

AQUENCE XP

Casein-free adhesives for glass container labeling



Excellence is our Passion

A perfect fit under all conditions



- » **Second-generation acrylic-based casein-free adhesives**
- » **Breakthrough polymer technology from Henkel**

Higher efficiency for customers and manufacturers



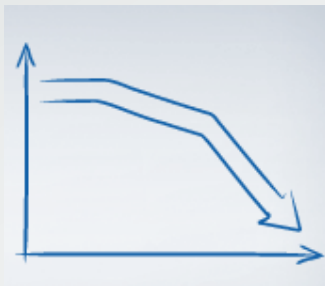
Improved processes

- » Reduced adhesive usage
- » Fast and reliable label removal
- » Super-easy cleaning



Reduced complexity

- » Wide range of applications
- » Lower number of adhesives required



Lower total costs

- » Greater price stability (independent of casein market)
- » More efficient production thanks to improved mileage/capacity utilization

AQUENCE XP

Adhesive range

AQUENCEXP 180-22

- » All-rounder with standard ice water resistance (IWR) and good condensation water resistance (CWR)
- » Returnable and non-returnable bottles

AQUENCEXP 190

- » All-rounder with min. 7 days of IWR and higher CWR
- » Returnable and non-returnable bottles

AQUENCEXP 200 Plus

- » 14 days IWR
- » non-returnable bottles for export

AQUENCEXP 500 Plus

- » for highly tempered bottles and/or difficult labels

Condensation water resistance (e.g. “Radeberger Test”)

Test time: 15 h

100% humidity

Freshly labeled
bottles at 12°C



Condensation water resistance

AQUENCE GL 701 Eticol



AQUENCE XP 180-22



Reliable label adhesion even under extreme conditions!
No risk of bacterial attack no casein in the formulation!
No label slippage!

Condensation water and ice water resistance after complete drying of the bottles

AQUENCE XP
180-22

AQUENCE GL
701 Eticol



Bottles were kept at 4 °C in a climate cabinet and then stored at 70% RH and 40 °C.

» Ice water resistance

(after 7 days drying): >3 days (Crushed-Ice Heineken Test)



Dependent on:

- adhesive quantity applied
- paper quality
- adhesive type
- drying process
- test method
- returnable/non-returnable

Ice water resistance and wash-off capability

AQUENCE XP 200 Plus

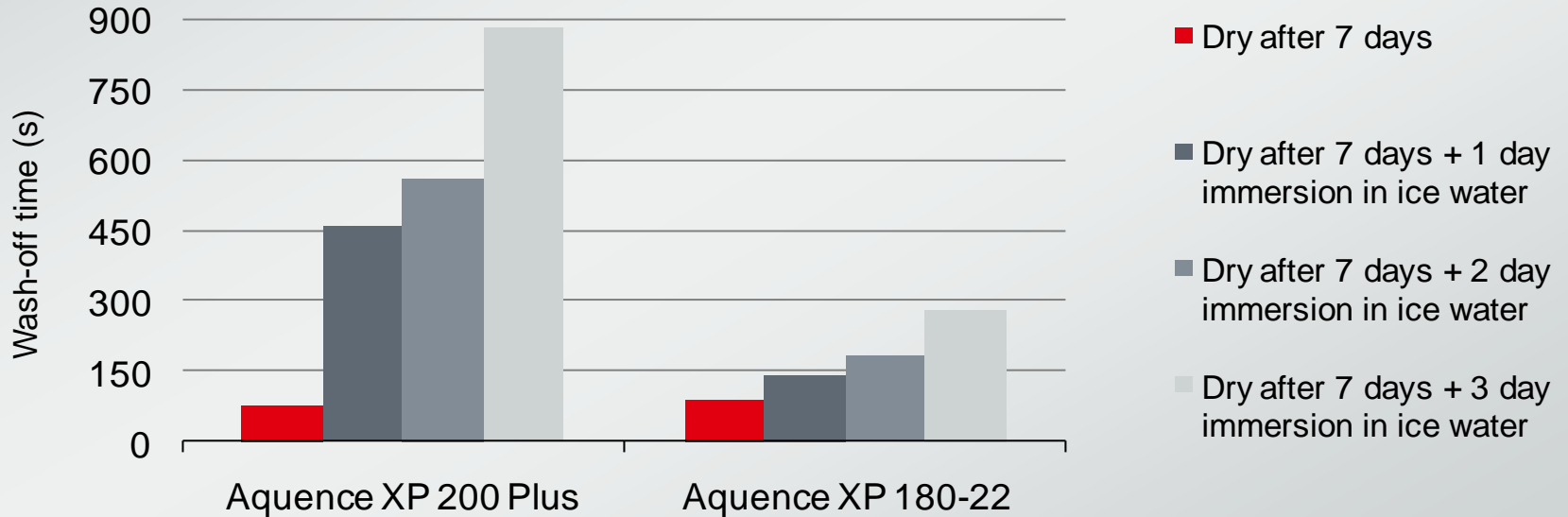
» For non-returnable bottles only

Caustic soda bath

» 2% NaOH, 80°C

AQUENCE XP 180-22

» New ice water resistant polymer with improved wash-off capability



Label quality and wash-off capability

AQUENCEXP 180-22

- » New ice water resistant polymer with improved wash-off capability

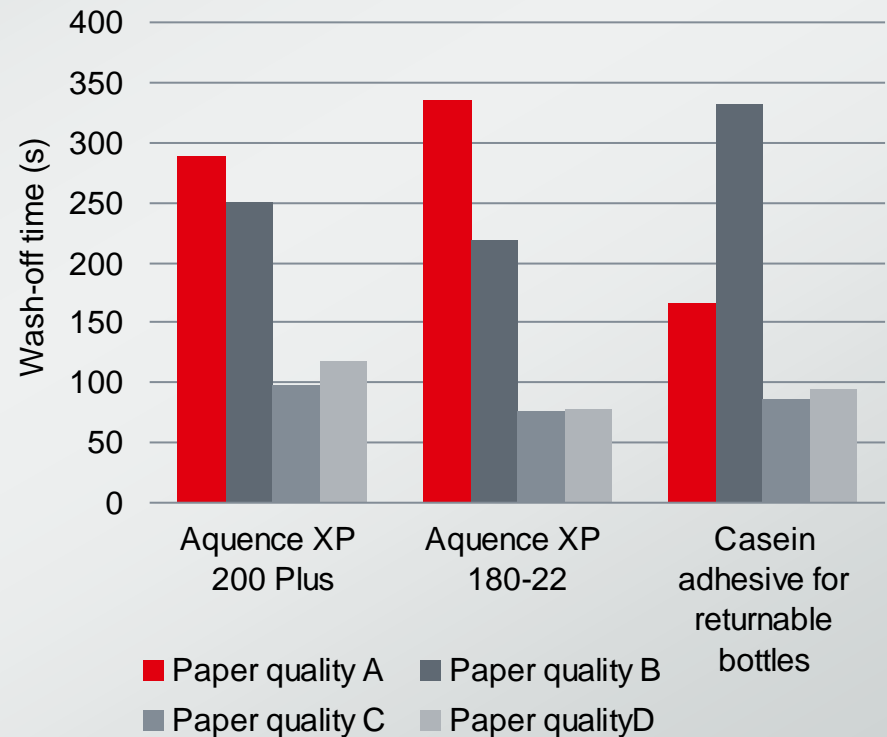
AQUENCEXP 200 Plus

- » For non-returnable bottles only

Caustic soda bath

- » 2% NaOH, 80 °C

Standard wash-off capability after 7 days' label drying

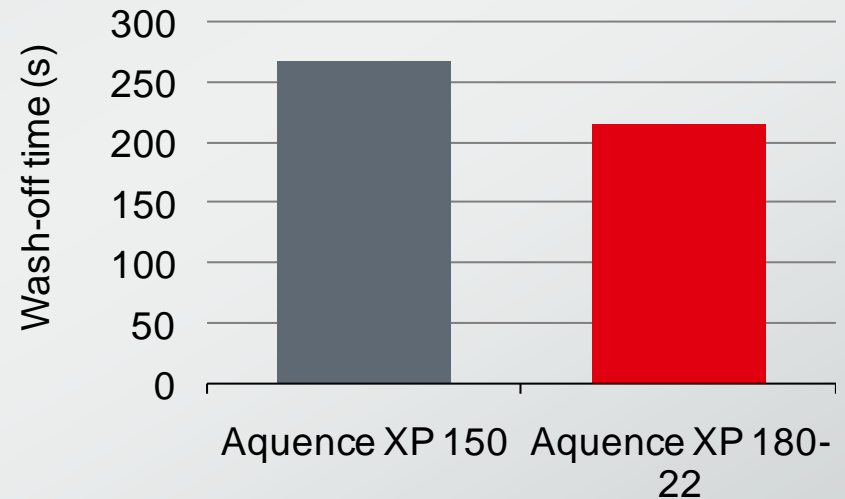


Wash-off capability in caustic bath despite adhesive saturation

Caustic soda bath

- » 2% NaOH
- » 10% adhesive
- » 80 °C

Standard wash-off capability after 7 days' label drying



No caustic soda bath impairment from sedimentation



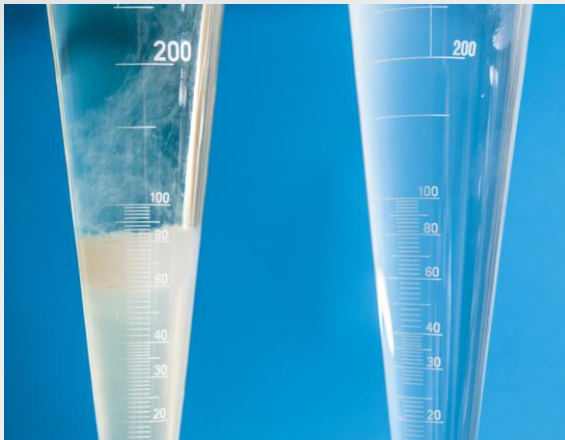
Caustic soda solution

» 2% NaOH + 1% Na₂CO₃ + 2% adhesive

Left: Casein-based adhesive

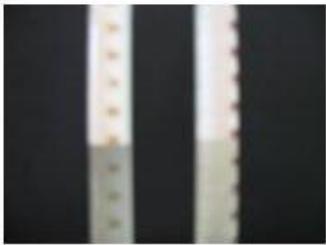
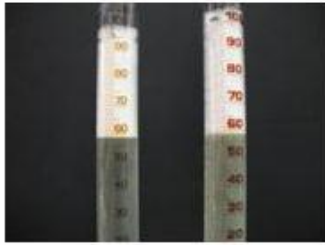
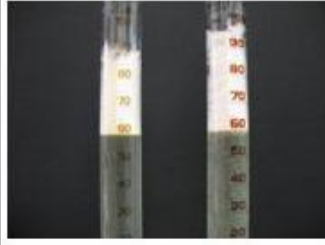
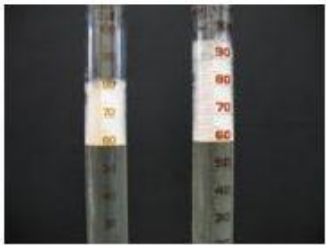
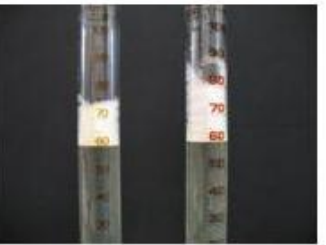
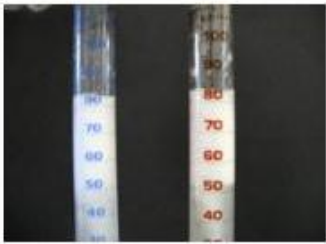
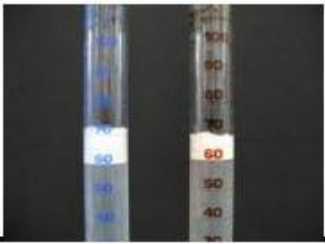
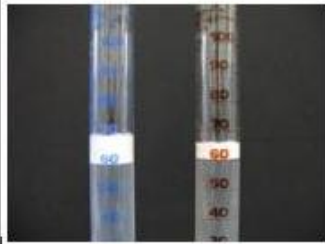
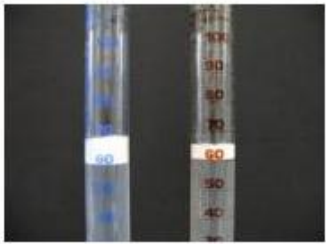
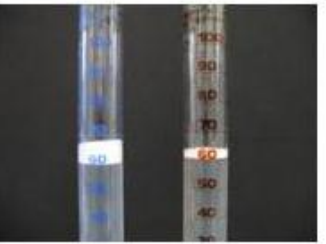

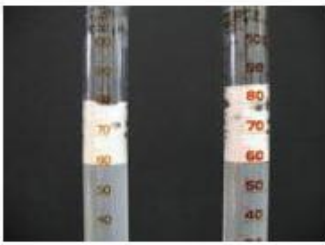
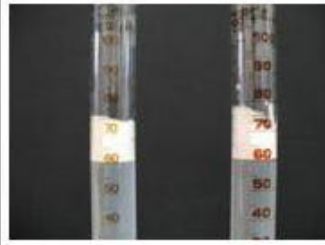
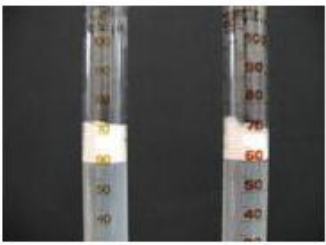
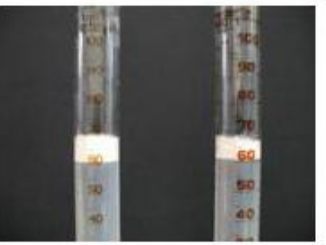
Right: AQUENCE XP 180-22

» The sedimentation is distinctly stronger in the caustic solution with the casein-based adhesive (left) than in the same solution with AQUENCE XP 180-22



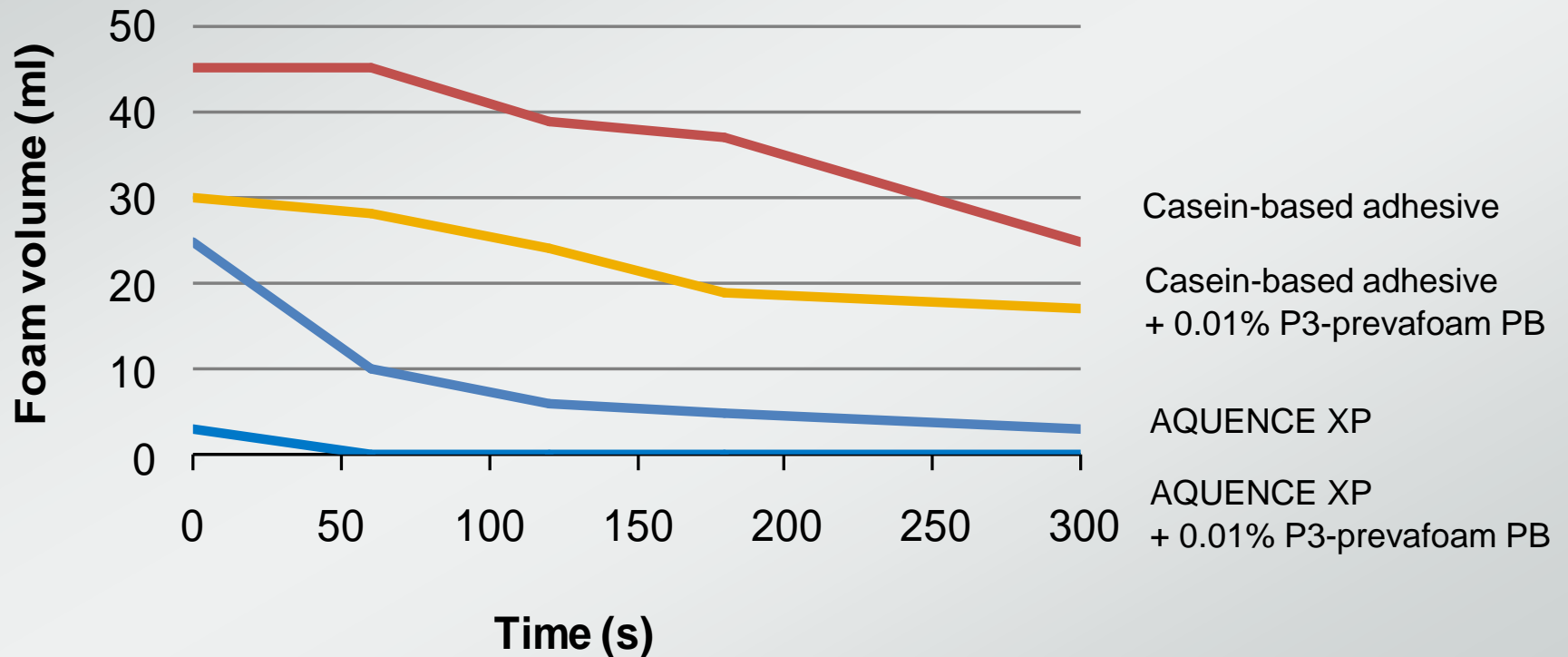
Unproblematic foaming behavior

Test without defoamer

	immediately	after 1 minute	after 2 minutes	after 3 minutes	after 4 minutes
	cylinder left side: + Na ₂ CO ₃ / right side: without Na ₂ CO ₃				
Casein					
XP 300					
Optal XP 180 +					

Unproblematic foaming behavior

Defoaming efficiency in the shake test (80 °C):
2% NaOH + 2% adhesive



Reliable label removal

AQUENCE XP grades have been successfully used side-by-side with casein-based adhesives since 2010!

Example for a single-end bottle washing machine

- » Preheating: 45°C
- » Warm water zone: 62°C
- » Caustic bath: 80°C, 85 mS
- » Dwell time: 10 min. in the caustic bath
27 min. in the bottle washing machine

Additives (examples):

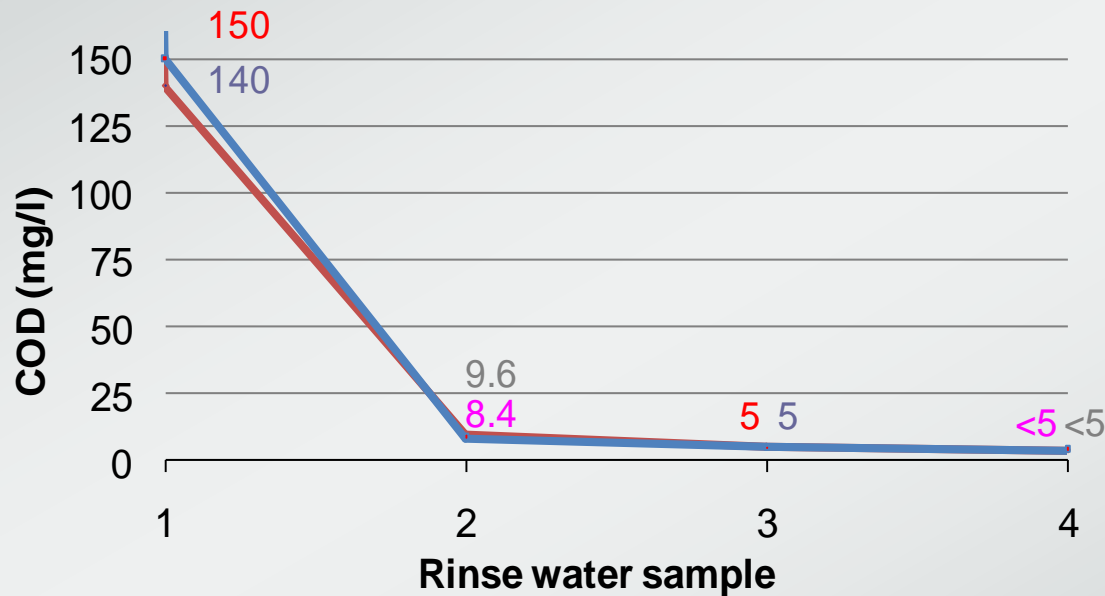
- » P3-prevafoam PB (defoamer)
- » P3-polix XT (water softener)

Problem-free bottle washing

Result

- » AQUENCE XP 180-22 offers precisely the same wash-off capability as casein-based adhesive!

COD measurement of rinse water

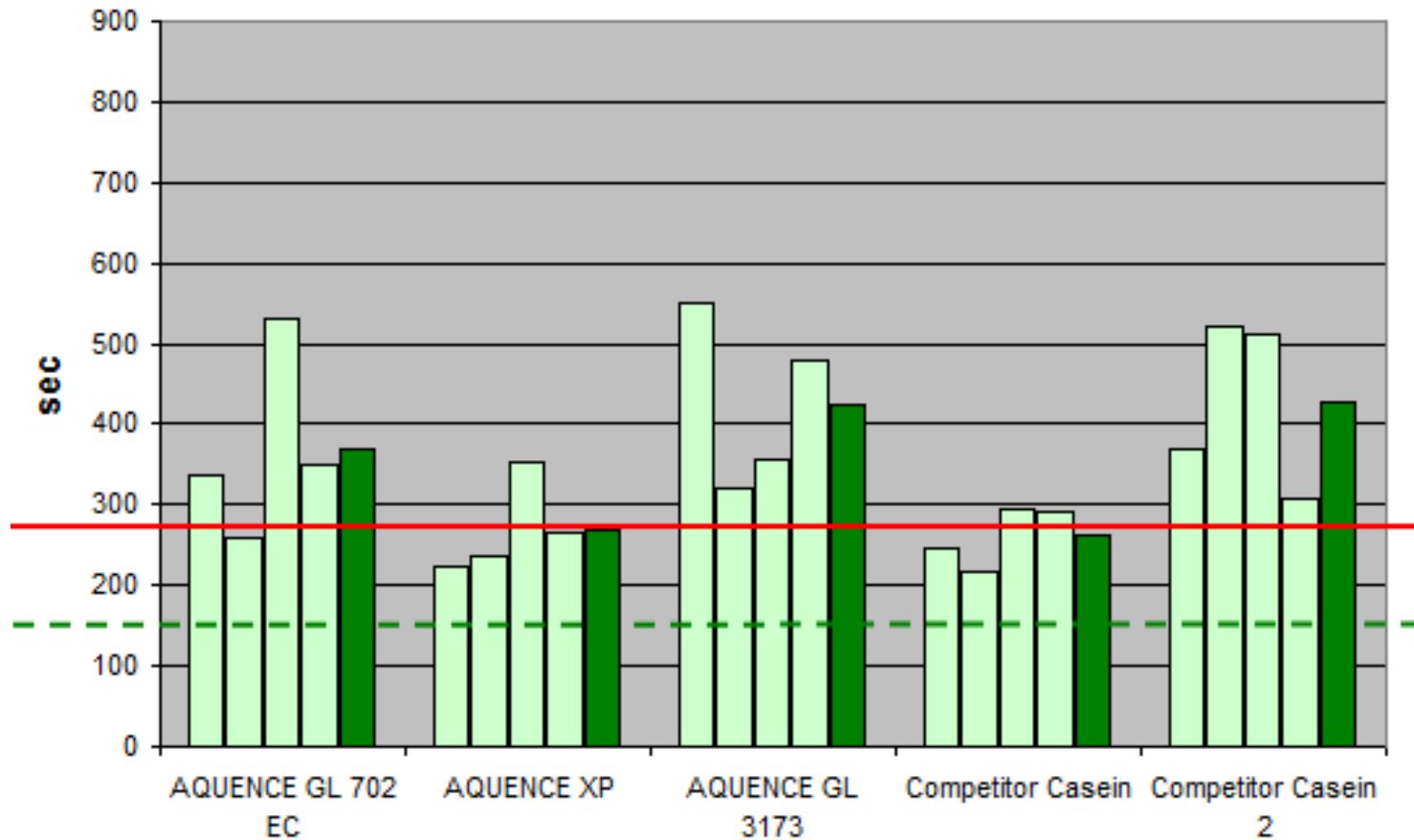


- COD of the rinse water: bottles washed with caustic solution containing casein-based adhesive
- COD of the rinse water: bottles washed with caustic solution containing AQUENCE XP

COD: Chemical Oxygen Demand

Problem-free bottle washing

wash off 70°C - 1.4% caustic soda



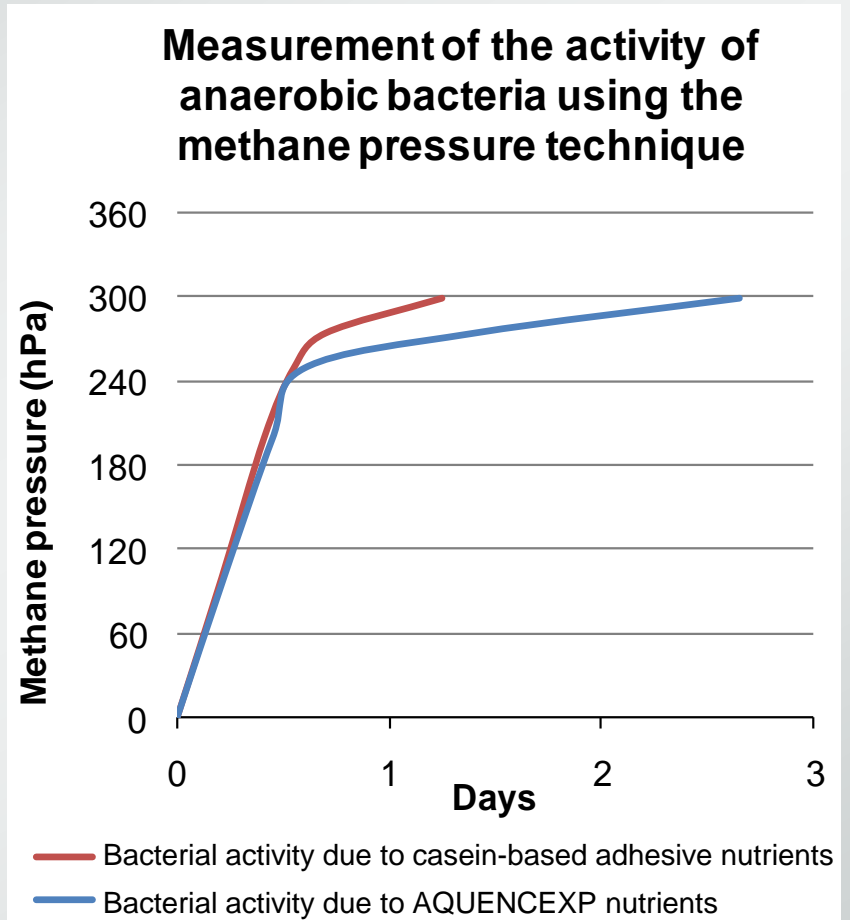
Harmless to anaerobic sewage treatment

Bacterial nutrient medium

» Acetate + 750 ppm adhesive

Result

» AQUENCE XP exhibits no toxicity harmful to the anaerobic bacteria present in sewage treatment facilities

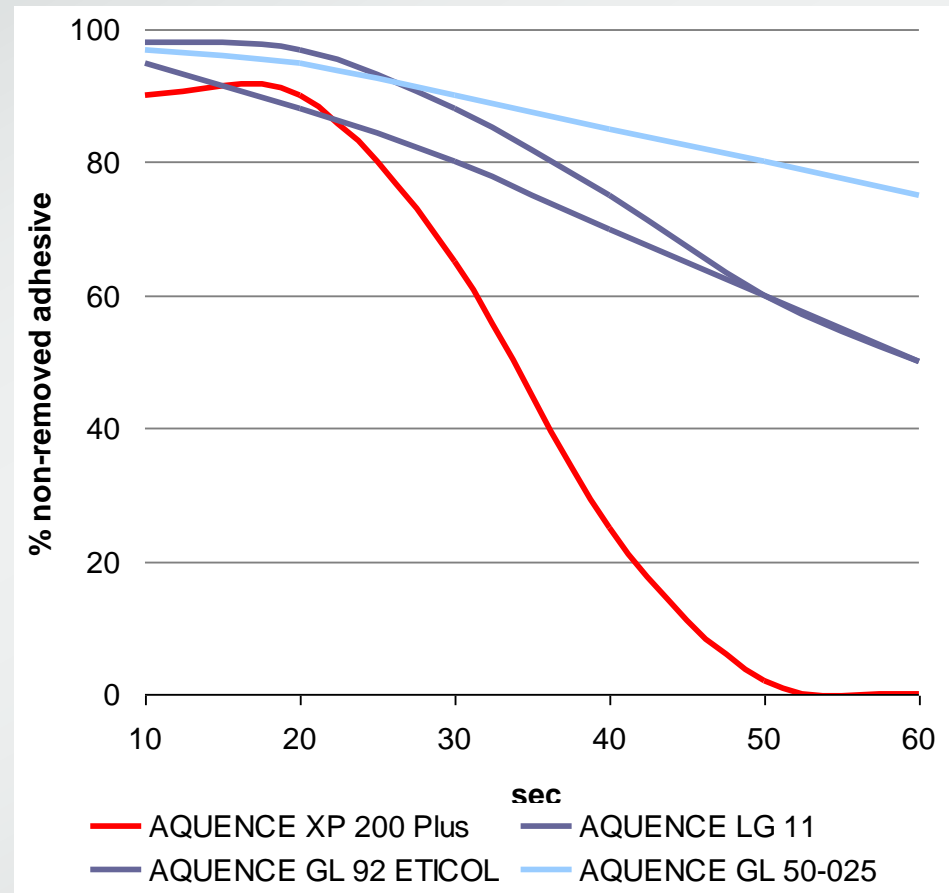


Easy to clean dry adhesive off hands

Adhesive cleaning test using the Erichsen scrub method

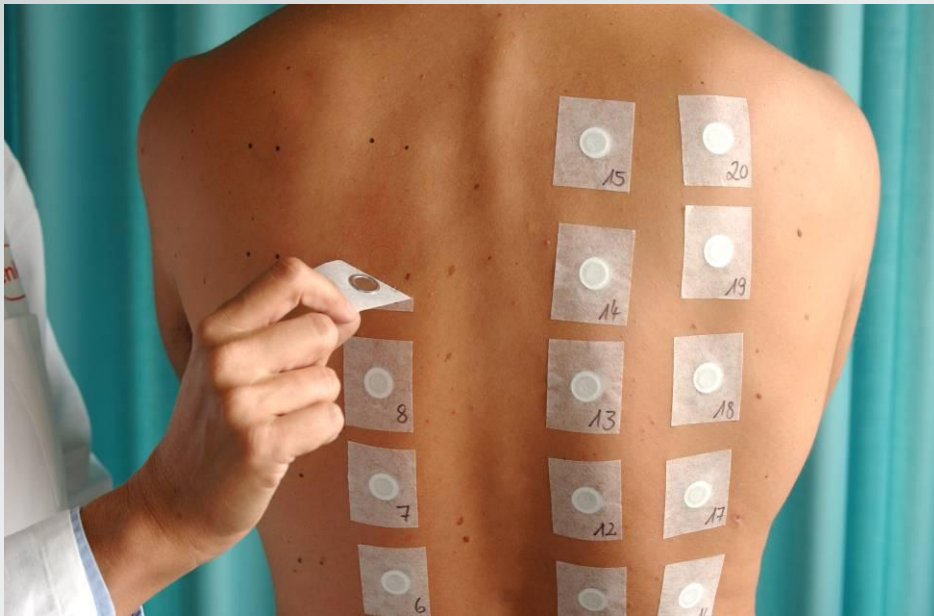
Result

» AQUENCE XP very easy to clean off



Dermatological compatibility test

Henkel AG & Co. KGaA
KKD/Biological & Clinical Research



Patch test – 72 hours

- » **AQUENCE XP 180-22**
- » **Demineralized water**

Result

- » No allergic skin reactions
- » Dermatological compatible as demineralized water

Summary

- ✓ **Unproblematic in the bottle washing machine**
 - No foaming (even in mixed mode with casein-based and AQUENCE XP adhesives in the same bath)
 - No entrainment of residues to the fresh water zone
 - No critical sedimentation
 - **Reliable label removal**
- ✓ **Harmless in sewage treatment facilities**
- ✓ **Exceptionally economic to use (micro-foaming effect)**
- ✓ **AQUENCE XP comes with tailored iced water resistance**
 - Depending on the XP type used, requirements and the application conditions (paper, adhesive thickness, transparent film bonding, suitability for returnable bottles, etc.)
- ✓ **Good condensation water resistance comparable to that of standard casein-based adhesives**
- ✓ **Long shelf life and high thermal stability**
- ✓ **No critical ingredients such as borax or heavy metals**

Zn & borax
free

Ready for a trial?



Excellence is our Passion