# Green that stays Clean

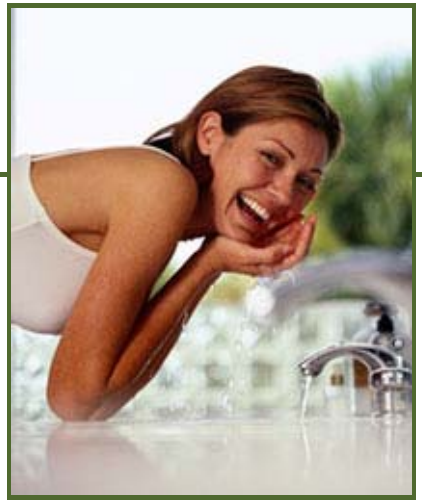
## ModiSurf Clarity

A natural world of home care

CRODA

# Introduction

- New ingredient for hard surface cleaning
- Modifies surfaces for easier cleaning
  - Repels limescale
  - Reduces misting
- Biodegradable
- Meets major consumer trends
  - Convenience
  - Environmentally friendly products

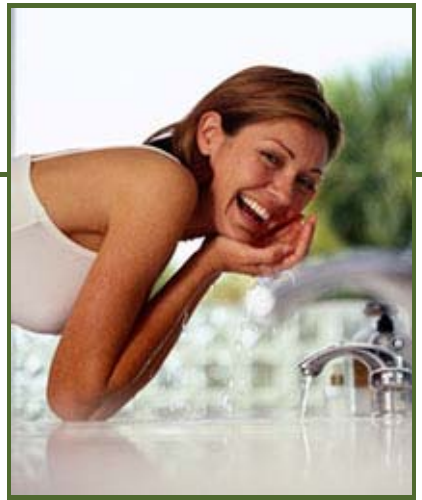


ModiSurf Clarity

CRODA

# Limescale repellency

- Effective on glass and polymeric surfaces
- Tested using commercial products
- ModiSurf Clarity post dosed into formulations

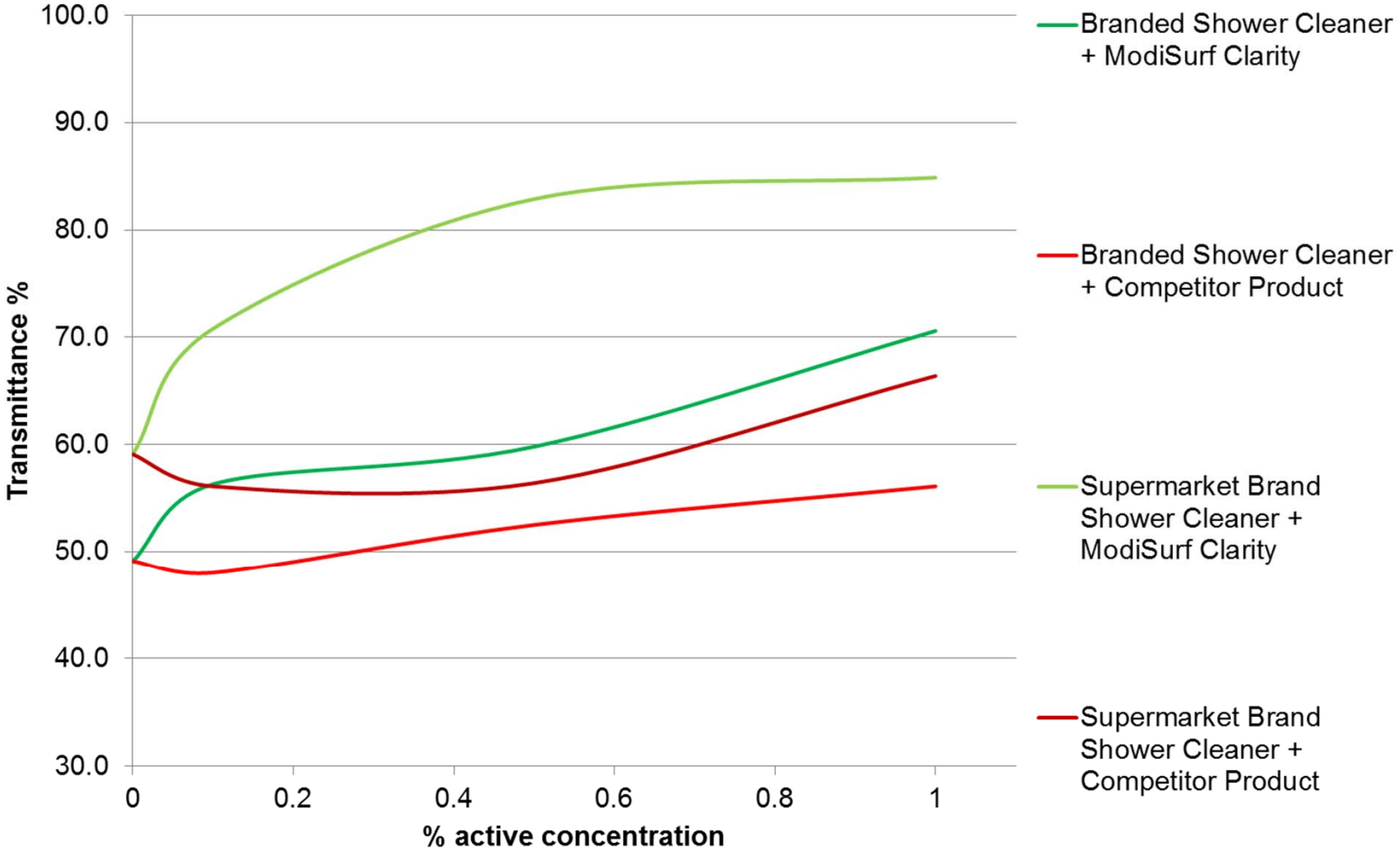


ModiSurf Clarity

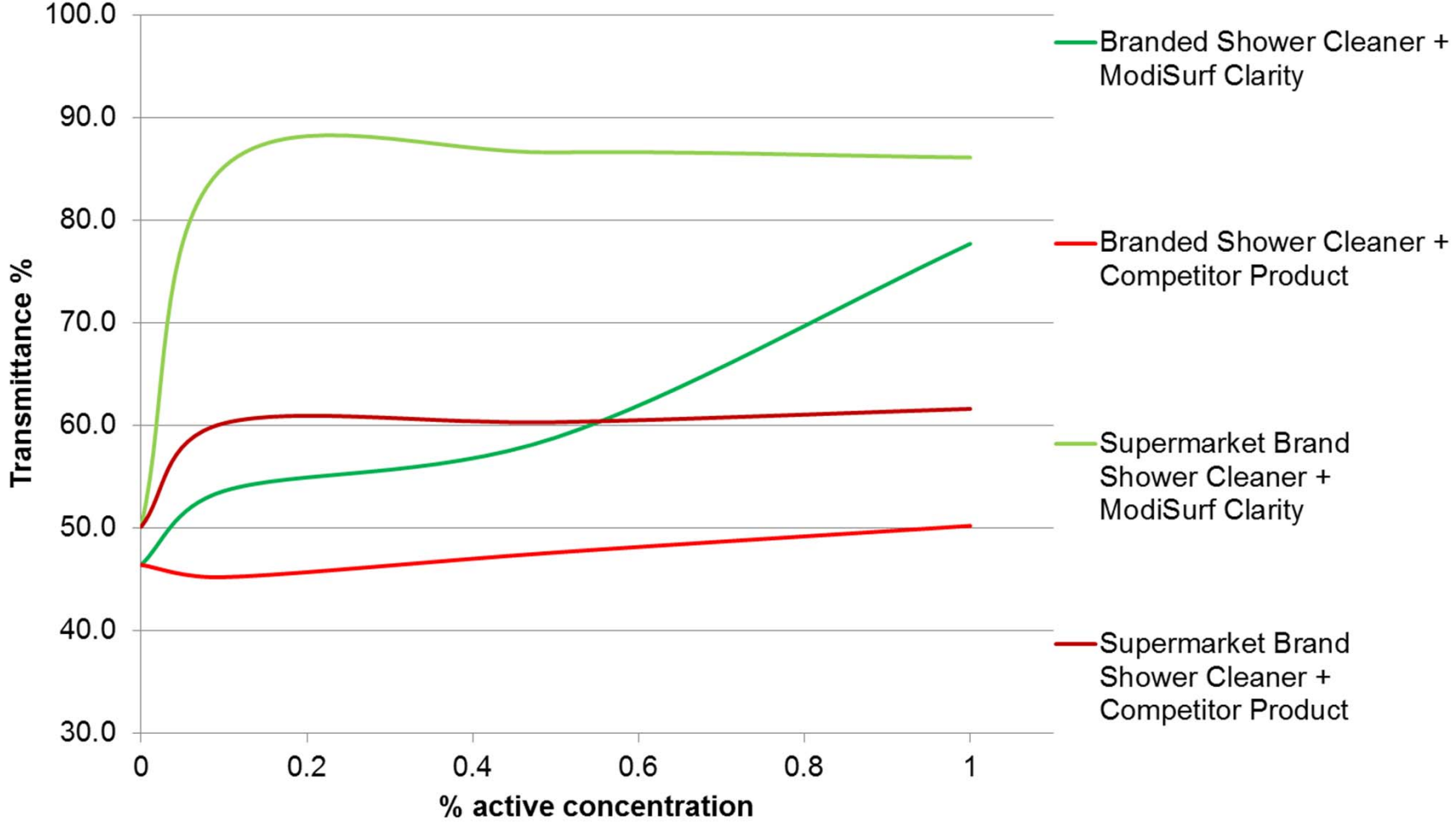
CRODA

# Limescale repellency demonstration

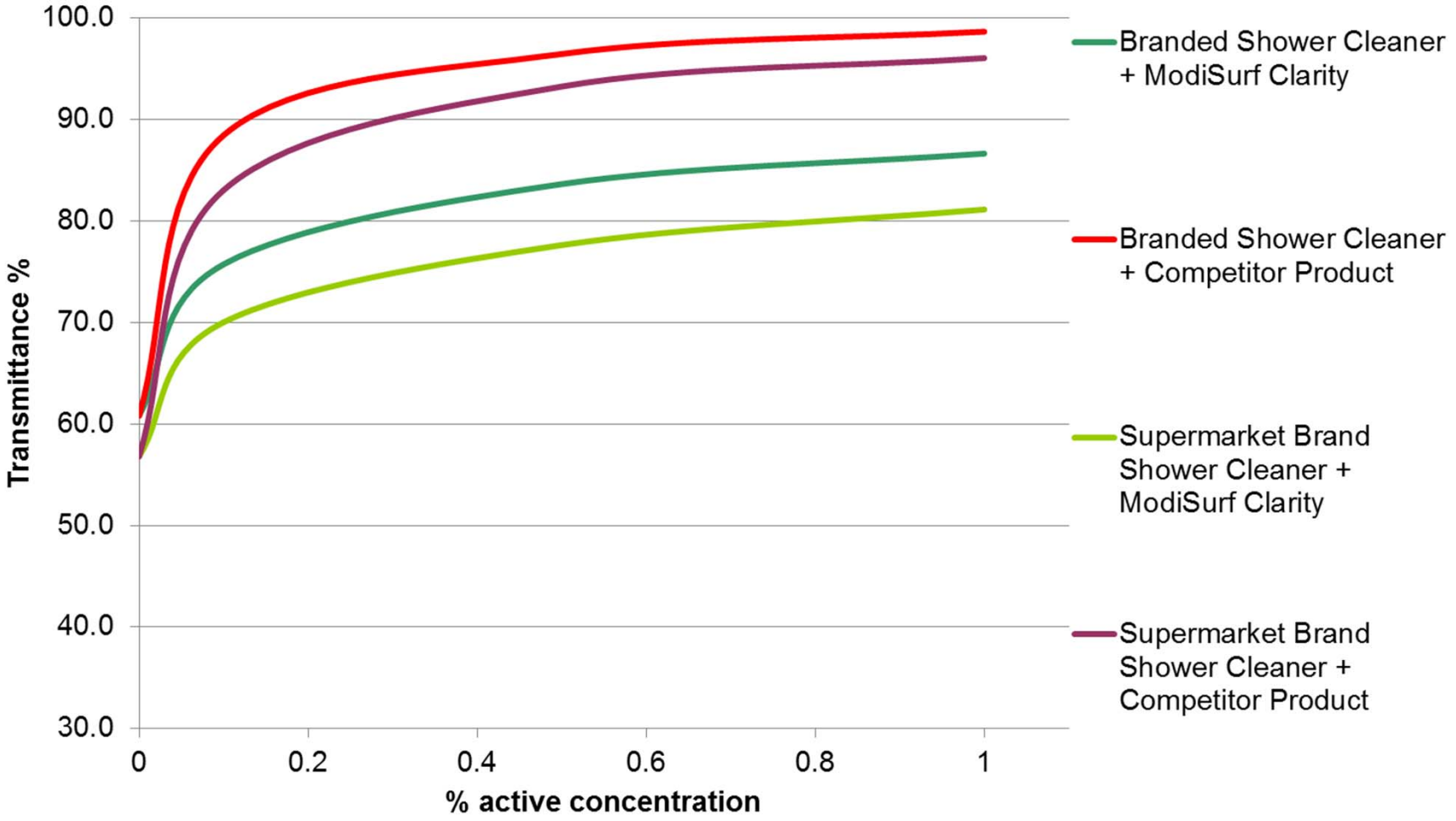
# Limescale repellency - polyacrylate



# Limescale repellency - polycarbonate



# Limescale repellency - glass



# Misting reduction

- Video demonstration protocol
- Untreated mirror tile vs one treated with glass cleaner containing ModiSurf Clarity
- Left to dry and then steam applied to both tiles

# Mist reduction video

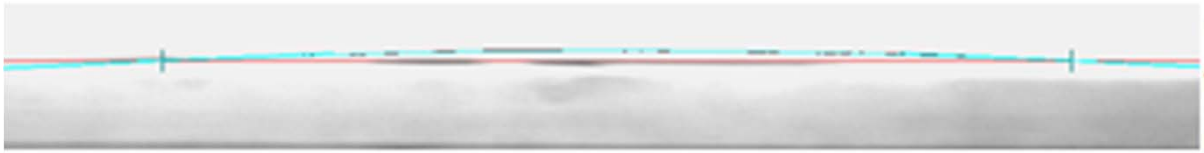
# Effect on contact angle

- ModiSurf Clarity works by:
  - Sticking to surfaces
  - Making those surfaces more water loving
- This repels problem soils such as limescale
- Also allows water to spread more easily across the surface
  - Makes cleaning easier
  - Reduces problem misting
- The ability of water to spread on the surface can be seen by looking at the contact angle

# Contact angle on glass

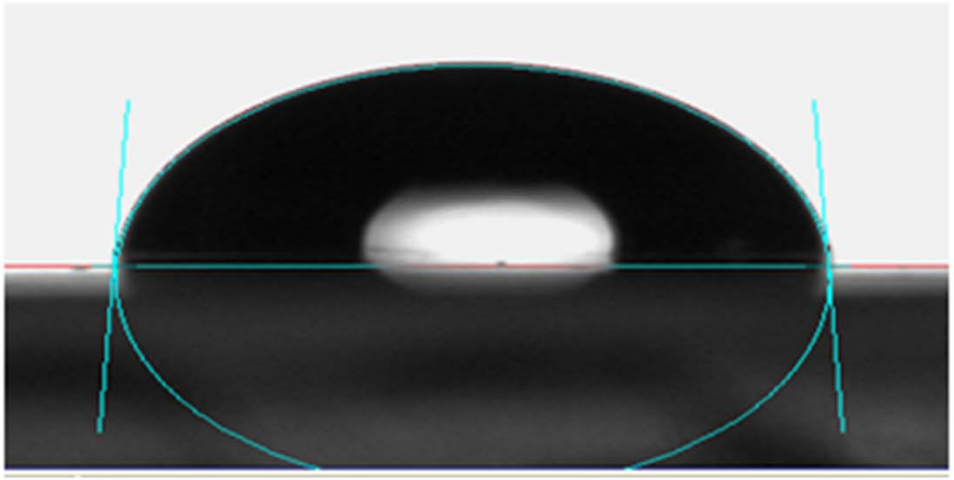
Contact angle 36.5° on an untreated Glass slide

Contact angle 11° when treated with 0.1% ModiSurf Clarity solution

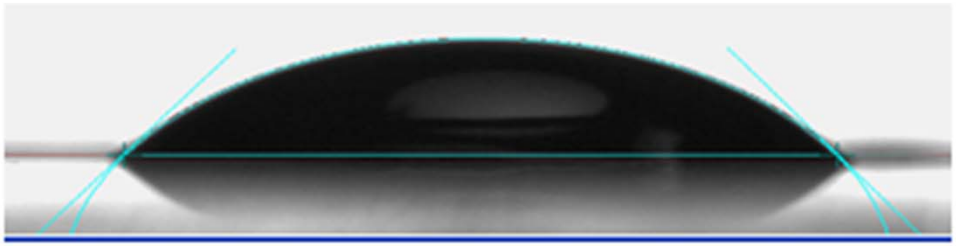


Contact angle 3.8° when treated with 0.5% ModiSurf Clarity solution

# Contact angle on polycarbonate



Contact angle 86.5° on an untreated polycarbonate slide



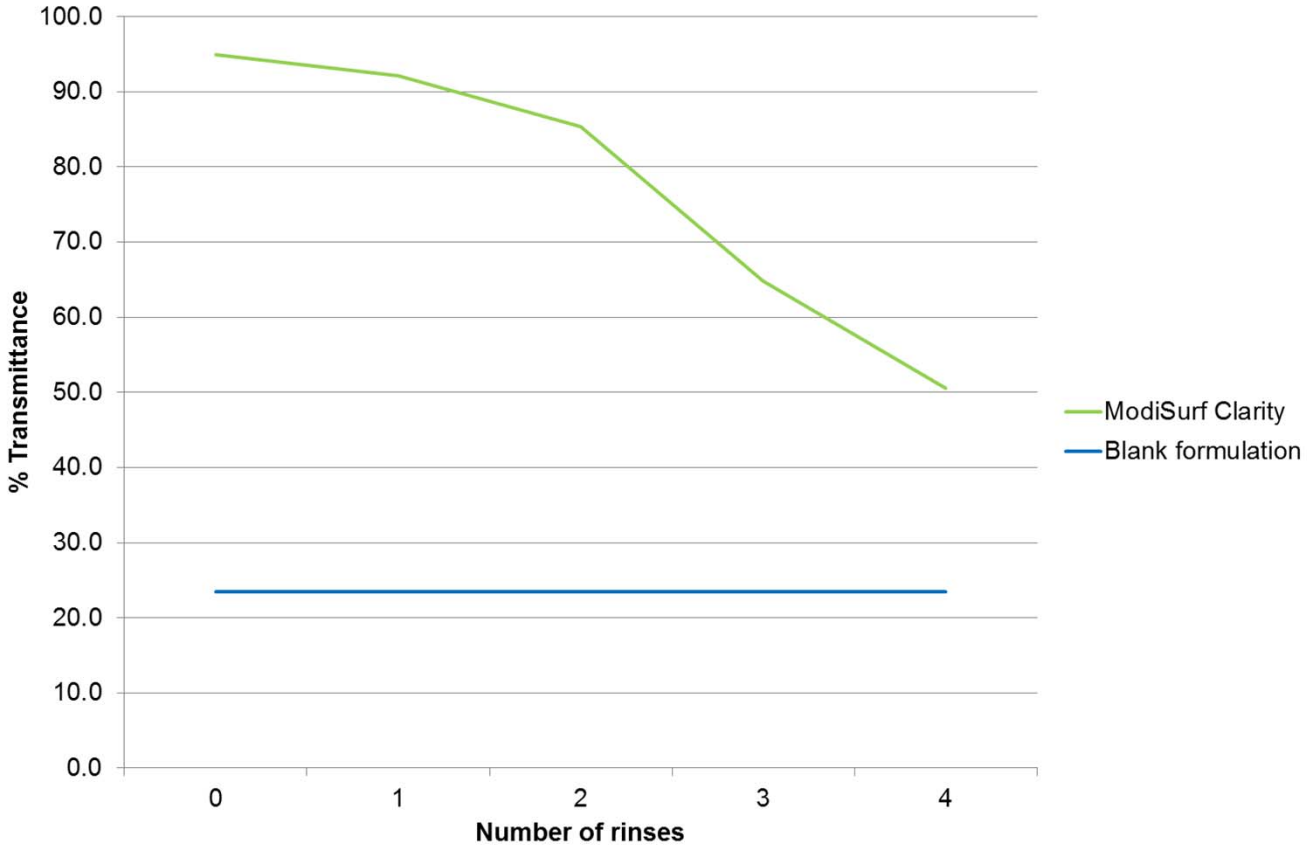
Contact angle 53.4° on a slide treated with 0.1% ModiSurf Clarity solution

Contact angle 15.4° on a slide treated with 0.5% ModiSurf Clarity solution

# Rinse off resistance

- ModiSurf Clarity remains active provided surface is not cleaned or rinsed
- Testing carried out on limescale repellency after a series of rinse cycles
- Glass slides treated with solution of 1% Synperonic 91/5 with 1% active ModiSurf Clarity
- Slides then rinsed up to 4 times – each equivalent quantity of water to 1.4L on a shower screen
- Limescale repellency retested

# Rinse off resistance

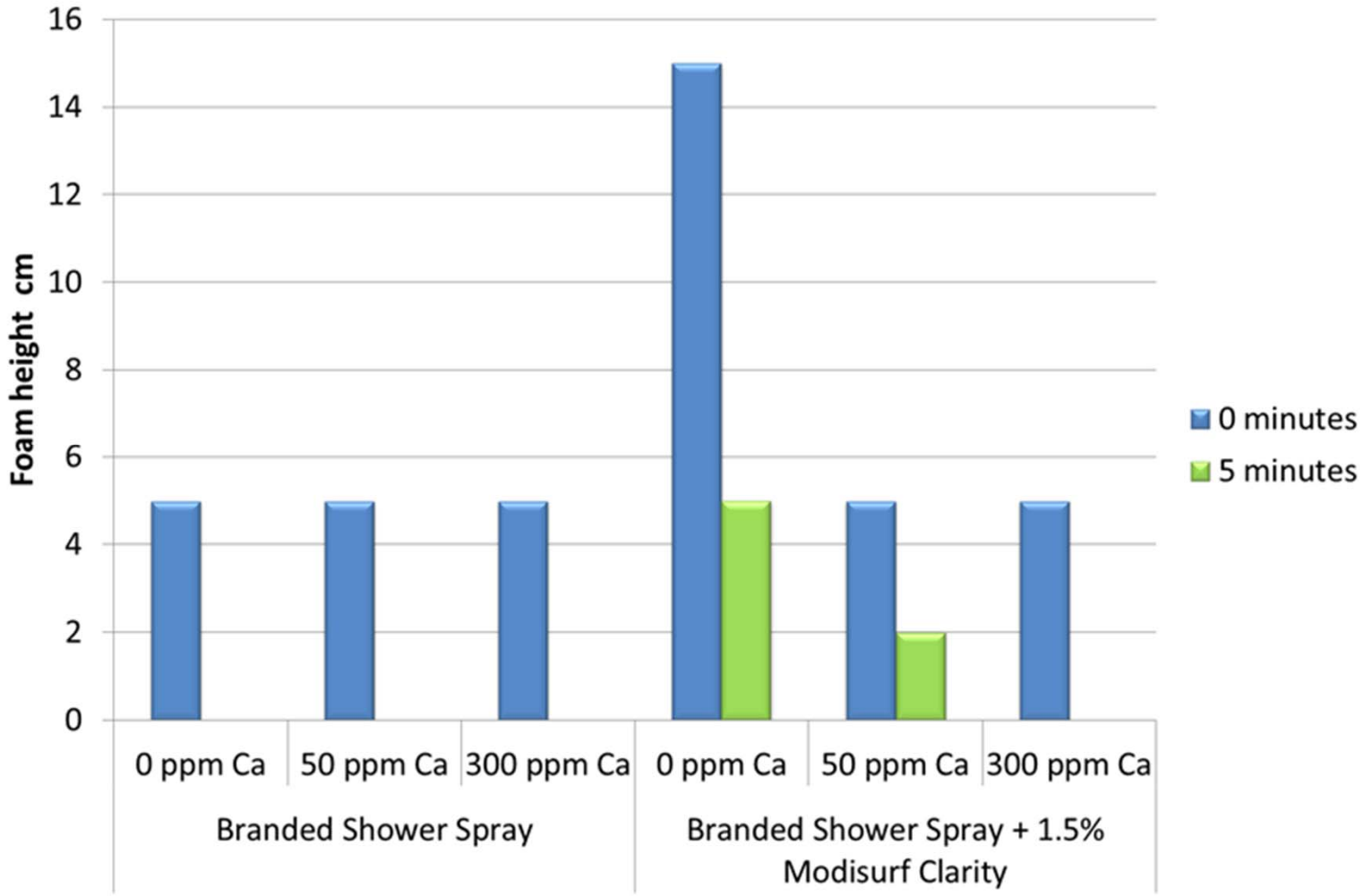



- ModiSurf Clarity is substantive to the surface
- Little drop off in performance after 2 rinse cycles
- Still significant limescale repellency after 4 rinse cycles

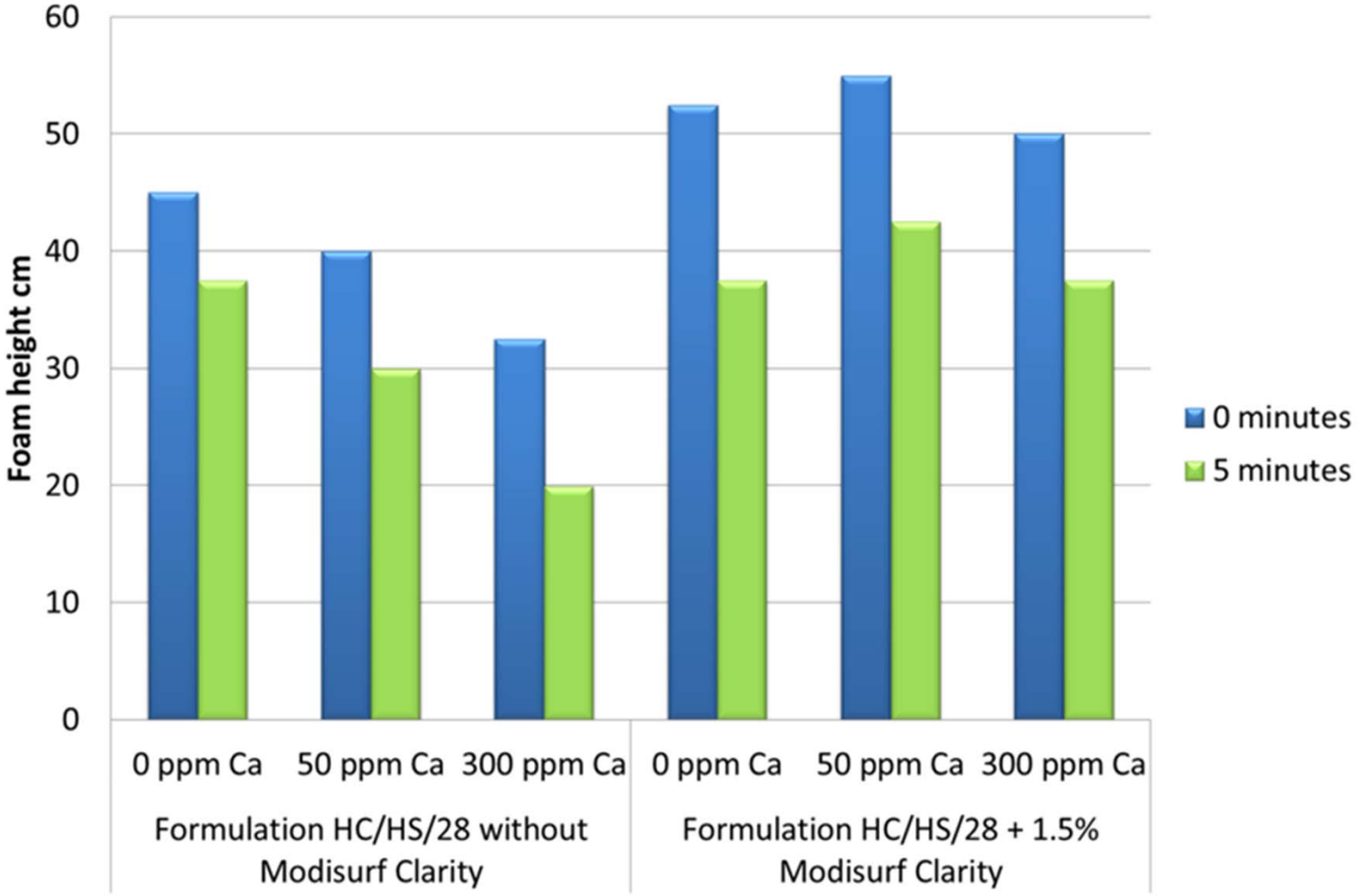
# Foaming characteristics

- ModiSurf Clarity can boost foaming and also add stability
- Tested using Ross Miles foam rig
- Tested over a range of water hardness levels

# Foaming characteristics – branded shower spray



# Foaming characteristics – Croda formulation HC/HS/28



# Formulating with ModiSurf Clarity

- ModiSurf Clarity approximately 30% active concentration
- Addition levels in formulations typically 0.5-3.0% as supplied
- Successfully post dosed into wide number of formulations
- Effective in acid, neutral and alkaline formulations
- Limitations
  - Care needed with solubility in formulations below pH 4
  - Check compatibility in formulations containing cationics

# Formulation used for foam testing

## Multisurface Cleaner HC/HS/28

| Product | Functionality | % w/w |
|---|---|---|
| Phase A | | |
| Synperonic 91/8[1] | Surfactant | 1.8 |
| Synperonic 91/6[1] | Surfactant | 3.2 |
| Modisurf Clarity[1] | Performance additive | 1.5 |
| Sodium Citrate | Builder | 1.0 |
| Benzisothiazolinone | Preservative | 0.03 |
| Citric acid (50%) | Solvent | To pH 6.0 |
| Water (Aqua) | Solvent | 93.0 |
| Phase B | - | |
| NatraGem™ S140[1] | Fragrance solubiliser | 0.8 |
| White Tea Fragrance[2] | Fragrance | 0.2 |
| Method | | |
| Blend phase A and Phase B separately. Add Phase b slowly to Phase A with gentle stirring in order to avoid generation of foam. | | |
| Suppliers | | |
| [1] Croda | | |
| [2] CPL Aromas | | |

# Daily Limescale Bathroom Cleaner HC/HS/44

| Product | Functionality | % w/w |
|---|---|---|
| Decyl polyglucoside | Surfactant | 4.6 |
| **ModiSurf Clarity[1]** | **Performance additive** | **1.0** |
| Sodium Laureth Sulfate | Surfactant | 1.4 |
| **Synperonic NCA850[1]** | **Surfactant** | **0.25** |
| Benzisothiazolinone | Preservative | 0.03 |
| Sodium Citrate | Complexing agent | 2.0 |
| Citric Acid (40%) solution | Acid | To pH 3.5 |
| Water | Diluent/Solvent | To 100 |

Suppliers:- **1: Croda**

**Method**

Add the decyl polyglucoside, Modisurf Clarity, Sodium Laureth Sulfate, Synperonic NCA850 and sodium citrate to the water with stirring until homogeneous. Then adjust the pH of the solution down to pH 3.5 with the 40% citric acid solution. Then add the benzisothiazolinone as a preservative. In systems with a pH less than 4, ModiSurf Clarity will be less soluble and more care needs to be taken during formulating in order to ensure formulation stability.

# Eco Shower Shine HC/HS/45

| Product | Functionality | % w/w |
|---|---|---|
| **Phase A** | | |
| Alkyl polyglucoside | Surfactant | 1.5 |
| **ModiSurf Clarity[1]** | **Performance additive** | **1.0** |
| Sodium Bicarbonate | Alkali | 0.5 |
| Potassium Hydroxide | Alkali | 0.2 |
| Benzisothiazolinone | Preservative | 0.03 |
| Citric Acid (40%) solution | Acid | To pH 7.0 |
| Water | Diluent/Solvent | To 100 |
| **Phase B** | | |
| **NatraGem™ S140[1]** | **Fragrance solubiliser** | **1.2** |
| Apple Fresh Fragrance[2] | Fragrance | 0.2 |

Suppliers:- 1: Croda 2: CPL Aromas

**Method**

Phase A: Add the alkyl polyglucoside to the water. If necessary, with stirring up to 40$^{o}$C until the solution is homogeneous. Then add the remaining ingredients in the order listed using the 40% citric acid solution to adjust the pH of the formulation down to pH 7.0.

Phase B: Pre-mix the NatraGem S140 and the Apple Fresh fragrance together. Complete formulation by adding Phase B slowly to Phase A with gentle stirring in order to avoid generation of foam. The solution may take 5 minutes to reach full clarity.

# Kitchen Surface Cleaner HC/HS/46

| Product | Functionality | % w/w |
|---|---|---|
| **Primasurf SC50[1]** | **Surfactant** | **1.9** |
| **Modisurf Clarity[1]** | **Performance additive** | **1.0** |
| Isopropanol | Solvent | 3.0 |
| Propylene Glycol n-Butyl Ether | Solvent | 1.0 |
| Sodium Carbonate | Complexing agent | 0.25 |
| Sodium Hydroxide (40%) solution | Base | To pH 10.0 |
| Water | Diluent/Solvent | To 100 |

Suppliers:- **1: Croda**

**Method**

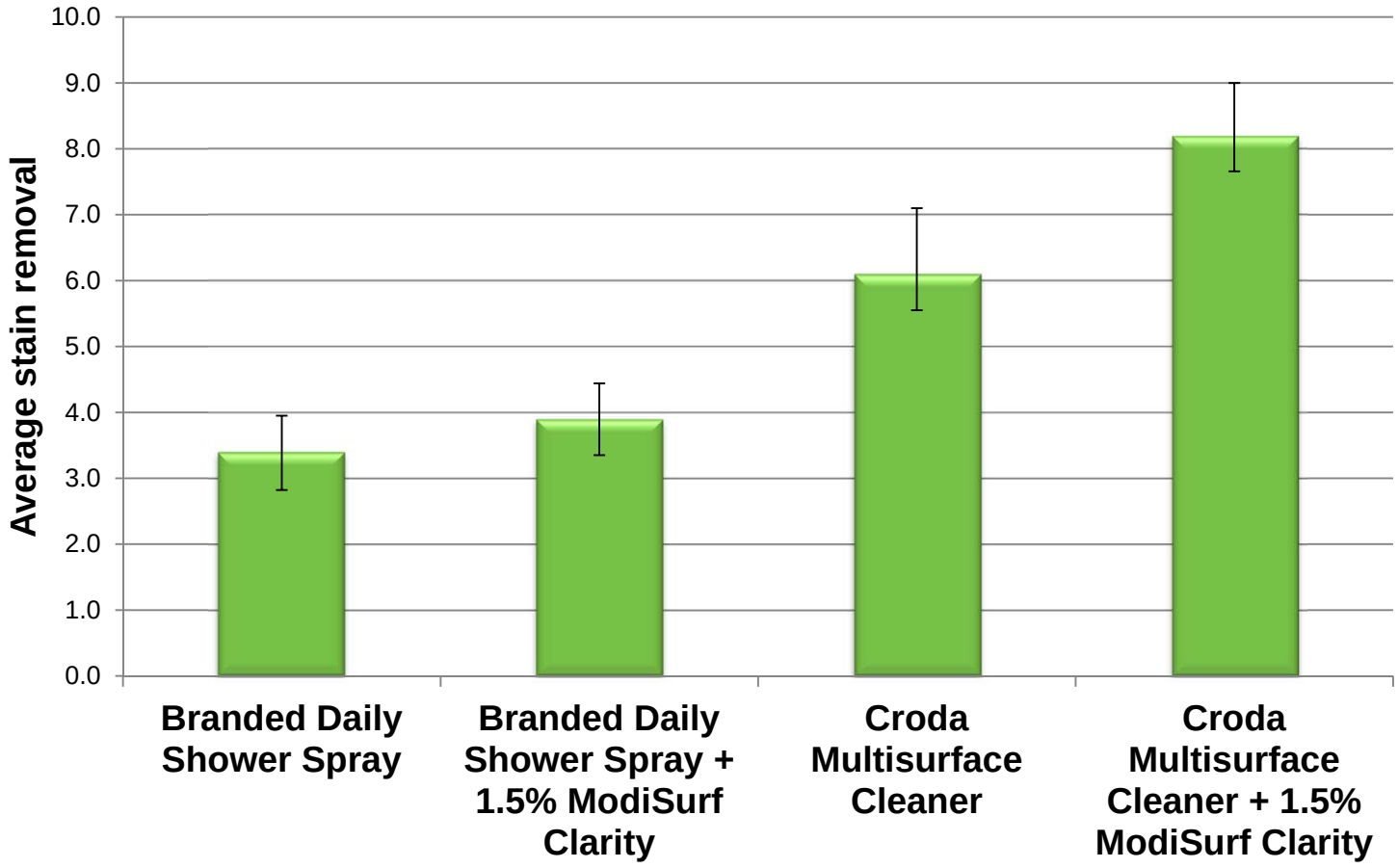
Add the Primasurf SC50, ModiSurf Clarity, isopropanol, propylene glycol n-butyl ether and sodium carbonate sequentially into the water stirring between additions until homogeneous. Then adjust the formulation to pH 10.0 with the 40% sodium hydroxide solution.

# Primary cleaning performance

- Test method based on the CSPA DCC-16 Part 2 scrubber test for measuring the removal of lime soap
  - Bathroom soil applied evenly to tiles
  - Dried at room temperature then at 180° C for 3 minutes
  - Cleaned using Sheen Scrub Tester
  - 2g cleaning product applied to each sponge
  - 2 passes per tile

- Visual assessment by trained panellists
  - Rated 0 (no soil removed) to 10 (complete soil removal)
  - Repeated 4 times and assessed by 20 panellists

# Primary cleaning performance



# Conclusions

- Excellent limescale repellency
- ModiSurf Clarity can boost foaming and also add stability
- Mist reduction
- Biodegradable, patent pending ingredient
- ModiSurf Clarity - Green that stays clean

ModiSurf Clarity

CRODA

# Green that stays Clean

## ModiSurf Clarity

A natural world of home care

CRODA