

DuraQuench™ IQ

Discover an innovative approach to effective moisturisation with Croda's scientifically balanced moisturising complex, DuraQuench IQ. By forming an intelligent structural bilayer on the skin's surface, DuraQuench IQ helps to reinforce the skin's natural barrier and delivers up to 72 hours of moisturisation. DuraQuench IQ also adapts to the surrounding environment, optimising hydration by regulating water loss from the skin at different temperatures and humidities.

Product name	INCI name	Appearance
DuraQuench IQ	Cetyl Alcohol (and) Isostearyl Isostearate (and) Potassium Cetyl Phosphate (and) Cetyl Behenate (and) Behenic Acid	White solid

Features / Benefits

- Up to 72 hours long-lasting hydration
- Temperature and humidity responsive
- Visible improvement in skin dryness
- Delivers superior moisturisation via dual action technology
- Smoother, more radiant skin

Applications

- Daily facial care
- Anti-ageing
- Body care
- Sun care
- Scalp care
- Soaps and detergents

Wash-off Features / Benefits

- Sensorial moisturisation
- Physical reduction in skin drying

Seasonal variation and temperature controlled environments can lead to skin dryness¹. DuraQuench IQ has been developed to combat these changes in temperature and humidity, specifically by reducing water loss more effectively at low relative humidity. With effective moisturisation contributing towards anti-ageing performance², DuraQuench IQ delivers a significant improvement in skin barrier function for lasting hydration benefits. These benefits have led to consumer perceived improvements in skin smoothness and radiance.

DuraQuench IQ is a scientifically balanced complex, developed to deliver optimum levels of moisturisation. Various combinations of ingredients at different ratios were screened in order to create the most effective moisturising product. Together, the ingredients listed below deliver a synergistic moisturising effect, while each individual component delivers a benefit to the complex and the consumer:

- Potassium Cetyl Phosphate contributes to the formation of lipid bilayers on the surface of the skin
- Isostearyl Isostearate reinforces the natural skin barrier
- Behenic Acid and Cetyl Behenate incorporated to replace long chain fatty acids and esters which are depleted in dry skin
- Cetyl Alcohol has the ability to assist in the formation of liquid crystals

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Formulations

The formulations in Table 1 were used in the following assessments:

	Control	DuraQuench IQ
	% w/w	
DuraQuench IQ (Cetyl Alcohol (and) Isostearyl Isostearate (and) Potassium Cetyl Phosphate (and) Cetyl Behenate (and) Behenic Acid)	-	5.0
Paraffinum Liquidum	5.0	-
Cithrol GMS 40 (Glyceryl Stearate)	1.2	1.2
Brij CS20 (Ceteareth-20)	0.4	0.4
Arlamol HD (Isohexadecane)	5.0	5.0
Arlamol PS15E (PPG-15 Stearyl Ether)	4.0	4.0
Dimethicone	1.0	1.0
Propylparaben	0.05	0.05
Water (Aqua)	68.2	68.2
Methylparaben	0.15	0.15
Pricerine 9091 (Glycerine)	5.0	5.0
OptaSense G82 (2% Sol.) (Acrylates/C10-30 Alkyl-Acrylate Crosspolymer)	10.0	10.0
Potassium Hydroxide	q.s.	q.s.

Table 1: Leave-on formulation with and without 5% DuraQuench IQ

Note: These formulations are used in all leave-on studies except the final consumer sensory perception study

How DuraQuench IQ Works

DuraQuench IQ is an effective moisturising complex which functions via two modes of action:

- Creates an intelligent lipid bilayer on the surface of the skin to regulate water loss
- Interacts with the lipid bilayers within the stratum corneum to reinforce the skin's natural barrier

X-ray diffraction can be used to give an indication of the lipid structure that an emulsion forms. Wide angle x-ray diffraction (WAXD) provides information about the smaller structural units in a sample, such as the lateral packing in a lamellar phase. Small angle x-ray diffraction (SAXD) provides information about larger structural units in a sample, such as the periodicity in a stack of bilayers (bilayer to bilayer distance)³. In this study, the DuraQuench IQ and control formulations (Table 1) were compared using both WAXD and SAXD.

The results from the WAXD show that the head groups of the lipid bilayers formed by DuraQuench IQ are organised in an orthorhombic structure. The distances between the head groups are 0.42nm and 0.38nm, while in the control these distances are greater, 0.47nm and 0.40nm. These results are seen in Figure 1 where the distances are represented as peaks in the graph. Packing of the bilayer head groups determines permeability, allowing more water to be retained within the skin with DuraQuench IQ in comparison to the control.

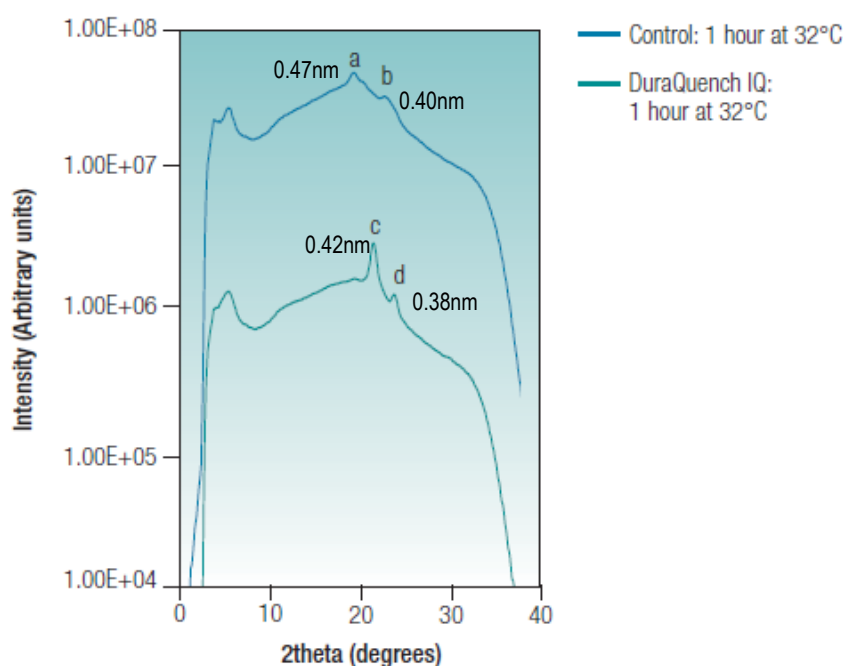


Figure 1: WAXD results of the DuraQuench IQ and control formulations which have undergone 1 hour drying at 32°C. Packing of the lipid bilayer head groups is much tighter with DuraQuench IQ than the control and will ultimately lead to long lasting hydration

The results from the SAXD show that the control formulation creates lipid bilayers which are 5.0nm thick, while the DuraQuench IQ formulation creates lipid bilayers which are twice as thick at 10.0nm, which is important for improved barrier function. These results can be seen as peaks in Figure 2.

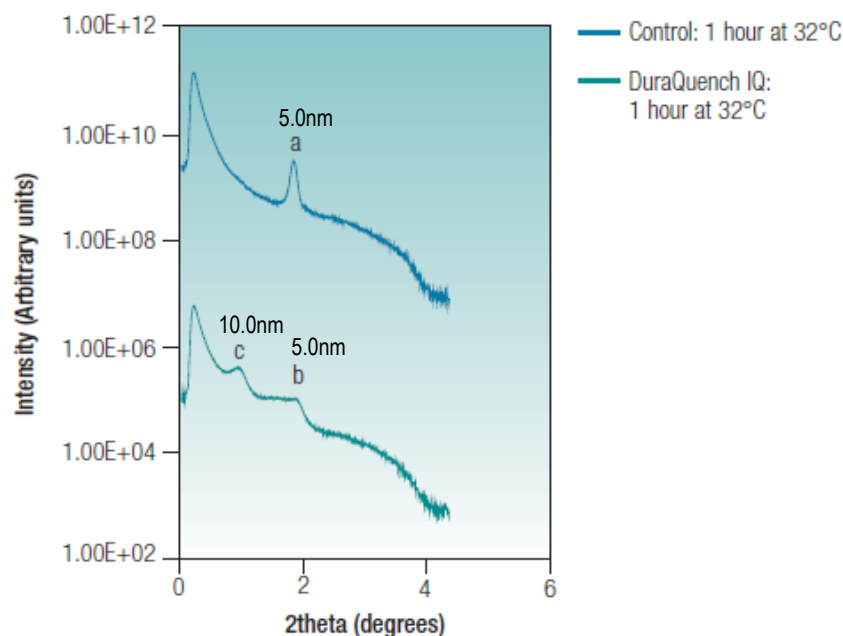
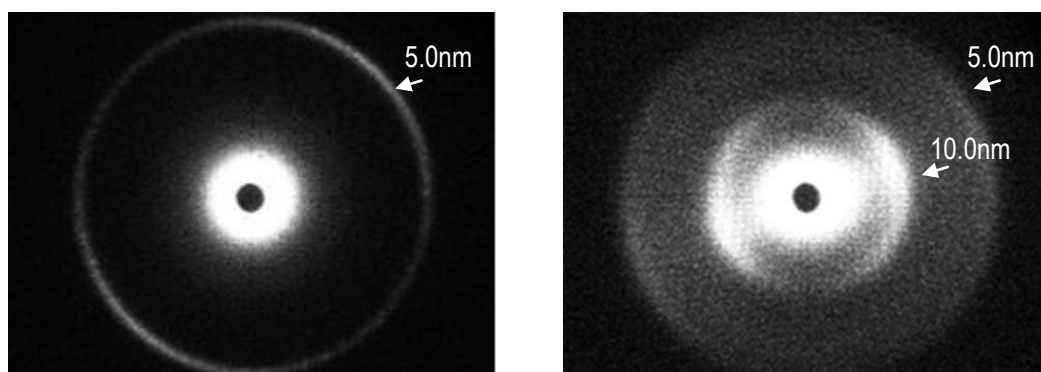


Figure 2: SAXD of the DuraQuench IQ and control formulations which have undergone 1 hour drying at 32°C. The results show that the formulation containing DuraQuench IQ forms bilayers which are twice as thick as the control formulation
Note: 2 peaks are observed with the DuraQuench IQ formulation, these are represent 1st order and 2nd order reflections of a stack of bilayers

Images from the SAXD show a 5.0nm thick lipid bilayer in the control sample, whereas the image of the DuraQuench IQ sample shows an additional band at 10.0nm representing a thicker bilayer (Figure 3).



Control

DuraQuench IQ

Figure 3: SAXD images showing that a 5.0nm lipid bilayer is present in the control formulation while a 10.0nm bilayer is present in the DuraQuench IQ formulation

In summary, the results of the X-ray diffraction show that DuraQuench IQ forms a lipid bilayer structure, similar to that found within healthy skin. In comparison to the control, the lipid head groups are more tightly packed allowing more water to be retained within the skin. In addition, the bilayer formed is twice as thick with the formulation containing DuraQuench IQ (Figure 4).

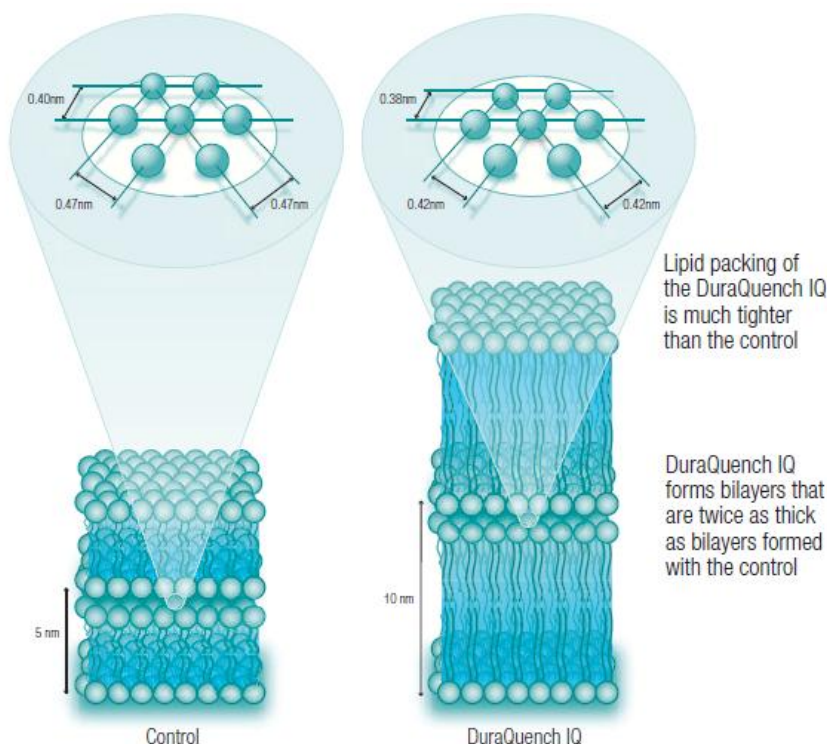


Figure 4: DuraQuench IQ forms a structured lipid bilayer that is twice as thick as the control, and the lipid head groups are more tightly packed, ultimately leading to long lasting moisturisation

Leave-on Systems

Long Lasting Moisturisation

Two robust dry skin clinical studies, officially known as a Moisture Efficacy Test (MET), were carried out in South Africa during a low humidity season. One was testing DuraQuench IQ on Caucasian skin, the second on black Ethnic skin. The MET, carried out by external, trained experts, provides visible and statistically significant differences in skin dryness.

Both studies consisted of the following protocol:

- Dry Down Phase (Day -7 to -1) :
 - Wash the lower legs with soap 2-4 times per day
 - No test creams applied
- Treatment Phase (Day 0 to 14):
 - In the morning, wash the lower legs with soap
 - Skin dryness was assessed by an expert
 - Apply the test creams
 - In the evening, wash the lower legs with soap
 - Apply the test creams
- Regression Phase (Day 15-17):
 - In the morning, wash the lower legs with soap
 - No test creams applied

During the Treatment Phase, panellists applied the DuraQuench IQ and control formulations twice daily to randomised treatment sites along with one site which was left untreated as a negative control. The level of skin dryness was assessed throughout the study and all measurements were taken after the morning wash and before the application of the moisturising creams where applicable. This was ensure that underlying skin dryness was assessed as opposed to the transient masking effects seen when a formulation is applied to the skin.

Glycerine is a commonly used moisturising ingredient and for this reason 5% glycerine was included in both the control and DuraQuench IQ formulations (Table 1). This ensures that the formulations are market relevant and also provide the opportunity to demonstrate the moisturising benefits of DuraQuench IQ over and above the control.

Skin dryness was assessed using a visual grading scale from 0 - 5, where 0 represents no evidence of dryness and 5 represents extremely dry skin (Figure 5). Due to the severity of grade 5, there are no images of this level of dryness. No panellists were graded as level 5 throughout the study. According to the trained experts, a difference of 1 is consumer perceivable.

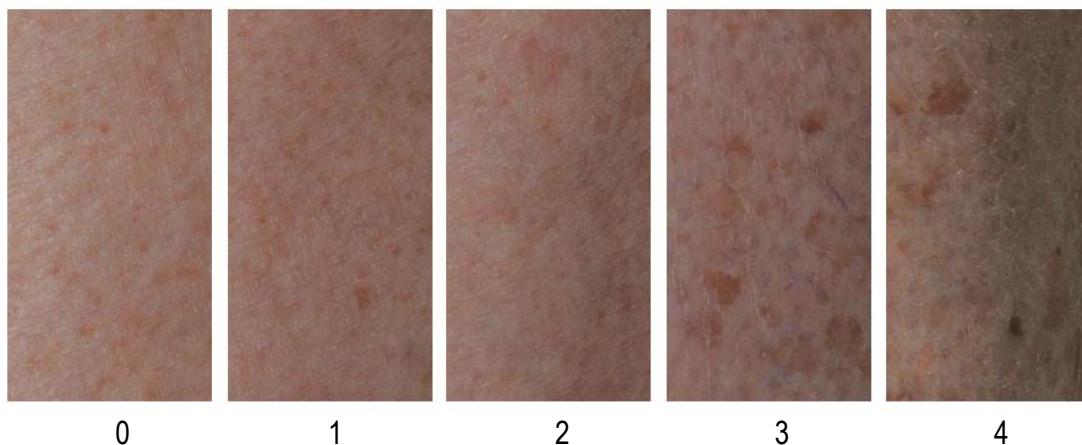


Figure 5: Dry skin of increasing severity from 0-4 on a clinical expert scale

The results of the study show that the inclusion of DuraQuench IQ in the formulation led to greater improvements in the visible signs of skin dryness versus the control formulation, with statistically significant results on day 11 ($p<0.05$) and day 14 ($p<0.05$) of the Treatment Phase in both studies. The results of the study on Caucasian skin can be seen in Figure 6.

Following the Treatment Phase, panellists entered the Regression Phase where they **continued to wash their lower legs with soap and stopped applying the test formulations**. Skin treated with the DuraQuench IQ formulation remained significantly more moisturised than skin treated with the control formulation throughout the Regression Phase (day 1 ($p<0.001$); day 2 ($p<0.01$); day 3 ($p<0.05$)) in both studies.

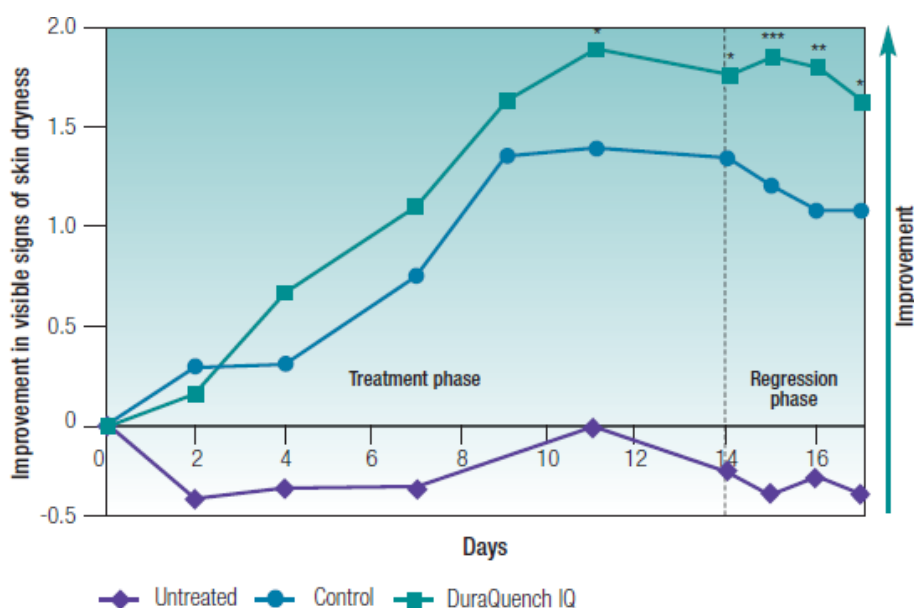


Figure 6: Significant improvement in visual skin dryness seen with the DuraQuench IQ formulation versus the control on day 11 ($p<0.05$) and 14 ($p<0.05$) of the treatment phase and day 1 ($p<0.001$), 2 ($p<0.01$) and 3 ($p<0.05$) of the regression phase

Throughout the Regression Phase, DuraQuench IQ maintains a visual improvement in skin dryness for 72 hours (Figure 7) while the control begins to lose its performance from the first day of the Regression Phase. This is characteristic of formulations containing glycerine as the only moisturising ingredient.

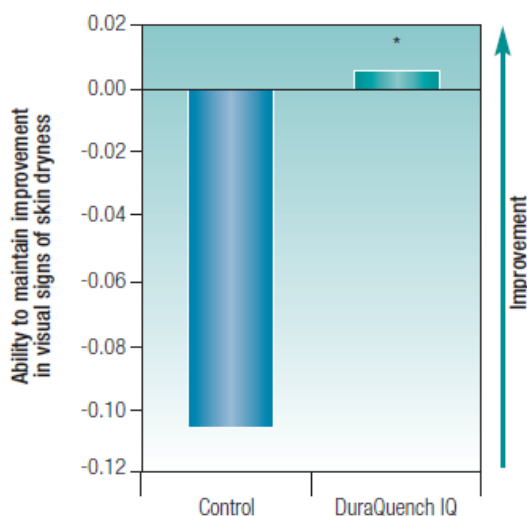


Figure 7: The DuraQuench IQ formulation significantly outperformed the control ($p < 0.05$), maintaining a visible improvement in skin dryness throughout the Regression Phase

The improvement and lasting moisturisation with DuraQuench IQ in comparison to the control can be seen in photographs of panellists' skin taken throughout this study (Figure 8 and Figure 9).



Figure 8: Photographs of Caucasian panellists' skin where the DuraQuench IQ and control formulations have been applied during the MET



Figure 9: Photographs of Ethnic panellists' skin where the DuraQuench IQ and control formulations have been applied during the MET

Lower Usage Level

A third MET was carried out in South Africa during a low humidity season using the same protocol above. DuraQuench IQ was tested at 2.5% on black Ethnic skin versus the control formulation. Skin treated with the DuraQuench IQ formulation remained significantly more moisturised than skin treated with the control formulation for day 1 of the Regression Phase ($p < 0.05$), providing a 24 hour moisturisation claim.

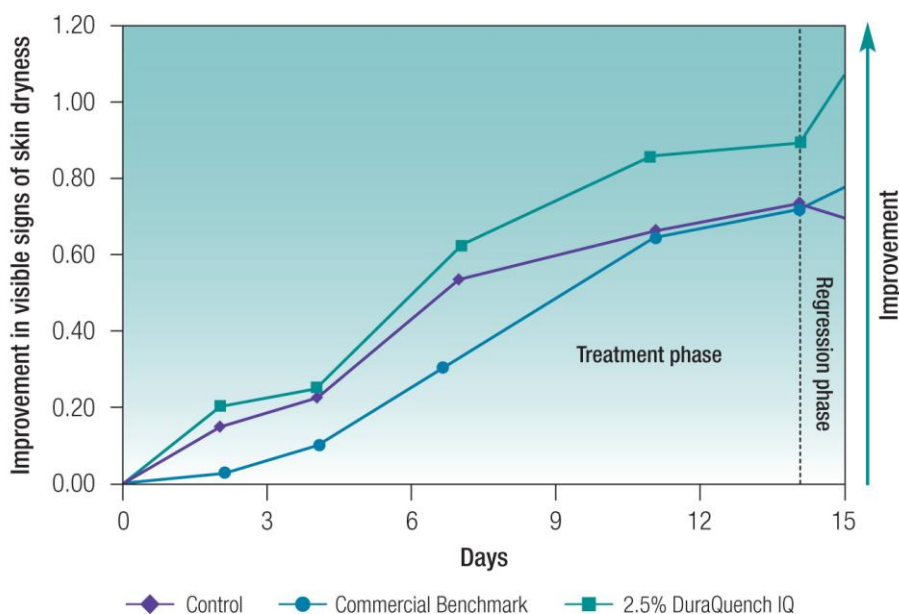


Figure 10: Significant improvement in visual skin dryness seen with the 2.5% DuraQuench IQ formulation versus the control formulation on day 1 of the regression phase ($p < 0.05$)

Skin Barrier Function

A half face dry skin study looking into water loss through the skin and superficial skin dryness was carried out and demonstrates how DuraQuench IQ leads to an improvement in skin barrier function above the control. The study included the following protocol:

- Dry Down Phase (Day -4 to -1) :
 - Wash the face with soap 2-4 times per day
 - No test creams applied
- Treatment Phase (Day 0 to 14):
 - In the morning, wash the face with soap
 - Skin dryness was assessed
 - Apply the test creams to each side of the face
 - In the evening, wash the face with soap
 - Apply the test creams
- Regression Phase (Day 15-19):
 - In the morning, wash the face with soap
 - No test creams applied

The results of the study (Figure 11) show the difference in water loss through the skin between DuraQuench IQ and the control formulation. Water loss is consistently lower with DuraQuench IQ, so more water is retained

within the skin, with a significant improvement on day 7 ($p<0.05$) and day 14 ($p<0.01$) of the Treatment Phase versus the control.

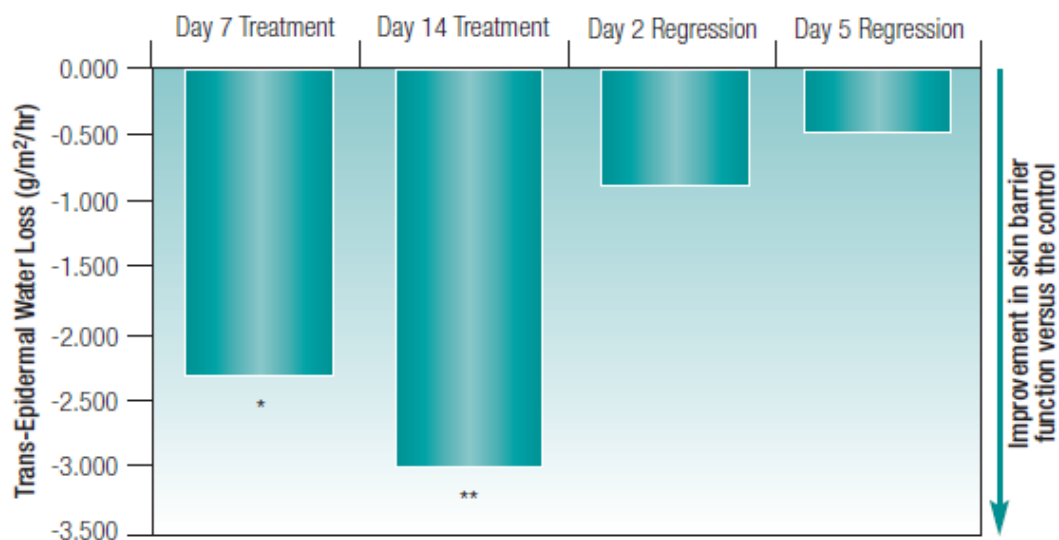


Figure 11: Water loss through the skin is consistently lower with DuraQuench IQ in comparison to the control with a significant difference on day 7 ($p<0.05$) and 14 of the Treatment Phase ($p<0.01$)

In dry skin, a higher number of visible, dead skin cells cluster on the surface of the skin (flakes) whereas in hydrated skin, this is not observed. Using an adhesive D-squame disc, skin dryness can be assessed. There are consistently fewer flakes from skin treated with DuraQuench IQ than skin treated with the control, and a significant improvement on day 14 of the Treatment Phase ($p<0.01$) and on day 2 of the Regression Phase ($p<0.01$).

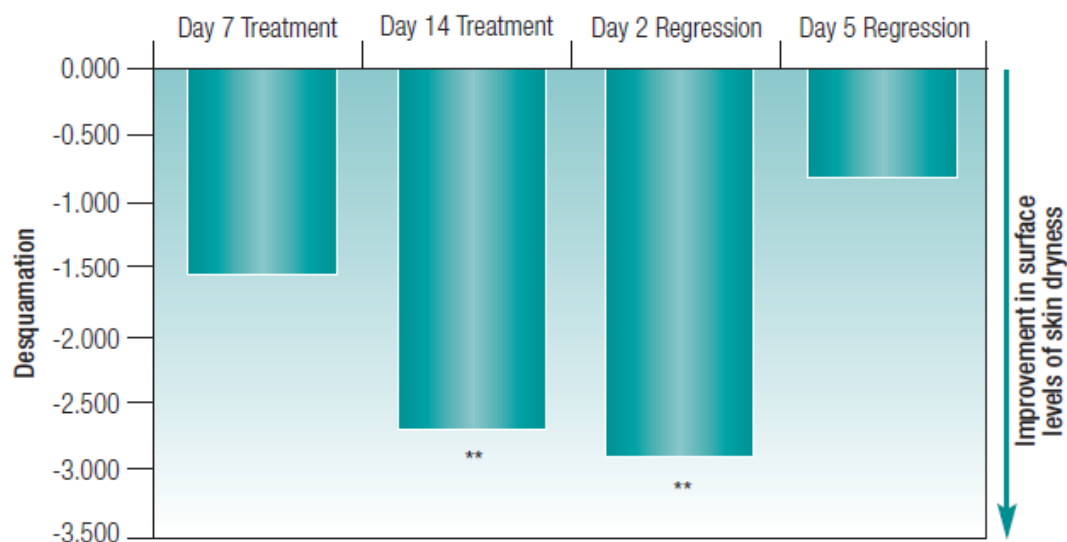


Figure 12: Consistently fewer skin cells are removed with an adhesive D-squame disc from the surface of the skin with DuraQuench IQ than the control formulation with a significant difference on day 14 of the Treatment Phase ($p<0.01$) and day 2 of the Regression Phase ($p<0.01$)

The results show that water loss through the skin is reduced followed by an improvement in superficial skin dryness with DuraQuench IQ versus the control. This can be attributed to the intelligent structure formed on the skin by DuraQuench IQ and the interaction with the lipid bilayer within the stratum corneum.

Temperature and Humidity Responsive

Skin hydration can be affected by a number of factors including sudden changes in environmental conditions, climate controlled environments and low humidity¹. Seasonal variation also has an effect on the biophysical properties of the stratum corneum as a lower absolute humidity in winter causes a higher humidity gradient at the stratum corneum/air interface, favouring water loss which leads to dehydrated skin⁴. DuraQuench IQ has been developed to combat these changes in temperature and humidity via the formation of an intelligent structural layer on the skin, thereby reducing the impact of these environmental conditions.

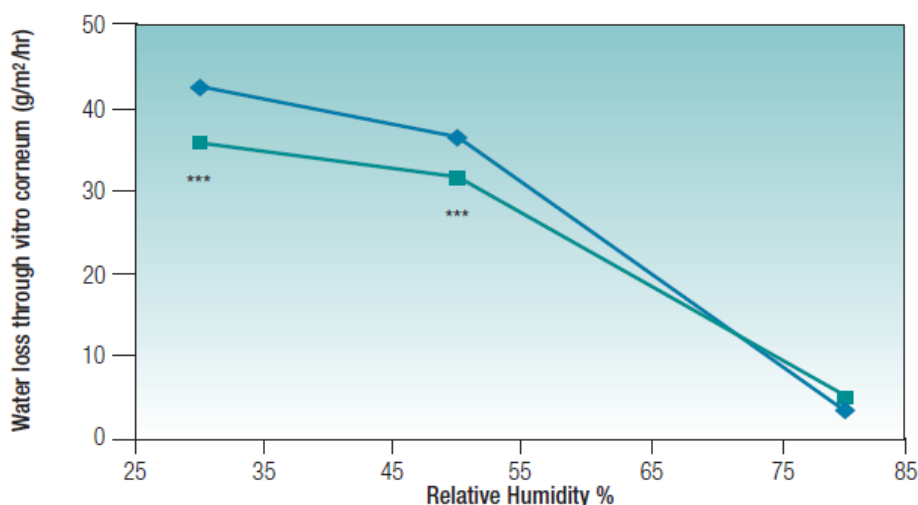
People around the world are exposed to varying temperatures and humidities on a daily basis as shown in Table 2. For example in Mexico City on the 1st January 2011, the temperature varied from a low of 7°C to a high of 22°C, and the relative humidity varied from a low of 15% to a high of 71%. Where extreme temperatures are present, skin is also exposed to air-conditioning and central heating which can lead to skin dryness.

	Temperature (°C)		Relative Humidity (%)	
	High	Low	High	Low
Mexico City	22	7	71	15
Sao Paulo	24	18	94	65
Tokyo	10	2	57	29

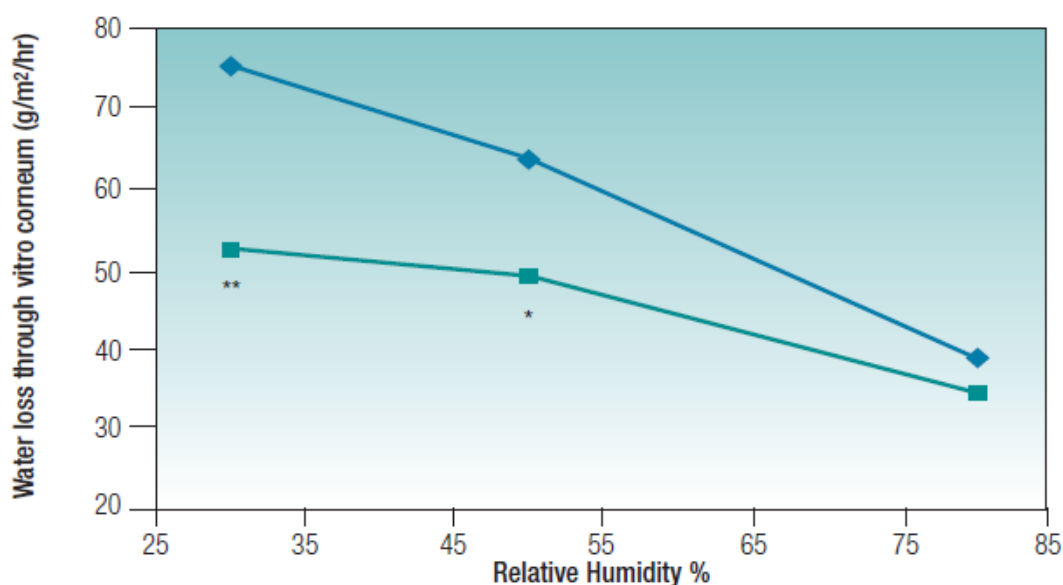
Table 2: High and low temperature (°C) and relative humidity (%) on the 1st January 2011

In order to evaluate how DuraQuench IQ responds to varying temperatures and humidities, a thin film of the DuraQuench IQ and control formulation were dried onto vitro corneum. Samples were analysed using a water vapour transport rate (WVTR) method at 20 °C, 32°C and 40 °C (±1.5°C) at 30%, 50% and 80% (± 5%RH) relative humidity respectively (32 °C represents surface skin temperature). The results of the WVTR were normalised as a percentage relative to the residual film weights.

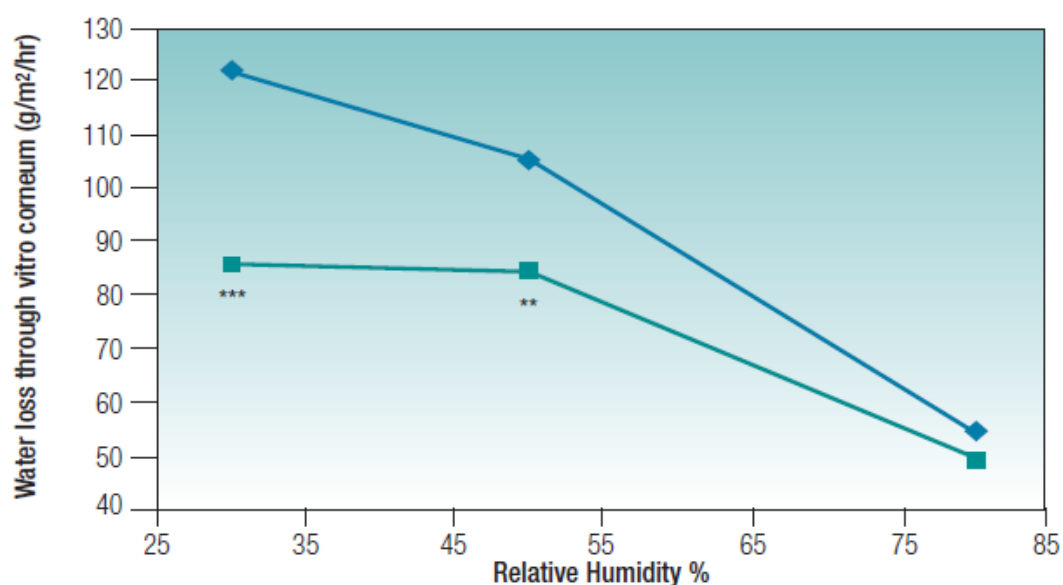
In comparison to the control, the formulation containing 5% DuraQuench IQ reduces the level of water loss when tested on vitro corneum at 30% and 50% relative humidity at 20°C, 32°C and 40°C (Figure 11). This shows that DuraQuench IQ can impart temperature and humidity responsive properties for optimised moisturisation benefits.



A. $20^{\circ}\text{C} \pm 1.5^{\circ}\text{C}$. Water loss through vitro corneum is significantly lower with DuraQuench IQ than the control formulation at 30% ($p<0.001$) and 50% ($p<0.001$) relative humidity



B. $32^{\circ}\text{C} \pm 1.5^{\circ}\text{C}$. Water loss through vitro corneum is significantly lower with DuraQuench IQ than the control formulation at 30% ($p<0.01$) and 50% ($p<0.05$) relative humidity



C. $40^{\circ}\text{C} \pm 1.5^{\circ}\text{C}$. Water loss through vitro corneum is significantly lower with DuraQuench IQ than the control formulation at 30% ($p<0.001$) and 50% ($p<0.01$) relative humidity

Figure 13: Water loss is significantly reduced with DuraQuench IQ versus the control formulation at 20°C , 32°C and 40°C at 30% and 50% relative humidity as DuraQuench IQ is able to adapt to varying conditions

This test was also carried out with a formulation containing 2.5% DuraQuench IQ which reduces the level of water loss in comparison to the control when tested on vitro corneum at 30% and 50% relative humidity at 20°C , 32°C and 40°C (Please see Validation Document for more information).

Consumer Sensory Perception

To evaluate consumer sensory perception of DuraQuench IQ, a panel study was carried out and 31 panellists were asked to apply a formulation with and without DuraQuench IQ to either side of their face respectively for 1 week. The panellists were asked to complete a pre- and post- study questionnaire. The results of the study show that 71% of panellists preferred the formulation containing DuraQuench IQ. Panellists also observed a significant improvement in skin smoothness ($p=0.0273$) and skin radiance ($p=0.0674$) versus the control formulation as seen in Figure 14.

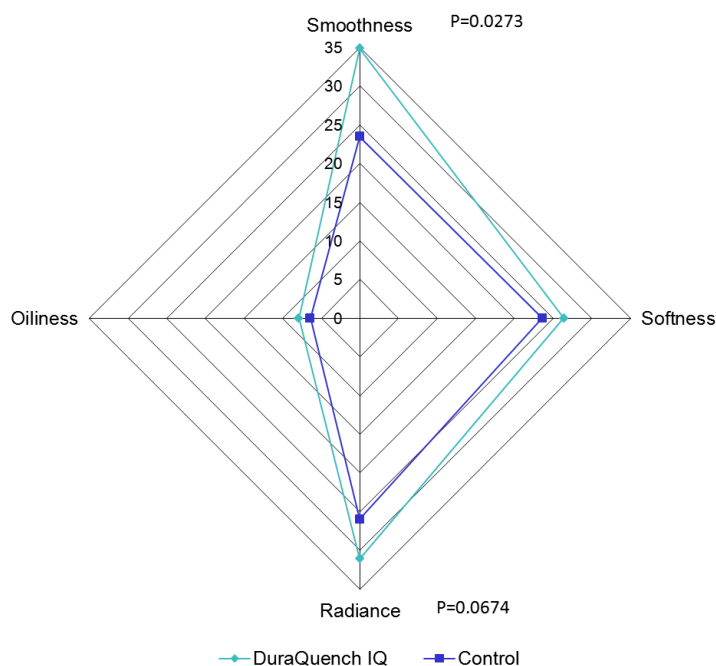
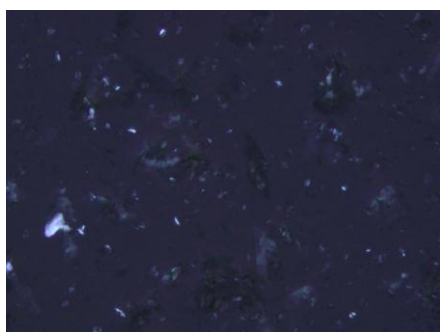


Figure 14: Consumer perception percentage change in smoothness, softness, radiance and oiliness after 1 week of application of the DuraQuench and control formulation to either side of their face respectively. Smoothness ($p=0.0273$) and radiance ($P=0.0674$) significantly improved using DuraQuench IQ versus the control

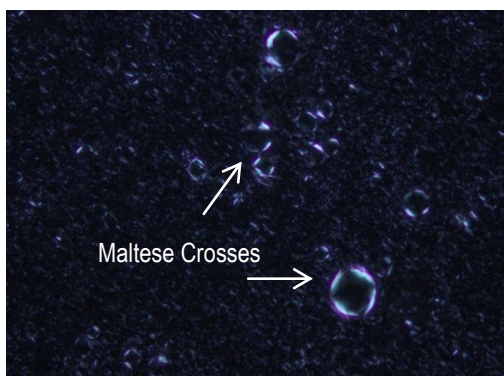
The significant increase in skin smoothness and radiance, seen using the DuraQuench IQ formulation, can be linked to skin hydration as there is a correlation between the level of skin hydration and the amount of light absorbed or scattered by the skin. In dehydrated skin, an increased amount of light is scattered at the skin surface due to the raised edges of corneocytes, whereas in hydrated skin, more light penetrates into the deeper skin layers resulting in darker, more pinkish and more translucent skin.⁵

Liquid Crystals

DuraQuench IQ has the ability to form liquid crystals. Linked to skin hydration, liquid crystals improve the stability of a formulation against coalescence and creaming and are also known to have a positive impact on the sensory properties of a formulation. These can be seen under a microscope in a formulation containing DuraQuench IQ (Figure 15B), while the control formulation shows no evidence of liquid crystal structures (Figure 15A).



A: Control formulation with no sign of liquid crystals



B: DuraQuench IQ formulation showing maltese crosses representing liquid crystals

Figure 15: Liquid crystals can be seen as maltese crosses under the microscope (x200) after the DuraQuench IQ formulation was dried for 10 minutes on a slide

Enhancing Viscosity

DuraQuench IQ can help build viscosity in formulation and help with the stability of emulsion systems. DuraQuench IQ contributes to the viscosity built-up in o/w systems enabling the reduction of other rheology modifiers. The viscosity enhancement of different emulsifier systems was investigated and the results can be seen in Figure 16.

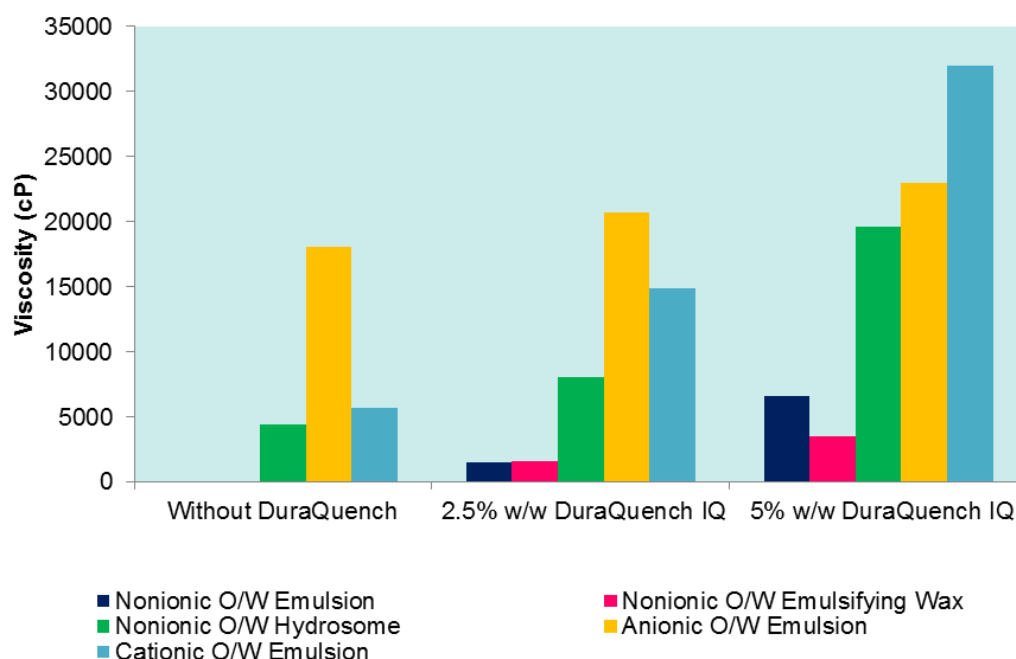


Figure 16: Viscosity measurements of different O/W emulsion systems with DuraQuench IQ

Figure 16 shows non-ionic hydrosome and cationic emulsion systems are more greatly affected by viscosity build up using DuraQuench IQ and anionic emulsions are least affected.

Wash-off Systems

DuraQuench IQ provides both sensorial moisturisation and visible improvements in skin dryness from wash-off detergent systems. DuraQuench IQ was tested in both a simple hand and body wash formulation from both a sensory perspective and instrumentally to measure skin hydration.

Product / INCI Name	Control (%w/w)	DuraQuench IQ (%w/w)
Water (Aqua)	59.21	59.21
Empicol ESB3 (Sodium Laureth Sulfate (and) Aqua)	26.79 (8% SLES)	26.79 (8% SLES)
Crodateric™ CAB30 (Aqua (and) Cocamidopropyl Betaine)	10.00	10.00
Incromine™ Oxide C (Cocamidopropylamine Oxide (and) Aqua)	1.50	1.50
DuraQuench™ IQ (Cetyl Alcohol (and) Isostearyl Isostearate (and) Potassium Cetyl Phosphate (and) Cetyl Behenate (and) Behenic Acid)	-	1.00
Cithrol™ EGMS (Glycol Stearate)	2.00	1.00
Phenova (Phenoxyethanol (and) Methylparaben (and) Ethylparaben (and) Butylparaben (and) Propylparaben (and) Isobutylparaben)	0.5	0.5
Sodium Chloride	n.a.	q.s.
Citric Acid (pH)	q.s.	q.s.

Table 3: Hand-wash formulation with and without 1% DuraQuench IQ

Product / INCI Name	Control (%w/w)	DuraQuench IQ (%w/w)
Water (Aqua)	33.7	33.7
Empicol ESB3 (Sodium Laureth Sulfate (and) Aqua)	44.6 (12% SLES)	44.6 (12% SLES)
Crodateric™ CAB30 (Aqua (and) Cocamidopropyl Betaine)	16.7	16.7
Incromine™ Oxide C (Cocamidopropylamine Oxide (and) Aqua)	2.5	1.5
DuraQuench™ IQ (Cetyl Alcohol (and) Isostearyl Isostearate (and) Potassium Cetyl Phosphate (and) Cetyl Behenate (and) Behenic Acid)	0.0	1.0
Cithrol™ EGMS (Glycol Stearate)	2.0	1.0
Phenova (Phenoxyethanol (and) Methylparaben (and) Ethylparaben (and) Butylparaben (and) Propylparaben (and) Isobutylparaben)	0.5	0.5
Sodium Chloride	n.a.	q.s.
Citric Acid (pH)	q.s.s	q.s.

Table 4: Body-wash formulation with and without 1% DuraQuench IQ

Sensorial Moisturisation

Consumers need to be able to see and feel moisturisation from their product, so the need for perceivable moisturisation means sensory data is very important. Two sensory studies were completed using DuraQuench IQ at 1% in both a simple handwash and bodywash formulation.

The handwash study included the following protocol:

- Pre-wash the hands with a commercial formulation rinse and dry with hand dryer
- Answer pre-handwash questions
- Rinse hands for 15 seconds (no rubbing)
- Apply 0.2ml of the control hand wash to the back of the hand and rub 30 times with the opposite hand.
- Apply 0.2ml of the DuraQuench IQ hand wash to the back of the hand and rub 30 times with the opposite hand
- Rinse hands for 15 seconds (no rubbing) and dry with the Dyson Air-Blade for 30 seconds
- Complete the final part of the sensorial questionnaire

The bodywash study included the following protocol:

- Pre-wash the forearms with a commercial formulation rinse and dry with hand dryer
- Answer pre-bodywash questions
- Rinse forearms for 15 seconds (no rubbing)
- Apply 0.2ml of the control body wash to the forearm and rub 30 times with the opposite hand
- Apply 0.2ml of the DuraQuench IQ body wash to the forearm and rub 30 times with the opposite hand
- Rinse forearms for 15 seconds (no rubbing) and dry with the Dyson Air-Blade for 30 seconds
- Complete the final part of the sensorial questionnaire

Both sensory studies measured skin tightness, softness and perceived moisturisation. The handwash results in Figure 17 show the change in skin tightness, moisturisation and softness after the 2 formulations were tested. We can see the DQ formulation gives statistically more moisturised and softer skin while the control significantly increases skin tightness.

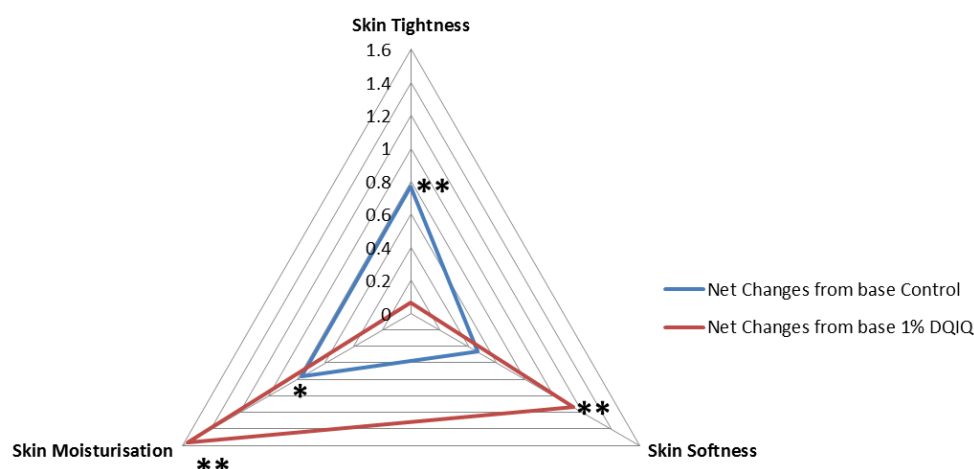


Figure 17: Significant improvement in skin moisturisation and softness with DuraQuench IQ while the control formulation significantly increases skin tightness ($p < 0.01$)

The body-wash sensory study results can be seen in Figure 18. A significant increase in skin softness and moisturisation is seen with the DuraQuench IQ formulation.

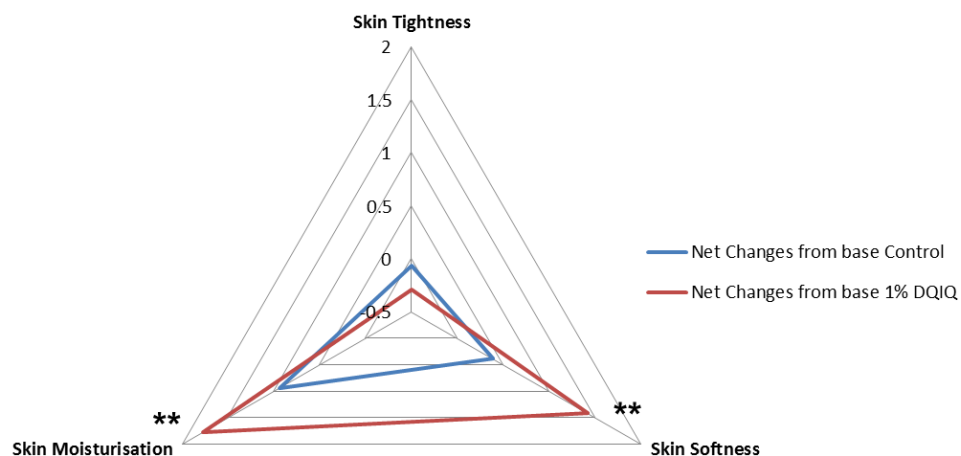


Figure 18: Significant improvement in skin moisturisation and softness with DuraQuench IQ ($p < 0.01$)

Physical Reduction in Skin Dryness

Additional studies collecting instrumental data were carried out measuring skin dryness. Three different skin care devices were used to assess the physical condition of the skin, looking at barrier integrity, skin hydration, skin flaking and dryness. The instruments used measured were Trans Epidermal Water Loss (TEWL), Corneometer and D-Squame discs.

The handwash study included the following protocol:

- Panellists attended two separate 1 hour sessions on non-consecutive days in a temperature and humidity controlled environment
- Panellists were tested with the control and DuraQuench IQ handwash formulations, one for each session
- Measurements were taken on the back of the left hand
- Each panellist then had a TEWL readings taken immediately followed by washing the back of their left hands and left for 5 minutes
- After 5 minutes the procedure was repeated a further 5 times

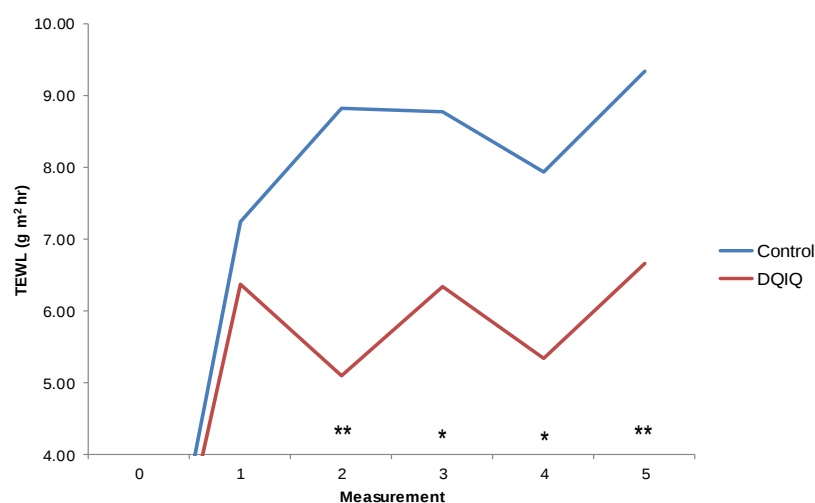


Figure 19: Trans Epidermal Water Loss (TEWL) data for DuraQuench IQ and the control formulation (** $p < 0.01$, * $p < 0.05$)

The results in Figure 19 demonstrates statistically lower Trans Epidermal Water Loss (TEWL) values signifying less water is being lost through the skin and the skin barrier is better maintained.

The bodywash study included the following protocol:

- On the panellists first day, pre-study measurements were taken for TEWL, corneometer and D-Squame
- The panellists underwent a 5 day dry down phase using a commercial basic soap. Panellists washed both forearms three times a day
- The panellist's measurements were taken at the end of the 5 day dry down phase and the readings treated as the baseline
- The panellists washed pre-assigned forearms 3 times a day with the DuraQuench IQ bodywash and the control formulation
- The panellist's measurements were taken on days 2, 4, 8, 10 and 14

The results from the TEWL study are seen in Figure 20. We can see that DuraQuench IQ gives consistently lower TEWL values versus the control formulation demonstrating the skin barrier is better maintained with less water leaving the skin.

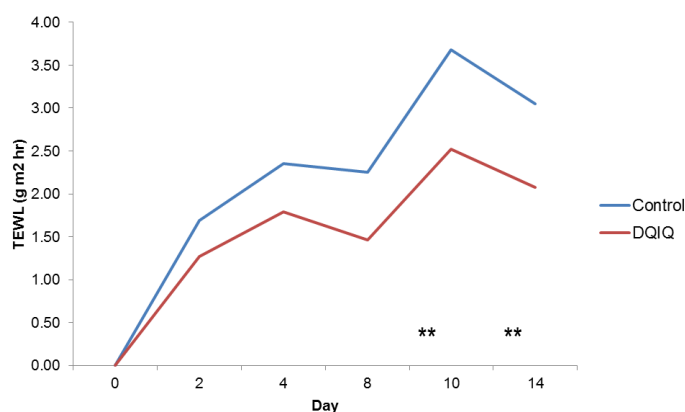


Figure 20: Trans Epidermal Water Loss (TEWL) data for DuraQuench IQ and the control formulation (** $p < 0.01$)

The corneometer data can be seen in Figure 21. A higher corneometer value signifies greater skin water content. The DuraQuench IQ formulation displays a consistently higher corneometer value with significant values from day 4. This means the skin is more moisturised and less dry than when using the control.

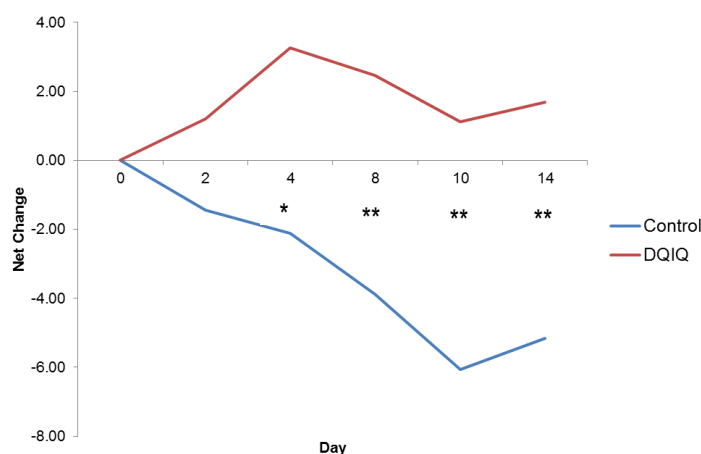


Figure 21: Corneometer data for DuraQuench IQ and the control formulation (** $p < 0.01$, * $p < 0.05$)

The D-Squame results demonstrate the DuraQuench IQ bodywash displays a consistently lower protein content value to the control body-wash seen in Figure 22. Lower protein content signifies less flaking and an enhanced skin barrier/moisturisation.

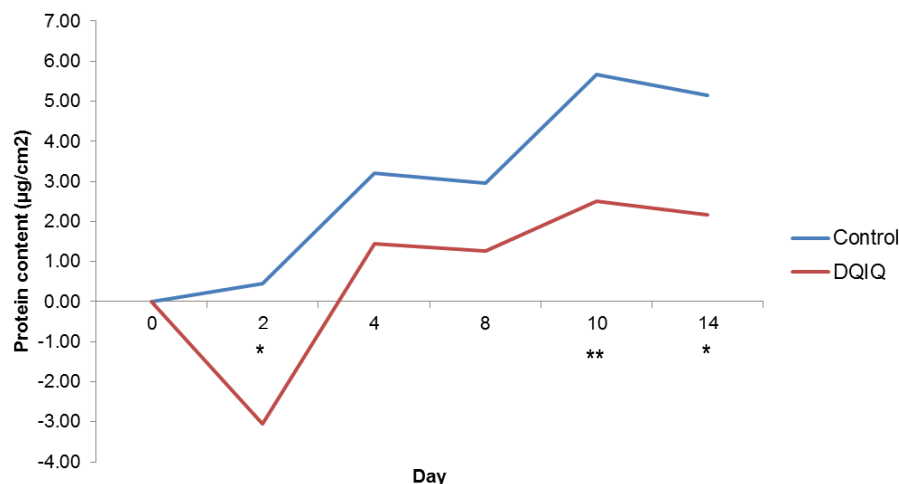


Figure 22: Corneometer data for DuraQuench IQ and the control formulation (** $p < 0.01$, * $p < 0.05$)

These results demonstrate DuraQuench IQ provides a convenient way of delivering sensorial moisturisation and skin softness while instrumental devices have shown DuraQuench IQ reduces physical skin dryness.

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