

A new perspective on styling

DynamX<sup>®</sup>H<sub>2</sub>O

AkzoNobel Global Personal Care  
Where science is a thing of beauty™



**AkzoNobel**

Tomorrow's Answers Today

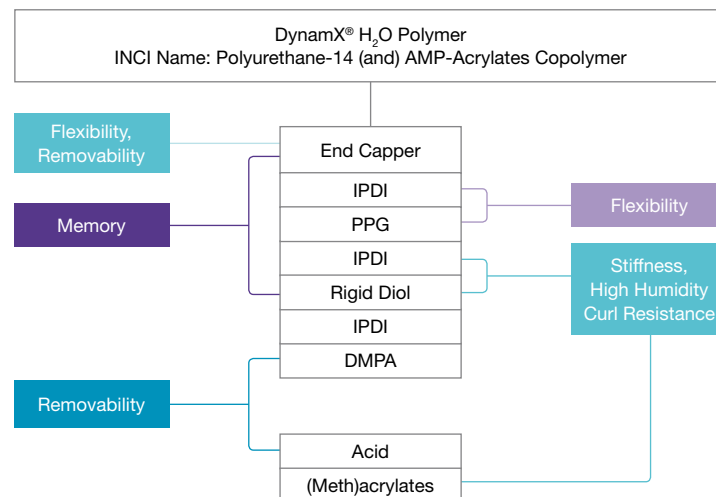


# Get a new perspective and change the way you look at styling.

Now you can get strong, durable hold without a raspy, crunchy or stiff feel. You can get flexible, touchable styles that still stay in place and last all day. With DynamX® H<sub>2</sub>O polymer, the rules of styling have changed. **Learn more at [www.akzonobel.com/personalcare](http://www.akzonobel.com/personalcare)**

The power behind DynamX® H<sub>2</sub>O polymer is a unique, patented composition based on polyurethane and acrylate technology.

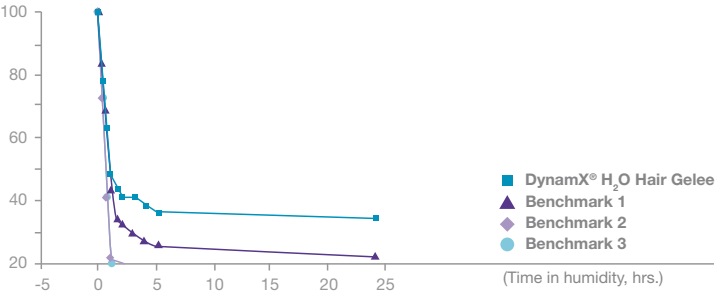
The unique polymer structure of DynamX® H<sub>2</sub>O is specially designed to enhance performance in products designed for dynamic styling properties. The urethane portion of the product helps to provide hold, elasticity and flexibility for soft, touchable hair feel (without tack), while the acrylic functionality provides strength, humidity resistance and easy shampoo removability. The combination of these two polymer chemistries gives the overall product properties of strength, flexibility and durability, which lead to truly dynamic styles.





# Now flexible hold can be durable hold.

High Humidity Curl Resistance with DynamX® H<sub>2</sub>O Polymer:  
Dynamic Hair Gelee vs. Commercial Benchmarks  
(% Curl Retention)



**Superior Humidity Resistance and Duration of Hold with DynamX® H<sub>2</sub>O Polymer**  
When used at 2% polymer solids in a clear hair gel formulation, the addition of DynamX® H<sub>2</sub>O polymer creates a gel that is statistically superior in high humidity curl retention compared to a range of commercially available benchmarks.

## Dynamic Hair Gelee 14590-34A

This medium viscosity gel combines DynamX® H<sub>2</sub>O polymer with a cellulosic thickener to provide long-lasting, flexible hold, excellent curl definition and frizz control.

TRADE NAME, SUPPLIER	INCI NAME	% W/W
Phase A		
DynamX® H <sub>2</sub> O Polymer (25% Solids), AkzoNobel Surface Chemistry	Polyurethane-14 (and) AMP-Acrylates Copolymer	8.00%
Natrosol® 250 HHR, Aqualon	Hydroxyethylcellulose	1.50%
Propylene Glycol	Propylene Glycol	0.20%
DC 193 Surfactant, Dow Corning Corp.	PEG-12 Dimethicone	0.10%
Glydant, Lonza	DMDM Hydantoin	0.30%
Deionized Water	Water (Aqua)	89.90%
Total:		100.00%

- PROCEDURE
1. Weigh all the water into a mixing vessel. Using an overhead mixer at 600 rpm slowly sift the Natrosol® into the vortex.
  2. Heat to 45°C and hold until completely in solution.
  3. Cool and add remaining ingredients. Mix thoroughly. Pour off into tubes and seal.

PROPERTIES	
Appearance	Clear Gel
Clarity	Clear
pH	7.5 - 8.5
Viscosity* (cps)	10,200 - 12,200

\*Brookfield Heliopath, Spindle #T-C / 10 rpm



## Contour Fiber Gel 14590-35D.2

This ringing fiber gel formulation features excellent moisturization, shine, and control with DynamX® H<sub>2</sub>O polymer. It also provides frizz control and texture without added weight. Smooth feel and excellent slip properties allow for easy application to hair. This product can be used to texturize, define and sculpt the hair. It can be used on wet or dry hair and is especially recommended for use on short hair.

TRADE NAME, SUPPLIER	INCI NAME	% W/W
<b>Phase A</b>		
Drakeol® 35, Penreco	Mineral Oil	11.00%
Brij IC20-SO-(AP), Croda, Inc.	Isoceteth-20 (and) Water	23.10%
Brij 93, Uniqema	Oleth-2	6.90%
<b>Phase B</b>		
Deionized Water	Water (Aqua)	46.24%
<b>DynamX® H<sub>2</sub>O Polymer (25% Solids), AkzoNobel Surface Chemistry</b>	<b>Polyurethane-14 (and) AMP-Acrylates Copolymer</b>	<b>6.00%</b>
Propylene Glycol	Propylene Glycol	5.00%
Sorbitol Solution, (70%) USP 10-015, Lipo Chemicals	Sorbitol	1.00%
Uvinul® MS-40, BASF Corporation	Benzophenone-4	0.01%
Phenonip®, Clariant Corp.	Phenoxyethanol (and) Methylparaben (and) Ethylparaben (and) Butylparaben (and) Propylparaben (and) Isobutylparaben	0.75%
<b>Total:</b>		<b>100.00%</b>

### PROCEDURE

1. Using an overhead mixer add all the ingredients in Phase A and heat to 80°C.
2. In a second beaker add all the ingredients in Phase B and heat to 80°C.
3. When both Phases are at 80°C, add Phase B to Phase A and mix for at least 5 minutes until homogeneous.
4. Pour off into containers and cap while still hot to prevent water loss.

**Caution:** This product requires a hot fill temperature of 70°C. Do not proceed if you don't have this filling capability.

### PROPERTIES

Appearance	Solid, ringing gel
Clarity	Slightly hazy



## Wetting Force and Hair Damage

Wetting force analysis is an effective way to measure the effect of treatment temperature on the deposition and substantivity of polymers applied to the surface of hair. Wetting force is correlated with the contact angle of water on the surface of a hair fiber. This is implicitly correlated with the degree to which a single hair fiber is damaged. Hair fibers are more hydrophilic when damaged. The greater the wetting force, the more damaged the hair fiber.

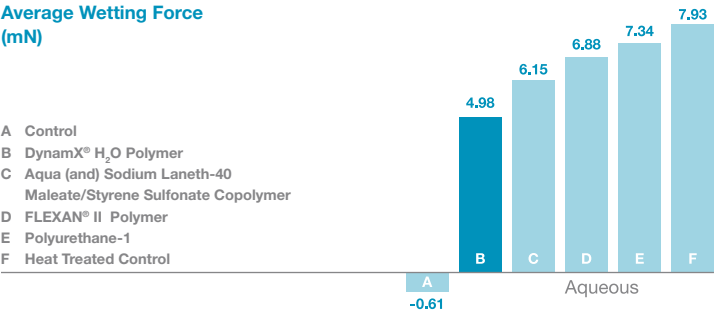
### Testing & Analysis

A test of thermal protection power was performed. The process involved 12 cycles of applying appropriate polymer spray, applying heat via flat iron at highest setting (410°F) – 5 min, washing and drying hair tress. A control sample was run without polymer applications. Each sample was evaluated for wetting force and image analysis by Scanning Electron Microscopy (SEM) Prior to the heating / application process each hair swatch sample was submerged in water for 5 min to completely hydrate the hair.

### DynamX® H<sub>2</sub>O Polymer Provides Excellent Thermal Protection to Hair

DynamX® H<sub>2</sub>O polymer offers the best thermal protection performance as seen by the lowest wetting force of all products tested, indicating that the hair is less hydrophilic and therefore less damaged.

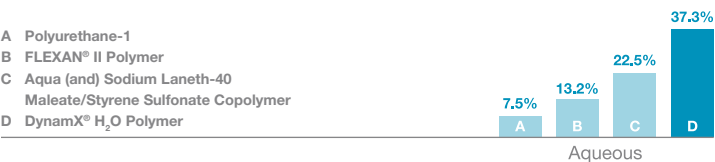
### Average Wetting Force (mN)



### Protect Hair from Damage with DynamX® H<sub>2</sub>O polymer

DynamX® H<sub>2</sub>O polymer provides the highest wetting force improvement relative to heat control; therefore delivering the best thermal protection relative to other technologies.

### Wetting Force Improvement Relative to Heat-Treated Control (%)



## Thermal Protection Spray 2359-15.C

Designed to work with a flat iron, curling iron or blow dryer, this pre-treatment spray contains DynamX® H<sub>2</sub>O polymer to protect the hair from the damaging effects of heat while also providing hold leaving hair with a smooth, shiny and healthy appearance.

TRADE NAME, SUPPLIER	INCI NAME	% W/W
DynamX® H <sub>2</sub> O Polymer (25% Solids), AkzoNobel Surface Chemistry	Polyurethane-14 (and) AMP-Acrylates Copolymer	10.00%
Deionized Water	Water (Aqua)	88.84%
Dow Corning 193 Surfactant, Dow Corning Corp.	PEG-12 Dimethicone	0.10%
Arquard® SV-60 PG Conditioning Agent (60% active), AkzoNobel Surface Chemistry	Soytrimonium Chloride (and) Propylene Glycol	0.41%
DC 245, Dow Corning Corp.	Cyclomethicone	0.15%
Glydant, Lonza	DMDM Hydantoin	0.50%
Total:		100.00%

### PROCEDURE

1. Weigh all of the water into a mixing vessel. Using an overhead mixer at 400 rpm add each ingredient, mixing thoroughly after each additional until homogenous.
2. Filter and fill containers.

### PROPERTIES

Appearance	Water thin liquid
Clarity	Slight haze
pH	7.75 - 8.75



## Transforming Wax Paste 2359-6B.3

TRADE NAME, SUPPLIER	INCI NAME	% W/W
<b>Phase A</b>		
Deionized Water	Water (Aqua)	40.15%
<b>STRUCTURE® XL Starch, AkzoNobel Surface Chemistry</b>	<b>Hydroxypropyl Starch Phosphate</b>	<b>5.00%</b>
<b>FLEXAN® II Polymer, AkzoNobel Surface Chemistry</b>	<b>Sodium Polystyrene Sulfonate</b>	<b>1.35%</b>
Propylene Glycol	Propylene Glycol	2.00%
<b>Phase B</b>		
Solulan™ C-24, Lubrizol Advanced Materials, Inc.	Choleth-24 (and) Ceteth-24	2.25%
Protalan Wax, Protameen Chemicals, Inc.	Lanolin Wax	8.00%
Drakeol® 7 LT, Penreco	Mineral Oil	2.50%
Drakeol® 35, Penreco	Mineral Oil	3.50%
Ceraphyl® 368, ISP	Ethylhexyl Palmitate	3.25%
Ultrapure SC White Petrolatum, Ultra Chemical Inc.	Petrolatum	8.00%
Promulgen™ D, Lubrizol Advanced Materials, Inc.	Cetearyl Alcohol (and) Ceteareth 20	5.00%
Refined #1 Yellow Carnauba Wax, Frank B. Ross Co.	Copernicia Cerifera (Carnauba) Wax/Cera Carnauba/Cire De Carnauba	2.50%
Super Hartolan, Croda, Inc.	Lanolin Alcohol NF	2.50%
DC 556 Fluid, Dow Corning Corp.	Phenyl Trimethicone	1.00%
<b>Phase C</b>		
<b>DynamX® H<sub>2</sub>O Polymer, (25% Solids), AkzoNobel Surface Chemistry</b>	<b>Polyurethane-14 (and) AMP-Acrylates Copolymer</b>	<b>12.00%</b>
Germaben® II, ISP	Propylene Glycol (and) Diazolidinyl Urea (and) Methylparaben (and) Propylparaben	1.00%
<b>Total:</b>		<b>100.00%</b>

This product provides strong hold, high gloss and texture. It contains DynamX® H<sub>2</sub>O, FLEXAN® II, and STRUCTURE® XL polymers for strong hold and control. It is suitable for use on wet or dry hair, and features excellent control and style definition.

### PROCEDURE

1. To prepare Phase A, charge mixing vessel with water. While maintaining moderate overhead agitation, add STRUCTURE® XL starch. Once dispersed add the FLEXAN® II polymer. Once the polymer is in solution add the propylene glycol. Very slowly add the sodium hydroxide, where the solution will thicken. Mix until Phase A is homogeneous. Cover and heat to 80°C while mixing.
2. For Phase B, mix all the ingredients in a separate mixing vessel, and heat to 80°C. Add the Carnauba wax just prior to mixing with Phase A (temperature greatly increases the color if heated too long). Add Phase B to Phase A very slowly, and reduce agitation. Mix until homogeneous and hold at 80°C for 5 minutes. Turn off the heat and allow to cool while mixing at low speed.
3. For Phase C, allow the batch to cool to 60° C, add DynamX® H<sub>2</sub>O and mix until homogeneous. At 50°C add the Germaben II. Mix and pour off into containers as soon as possible.

### PROPERTIES

Appearance Off-white, creamy solid





**We're taking  
styling beyond  
hairspray.**

**Curl Defining Aerosol Mousse**  
**6% VOC**  
**14590-36.B4**

The flexible and long-lasting hold properties of DynamX® H<sub>2</sub>O polymer are featured in a creamy, luxurious mousse. This product provides curl definition, volume control and manageability. The addition of CELQUAT® L-200 polymer to the formulation provides a soft, conditioned hair feel and improved manageability.

TRADE NAME, SUPPLIER	INCI NAME	% W/W
<b>Phase A</b>		
Deionized Water	Water (Aqua)	82.70%
<b>CELQUAT® L-200 Polymer, AkzoNobel Surface Chemistry</b>	<b>Polyquaternium-4</b>	<b>0.35%</b>
<b>DynamX® H<sub>2</sub>O Polymer (25% Solids), AkzoNobel Surface Chemistry</b>	<b>Polyurethane-14 (and) AMP-Acrylates Copolymer</b>	<b>10.00%</b>
Tergitol™ 15-7-S, Dow Chemical	C11-15 Pareth-7	0.25%
<b>Ethoquad® O/12 PG Conditioning Agent, AkzoNobel Surface Chemistry</b>	<b>PEG-2 Oleammonium Chloride (and) Propylene Glycol</b>	<b>0.20%</b>
Glydant Plus (liquid), Lonza	DMDM Hydantoin (and) Iodopropynyl Butylcarbamate	0.50%
<b>Phase B</b>		
A-46	Isobutane (and) Propane	6.00%
<b>Total:</b>		<b>100.00%</b>

**PROCEDURE**

1. To prepare Phase A, weigh all the deionized water into a mixing vessel. Using an overhead mixer at moderate agitation (500 rpm), slowly sift in the CELQUAT® L-200 polymer into the vortex. Once completely in solution, reduce speed to 200 rpm, add the remaining ingredients and mix until homogeneous.
2. Filter and fill with a ratio of 94:6 concentrate: propellant A-46

**PROPERTIES**

pH 7.5 - 8.5



## Curl Control and Hydrating Cream 14590-33.E

This creamy emulsion features high level of conditioning and hydrating ingredients and provides curl control, definition, and moisturization. Arquad® 16-29 quaternary ammonium compound provides improved wet comb properties. DynamX® H<sub>2</sub>O polymer gives excellent anti-frizz and volume control, while taming the most unruly curly hair. Helps curls to look and feel their best all day long.

TRADE NAME, SUPPLIER	INCI NAME	% W/W
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### Phase A

Deionized Water	Water (Aqua)	90.41%
<b>STRUCTURE® ZEA Starch, AkzoNobel Surface Chemistry</b>	<b>Hydroxypropyl Starch Phosphate</b>	<b>2.00%</b>
<b>DynamX® H<sub>2</sub>O Polymer (25% Solids), AkzoNobel Surface Chemistry</b>	<b>Polyurethane-14 (and) AMP-Acrylates Copolymer</b>	<b>2.00%</b>

### Phase B

Crodacol™ CS-50, Croda, Inc.	Cetearyl Alcohol	2.20%
Incropol™ CS-20, Croda, Inc.	Ceteareth-20	0.30%
Incroquat Behenyl TMS (25.0% / 75.0%), Croda, Inc.	Behentrimonium Methosulfate (and) Cetearyl Alcohol	1.00%

### Phase C

<b>Arquad® 16-29 Conditioning Agent (29% active), AkzoNobel Surface Chemistry</b>	<b>Cetrimonium Chloride</b>	<b>0.79%</b>
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### Phase D

DC 1664 Emulsion, Dow Corning Corp.	Dimethicone (and) Laureth-4 (and) Laureth-23	1.00%
Glydant, Lonza	DMDM Hydantoin	0.30%
<b>25% Citric Acid Solution, AkzoNobel Surface Chemistry</b>	<b>Citric Acid (and) Water</b>	<b>q.s. to pH 6.5-7.5</b>
<b>Total:</b>		<b>100.00%</b>

### PROCEDURE

1. To prepare Phase A, weigh all the water into a mixing vessel. Using an overhead mixer at 500 rpm, slowly sift the STRUCTURE® ZEA polymer into the vortex. Once dispersed, add the DynamX® H<sub>2</sub>O polymer. Reduce speed to 200 rpm and heat to 80°C.
2. In a separate vessel, combine all of the components in Phase B and heat to 80°C with mixing. Add Phase B to Phase A and mix well, while maintaining temperature.
3. Add Phase C and mix at temperature for 15 minutes. Cool to 40-45°C with continued mixing and add Phase D ingredients one component at a time.
4. Cool to room temperature with mixing. Adjust pH if necessary. Fill containers.

### PROPERTIES

Appearance	White to Off-white
pH	6.5 - 7.5
Viscosity* (cps)	27,000 - 30,000

\*Brookfield Heliopath, Spindle #T-C / 10 rpm



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