Scavenger

October 2011

A member of ALTANA

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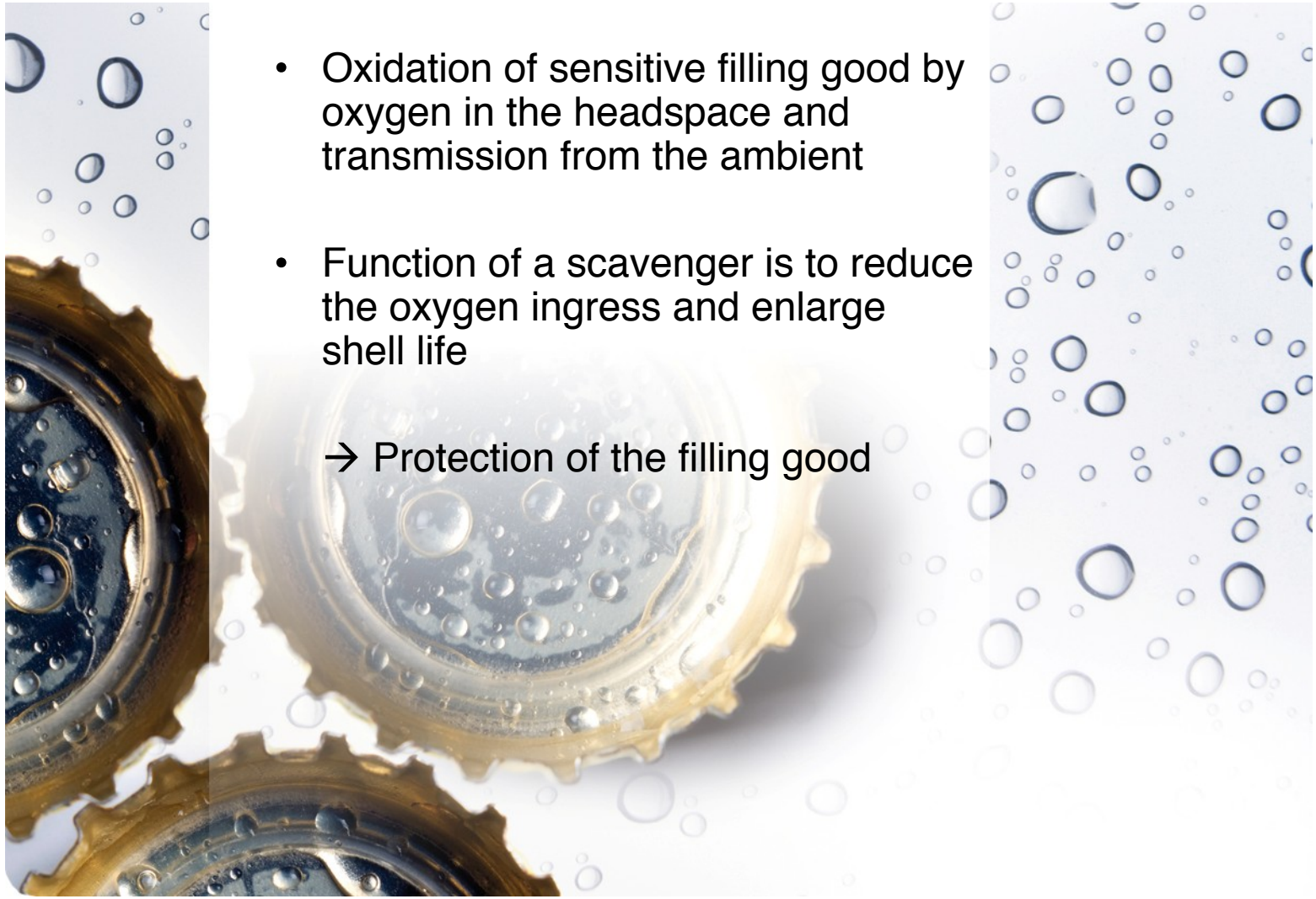
Coatings & Sealants

Scavenger – Function



- Oxidation of sensitive filling good by oxygen in the headspace and transmission from the ambient
- Function of a scavenger is to reduce the oxygen ingress and enlarge shell life

→ Protection of the filling good

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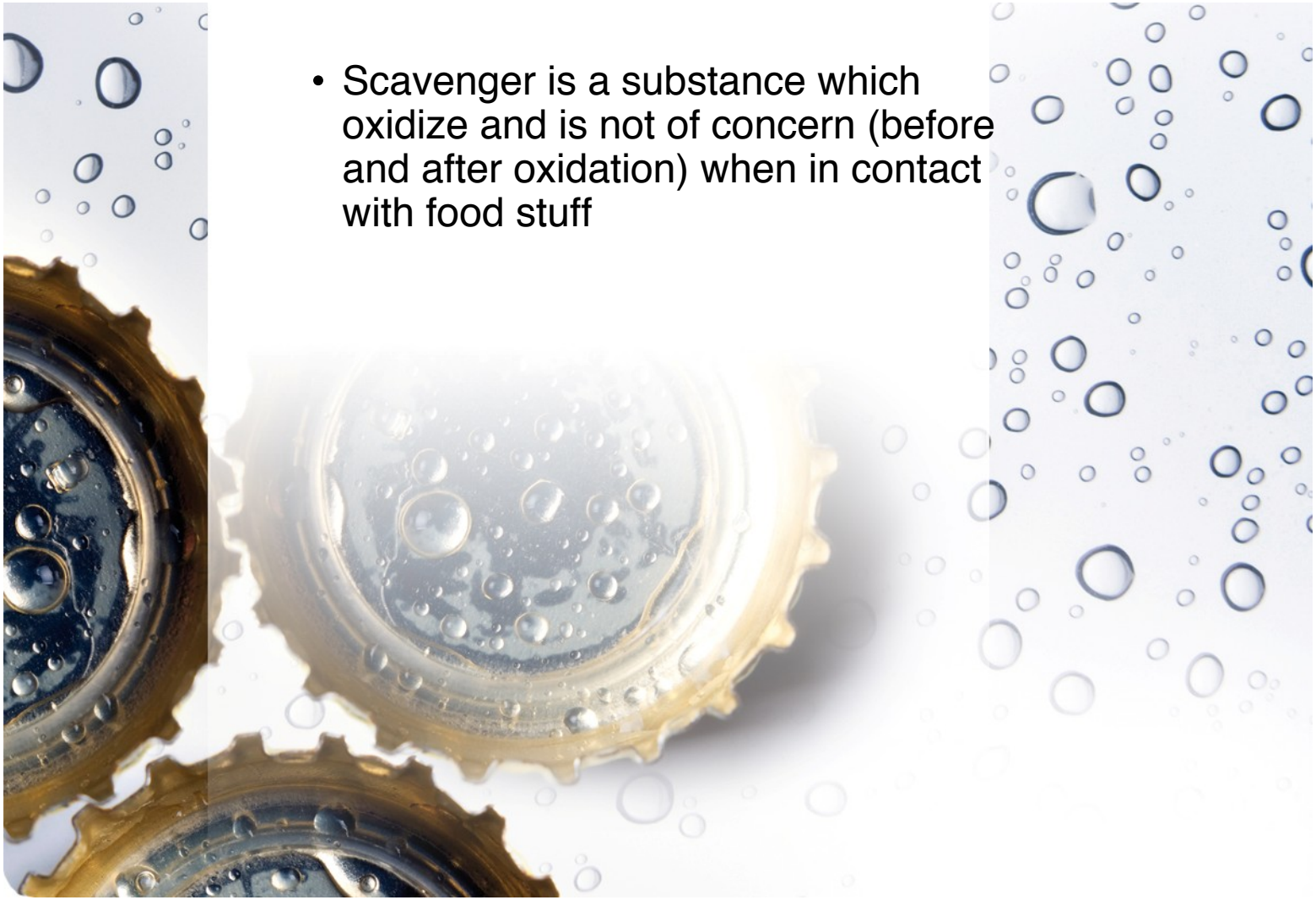
Scavenger – System



- Scavenger is a substance which oxidize and is not of concern (before and after oxidation) when in contact with food stuff

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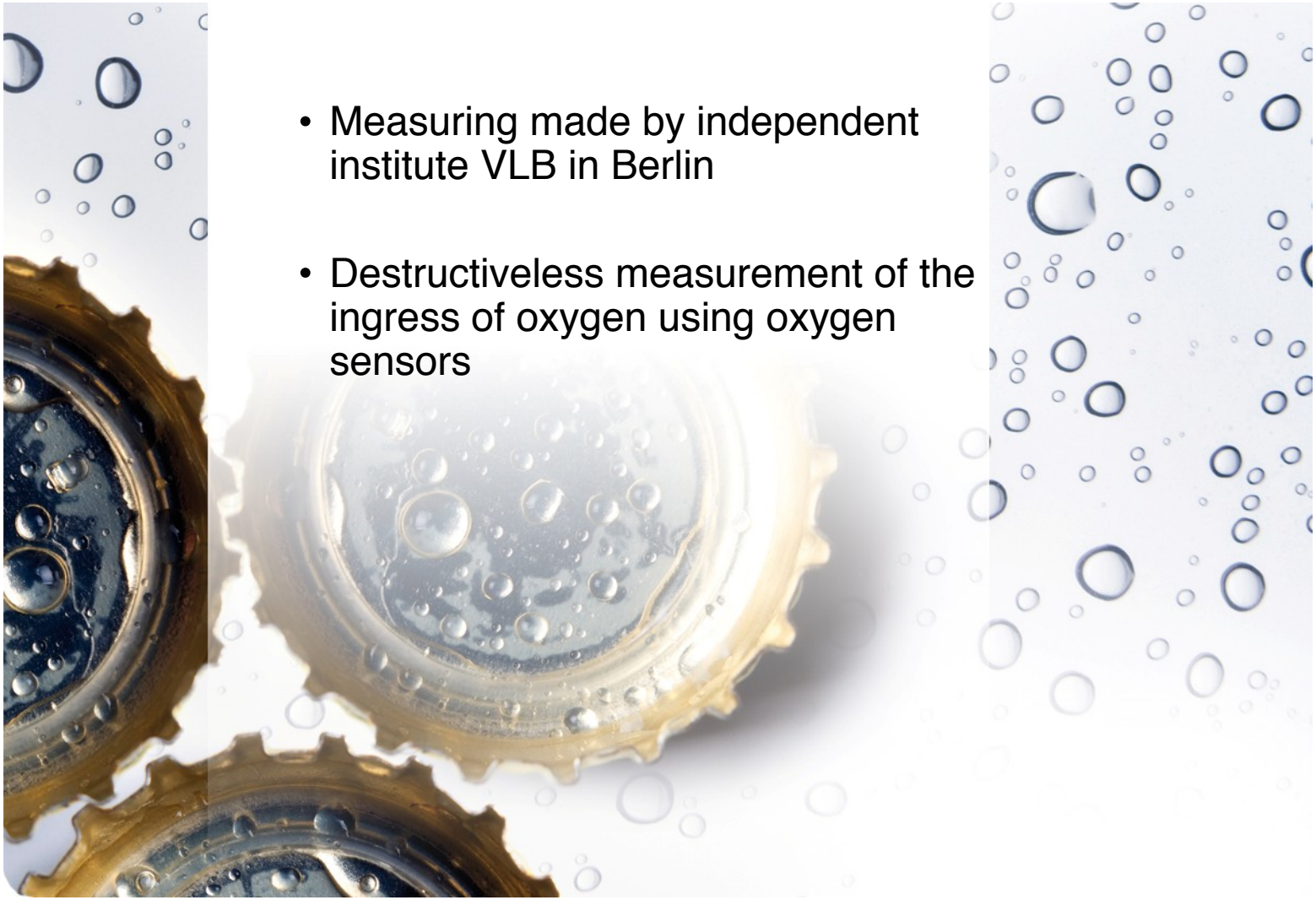
Scavenger – Measuring



- Measuring made by independent institute VLB in Berlin
- Destructiveless measurement of the ingress of oxygen using oxygen sensors

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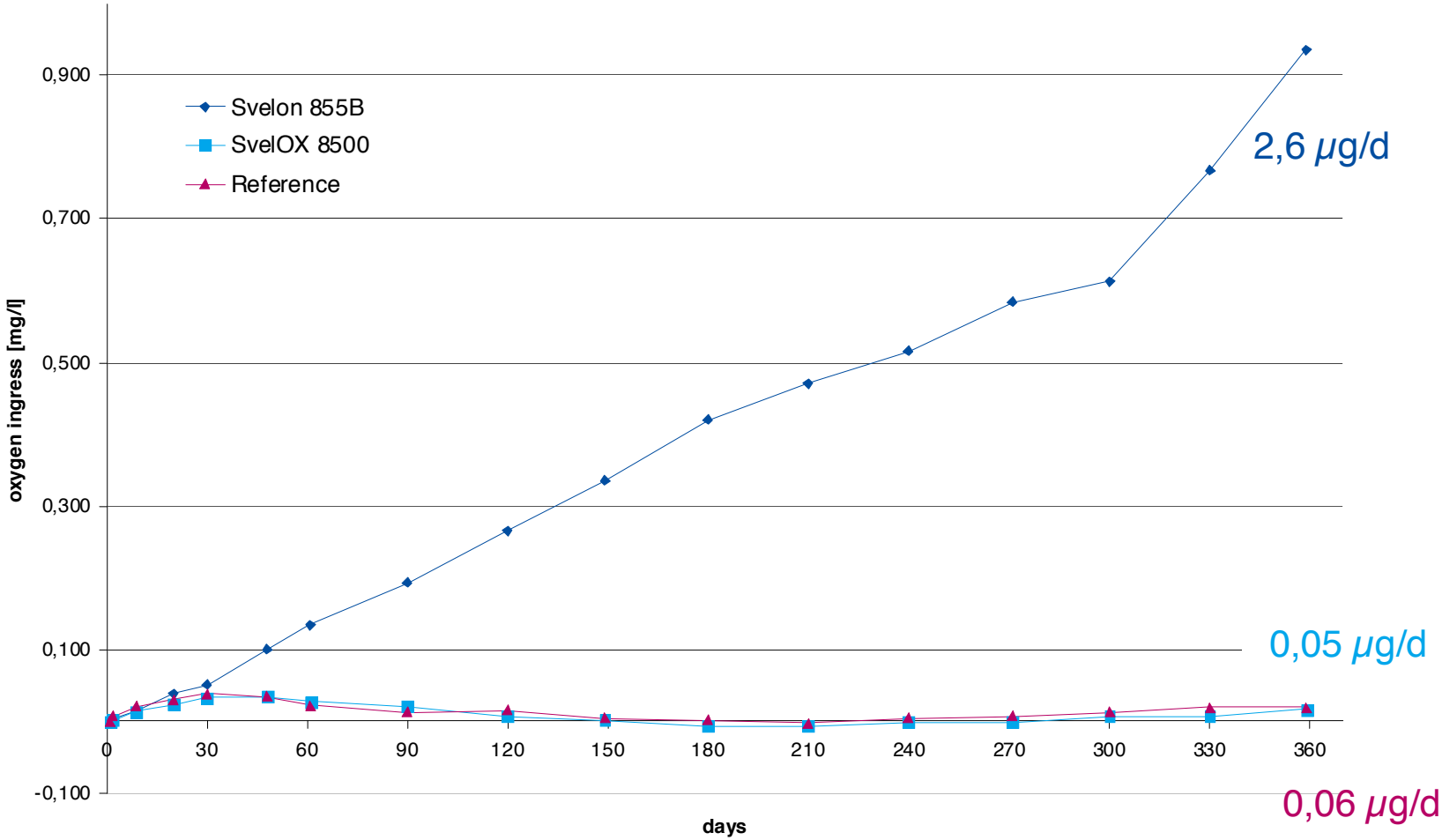
Scavenger – PryOff-Crown Corks SvelOX 8500

Standard-crown-Liner: O_2-ingress 1 - 4 µg/d



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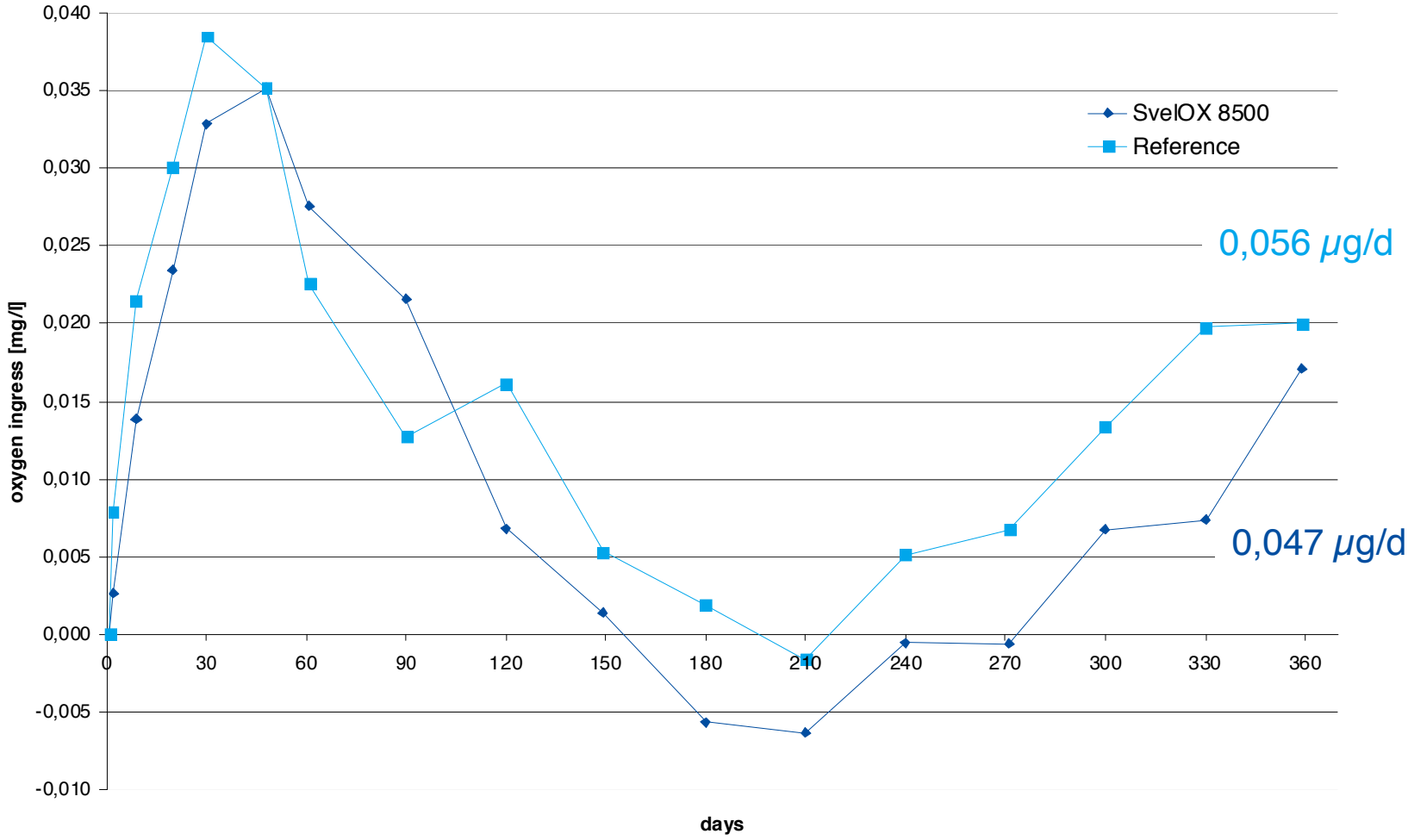

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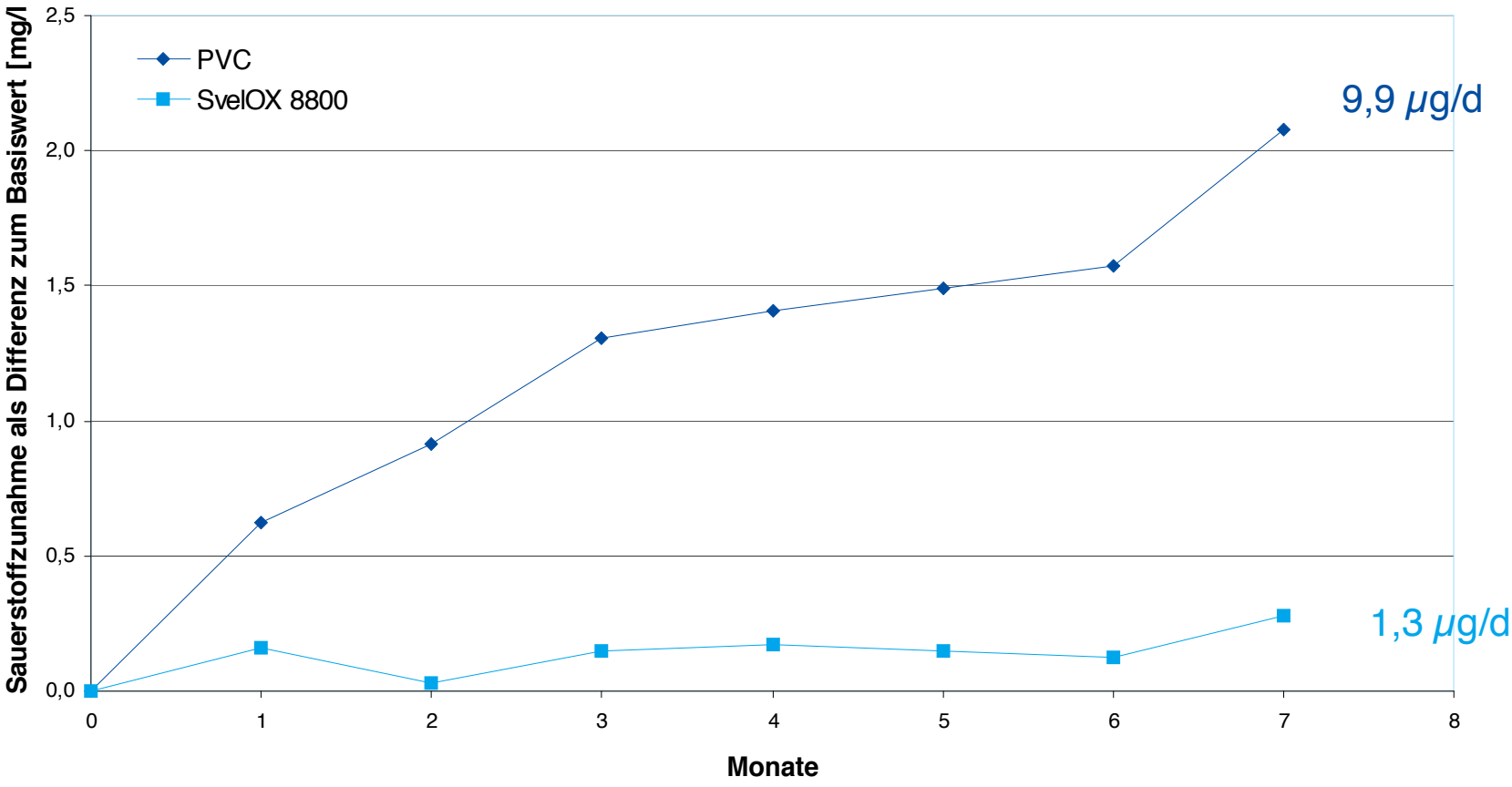
Scavenger – Twist-Crowns
SvelOX 8800



Measuring of the oxygen content in water and storate at 20°C.
Results submitted by an well know brewery

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Problem of Corrosion

- Basis: Contact between unprotected metal and humidity as well as oxygen
- pH-value of beer: 4 - 5, (sour)
- Oxidation of iron → corrosion

$$Fe \rightarrow Fe^{2+} + 2e^-$$

$$O_2 + 4\,H_3O^+ + 4e^- \rightarrow 6\,H_2O$$

$$2\,Fe + O_2 + 4\,H_3O^+ \rightarrow 2\,Fe^{2+} + 6\,H_2O$$

- Depending on used scavenger addives corrosion is accelarated
- Metaltype (TFS less oxydation as tinplate)

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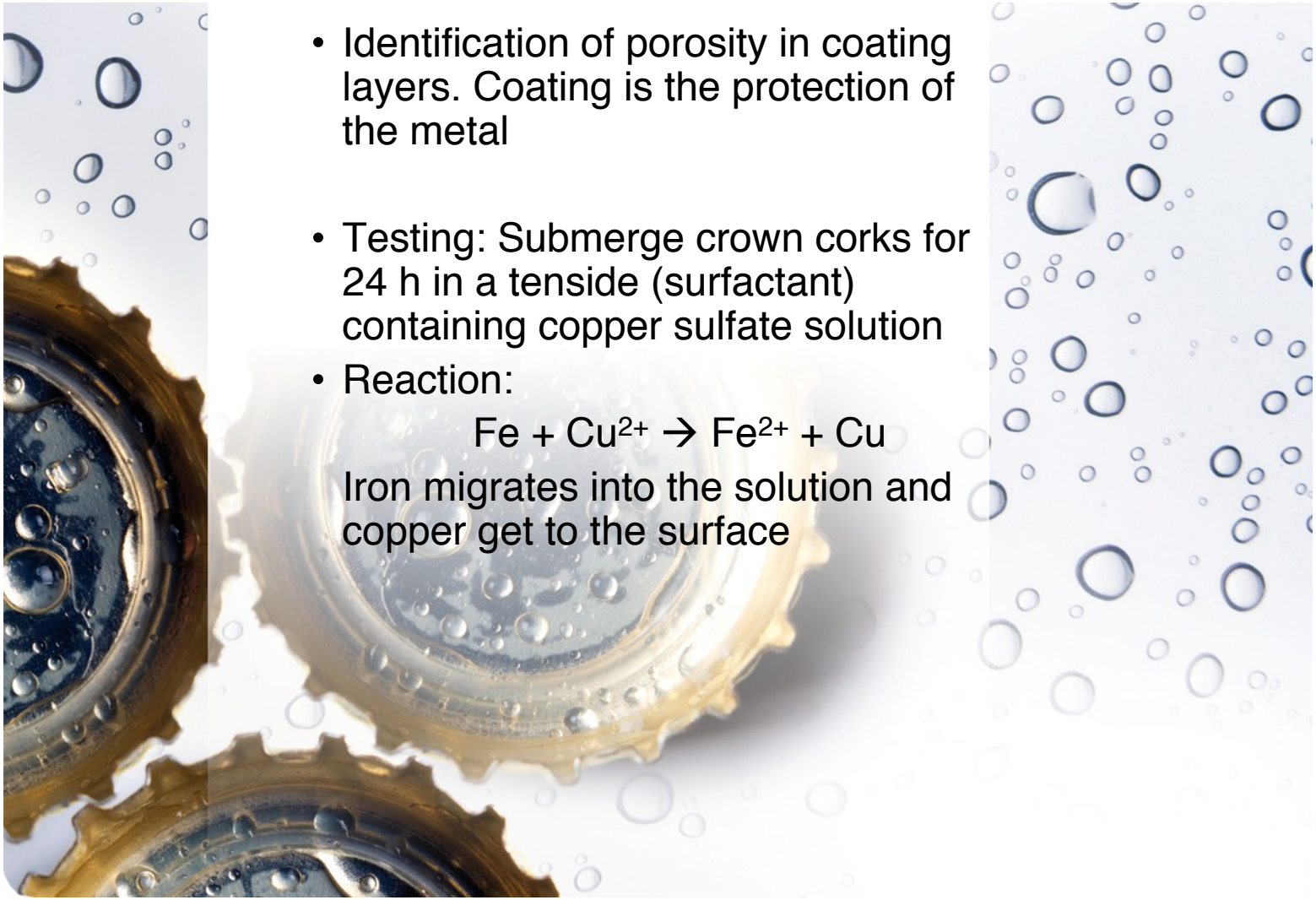
Surface testing



- Identification of porosity in coating layers. Coating is the protection of the metal
- Testing: Submerge crown corks for 24 h in a tenside (surfactant) containing copper sulfate solution
- Reaction:

$$Fe + Cu^{2+} \rightarrow Fe^{2+} + Cu$$

Iron migrates into the solution and copper get to the surface

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Porosity testing – Crown Cork comparision

Reference (Tinplate)

SvelOX 8500 (TFS)

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Scavenger – Storage

- Original beer bottles closed with crown corks to be tested and pasteurized at 62°C for 20 min
- Storage horizontal at room temperature to have contact of liner with beer

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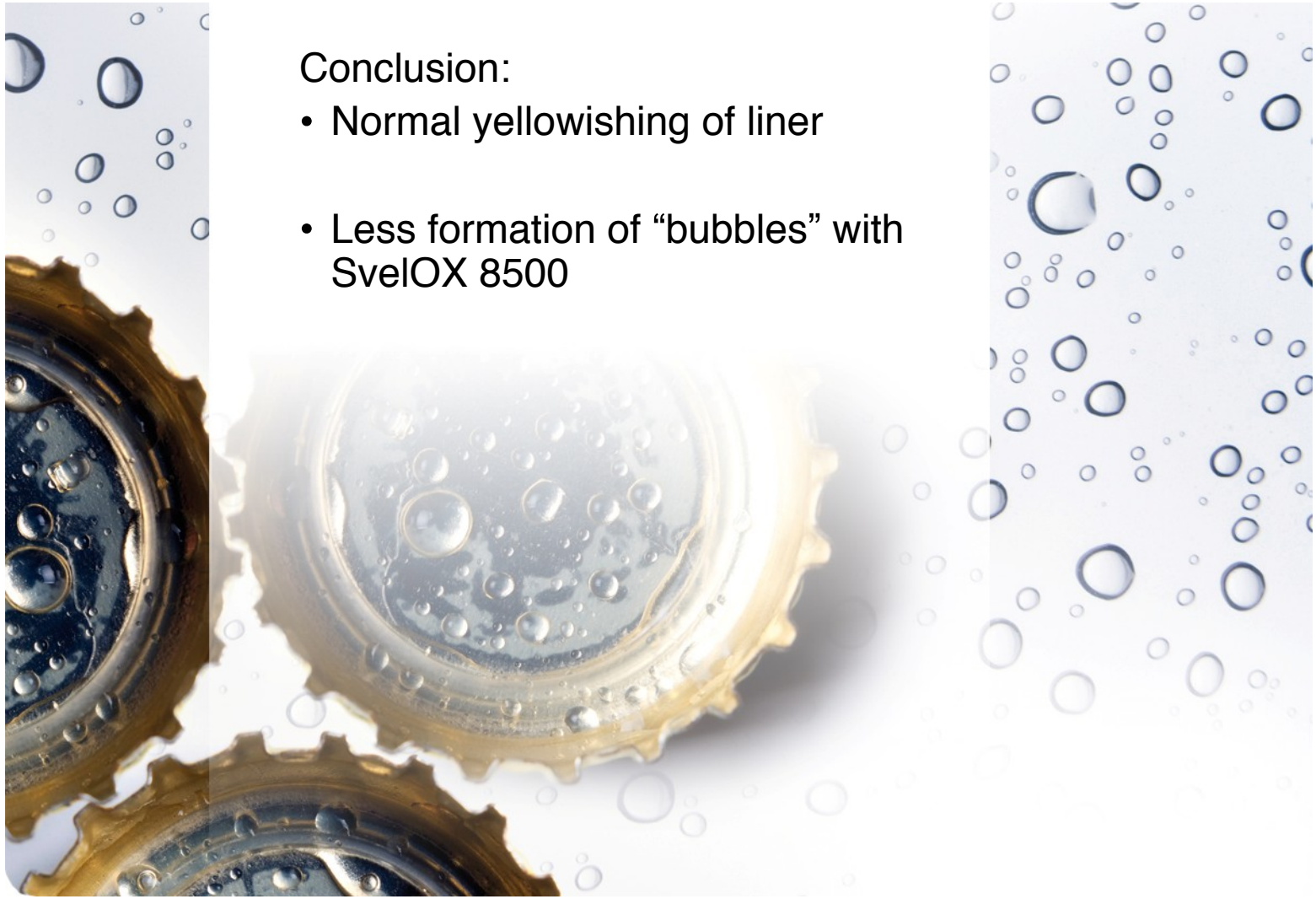
Scavenger – Storage



Conclusion:

- Normal yellowishing of liner
- Less formation of “bubbles” with SvelOX 8500

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Thank you for your attention!