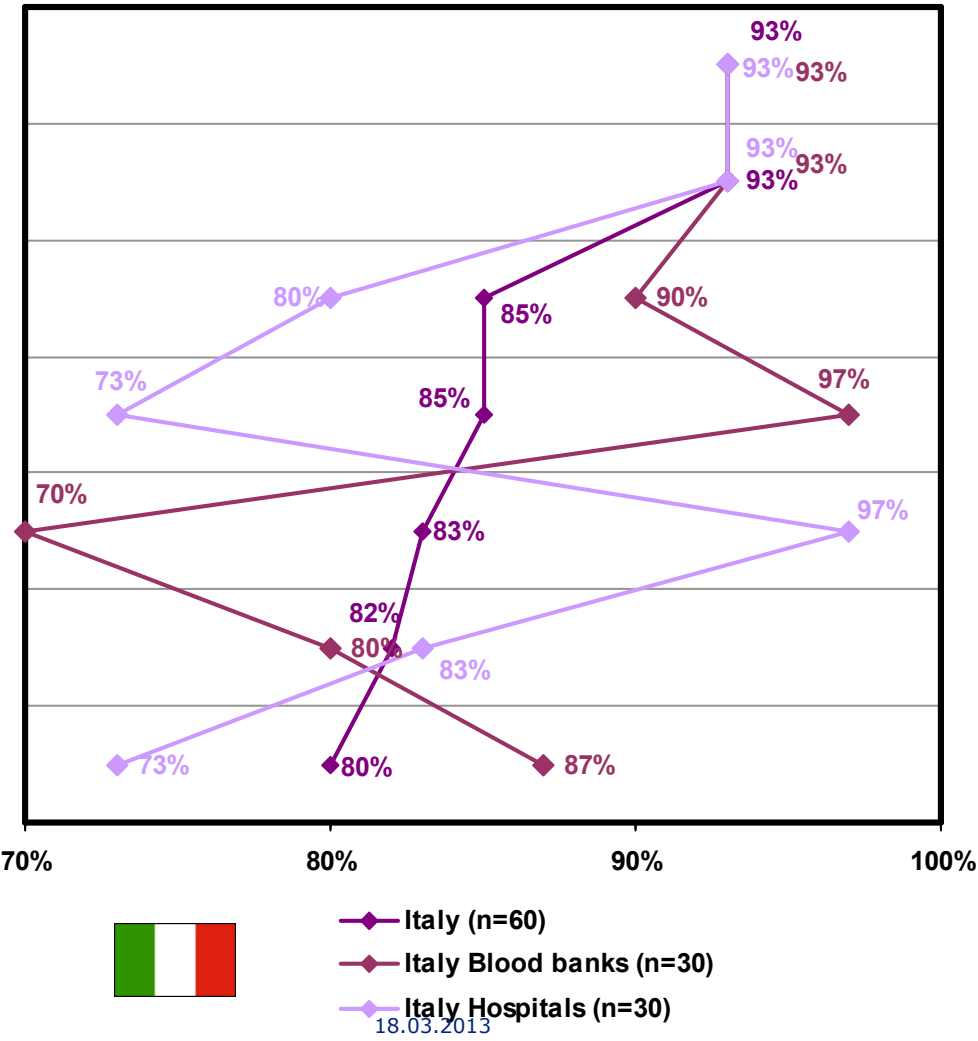
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Transfusion Technology - Market research „DEHP“

Now I will read out some material features of the blood bag foil. Please tell me how important these aspects are to you using a scale from 1 to 5. 1 meaning "very important" and 5 meaning "not at all important". (Top-2-Boxes; Diagram: Ranking per total n=60 for Italy)

Blood banks*	Hosp.*	
2	2	Cell Protection
2	2	Resistance against strong temperature change
3	4	Flexibility
1	5	Gas permeability
6	1	Migration of softeners
5	3	Resistance against external pressure
4	5	Resistance against mechanical stress

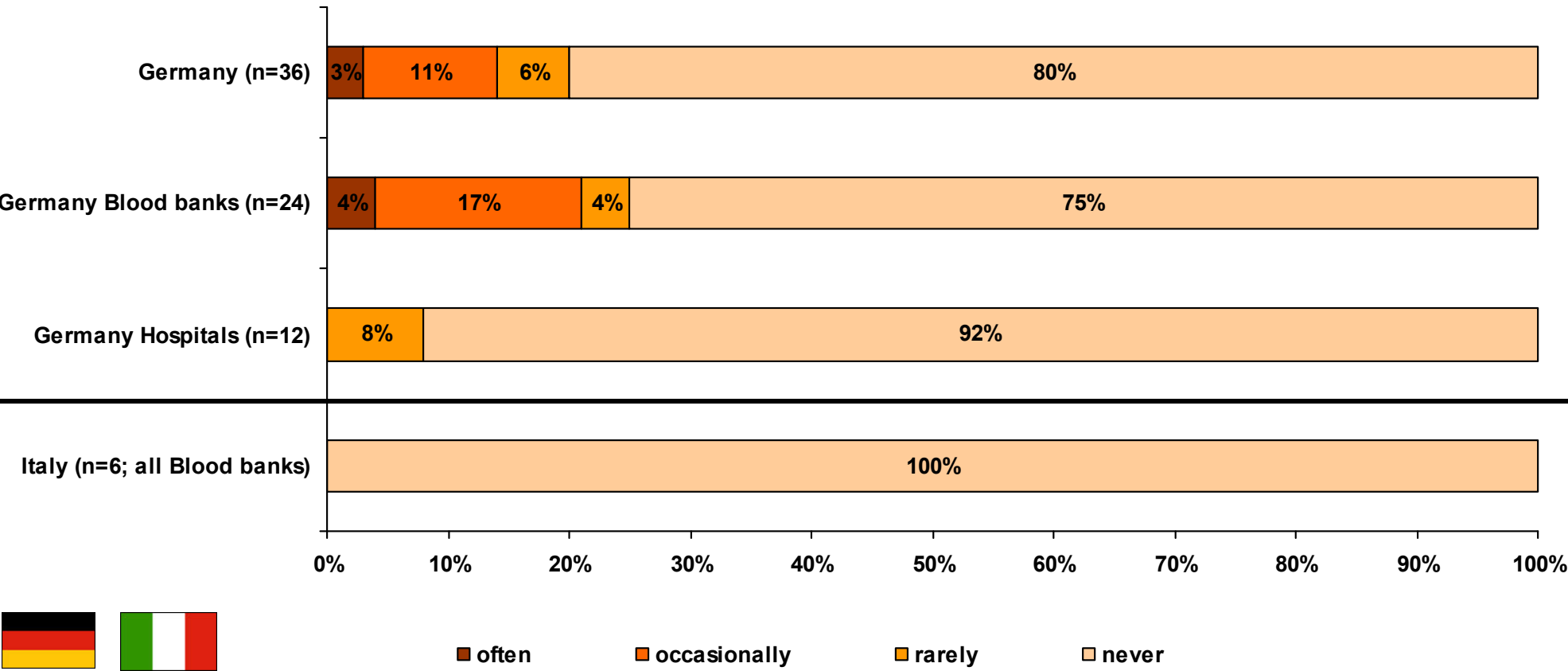
* ranking per target group (each n=30)



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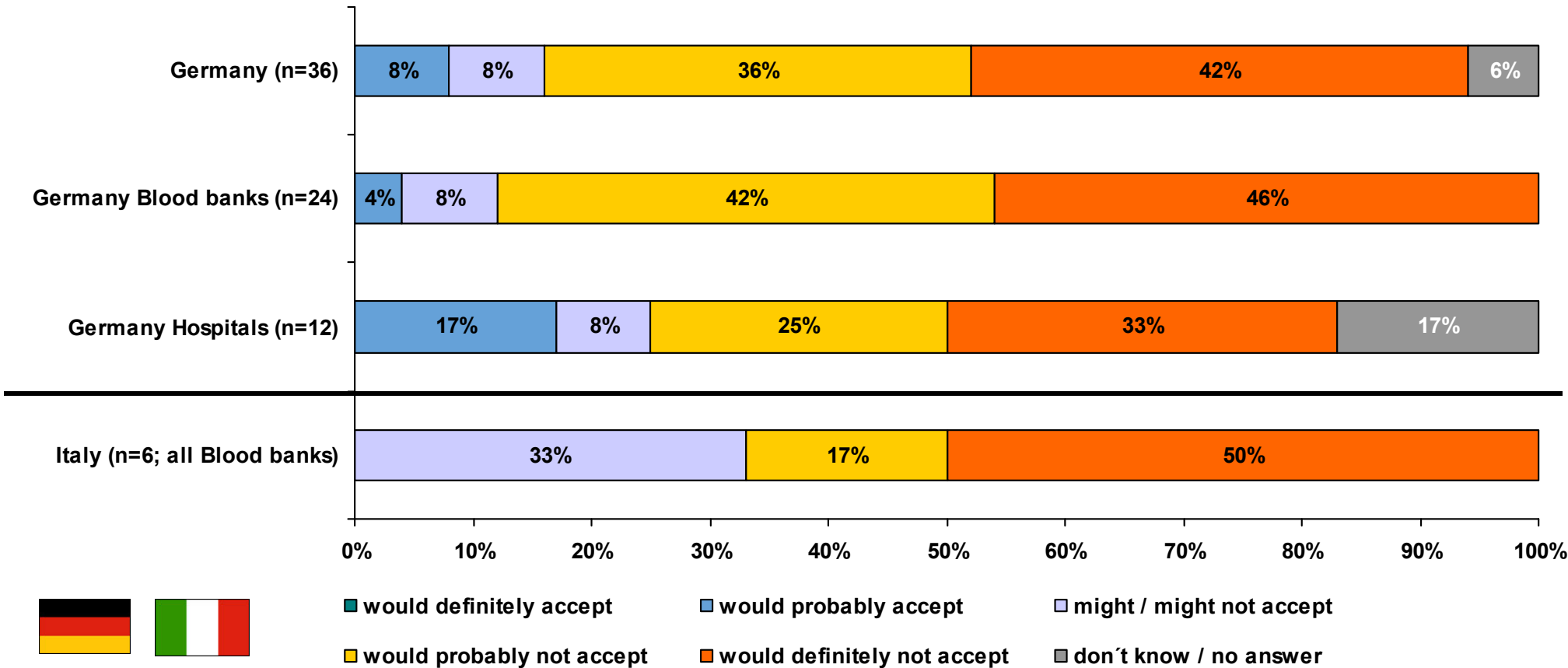
Transfusion Technology - Market research „DEHP“

Now, we are talking about the softener DEHP. In the last three months, have you spoken with your colleagues about DEHP softener? Was it often, occasionally, rarely or never?
[If DEHP is known]





Very small bases
 (esp. for Italy)!

Every softener has its pros and cons. Would you accept restrictions like a reduced time of storage, an increased haemolysis or a limited therapeutically applicability if blood bags would contain another softener than DEHP? *[If DEHP is known]*



■ would definitely accept
 ■ would probably accept
 ■ might / might not accept
■ would probably not accept
 ■ would definitely not accept
 ■ don't know / no answer

		
CONCLUSION	<p>Great lack of information about softeners and DEHP:</p> <ul style="list-style-type: none"> → more in Italy than in Germany → more in hospitals than in blood banks <p>Most of the respondents don't have a preference for a special softener, they don't talk about DEHP with colleagues etc.</p>	
	<p>"Cell protection", "resistance against strong temperature change" and "resistance against mechanical stress" are the most important material features for blood bag material in general.</p> <p>Additionally for DEHP, "flexibility", "resistance against external pressure" and "migration of the softener" are also very important.</p>	
	<p>Summing up, there is no deeper discussion about softener and DEHP in particular . It seems, that especially the Italian respondents don't really care about the texture of the materials.</p> <p>More relevant seems aspects according to safety, hygiene, sterility, usage and biocompatibility overall.</p>	

- Fresenius already offers a wide range of DEHP-free medical devices, enabling a nearly complete DEHP-free application
- Fresenius Kabi has started a program to eliminate DEHP-containing material in its disposable portfolio some years ago
- Fresenius Kabi will continue the policy of consistently replacing DEHP in those products in which this plasticizer can be replaced by a safe alternative

Why do we still have PVC-DEHP containing products in our portfolio?

- Because the customer asks for it. Reasons given:
 - Cheaper
 - Risks of DEHP regarded as minor compared to therapy at all
 - Risks of alternative materials not known or not sufficiently proven

- Hard to find alternative solutions meeting special requirements like e.g.
 - high level of oxygen permeability => extended thrombocyte stability
 - Protective impact on erythrocytes => extended erythrocyte stability
 - Manufacturability at customer side (sterile connection via high frequency sealing)