



Pharmaversity®

Future-ready
ADCs – advanced
vial solutions for
superior stability
and performance

SCHOTT
PHARMA

Summary

Whether it's fogging in lyophilized vials threatening Container Closure Integrity, light sensitivity accelerating molecular degradation, or instability in liquid formulations jeopardizing safety and efficacy, every step of the packaging process must meet the demanding requirements of antibody-drug conjugates (ADCs). These challenges are not merely technical; they are essential to unlocking the full therapeutic potential of these advanced medications. This paper presents primary packaging solutions that address the unique requirements of ADCs.

ADCs – from early setbacks to a leading force in modern oncology

It's hard to believe that the first antibody-drug conjugates (ADC) was introduced to the US market in 2000 (Mylotarg®), but was withdrawn due to safety and efficacy concerns in 2010¹. After getting off to a bumpy start, ADCs have transformed from a niche market into a major commercial application¹, with around 20 launched modalities, hundreds of candidates in development, and the drugs Enhertu®, Kadcyla®, and Adcetris® achieving blockbuster status with > 2bn USD in sales in 2025².

Depending on the source, the market is expected to reach sales of 35-57bn USD in 2030¹²³. While 80-85% of ADCs' core focus is on solid tumors, hematological disorders are also targeted in cases such as autoimmune disease².

¹ GlobalData, Jan 2026

² DCAT, 2025

³ IQVIA analytics, January 2026

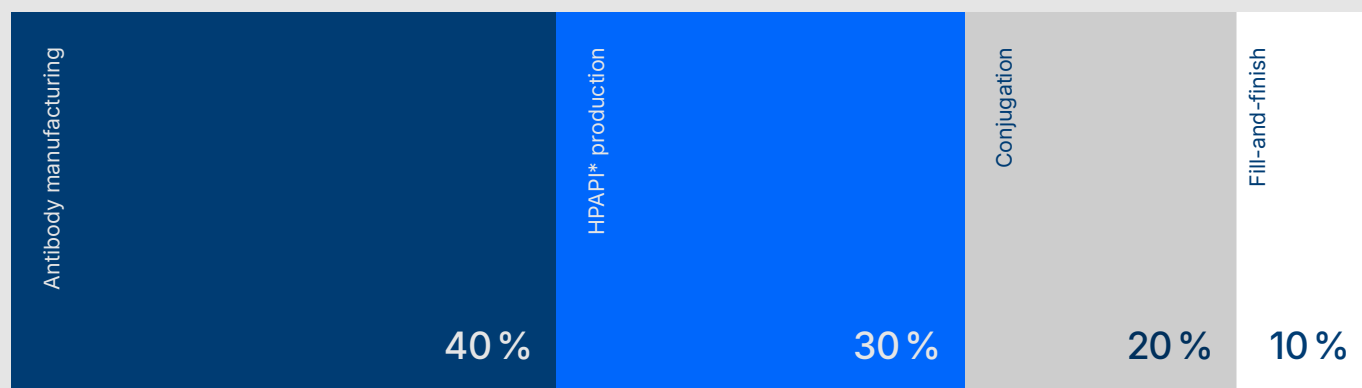
⁴ Harp, 2025

CDMOs – essential manufacturing partners in a fragmented developer landscape

The manufacturing and containment of ADCs is complex and challenging. Not only do the processes comprise multiple steps, but ADCs require high containment manufacturing due to their high potency. To protect operating personnel, the containment solution needs to meet at least occupational exposure band (OEB) 4. This is achieved through a dedicated pressure zone concept, specialized protective gowning, and a bespoke filtration system⁴.

Mainly based in North America and Europe, between 30-35 companies are able to offer contract manufacturing services for ADCs². Considering that 40-50% of the 170 international companies working on developing ADCs are very small entities – having neither the resources nor capital to set up manufacturing facilities – CDMOs (Contract Development & Manufacturing Organizations) play a major role in this market. Overall, the market is estimated to be worth 1.5 bn USD in 2025², as shown in Figure 1. However, with US policies requesting the construction of domestic manufacturing plants, the share of outsourcing may reduce in the future².

ADC manufacturing / 1.5bn USD



*Highly potent active pharmaceutical ingredients

Figure 1: ADC manufacturing market 2025

(DCAT Podcast – Product to Prescription: “What’s Trending: ADCs: Pipelines, Products, & CDMO Growth”, November 2025)

With new cancer therapies come new challenges for primary packaging

The challenges of ADCs go beyond their manufacture. Made up of a monoclonal antibody, a linker, and a cytotoxic payload to deliver targeted cancer therapy with high potency, these advanced medications present significant challenges for packaging. These can be summarized in three major topics:

1. Fogging during lyophilization
2. Light sensitivity
3. Stability in liquid

1. Fogging

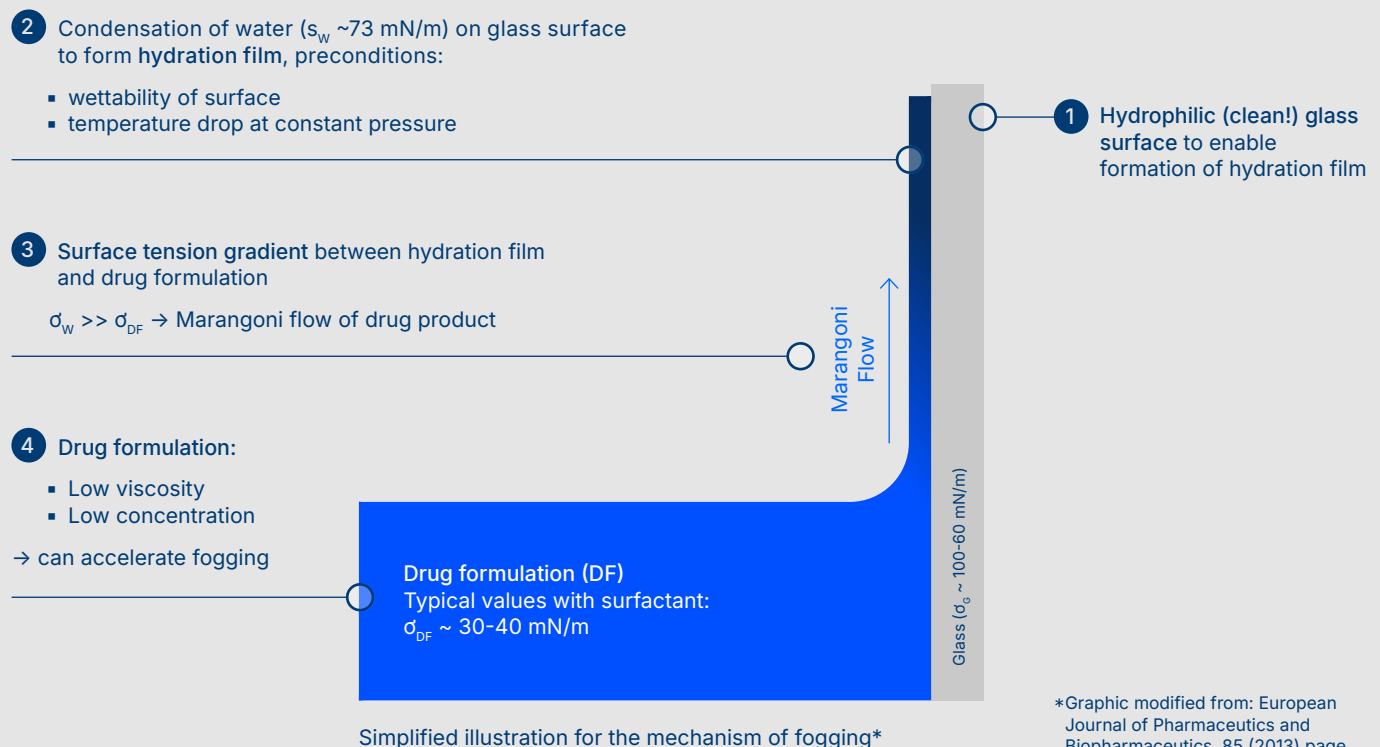
A well-known phenomenon with high impact for ADCs

Due to their complexity and fragility, freeze-drying of ADCs is common practice. However, the lyophilization process can result in fogging – a visible haze forming above the lyophilized formulation. This

is a widespread phenomenon that occurs erratically and is more than a cosmetic issue. Fogging can not only have an impact on the lyo cake's constitution, but also on Container Closure Integrity (CCI), which poses a significant safety risk for highly potent ADCs. The main factors in the occurrence of fogging are:

- a) Drug formulation
- b) Surface wettability

Figure 2 explains the mechanism of fogging. A hydrophilic, clean glass surface provides the right conditions for the formation of a hydration film (1). This wettability of the glass surface in combination with a temperature drop at constant pressure (2) leads to the formation of a hydration film. The surface tension gradient between the hydration film and the drug formulation determines whether Marangoni flow occurs – an up-creeping of drug product along the glass inner surface (3). Therefore, low drug viscosity and concentration can accelerate fogging (4).



*Graphic modified from: European Journal of Pharmaceutics and Biopharmaceutics, 85 (2013) page 315, Investigating factors leading to fogging of glass vials in lyophilized drug products, Hanns-Christian Mahler et-al.

Figure 2: Mechanism of fogging

Drug formulation of ADCs – a double fogging risk

Unfortunately, ADC formulations typically fulfill two requirements that increase the risk of fogging:

- 1) Low concentration
- 2) Use of Polysorbate 80

Figure 3 shows the correlation between protein concentration and the likelihood of fogging (Huang, et al., 2018), confirming that lower concentrations increase the risk for fogging.

In 2023, Weber et al. compared the surfactants polysorbate 80 (PS80) and polysorbate 20 (PS20)¹. They found that PS80 is more hydrophobic due to its higher share of oleic acid. It is therefore more likely to provide better compatibility with hydrophobic ADC payloads, leading to less conformational change. Based on its current use, it can be concluded that PS80 offers superior stability and performance in hydrophobic ADC formulations. However, PS80 seems to pose a higher risk for fogging, as shown by Huang et al. in 2018 (see Figure 4). The widespread use of PS80 as a surfactant for ADC formulation consequently elevates the likelihood of encountering fogging.

¹Weber, Buscke, Mäder, Garidel, & Diederichs, 2023

Impact of protein concentration (viscosity)

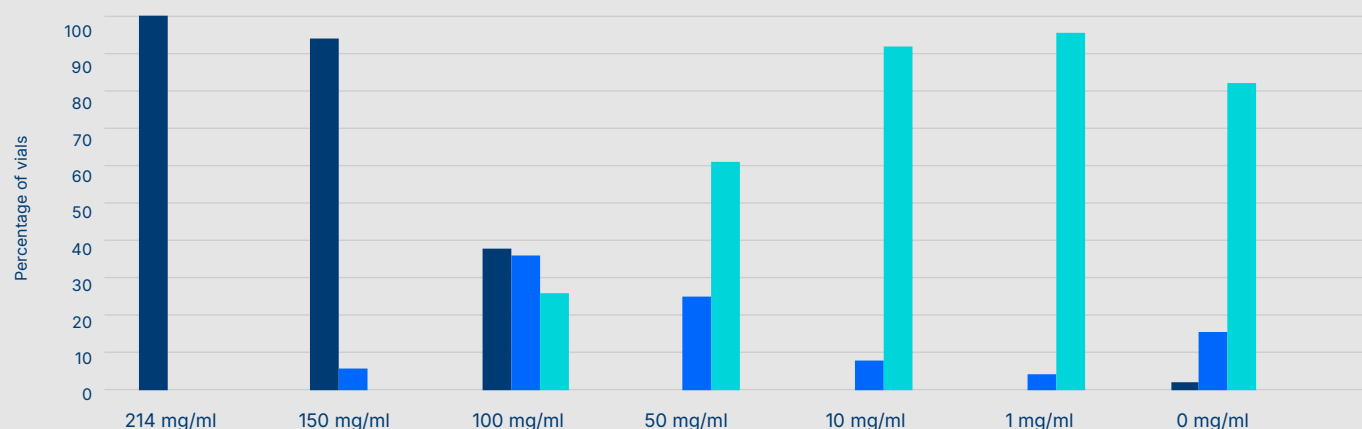


Figure 3: Impact of protein concentration on fogging (Huang, et al., 2018)

Impact of surfactants and holding time

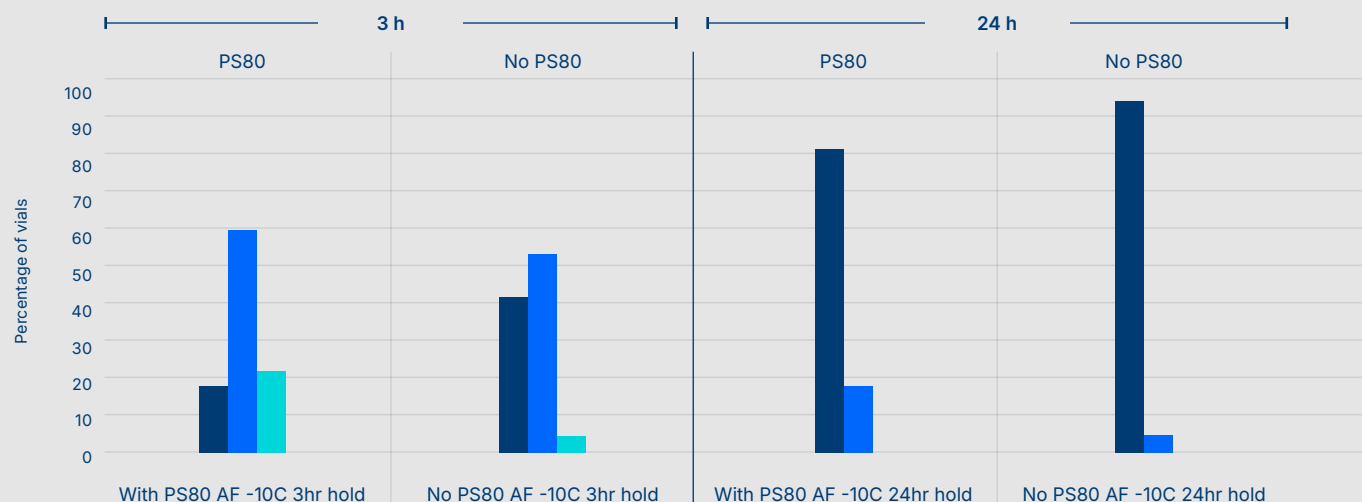


Figure 4: Impact of surfactants and holding time on fogging occurrence (Huang, et al., 2018)

Surface wettability – finding the right container

Clearly, it's unlikely, if not impossible, to adapt an ADC formulation so that protein concentration is increased and/or PS80 is avoided to minimize fogging during lyophilization. In such cases, the primary packaging container – more precisely, a vial – acts as savior. Since the wettability of the inner surface plays a crucial role in the mechanism of fogging, this can be controlled by choosing a vial with a hydrophobic inner surface (see Figure 5). This hydrophobicity prevents the formation of a hydration film that could potentially trigger the drug product to crawl up due to a surface tension gradient.

Why silicone is not suitable for ADCs

Since the water contact angle is the same, similar hydrophobicity could be achieved with a silicone coating. As cartridges and syringes must be siliconized to enable lubrication for smooth plunger movement, various literature exists covering siliconization. The primary methods for siliconization use sprayed-on or baked-on technologies¹.

Mundry et al. described a distinct behavior of silicone layer regions under heat exposure: when heated, only a very thin, nanometer scale bonded layer forms, driven by the hydroxyl groups present on the glass surface. These bonds are believed to be

covalent and develop during heat treatment above 300 °C for 10-30 minutes. Although this layer remains highly stable up to 400 °C, it is not distributed uniformly across the inner glass surface².

The upper portion of the silicone coating – typically ranging from several tens to more than 100 nanometers – does not become fully immobilized during the baked on treatment, and can still be dissolved when exposed to appropriate solvents. As a result, this non fixed silicone segment remains in contact with the drug formulation throughout storage, allowing parts of it to migrate into the liquid phase². Multiple studies have described similar observations, noting that residual, unbound silicone can interact with therapeutic proteins, potentially promoting protein aggregation or reducing the amount of soluble protein³.

In addition, Rupertus et al.⁴ showed that after terminal sterilization, a part of the original silicone layer was dissolved and an island-like structure remained on the inner glass surface (see Figure 6).

Considering the fragility and high value of ADCs, the risk that comes with the use of silicone should be thoroughly evaluated.

¹ Funke, et al., 2016

² Mundry, Schurreit, & Surmann, 2000

³ Jones, Kaufmann, & Middaugh, 2005; Krayukhina, Tsumoto, Uchiyama, & Fukui, 2015; Majumdar, et al., 2011; Shi, et al., 2018; Thirumangalathu, et al., 2009

⁴ Rupertus, Hladik, & Löber, 2020

Conventional vial



EVERIC® Iyo



Figure 5: Inner surface wettability of a conventional vial vs. EVERIC® Iyo

Baked-on silicone:

terminal sterilization 121 °C, 20 min with saturated water vapor

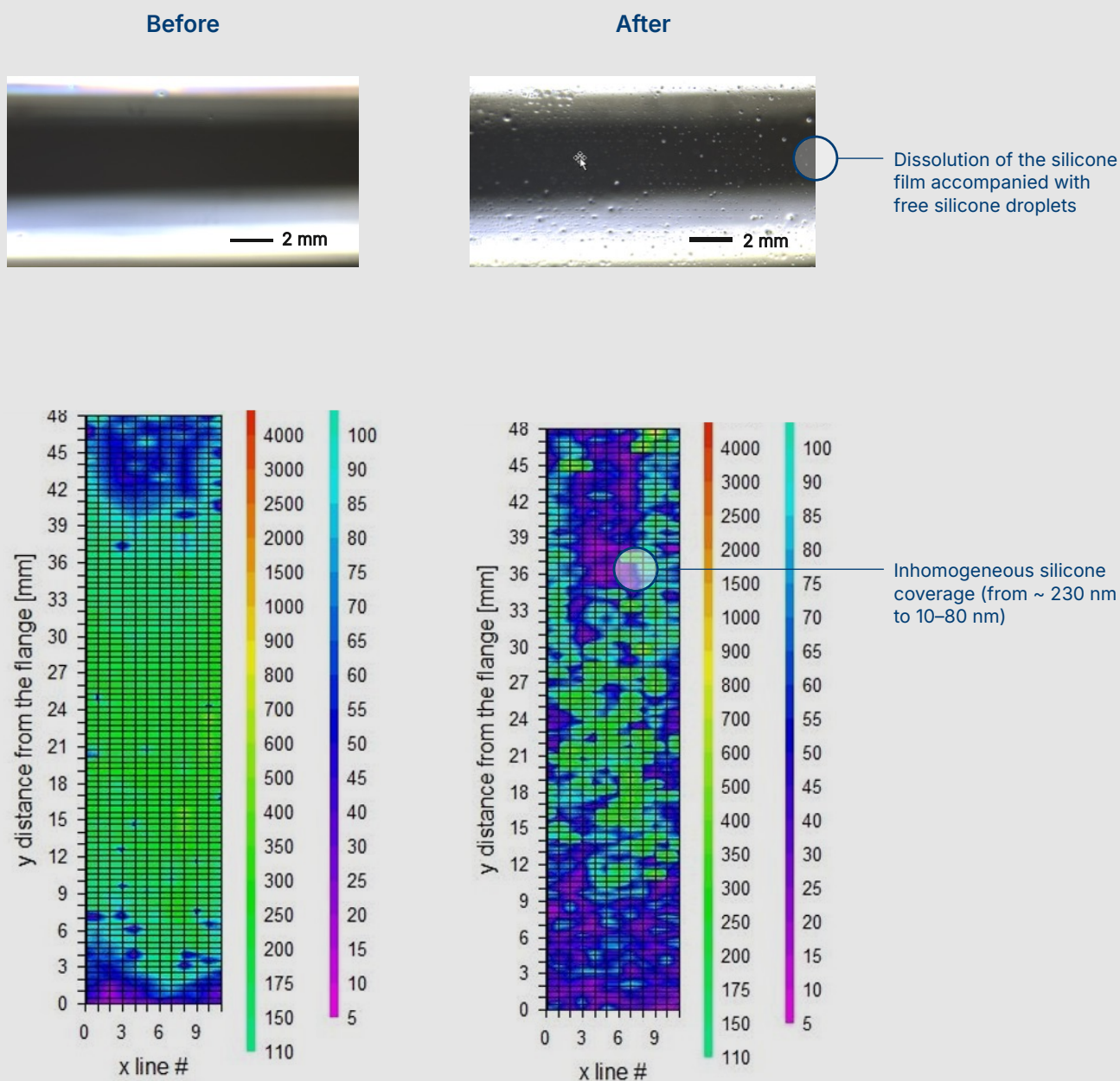


Figure 6: Baked-on silicone coating before and after terminal sterilization with saturated water vapor at 121 °C for 20 min.
(Rupertus, Hladik, & Löber, 2020)

PICVD – ADC safeguarding through covalent bonding

In contrast to silicone, coatings applied via a PICVD (Plasma Impulse Chemical Vapor Deposition) show an overall homogeneous distribution, characterized by a covalent bond to the glass vial substrate. PICVD uses pulsed microwave radiation to break apart the molecules of the precursor gas HMDSO (hexamethyldisiloxane) through electrons in the plasma (see Figure 7). The inner surface, previously

activated by oxygen, serves as reaction partner and enables the deposition of the coating on the vial's inner surface.

Figure 8 shows that the PICVD coated container's inner surface exhibits a completely homogeneous layer, with no detectable alterations despite being exposed to considerably more severe test conditions than those applied to the siliconized container¹.

¹Rupertus, Hladik, & Löber, 2020

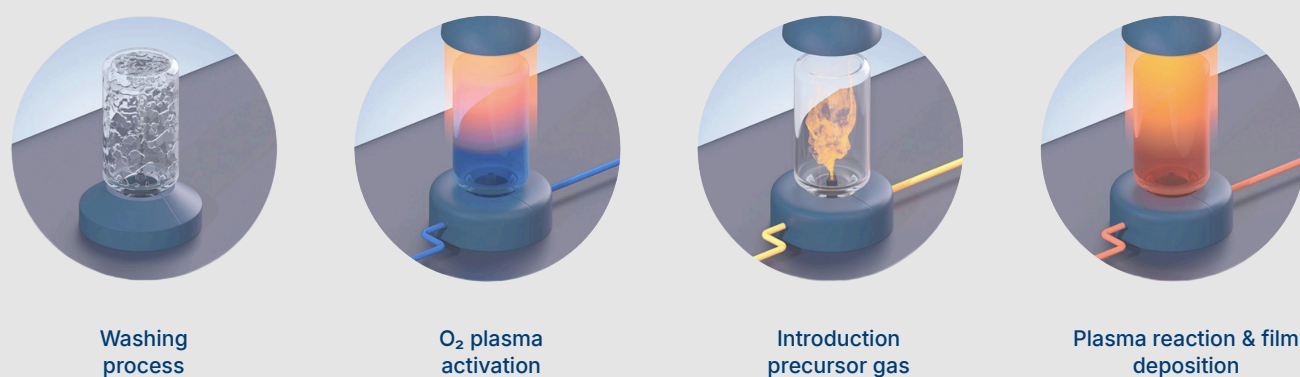


Figure 7: PICVD coating process – schematic illustration

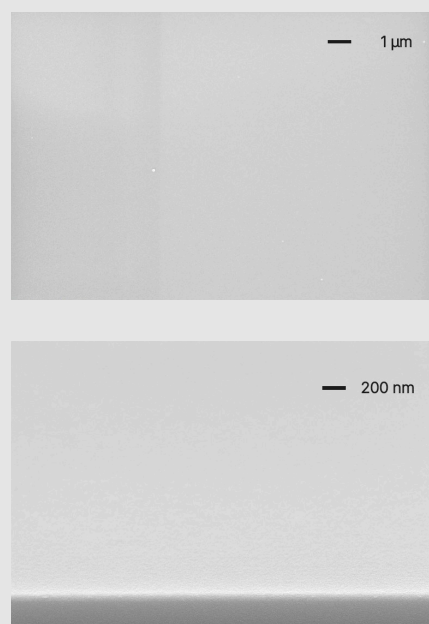
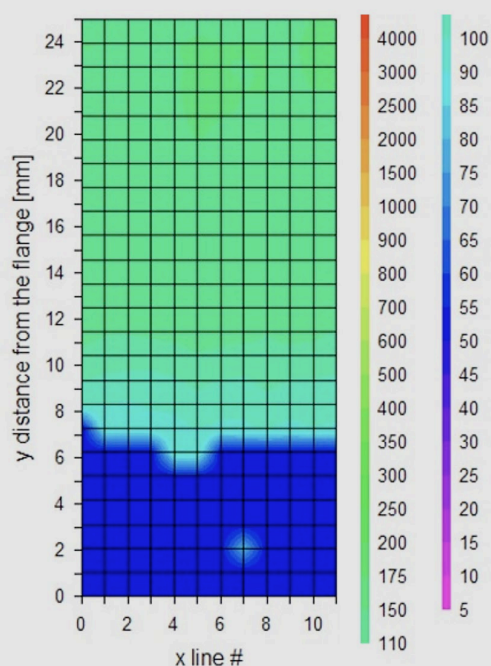


Figure 8: PICVD-coated inner surface after autoclaving with purified water at 121 °C for 60 minutes and storage at room temperature for four months. Left: optical reflectometry measurements. Right: SEM image in high resolution, including cross section (Rupertus, Hladik, & Löber, 2020)

Residual emptying – additional savings through hydrophobicity

A non-negligible side effect is the improved residual emptying when using a container with a hydrophobic inner surface. Assuming average production costs of €50 per vial and a batch size of 50,000 pieces, a typical increase in extractable volume of just 4% leads to savings of €100,000 per batch. Overfilling and unnecessary drug loss are avoided.

2. Light sensitivity

Amber glass as solution

The fact that certain medications undergo photodegradation when exposed to ultraviolet and visible light is nothing new. For high value drugs such as monoclonal antibodies, this risk has been

typically addressed by using appropriate secondary packaging. With the rise of ADCs, it's become apparent that these modalities show such light sensitivity, that light protection is required during filling.

One solution could be the adaptation of the light set-up in the manufacturer's facilities. As proteins are typically sensitive towards visible light, one option could be switching to infrared light. However, this route typically comes with huge effort and expense. Another solution is to use the container to protect the formulation from light, as commonly used in the packaging for vitamins, nasal sprays and antibiotics. To achieve this, a darker glass, such as FIOLAX® amber, is used to reduce light transmission (see Figure 9). This is realized through the addition of metal oxides (barium, titanium, ferrum) to the glass composition.

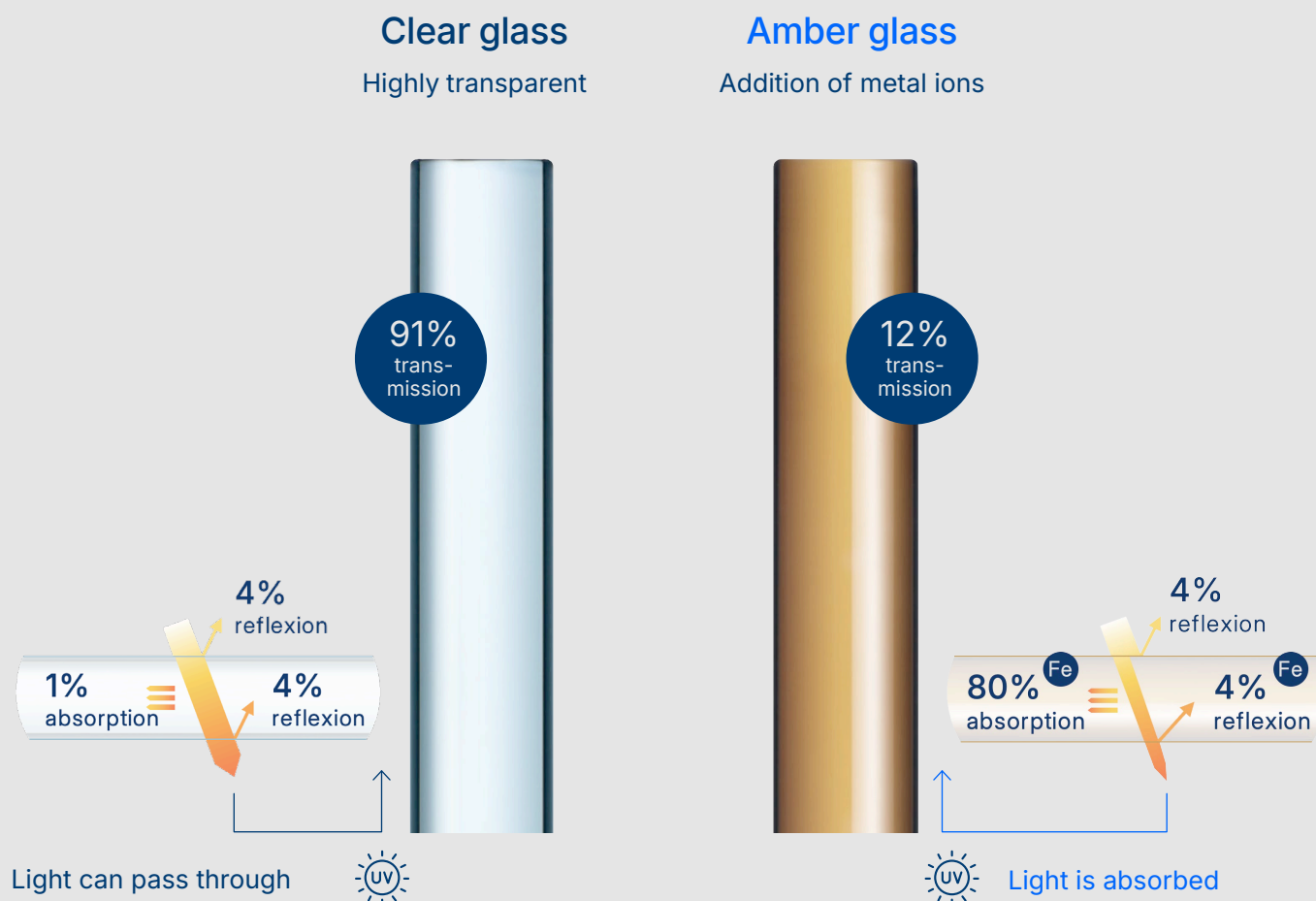


Figure 9: FIOLAX® clear vs. FIOLAX® amber glass

Regulatory light transmission requirements

As modalities such as ADCs become rolled out globally, compliance with light transmission requirements of international pharmacopoeias plays an important role. For many pharma companies, this mainly comprises the United States Pharmacopeia (USP), the European Pharmacopeia (Ph. Eur.), and the Japanese Pharmacopeia (JP). As seen in Figure 10, pharmacopoeias requirements differ and can even be conflicting.

In general, a wavelength range between 290-450 nm is relevant to ensure light protection. Therefore, maximum values (in %) are defined in this range for all pharmacopoeias. However, the JP additionally requires a minimum transmission percentage between 590-610 nm to enable inspection in orange light without jeopardizing a drug's stability.

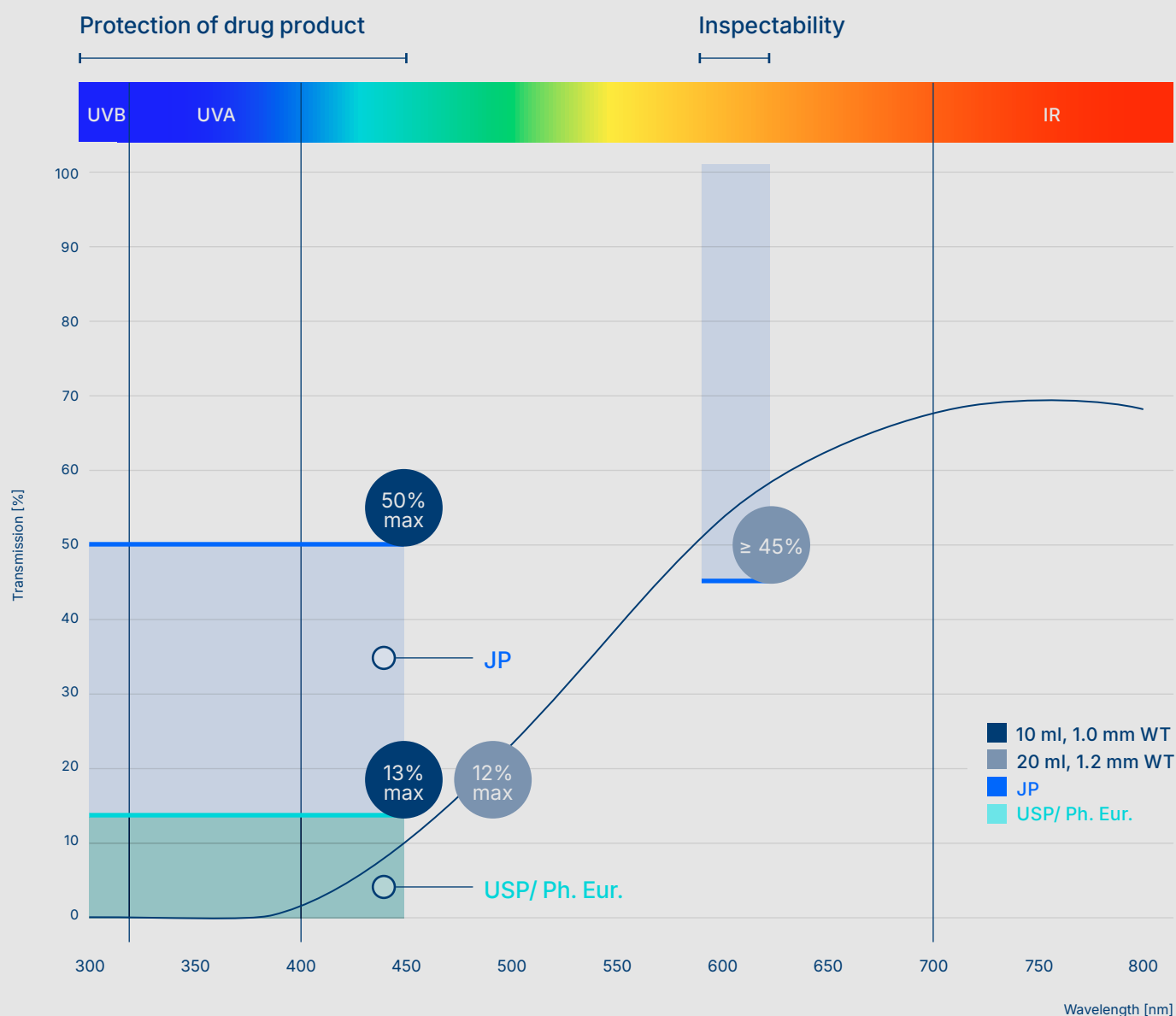


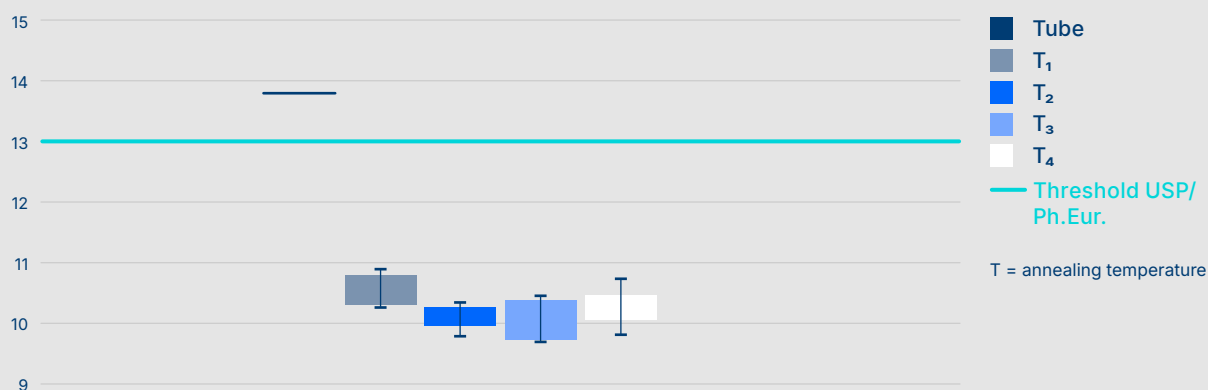
Figure 10: Light transmission compliance of different pharmacopoeias
In the wavelength range of 590 -610 nm threshold shown for wall thickness of ≥ 1.00 mm

To meet all these requirements, a tightly controlled manufacturing process is required, as the heat can induce darkening of the glass. Particularly relevant is the “annealing process”, a mandatory step after hot forming of the vial to release the glass from stress originating from a thermal gradient evoked during hot forming. The vials are therefore heated up to ~ 550-600 °C, before being subjected to a continuous decrease in temperature. Without this procedure, residual stress would result in an unacceptable risk for breakage.

Consequently, a process window during annealing needs to be determined that allows the release of residual stress, while ensuring that glass darkening is kept at a level that meets light transmission requirements. Therefore, light transmission for the required wavelength ranges has been measured after exposure to different temperatures during annealing. Figure 11 shows that for a 10R ISO vial (wall thickness of 1.00 mm) both requirements ($\leq 13\%$ for 290-450 nm, $\geq 45\%$ for 590-610 nm) can be met simultaneously. However, this outcome is rather coincidental if light transmission is not defined as release criteria and therefore continuously controlled.

10R specification: 290 - 450 nm ($\leq 13\%$)

Transmission [%]



10R specification: 590 - 610 nm ($\geq 45\%$)

Transmission [%]

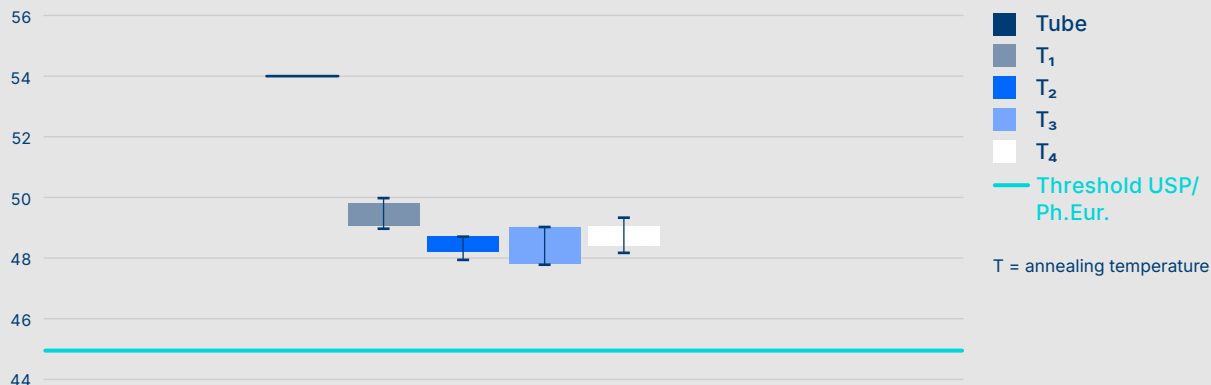
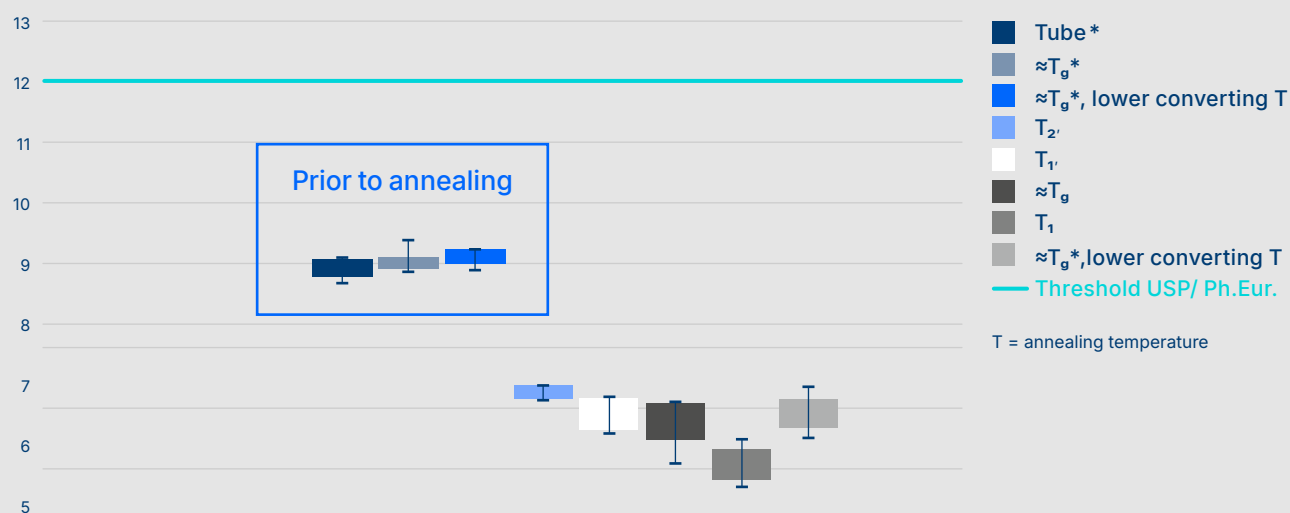


Figure 11: Light transmission of a 10R vial after exposure to different annealing temperatures

The picture is different for 20R (wall thickness 1.2 mm), as seen in Figure 12. With the temperature required for the release of residual stress, this format cannot fulfill the required light transmission of $\geq 45\%$ in the upper wavelength range. Consequently, it cannot be guaranteed that residual stress will be released and the light transmission requirements of USP, Ph. Eur., and JP will be met.

20R specification: 290 - 450 nm ($\leq 12\%$)

Transmission [%]



20R specification: 590 - 610 nm ($\geq 45\%$)

Transmission [%]

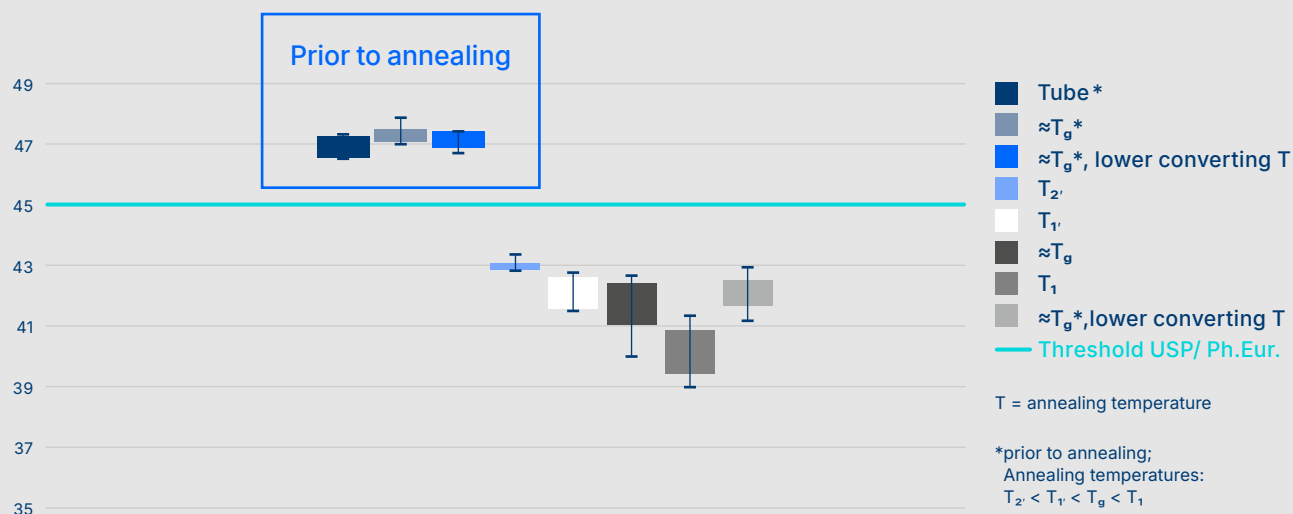
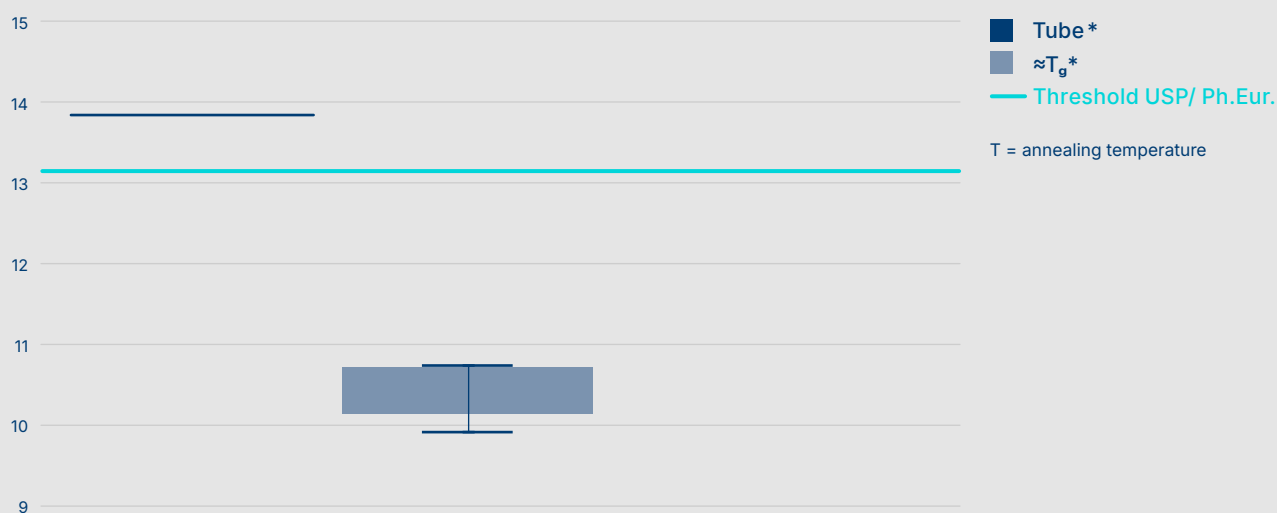


Figure 12: Light transmission of a 20R vial after exposure to different annealing temperatures

However, a solution is required to enable pharma companies to utilize one vial type globally and prevent the complexity of having multiple primary packaging articles for one formulation. To achieve this, the wall thickness of a 20R vial has been reduced from 1.2 mm to 1.0 mm. With this dimensional change, the requirements regarding light transmission of USP, Ph. Eur. and JP can all be met, as shown in Figure 13.

20 ml specification: 290 - 450 nm ($\leq 12\%$)

Transmission [%]



20ml specification: 590 - 610 nm ($\geq 45\%$)

Transmission [%]

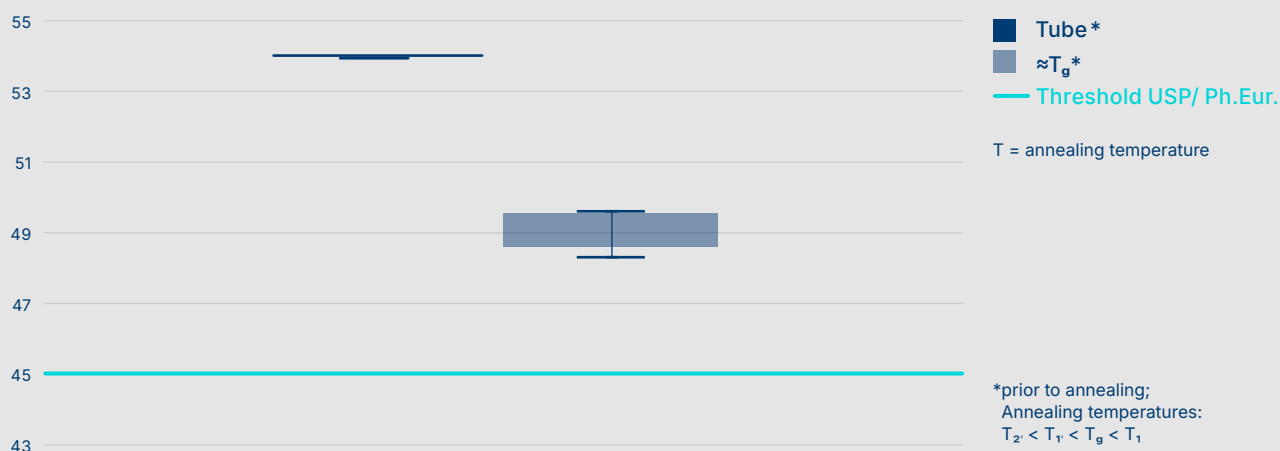


Figure 13: Light transmission of a 20R vial with reduced wall thickness after exposure to different annealing temperatures

Full global light transmission compliance without affecting breakage

Reducing the wall thickness can increase the stress of burst-, axial- or side-compression, leading to an increased likelihood of breakage when mechanical load is applied (see exemplary internal simulation in Figure 14). This is even more relevant in the case of ADCs due to their high potency. Any breakage events would result in a contaminated filling line and a complex and costly cleaning procedure.

To avoid this, SCHOTT Pharma used the knowledge built up in the development of its EVERIC® strong vial to increase the strength of EVERIC® amber. Since internal research has shown that increased homogeneity in the bottom area leads to improved overall strength, the development of the vial concentrated on this area. Hot forming with tighter tolerances in combination with focused inspection on the bottom area controls the dimensional parameters that lead to increased homogeneity and strength.

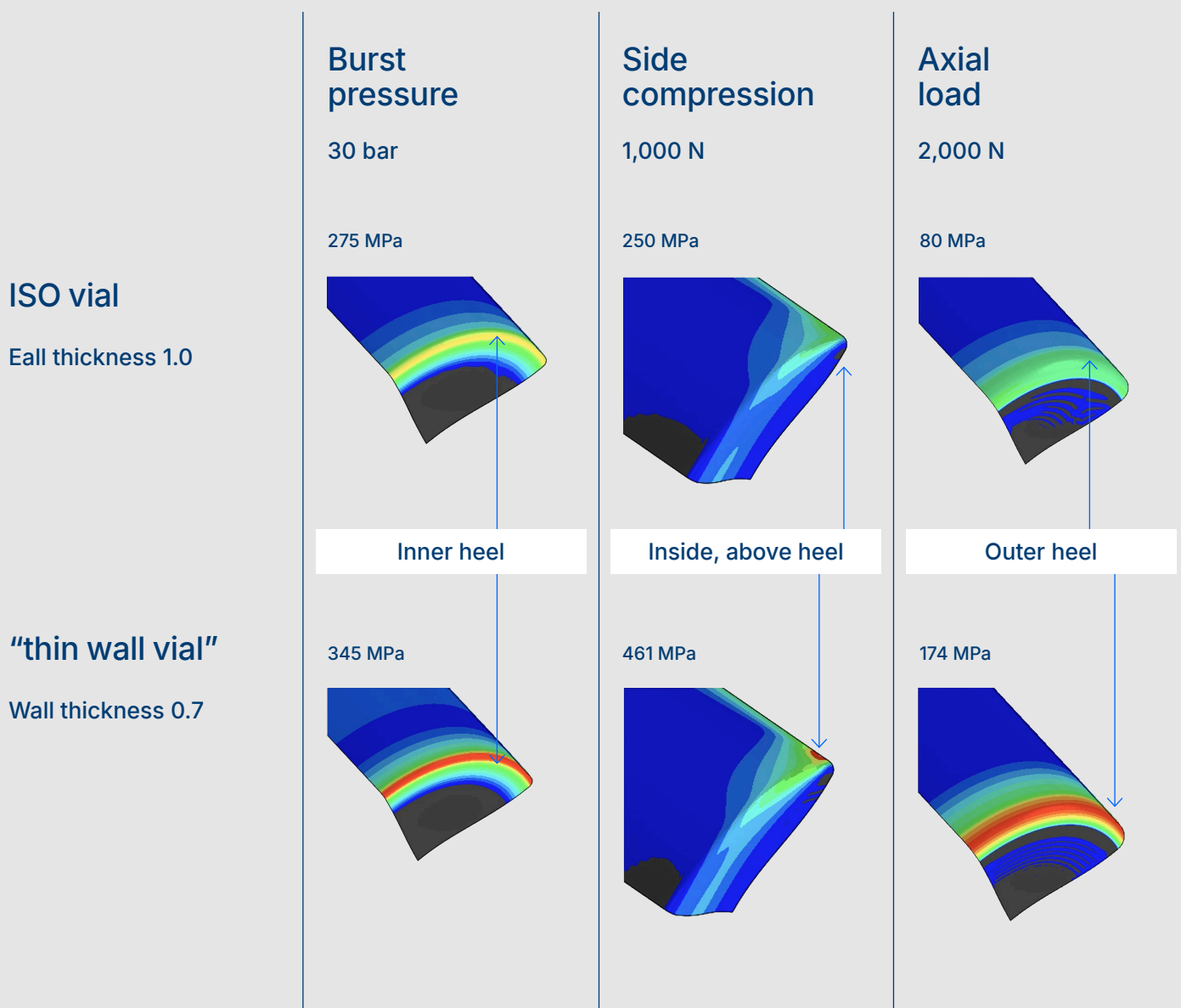
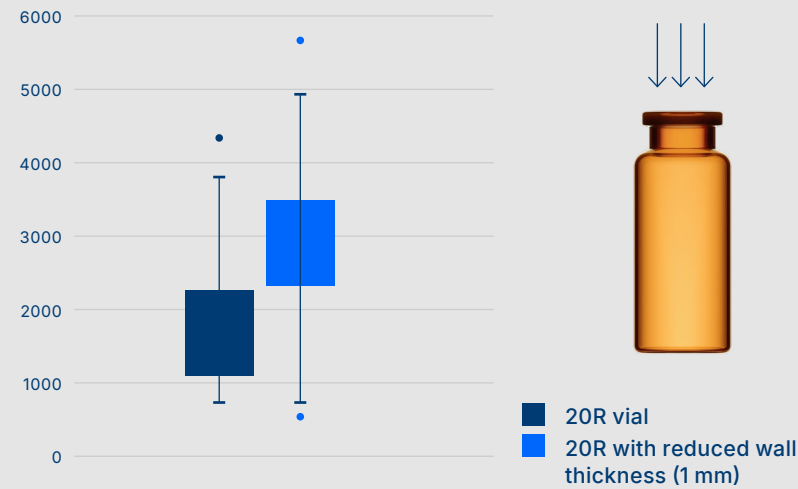


Figure 14: Stress simulation ISO vial vs. vial with reduced wall thickness

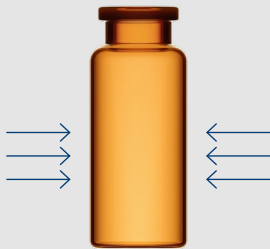
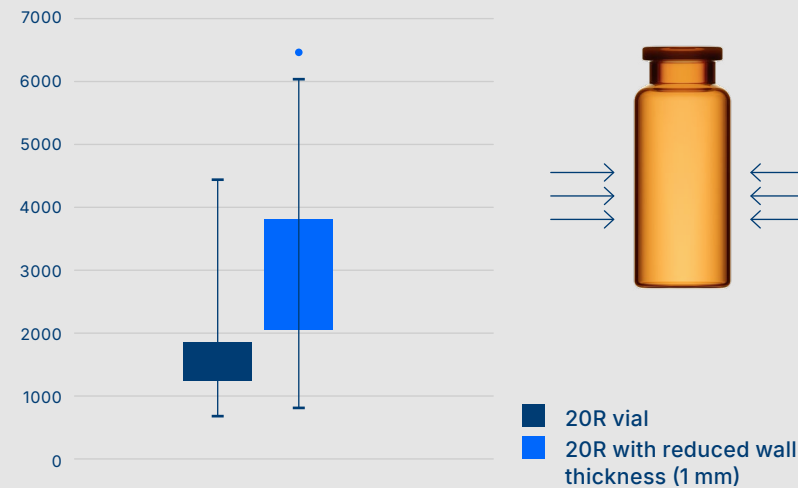
Axial load (N)



In addition, to protect the vial from the introduction of cosmetic defects during transport and handling, dividers made of polypropylene arranged in a grid-pattern are added to the product configuration. Figure 15 illustrates:

- 1. How axial- and side-compression strengths of vials with reduced wall thickness outperform standard 20R vials thanks to an improved production process
- 2. How reduced burst pressure strength due to transportation can be mitigated by packaging dividers

Side compression (N)



Burst pressure (N)



Figure 15: Strength comparison 20R vial vs. 20R vial with reduced wall thickness

RTU vials – another tool to optimize ADC fill-and-finish

One other option to consider with ADC packaging is to use RTU (ready-to-use) vials to prevent any further risk of breakage. Any contamination of the filling line is especially serious for ADCs because of their toxicity, requiring a complex and costly cleaning procedure.

For RTU vials, containers are placed in nests to prevent glass-to-glass contact, which are then put in standardized tubs, sealed with a protective barrier and sterilized (see SCHOTT Pharma adaptiQ® RTU

vials in Figure 16). Using this method, the flexibility of container choice is increased, while equipment complexity is decreased.

Reducing the footprint by skipping the process steps prior to filling also leads to less effort required for operation, maintenance, and qualification. This supports the EU GMP Annex 1 demands for reduced human intervention and the required shift towards automation and isolator technology. For further information on RTU vials, please read “Flexible, scalable and safe: the benefits of adaptiQ® RTU vials”¹.

¹a) Löber, 2025

adaptiQ® cup nest

Tyvek® seal/HDPE

Industry standard sterile barrier

Vials / Core Vials & EVERIC®

Gold standard high-quality glass vials

Tub / PP

Industry-standard 3" syringe tub

Tyvek® inlay/HDPE

Protection against particles

Nest / POM

- High mechanical stability
- Low abrasion
- Flat nest rim → firm grip during nest take-out



Figure 16: SCHOTT Pharma adaptiQ® RTU vials

Figure 17 summarizes the results of the previous sections. The main challenges for ADC packaging are fogging during lyophilization and light transmission compliance. EVERIC® amber provides the right solution for light protection, as well as compliance with global light transmission requirements. To avoid fogging, a hydrophobic inner vial surface is required. Due to associated risks, the utilization of silicone should be carefully evaluated, but EVERIC® Iyo provides a safe option to mitigate the risk of free silicone. Where an ADC exhibits both light sensitivity and risk of fogging, EVERIC® Iyo & amber vials provide the ideal solution.

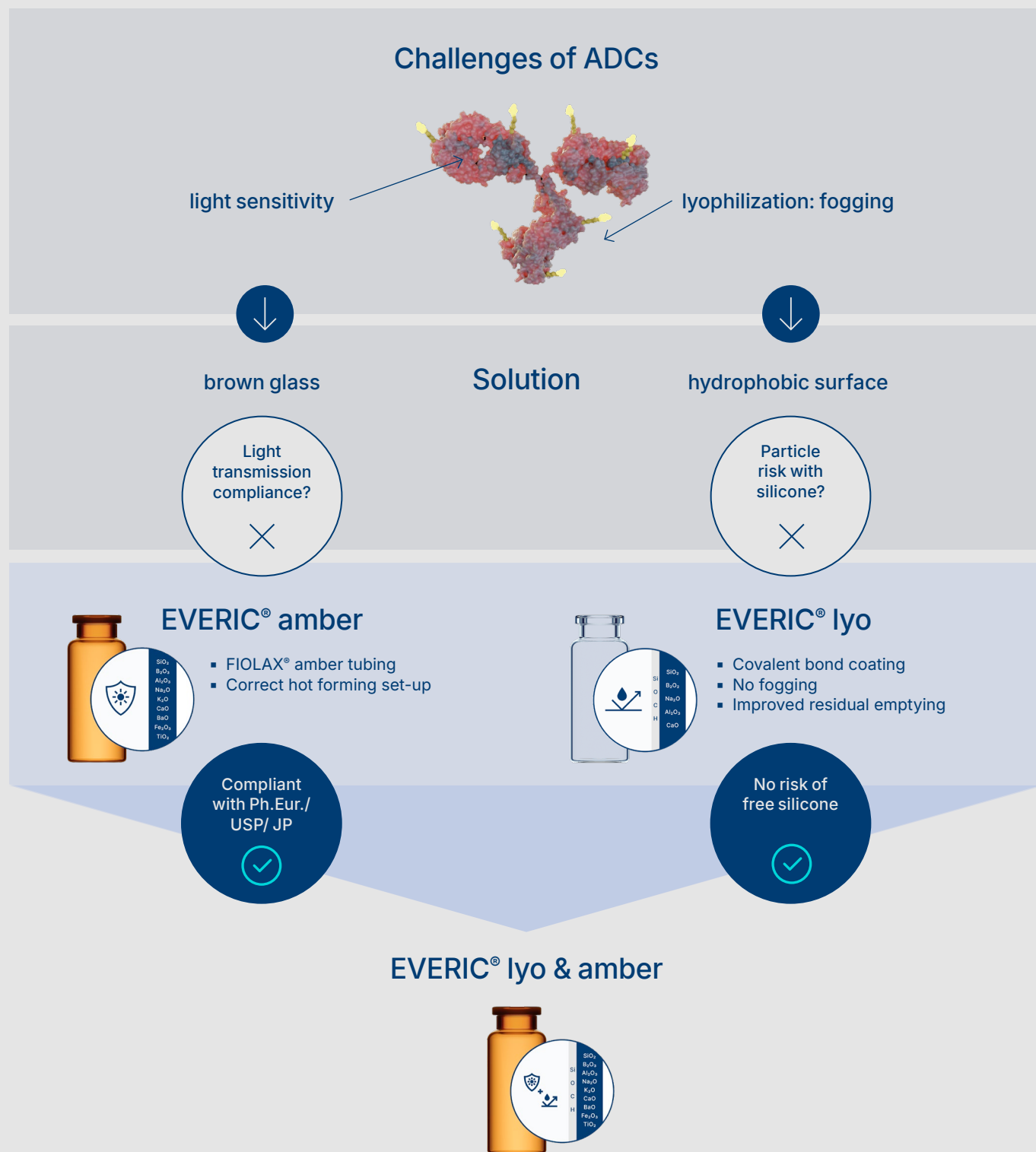


Figure 17: Challenges and solutions for ADC primary packaging

3. Stability in liquid

Can the right container make lyophilization obsolete?

As outlined at the start of this report, most ADCs require freeze-drying due to their fragility. However, lyophilization is not the preferred option as it comes with many disadvantages, as shown in Table 1. Not only is lyophilization an additional production step, but there are other potential issues such as challenging cycle development, a demanding upscaling process, and due to its non-continuity, difficult in-process adjustments. Freeze-drying also requires high investment and running costs. Besides the production challenges, a lyophilized drug also requires additional handling steps prior to administration, making it prone to error, leading to higher risks for patient safety.

It's clear that it's in the interest of the selling company, the healthcare professional, and especially the patient to provide drugs in liquid form. The key challenges for liquid storage are:

1. Delamination
2. Leachables
3. Protein adsorption
4. Light sensitivity

Delamination – control as the foundation for liquid-form stability

Delamination is a well-known and extensively described phenomenon¹ that comprises the formation of detached, loose glass flakes in the formulation that could potentially lead to the occlusion of a patient's pulmonary capillaries. The origin of delamination has been proven to lie in a zone just above the heel of the vial. During the vial production process, the glass tube is heated. During that process, evaporates re-condense on the nearest cooler region of the vial's inner surface: the "heel zone". This area is less chemically durable and more susceptible to the processes that lead to delamination (as described in USP <1660> (USP <1660>, 2015)), such as terminal sterilization, high pH, and the usage of certain buffers.

In combination with glass tubing developed to reduce leachables (with no change in chemical composition), SCHOTT Pharma has established a patented process that avoids these condensates and results in a homogenous inner surface. A patented release test has also been developed that proves this inner surface homogeneity. The result of this process is EVERIC® pure vials. In order to increase stability in liquid form, a delamination-controlled vial should be the starting point for container development, especially for fragile and complex proteins.

¹Haines, Scheumann & Rothhaar, 2013; Rothhaar, Klause, & Hladik, 2016; Hladik, Buscke, Frost & Rothhaar, 2019; Bicker, Haines & Rothhaar, 2020

	Liquid	Lyophilization
Process	+	— ▪ Additional step ▪ Non-continuous - in-process adjustment is difficult ▪ Cycle development is challenging
Running costs	+	— ▪ Energy ▪ Time
Investment costs	+	— ▪ Freeze dryer ▪ Space ▪ Environmental control systems
Scalability	+	— ▪ Complexity of lyophilization cycle ▪ Size of equipment
Ease-of-use	+	— ▪ More preparation steps (reconstitution) → more prone to error → risk for patient safety
Product stability	—	+
		▪ Normally no refrigeration or freezing necessary ▪ Often stable even at room temperature

Table 1: Comparison liquid vs. lyophilization

Leachables – a critical factor in the stability of sensitive molecules

Glass leachables are unavoidable and, in most cases, non-critical. However, there are applications that show a high sensitivity towards glass leachables. Aside from diluents, where the pH-shift poses a major challenge, these are typically large, complex molecules that tend to be sensitive. At worst, the drug might lose its activity due to denaturation or aggregation of the protein, for example. Other formulation parts such as the surfactant can also be affected by leachables and degrade. Employing a primary packaging container that minimizes leachables could help to support stability in liquid form. SCHOTT Pharma offers three different options to address this challenge.

EVERIC® pure vials not only help to control delamination, but show a reduced leachable level, which is particularly relevant for low-fill volumes. The vials also offer a lower risk of pH shift. For further information, please refer to the whitepaper “EVERIC® pure – take the safe option from the start” (Löber, 2024). EVERIC® pure offers a safe platform that should be considered as the default starting solution when it comes to complex, demanding, and high value formulations.

EVERIC® plus vials should be considered for low-to-medium pH ranges when it comes to leachable sensitivity. This vial is based on Type I Borosilicate Glass with an inner coating. This coating is applied using PICVD, which involves microwave-induced plasma with HMDSO (hexamethyldisiloxane) used as precursor gas and oxygen used to activate the inner surface. The result is a covalently bonded SiO₂ coating that acts as a stable barrier towards glass leachables.

A third option is EVERIC® care. This vial also has an inner coating applied via PICVD, but rather than SiO₂, it features a covalently bonded Si-O-C-H coating that can also withstand high pH formulations.

For further details please read “How to choose the right vial: Influencing factors and solutions for liquid fill” by Diana Löber, which has also been published in the Pharmaversity® whitepaper series¹.

Protein adsorption – inner-surface chemistry influences drug stability

Another, often underestimated mechanism is the adsorption of proteins to the glass surface. This is typically triggered by multiple glass surface-to-protein interactions and leads to the non-covalent adhesion of proteins to the glass surface, which can result in conformational changes, denaturation, aggregation, and loss of biological activity.

Here, the surface charge and the presence of hydrophilic vs. hydrophobic areas play a major role. Typically, a low concentration is associated with a higher risk for adsorption, as is often the case for ADCs. In this case, both EVERIC® plus (hydrophilic inner surface) and EVERIC® care (hydrophobic inner surface) can be explored to potentially avoid adsorption and increase stability in liquid form.

Light sensitivity – leveraging light-protective glass to stabilize liquid formulations

As previously described, UV light can cause photo-induced degradation or molecular oxidation, resulting in protein cross-linking, fragmentation or aggregation. If this is a potential issue, it's worth exploring whether using light-protective glass could lead to an increased stability in liquid form, potentially avoiding the need for lyophilization.

Figure 18 gives an overview of the challenges and potential solutions for liquid and lyophilized fillings.

¹b) Löber, 2025



From ADCs to next-generation conjugates – why packaging matters more than ever

ADCs have evolved from a niche technology to the leading type of conjugates, growing continuously. Their complexity, fragility, and high potency create unique manufacturing and primary packaging challenges, such as fogging during lyophilization, light sensitivity, and stability in liquid form.

SCHOTT Pharma's EVERIC® vial portfolio provides a comprehensive toolbox that enables fogging mitigation, light protection, enhanced stability in liquid form, and maximum safety for highly potent ADC formulations. As well as radionuclide drug conjugates (RDCs), conjugates such as ligand-conjugated antisense medicines and bispecific ADCs may show even more complex, fragile structures in the future, making their primary packaging more crucial than ever.

Factors why formulations might not be stable in liquid



Delamination

Leachables

Adsorption

Light sensitivity

Fogging

Dosage accuracy

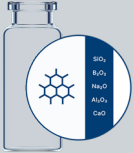
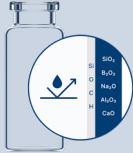
Liquid				Lyo	
					
EVERIC® pure the default	EVERIC® plus protection in lower pH	EVERIC® care protection in high pH	EVERIC® amber light protection	EVERIC® lyo optimized lyophilization	EVERIC® lyo & amber optimized lyophilization + light protection
×					
×	×	×			
	×	×			
			×		×
		×		×	×
		×		×	×

Figure 18: Overview of SCHOTT Pharma vial solutions for liquid and lyophilized filling



Diana Löber

Diana Löber (Global Product Manager Specialty Vials & adaptiQ®) started her career in the medical device industry prior she joined SCHOTT in summer 2018. With now more than 10 years experience in the area of product management, as global product manager for vials, she is responsible for the product strategy, including the identification of new market opportunities, implementation of lifecycle measures and the development and launch of innovative products.



Sarawut Künzl

Sarawut Künzl is a Business Development Manager at SCHOTT Pharma, responsible for Specialty Vials within the EMEA region. With experience in business development, corporate strategy, and the biotechnology industry, Sarawut has been supporting biotech and pharma companies in addressing evolving drug containment challenges since joining SCHOTT Pharma in 2020. Today, Sarawut works closely with customers to advance packaging solutions, such as EVERIC® vials, for complex and innovative therapies.

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