Ultra smooth Amino-terminated Siloxane

DX-1708 & 1709

Leslie Li
Mabel Zhang

International Sales
International Sales

GUANGZHOU DX CHEMICAL CO., LTD.
Company Profile

Founded in 1994, Guangzhou DX Chemical Co., Ltd is one of the leading pioneers in researching and manufacturing cosmetics raw material. After 20 years of persistent exploration and innovation, in accordance with our principle “On Demand, Value Innovation.” DX Chemical has developed into a fine chemical raw material manufacturer with annual output of over 30,000MT. With constant product structure optimization, our products cover a wide range of Excellent Emulsifier, High Polymer Silicone Oil, Cationic Copolymer, Mild Surfactant, Acrylates Copolymer (Carbomer Resin and Hair Styling Gel), etc.

Our products are generally applied in shampoo, hair conditioner, skin care products, hair styling gel and color cosmetics. While the domestic market is thriving and prosperous, we keep on working hard to bring DX Chemical to the international market since 2008, now, DX Chemical products are popular in more than 20 nations and regions.

Under the new market environment of this new era, DX Chemical commits to provide all customers with high-quality products and first-rate service as always.
Market Demand

Star brands in personal care products like: Pantene, Rejoice, L’ Oreal, Lux and Dove launch upgraded hair conditioner, hairdressing treatment and shampoo products. Among these products, key ingredient which gives hair smooth and fullness effects is the advanced version of amino silicone polymer---

**Amodimethicone & Bis-Aminopropyl Dimethicone**
Amino group has strong polarity, can interact with hydroxyl and carboxyl on hair surface, brings very good orientation and absorption property, a smooth and solid film formed on the hair.

Amodimethicone Advantage 1
Amodimethicone Advantage 2

Excellent shear stability, no change of color and luster, improve hair elasticity, softness and wearability
Repair damaged hair, excellent conditioning and sedimentation performance. Gives hair moist, smooth, soft and fluffy feeling, improves hair wet and dry combing properties, reduce static.
Bis-amino structure DX-1709 has particular smooth verticality performance, makes hair easy to comb.
INCI Name & CAS No

DX-1708: Amodimethicone

DX-1709: Bis-Aminopropyl Dimethicone

106214-84-0
## Technical Data

<table>
<thead>
<tr>
<th>Item/ Spec</th>
<th>DX-1708</th>
<th>DX-1709</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Colorless to light yellow viscous liquid</td>
<td></td>
</tr>
<tr>
<td>mPa.s Viscosity</td>
<td>5,000~15,000</td>
<td>50,000~200,000</td>
</tr>
<tr>
<td>Amine Value , %</td>
<td>0.2~0.5</td>
<td>≤0.2</td>
</tr>
<tr>
<td>Refractive Index 25℃</td>
<td>1.4000~1.4100</td>
<td></td>
</tr>
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</table>
## Characteristics of Amino Silicone Oil

<table>
<thead>
<tr>
<th>Spec</th>
<th>Softness</th>
<th>Elastic (Fullness)</th>
<th>Smooth</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Amine Value</strong></td>
<td>Higher Amine Softer</td>
<td>Higher amine Better elastic</td>
<td>Lower amine, Smoother</td>
</tr>
<tr>
<td><strong>Viscosity</strong></td>
<td>No obvious impact</td>
<td>Higher viscosity, Better elastic</td>
<td>Higher viscosity, Smoother</td>
</tr>
</tbody>
</table>
Conclusion: Higher Amine value, softer
Amine Value vs Elastic

Conclusion: Higher Amine value, better elastic
Conclusion: Lower Amine value, smoother
Viscosity vs Elastic

Conclusion: Higher viscosity, better elastic
Viscosity vs Smooth

Conclusion: Higher viscosity, smoother
Application

1. Application Range: hair conditioner, hairdressing treatment, shampoo, hair dye, etc.

2. Suggested Dosage: 0.5~5.0%.

3. Application Method:
   A. Due to the high viscosity of DX-1709, it’s not easy to emulsify when used directly. So when used in hair care products, we advise to pre-disperse Dx-1709 with Cyclopentasiloxane or low-viscosity silicone oil. When used in shampoo, the above method is not applicable.
   B. When used in hair care products, heat oil phase to 70-80℃, add amino silicone oil into completely melt oil phase. Mix with water phase, emulsify or dilute with low-viscosity silicone oil. Avoid over-heating.
   C. When used in shampoo, the viscosity of ordinary system gradually decreases, should adjust formulation to keep it stable.
Precaution

Due to its strong moisture-absorbing ability, it absorbs vapor in the air. Thus its appearance will gradually become translucent, sometimes with cloudiness. It is characteristic feature of this product, which does not affect physical and chemical features nor usage of the product.
# Formulation: Silky Hair Conditioner

<table>
<thead>
<tr>
<th>S/N</th>
<th>Ingredient</th>
<th>Dosage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Cetearyl Alcohol</td>
<td>6.0</td>
</tr>
<tr>
<td></td>
<td>Cetyl Trimethyl Methyl Sulfate S-1632</td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td>Amodimethicone DX-1708</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>DimethiconeDX-350 ( 350 Cst )</td>
<td>1.0</td>
</tr>
<tr>
<td>B</td>
<td>Glycerium</td>
<td>2.0</td>
</tr>
<tr>
<td></td>
<td>Deionized Water</td>
<td>Add to 100%</td>
</tr>
<tr>
<td>C</td>
<td>Preservative</td>
<td>q.s</td>
</tr>
<tr>
<td></td>
<td>Fragrance</td>
<td>q.s</td>
</tr>
</tbody>
</table>

**Operating Procedure:**
Heat A and B separately to 80~85°C, keep good stirring speed, add B slowly into A, homogenize 1~3 minutes. Cool system down to 45~50°C while stirring, add C, stir well.
# Formulation: Deep Repair Hairdressing

<table>
<thead>
<tr>
<th>S/N</th>
<th>Ingredient</th>
<th>Dosage</th>
<th>S/N</th>
<th>Ingredient</th>
<th>Dosage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Cetearyl Alcohol</td>
<td>6.0</td>
<td>B</td>
<td>Glycerium</td>
<td>3.0</td>
</tr>
<tr>
<td></td>
<td>Cetyl Trimethyl Methyl Sulfate S-1632</td>
<td>1.5</td>
<td></td>
<td>Cationic Cellulose JR-400</td>
<td>0.3</td>
</tr>
<tr>
<td></td>
<td>Bis-Aminopropyl Dimethicone DX-1709</td>
<td>2.0</td>
<td></td>
<td>Deionized Water</td>
<td>Add to 100%</td>
</tr>
<tr>
<td></td>
<td>Dimethicone DX-350 (350 Cst)</td>
<td>1.0</td>
<td>C</td>
<td>Preservative</td>
<td>q.s</td>
</tr>
<tr>
<td></td>
<td>PEG-100 Stearate/ Glyceryl Stearate DX-165</td>
<td>1.0</td>
<td></td>
<td>Fragrance</td>
<td>q.s</td>
</tr>
<tr>
<td></td>
<td>Oil Soluble Silicone Wax DX-2503</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Operating Procedure:**
Heat A to 80~85℃. Dissolve JR-30M in water, add other ingredients, stir and heat to 80~85℃, keep a steady stirring speed. Add B slowly into A, homogenize 1 minute. Stir to cool down to 45~50℃. Add C, stir well.
Amodimethicone Examples of Application In The Market

Conditioner
Hair dressing treatment
Essence spray
Shampoo
Hair Conditioner

Maetro Repair Therapy Hair Conditioner

Product Ingredients:
Water, Stearyl Alcohol, Dimethicone, Behentrimonium Chloride, Cetyl Alcohol, Amodimethicone, Stearyl Dihydroxypropyldimonium Oligosaccharides, Hydrolyzed Keratin, Cyanocobalamin, PPG-3 Octyl Ether, Trideceth-10, CTAC, Methyl Chloride Isobutyl Thiazolinone, MIT, Benzyl Alcohol, Fragrance.
L’OREAL - Multiple Repair Moisturizing Hair Conditioner

Product Ingredients:
Water, Cetyl Alcohol, Amodimethicone, Fragrance, Limonene, CI19140, Behentrimonium Chloride, Hydroxyethyl Cellulose, Methylpropional, Chlorhexidine Dihydrochloride, Dipalmitoylethyl Hydroxyethylmonium Methosulfate, CTAC, 2-oleamide-1, 3-Octodecanediol, Trideceth-6, Methylparaben, Cetostearyl Alcohol, Hexylcinnamaldehyde, Myristyl Alcohol, Benzyl Salicylate, Citric Acid, Linalool, Geraniol, Cetyl esters [1054783/B ; C33820/2]
Dove - Deep Damage Repair Hair Conditioner

**Product Ingredients:**
Water, SLES, Dimethiconol, CAB, NaCl, Hydrolyzed Keratin, Trehalose, Adipic Acid, Gluconic Acid Lactone, Sodium Sulfate, Amodimethicone, Panthenol, DMDMH, Lysine HCl, Fragrance, Citric Acid, NaOH, Guar Gum Hydroxypropyl Trimethyl Ammonium Chloride, Carbomer, CI77019, Ethylene Glycol Distearate, EDTA Tetrasodium, Methyl Chloride Isobutyl Thiazolinone, MIT, Hair Oil: Pure nutrients used to nourish hair (such as Dimethicone)
Hair Mask

PANTENE - Deep Nourish Hair Mask

Product Ingredients:
Water, Bis-Aminopropyl Dimethicone, Stearyl Alcohol, Behentrimonium Methosulfate, Cetyl Alcohol, Fragrance, Isopropanol, Benzyl Alcohol, EDTA Na, Panthenyl Ethyl Ether, Panthenol (provitamin), Lysine HCl, L-Tyrosine Ethyl HCl, Histidine, Chloride Isobutyl Thiazolinone, MIT
PROSERIES - Multiple Effect Moisturizing Hair Mask

Product Ingredients:
Water, Stearyl Alcohol, Bis-Aminopropyl Dimethicone, Behentrimonium Chloride, Cetyl Alcohol, Fragrance, Benzyl Alcohol, EDTA-Na, NaOH, Methyl Chloride Isobutyl Thiazolinone, MIT
PANTENE - Emulsion Repair Essence Spray

Product Ingredients:
Water, Glycerin, Amodimethicone, PEG-40 Hydrogenated Castor Oil, PPG-2 Methyl Ether, Benzyl Alcohol, PQ-11, Fragrance, Polysorbate-80, EDTA-Na, Aminomethyl Propanol, Citric Acid, Cetrimonium Chloride Ammonium, Trideceth-12, Panthenol, Panthenol Ethyl Ether, MIT
Shampoo

Dove - Deep Damage Repair Shampoo

Product Ingredients:
Water, SLES, Dimethiconol, CAB, NaCl, Hydrolyzed Keratin, Trehalose, Adipic Acid, Gluconic Acid Lactone, Sodium Sulfate, Amodimethicone, Panthenol, DMDMH, Lysine HCl, Fragrance, Citric Acid, NaOH, Guar Gum Hydroxypropyl Trimethyl Ammonium Chloride, Carbomer, CI77019, Ethylene Glycol Distearate, EDTA Tetrasodium, Methyl Chloride Isobutyl Thiazolinone, MIT, Hair Oil:
Pure nutrients used to nourish hair (such as Dimethicone)
LUX-Water embellish smooth soft shampoo

Product Ingredients:
Water, SLES, CAB, NaCl, Dimethiconol, Dimethicone, Amodimethicone, Collagen Amino Acids, Soluble Collagen, Fragrance, Glycine, Alanine, Valine, Tyrosine, Leucine, Ileucine, Serine, Threonine, Tspartic Acid, Thrutamic Acid, Arginine, Histidine, Phenylalanine, Proline, Tryptophan, Cystine, Methionine, Glutamine, Cysteine, Lysine HCl, Citric Ccid, Sodium Hydroxide, Carbomer, Guar Gum Hydroxypropyl Trimethyl Ammonium Chloride, EDTA Tetrasodium, Cocoamide MEA, Ethylene Glycol Distearate, CI77019, CI77891, CI47005, CI14700, CI42090, Phenoxyethanol, Methyl Chloride Isobutyl Thiazolinone, MIT, Silky Refresh Collagen, Coluble Collagen and Collagen Amino Acids
Facial Mask Foundation essence Formulation and Application
Facial Mask Maintenance Technology

• Facial mask maintenance technology comes from drug treatment, it is the rise of common skin care technology, this technology has become one of indispensable means of cosmetology. Mask is made of material and drug, a film layer formed on face, so it is called facial mask.

• Different compositions bring different function. In actual application, you need to choose according to individual skin type.
Function of Facial Mask

Facial mask has affinity with skin, gradually dry on face, skin temperature rise up, blood circulation speed up, accelerate metabolism and enhance ability of skin self-repair; also it makes skin taut and tension, skin secretion sebum and water stay inside the membrane, which are absorbed by cuticle, make skin soft, stretch, wrinkles disappear, pores open; open pores make nutrients in facial mask easy to be absorbed; meanwhile, due to the effect of adsorption, when removing the mask, aged cutin and dirt in pores are removed, make skin deep clean.
Classification of Facial Mask

According to product material, facial mask can be divided into the following categories:

A、Non-woven Facial Mask
B、Filling Facial Mask
C、Tearing Facial Mask
D、Paste Facial Mask
E、Freezing Gel Facial Mask
F、Foam Facial Mask
G、DIY Facial Mask
Introduction of Facial Mask

1. Non-woven wipes type facial mask
2. Foundation and moisturizing essence
3. Water Soluble Silicone Wax DX-2501
4. Hydrolyzed Collagen DX-2982
5. Facial Mask Excipient EMT-10
1. **Base Composition**: Non-woven (or silk) mask

2. **Main Composition**: Moisturizing essence

3. **Product Character**: After use facial mask, don't have to do any cleaning action. Lipid infusion and moisturizing ingredients mixed together in the wipes, feel like apply cream on face.

4. **Suitable User**: Various type of skin

5. **Contraindication**: Allergic or pyogenic skin

6. **Caution**: High moisturizing property, no risk.
Facial Mask Essence

I. Facial Mask Foundation Essence
Composition: water/Glycerin / Water Soluble Silicone Wax/ Hydrolyzed Collagen / Hydroxyethyl Acrylate & Sodium Acryloyl Dimethyl Laurate Copolymer.
Characteristic: Basic nursing type, skin moisture, Promote absorption of nutrition components, make skin smooth and shining!

II. Facial Mask Moisturizing Essence
Composition: Water/Glycerin / Water Soluble Silicone Wax/Hydrolyzed Collagen /Hyaluronic Acid/ Hydroxyethyl Acrylate & Sodium Acryloyl Dimethyl Laurate Copolymer.
Characteristic: Super moisturizing effect, make skin fresh and supple!
**Water Soluble Wax DX-2501**

Chemical Name: Bis-PEG-18 Methyl Ether Dimethyl Silane

**Characteristics:**
- Non-oily, light skinfeel, doesn’t clog the pores, let skin breathe freely.
- Good hydrating and complexion-brightening effects.
- Outstanding moisturizing and smoothing effect.
- Mildness can reduce irritation from surfactant.
After adding water soluble wax DX-2501

- Improve hydrophily of non-woven fabric.
- Increase essence absorption onto non-woven fabric.
- Shorten soaking time.

Comparison test of non-woven fabric absorption

<table>
<thead>
<tr>
<th>Sample</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-woven fabric base 5.06g</td>
<td>Non-woven fabric base 2.52g</td>
<td></td>
</tr>
<tr>
<td>deionized water</td>
<td>55</td>
<td>30</td>
</tr>
<tr>
<td>deionized water + 0.3% DX-2501</td>
<td>68</td>
<td>39</td>
</tr>
</tbody>
</table>

Test result: increase essence absorption onto non-woven fabric by 20% and above.
Facial mask essence ingredients 2

Hydrolyzed Collagen DX-2982

Chemical Name: hydrolyzed collagen
CAS No.: 83138-06-1

Characteristics:
• Deep moisturizing, absorbing and repairing
• Promote the rebirth of subcutaneous collagen
• Like absorbent sponge can keep skin moisturized and radiant.
Hydrolyzed collagen DX-2982’s benefits to skin

- Hydrating and moisturizing
- Brightening complexion
- Gives skin softness and radiant
- Repair damaged skin
- Stretch factor to tighten skin
- Slow down aging and reduce wrinkle
Facial mask essence excipient EMT-10

Chemical Name: Hydroxyethyl Acrylate/Sodium Acryloyldimethyl Aurate Copolymer

CAS No.: 111286-86-3

Characteristics:

1. Gives essence certain viscosity to better adhering to non-woven fabric.
2. Under room temperature, EMT-10 can disperse many fat and lipid infusion agent evenly, prolongs product shelf life. Solved the problem of Carbomer’s insufficient dispersing abilities as well as stabilizing effect.
Application instruction of excipient EMT-10

Only 0.1% dosage of excipient EMT-10 can disperse lipid infusion agent and thicken essence.
## Facial mask essence formulation 1

<table>
<thead>
<tr>
<th>S/N</th>
<th>Ingredient</th>
<th>INCI Name</th>
<th>Dosage %</th>
<th>Supplier</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Facial mask essence base</td>
<td>Glycerine / water soluble wax/hydrolyzed collagen/Hydroxyethyl Acrylate/ Sodium Acryloyldimethyl Aurate Copolymer</td>
<td>10.0</td>
<td>DX</td>
</tr>
<tr>
<td>2</td>
<td>Fragrance</td>
<td>q.s.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Preservative</td>
<td>Diazolidinyl urea/ IPBC</td>
<td>q.s.</td>
<td></td>
</tr>
</tbody>
</table>

**Formulation feature:**

This formulation contains facial mask foundation essence only, customers can add other ingredients based on their own wishes. Then can be processed as final product.
### Facial mask essence formulation 2

<table>
<thead>
<tr>
<th>S/N</th>
<th>Ingredient</th>
<th>Dosage%</th>
<th>Supplier</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Deionized water</td>
<td>Add to 100</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Glycerine</td>
<td>5.0</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Water soluble wax DX-2501</td>
<td>0.5</td>
<td>DX</td>
</tr>
<tr>
<td>4</td>
<td>Hydrolyzed collagen DX-2982</td>
<td>1.0</td>
<td>DX</td>
</tr>
<tr>
<td>5</td>
<td>hyaluronic acid HA</td>
<td>0.05</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Thickening emulsifier EMT-10</td>
<td>0.20</td>
<td>DX</td>
</tr>
<tr>
<td>7</td>
<td>Diazolidinyl urea/ IPBC</td>
<td>q.s.</td>
<td>DX</td>
</tr>
</tbody>
</table>

**Formulation feature:**

Easy to process, no need to heat. Outstanding hydrating and moisturizing effect, keep skin tight and radiant.
A facial mask a day,
You will look younger one year from now.

Indeed, facial mask is one of the most common and effective skin care products. It can subside wrinkles, moisturize skin, can also deep nourish skin to slow down aging.
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Thanks for your attention!

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