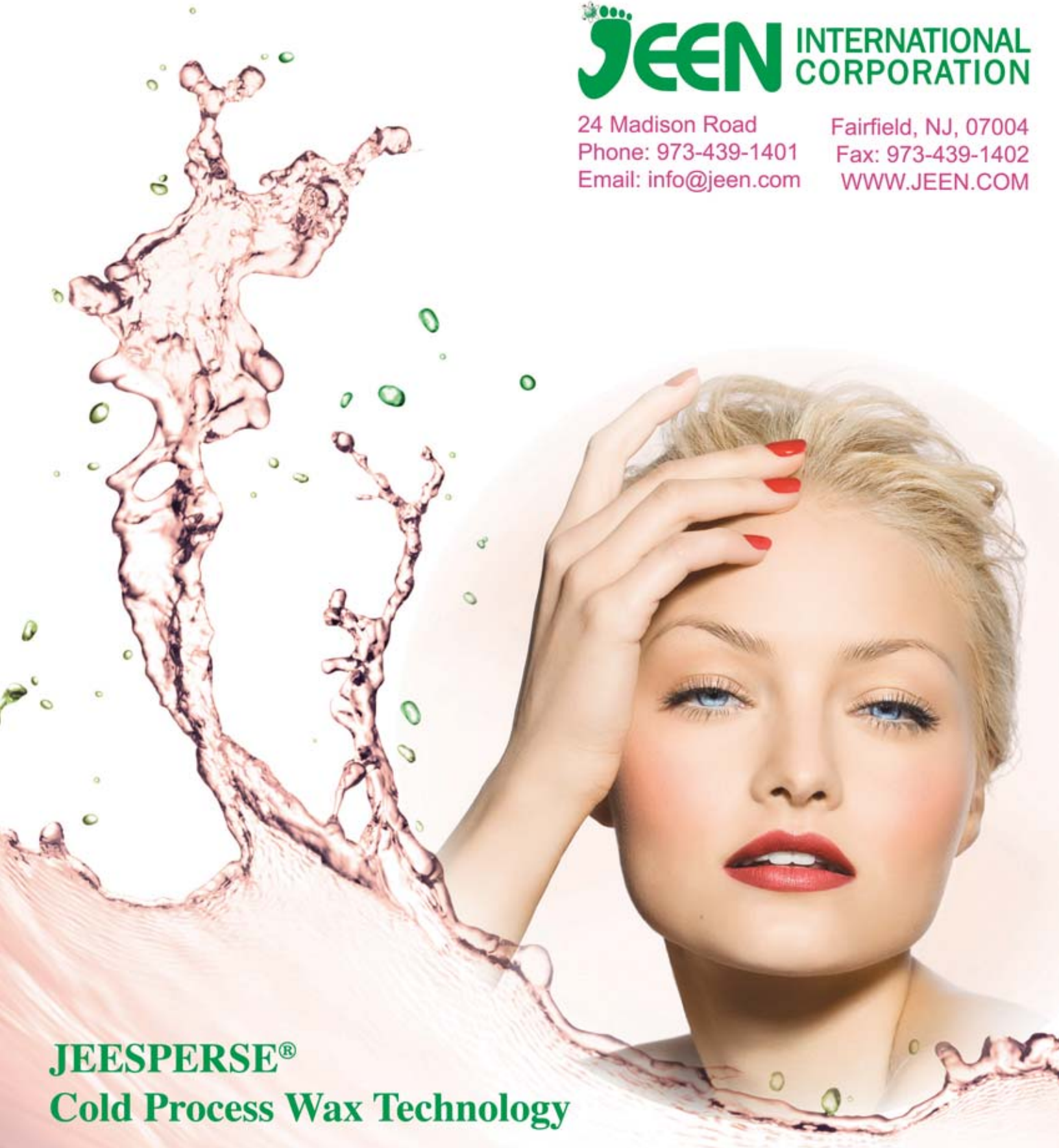
JEEN INTERNATIONAL CORPORATION

24 Madison Road
Fairfield, NJ, 07004
Phone: 973-439-1401
Fax: 973-439-1402
Email: info@jeen.com
WWW.JEEN.COM



JEESPERSE®
Cold Process Wax Technology

YOU CAN COUNT ON US!

Patented!

JEESPERSE® COLD PROCESS WAX TECHNOLOGY

JEEN International initially launched our now patented Cold Process Wax Technology in 2009. Since then, this breakthrough technology has evolved into a potent line up of traditional, specialty and natural waxes combined via the JEEN patented process with a variety of emulsifying ingredients to meet a wide range of formulating needs.

Technology Description

The Cold Process Wax Technology is built on the interaction of generally non-polar waxes with polar, emulsifying electrolytes. JEEN uniquely combines these ingredients into optimized powders that, when introduced into water at room temperatures, rapidly form stable emulsions typically eliminating the need for traditional emulsifiers and allowing the addition of waxes into the system without heating. The resulting formulations provide exceptional aesthetics, formulator flexibility and related benefits to creams, lotions and hair care products.

The chemistry of the technology is elegantly simple: polarity is induced in the oil phase by the highly polar electrolytes through JEEN's patented process. The resulting powdered blends disassociate in water causing an electrostatic charge which creates repulsion between the moieties. It is this repulsion that creates the thickening and stability attributes associated with polyelectrolytes.

Technology Features and Benefits

Formulating

Since formulations can be developed without the traditional heating and cooling steps, bench time can be minimized and a greater number of formulations produced. Since a "cooling rate" is not necessary, there is greater control over the final formulation viscosity. Additionally, heat-sensitive active ingredients and volatile oils can be formulated without impact on their activity or flash points since heating is not involved.

Manufacturing

Due to its nature, key benefits of cold processing include energy cost savings, reduction in water usage and overall manufacturing production time savings. The result is more

batches can be produced—typically in just one vessel—leading to improved plant efficiency. Eliminating the traditional two-phase heating/cooling cycles to produce hot process emulsions has obvious and immediate benefits within the plant.

Sustainability

The sustainable, green focus of the JEEN Cold Process Wax Technology has been recognized by the United States Environmental Protection Agency as one of the first technologies to be expedited through their Green Initiatives patent process. This continues the advanced, green technology tradition at JEEN International. As noted above, this allows formulators to choose instant cold process emulsions to improve their carbon footprint as well as streamline their manufacturing processes.

JEESPERSE® Cold Process Wax Technology Product Lines

JEESPERSE® ICE-T™

The most recent advances with the patented JEEN cold process waxes have been made under the JEESPERSE® Instant Cold Emulsion Technology (ICE-T™) product line. These unique blends include the most frequently used emollients and aesthetic modifiers in the industry and deliver multi-level benefits for texture development, enhanced stabilization and the ability to formulate creative profiles. Future advances in the JEEN cold process wax development such as actives incorporation and increased salt tolerance will be launched under the JEEPSERSE ICE-T product umbrella.

The current lineup includes the following series of products. Specific components as well as further details can be found in the JEESPERSE ICE-T Product Selection Chart.

National Brand Equivalent Series

JEESPERSE ICE-T AJ
JEESPERSE ICE-T EUC-DRL
JEESPERSE ICE-T LB980
JEESPERSE ICE-T LDERM
JEESPERSE ICE-T VICL-C-A
JEESPERSE ICE-T VICL-OAT
JEESPERSE ICE-T VICL-OAT-21

Emulsifying Wax Series

JEESPERSE ICE-T 5LP
JEESPERSE ICE-T CARB-1
JEESPERSE ICE-T GCS
JEESPERSE ICE-T GCS-10
JEESPERSE ICE-T GCS-21
JEESPERSE ICE-T LB-21
JEESPERSE ICE-T LB-T
JEESPERSE ICE-T LB-T-NS
JEESPERSE ICE-T P100S
JEESPERSE ICE-T P100S-21
JEESPERSE ICE-T P100S-T

Hair Conditioning Series

JEESPERSE ICE-T-C GARN
JEESPERSE ICE-T-C-PANT

JEESPERSE® CPW

The initially launched products and workhorses of the patented JEEN cold process waxes fall under the JEESPERSE® Cold Process Wax (CPW) line. This extensive and versatile line is organized into several series of products as follows ranging from those containing traditional waxes to emulsifying and specialty waxes to fully natural waxes.

The current lineup includes the following series of products. Specific components as well as further details can be found in the JEESPERSE CPW Product Selection Chart at the end of this brochure.

Conventional Wax Series

JEESPERSE CPW-2
JEESPERSE CPW-3
JEESPERSE CPW-5
JEESPERSE CPW-PE126A
JEESPERSE CPW-B
JEESPERSE CPW-BC
JEESPERSE CPW-S
JEESPERSE CPW-S-T
JEESPERSE CPW CARNAUBA MASCARA

Emulsifying Wax Series

JEESPERSE CPW-SG2020LV
JEESPERSE CPW-P
JEESPERSE CPW-P934-LP
JEESPERSE CPW-P940-LP
JEESPERSE CPW-EW-1LP
JEESPERSE CPW-CG-02
JEESPERSE CPW-CG-T-02

Specialty Wax Series

JEESPERSE CPW-2
CROSSPOLYMER-G-02
JEESPERSE CPW-CG
CROSSPOLYMER-G-02
JEESPERSE CPW-2 PVPK-30

Natural Wax Series

JEESPERSE CPWN
SUNCARRA
JEESPERSE CPWN
NaALGIN

Formulating with JEESPERSE® Cold Process Wax Technology Products

Incorporation Approaches

Depending upon the JEESPERSE product selected, add the appropriate level—typically between 5 to10%—of the material to water while mixing. As the product disperses, mixing speed should be increased. Using the specific JEESPERSE product chosen and incorporation level, the viscosity of the emulsions formed range widely from 500 to over 500,000 cps.

Note that 1 to 4% of any JEESPERSE product can be added to existing formulations to increase viscosity or increase the number of attributes such as texture. This approach is

often used to enhance the performance of various skin, hair, sunscreen, color and related formulations.

We have found that the most efficient way to "activate" the JEESPERSE cold process technology products is to add the formulation aqueous phase components, the JEESPERSE powder and oil phase components in steps as follows:

- Begin with one-third to one-half of the water in the formulation to the mix tank.
- With the mixer on (a wide sweeping blade is best), gradually sprinkle the JEESPERSE powder into the mix tank.
- As the JEESPERSE powder is added, a gel matrix will start to form with a thick, pasty look—this is expected.
- Gradually add the oil phase components. This will start to smooth out formulation from the initial look.
- Continue to mix, gradually adding the remaining water to further smooth the consistency and maintain a workable viscosity.
- Add the remaining water phase components and mix until a uniform texture is obtained. The formulation is now ready for packaging.

The above incorporation approach is effective since it allows the JEESPERSE particles to be in close proximity, thus increasing "collisions" with each other when initially dispersed in water. The large number of collisions results in significant grinding of the wax particles increasing the polymer/electrolyte exposure to the water. When the oil phase components are added, this further incorporates the wax into the system smoothing out the resulting formulation.

Further information and instructive videos regarding incorporation approaches can be accessed on the Jeen website at www.jeen.com .

Formulating Tips

If heat is typically required for your formulations to incorporate non-wax ingredients, using JEESPERSE allows for lower manufacturing temperatures. The use of high heat to melt typical waxes is no longer needed, as JEESPERSE works at any temperature.

Using a higher level of JEESPERSE will yield a higher viscosity "hydrogel" which may require higher mixing speeds or homogenization to fully disperse the gel. To fully disperse the wax, it is important to "keep the gel moving" to enhance incorporation. Adding oil before the JEESPERSE is completely dispersed can also help eliminate any white particles or globules that might appear during lab batches.

Water dispersible gums can be used in JEESPERSE "hydrogels" since materials such as xanthan and cellulosic gums can be used to change the texture and feel of the finished formulation.

Addition of hydrophilic and/or lipophilic phases can reduce the viscosity of the Conventional Wax series of JEESPERSE products. Conversely, viscosity can increase with the addition of these ingredients to the Emulsifying Wax series products.

Several JEESPERSE products contain stearic acid and/or carbomer which requires neutralization. The neutralizer should be mixed in the water before the addition of the JEESPERSE. This will allow viscosity to build faster than adding neutralizer later in the formulating process.

JEESPERSE products are compatible with most "oil phase" ingredients such as silicone oils, silicone gums, natural oils, esters and synthetic oils. Any insolubility will correlate directly to the polyelectrolyte present in the product. For example, sodium polyacrylate does not tolerate a significant percentage of electrolyte—therefore, neither will the JEESPERSE products containing sodium polyacrylate.

Formulating issues may arise when ingredients which disrupt the gelling properties of the polyelectrolyte are used. For example, sodium polyacrylates do not work best in acidic conditions.

As with any emulsion, higher levels of oil may require the addition of an emulsifier. Since the JEESPERSE products are comprised of primarily waxes, these need to be taken into account when calculating the oil phase level used in the emulsion. Note that the addition of a liquid emulsifier of your choice will have increase viscosity and likely change the texture/feel of the finished formulation.

To evaluate multiple formulations quickly, try our rapid laboratory development plan to save bench time:

- Mix a kilogram of the JEESPERSE product of choice in water.
- Split the batch into twenty 50 gram samples.
- Add any ester, natural oil, silicone oil, silicone polymers or other ingredients to the samples as desired.
- You now have 20 samples that can be evaluated for texture, feel and even stability.
- Evaluate the ingredients individually or as blends.

JEESPERSE® ICE-T™ Product Selection Chart

**Viscosity is at 5% in aqueous solution unless otherwise noted. Measured in centipoise with Spindle T-B @ 10 rpm at room temperature.*

***Recommended formulation pH range for the product. See Technical Bulletin for the specific product for further details.*

Product	Waxy Components	Polymer	Viscosity Range*	pH Range**
National Brand Equivalent Series				
Jeesperse ICE-T AJ	Stearic Acid, Cetearyl Alcohol, Ceteareth-20, Cetyl Esters Wax, Theobroma Cacao (Cocoa)Seed Butter, Shea (Butyrospermum Parkii) Butter	Carbomer	60,000 – 70,000	5.0 – 8.0
Jeesperse ICE-T-EUC-DRL	Glyceryl Stearate (and) PEG-100, Stearate, Stearic Acid, Cetearyl Alcohol, Lanolin Alcohol	Carbomer	70,000 – 80,000	5.0 – 8.0
Jeesperse ICE-T-LB980	Cetyl Alcohol, Glyceryl Stearate, Glycol Stearate, Stearic Acid	Carbomer	81,000 – 84,000	5.0 – 8.0
Jeesperse ICE-T-LDERM	Cetearyl Alcohol, Stearic Acid, Ceteareth-20, Cetyl Alcohol	Carbomer		5.0 – 8.0
Jeesperse ICE-T-VICL-C-A	Stearic Acid (Triple Pressed) NF, Glycol Stearate, Stearamide AMP, Glyceryl Stearate, Cetyl Alcohol	Carbomer	75,000 – 80,000	5.0 – 8.0
Jeesperse ICE-T-VICL-C-OAT	Stearic Acid (Triple Pressed) NF, Glyceryl Stearate, Cetyl Alcohol	Carbomer	22,000 – 50,000 (3-10%)	5.0 – 8.0
Jeesperse ICE-T-VICL-C-OAT-21	Stearic Acid (Triple Pressed) NF, Glyceryl Stearate, Cetyl Alcohol	Acrylates/ C10-30 Alkyl Acrylate Crosspolymer	TBD	5.0 – 8.0
Emulsifying Wax Series				
Jeesperse ICE-T 5LP	Cetearyl Alcohol, Stearic Acid Ceteareth-20	Sodium Polyacrylate	14,000 – 20,000	5.0 – 9.0
Jeesperse ICE-T CARB-1	Cetyl Alcohol, Glyceryl Stearate, Stearic Acid, Glycol Stearate	Carbomer	11,000 – 42,000 (3-10%)	5.0 – 8.0
Jeesperse ICE-T-GCS	Cetearyl Alcohol, Stearic Acid, Glyceryl Stearate, PEG-100 Stearate	Sodium Polyacrylate	8,000 – 13,000	5.0 – 9.0
Jeesperse ICE-T-GCS-10	Cetearyl Alcohol, Stearic Acid, Glyceryl Stearate, PEG-100 Stearate	Carbomer	TBD	5.0 – 8.0
Jeesperse ICE-T-GCS-21	Stearic Acid, Cetearyl Alcohol Glyceryl Stearate (and) PEG-100 Stearate	Acrylates/C10-30 Alkyl Acrylate Crosspolymer	TBD	5.0 – 8.0
Jeesperse ICE-T LB21	Cetyl Alcohol, Glyceryl Stearate, Stearic Acid, Glycol Stearate	Acrylates/C10-30 Alkyl Acrylate Crosspolymer	18,000 – 39,000 (3-10%)	5.0 – 8.0
Jeesperse ICE-T LB-T	Cetyl Alcohol, Glyceryl Stearate, Stearic Acid, Glycol Stearate	Sodium Acrylate/Sodium Acryloyl Dimethyl Taurate Copolymer	38,000 – 66,000 (3-10%)	4.0 – 9.0
Jeesperse ICE-T-LB-T-NS	Cetyl Alcohol, Glyceryl Stearate, Glycol Stearate, Caprylic/Capric Triglyceride	Sodium Acrylate/Sodium Acryloyl Dimethyl Taurate Copolymer	59,000 – 90,000 (3-10%)	4.0 – 9.0

Jeesperse ICE-T P100S	PEG-100 Stearate	Sodium Polyacrylate	TBD	5.0 – 9.0
Jeesperse ICE-T P100S-21	PEG-100 Stearate	Acrylates C10-30 Alkyl Acrylate Crosspolymer	TBD	5.0 – 8.0
Jeesperse ICE-T P100S-T	PEG-100 Stearate	Sodium Acrylate/Sodium Acryloyl Dimethyl Taurate Copolymer	TBD	4.0 – 9.0
Hair Conditioning Series				
Jeesperse ICE-T-C-GARN	Cetearyl Alcohol, Behenyl Trimonium Chloride, Stearamidopropyl Dimethylamine	Hydroxypropyl Guar	9,000 – 17,000	4.0 – 8.0
Jeesperse ICE-T-C-PANT	Cetyl Alcohol, Behenyl Trimonium Chloride, Stearamidopropyl Dimethylamine, Stearyl Alcohol, Cetearyl Alcohol, Polysorbate 60, Glyceryl Stearate	Hydroxypropyl Guar	22,000 – 35,000	4.0 – 8.0

JEESPERSE® CPW Product Selection Chart

**Viscosity range is from 3% to 10% in aqueous solutions unless otherwise noted. Measured in centipoise with Spindle T-B @ 10 rpm at room temperature.*

***Recommended formulation pH application range for the product. See Technical Bulletin for the specific product for further details.*

Product	Waxy Components	Polymer	Viscosity Range*	pH Range**
Conventional Wax Series				
Jeesperse CPW-2	Polyethylene	Sodium Polyacrylate	35,000 – 100,000	5.0 – 9.0
Jeesperse CPW-3	Polyethylene	Sodium Polyacrylate	55,000 – 125,000	5.0 – 9.0
Jeesperse CPW-5	Polyethylene	Sodium Polyacrylate	65,000 – 130,000	5.0 – 9.0
Jeesperse CPW-PE-126A	Polyethylene	Sodium Polyacrylate	15,000 – 65,000	5.0 – 9.0
Jeesperse CPW-B	Beeswax Yellow	Sodium Polyacrylate	18,000 – 78,000	5.0 – 9.0
Jeesperse CPW-BC	Beeswax Yellow, Theobroma Cacao (Cocoa) Seed Butter	Sodium Polyacrylate	18,000 – 78,000	5.0 – 9.0
Jeesperse CPW-S	Helianthus Annus (Sunflower) Seed Wax	Sodium Polyacrylate	17,000 – 85,000	5.0 – 9.0
Jeesperse CPW-S-T	Helianthus Annus (Sunflower) Seed Wax	Sodium Acrylate/Sodium Acryloyl Dimethyl Taurate Copolymer	30,000 – 95,000	4.0 – 9.0
Jeesperse CPW Carnauba Mascara	Copernicia Cerifera (Carnauba) Wax	Sodium Polyacrylate	24,000 – 27,000 (5% only)	5.0 – 9.0
Emulsifying Wax Series				
Jeesperse CPW-SG2020LV	Cetearyl Alcohol, Ceteareth-20, Glyceryl Monostearate, Stearic Acid,	Acrylates/C10-30 Alkyl Acrylate Crosspolymer	700 – 4,800	5.0 – 8.0
Jeesperse CPW-P	Cetearyl Alcohol, Polysorbate 60	Sodium Polyacrylate	53,000 – 110,000	5.0 – 9.0
Jeesperse CPW-P934-LP	Cetearyl Alcohol, Polysorbate 60	Carbomer	TBD	5.0 – 8.0
Jeesperse CPW-P940-LP	Cetearyl Alcohol, Polysorbate 60	Carbomer	TBD	5.0 – 8.0
Jeesperse CPW-EW1LP	Stearic Acid, Ceteareth-20, Cetearyl Alcohol	Sodium Polyacrylate	5,000 – 40,000	5.0 – 9.0
Jeesperse CPW-CG-02	Cetearyl Alcohol, Glyceryl Stearate, Polysorbate 80, Caprylic/Capric Triglyceride	Sodium Polyacrylate	25,000 – 62,000	5.0 – 9.0
Jeesperse CPW-CG-T-02	Cetearyl Alcohol, Glyceryl Stearate, Polysorbate 80, Caprylic/Capric Triglyceride	Sodium Acrylate/Sodium Acryloyl Dimethyl Taurate Copolymer	12,000 – 59,000	4.0 – 9.0
Specialty Wax Series				
Jeesperse CPW-2 CROSSPOLYMER-G-02	Polyethylene, Dimethicone/Divinyldimethicone Silesquioxane Crosspolymer, Polysorbate 80	Sodium Polyacrylate	TBD	5.0 – 9.0

Jeesperse CPW-CG-CROSSPOLYMER-G-02	Cetyl Alcohol, Glyceryl Stearate, Dimethicone/Divinyldimethicone Silesquioxane Crosspolymer, Polysorbate 80	Sodium Polyacrylate	30,000 – 68,000	5.0 – 9.0
Jeesperse CPW-2 PVPK-30	Polyethylene, Polyvinylpyrrolidone	Sodium Polyacrylate	24,000 – 48,000	5.0 – 9.0
Natural Wax Series				
Jeesperse CPWN SUN CARRA	Helianthus Annus (Sunflower) Seed Wax, Caprylic/Capric Triglyceride	Carrageenan	15,000 – 22,000 (10% only)	3.0 – 8.0
Jeesperse CPWN NaALGIN	Helianthus Annus (Sunflower) Seed Wax, Caprylic/Capric Triglyceride	Sodium Alginate	2,000 – 3,000 (5% only)	5.0 – 8.0

JEEN INTERNATIONAL CORPORATION
24 Madison Road
Fairfield, New Jersey USA 07004
Tel: 973-439-1401 Fax: 973-439-1402
Email: info@jeen.com Website: www.jeen.com

All rights reserved. Document revision date: October 24, 2013.