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MUHU
U·S·A
CONSTRUCTION MATERIALS

MUHU (USA) CONSTRUCTION MATERIALS LLC

COMPANY PROFILE

MUHU (USA) Construction Materials (LLC) was established to provide altruistic professional service and extensive customer support throughout the United States and neighboring geographical areas such as Latin, Central, and South America as well as Canada and the Caribbean regions. MUHU (USA) is affiliated with MUHU (MENA) Company Dubai and is engaged in the Research & Development of new concrete admixtures, admixture production equipment and customer training and on-site technical support.

Firstly, a concrete admixture production facility will be established focusing primarily on the production of polycarboxylate superplasticizers including PC-F (high water-reducing), PC-R (high slump retention), and PC-E (high early strength) types that all meet ASTM C 494 types B, D, E and F.

Secondly, we will set up a MNC-P2, PC-P2 and PC-USAL chemical additives facility using ready-mix or precast concrete plants to produce tailor-made products for customers to meet the needs of different concrete mix designs and cementitious materials. Through the accumulation of laboratory data at different ready-mix concrete plants around the world where MUHU has conducted numerous ready-mix plants lab trials starting from 2021 to present. MUHU's products' excellent, and in many cases superior, performance has been proven on numerous occasions. Coupled with notable reductions in admixtures and water consumption when using MUHU admixtures, MUHU products offer substantial savings compared to competitors. All MUHU products meet ASTM C 494 types E, F and G.

Lastly, countries currently using MUHU equipment and technology include India, Vietnam, Myanmar, Bangladesh, Philippines, Mongolia, Ukraine, Azerbaijan, Turkey, Jordan, Saudi Arabia, Qatar, Bahrain, Iraq, Albania, Algeria, France, Guatemala, Mexico and many other countries.

We provide customers with professional technical support services, including installation and commissioning guidance of fully automatic production equipment, provision of raw materials, personnel training and production formulas. Additionally, MUHU (USA) is a proud member of Florida Independent Concrete and Associated Products, Inc. (FICAP) and National Ready Mixed Concrete Association.

ENTERPRISE OUTLOOK

MUHU (USA) will also seek partnerships in various key U.S cities to establish new marketing such as chemical additives production plants and warehouses becoming a truly American manufacturer of highly reliable and time-tested polycarboxylate superplasticizers.

MUHU's three tenets for partners and customers are:

1. Best quality products;

2. Most economical prices;

3. Reliability unsurpassed by any competitor.

SERVICE SYSTEM

MUHU has established its licensed headquarters in Florida to serve customers across the United States. MUHU Company is dedicated to providing customers with affordable and reliable solutions from basic raw materials to the final admixture products. Based on product compatibility tests, MUHU engineers continue to design customized best-fit production processes according to customers' needs, available resources and materials. To meet the environmental requirements from customers, MUHU provides advanced, automatically controlled production equipment with exceptional accuracy and impeccable reliance.

SALES GOALS AND PLANS

- The production of polycarboxylate additives will have an annual production capacity of 50,000 tons;
- Meet the market needs for North, Central and South America, and the Caribbean areas.

Facility Space Requirements

The primary production factory will cover an area of 5,000 square feet, including laboratories, storage areas for raw materials and finished products, production workshops, etc.;

Long-Range Planning

MUHU provides production equipment, raw materials and production technology for interested customers at their locations. At the same time, the installation and commissioning guidance, personnel training and production formulas provided with the equipment customers purchase are provided to ensure product quality to meet the market demand of each customer's location and beyond. Since MUHU's production line is fully automated, operations will not need large number of workers in fact, the number of employees needed for transportation and loading and unloading are approximately 2-3 people per site.

Finally, with the United States as the leading producer of these reliable and economical products, MUHU producers can develop markets throughout neighboring countries. Annual market sales could ostensibly reach US $10 million.

PRODUCT LINES

MUHU products fall into eight production lines.
Our products meet any admixture requirements.

CONCRETE ADMIXTURES

Concrete admixtures are one of MUHU's main production lines. From the first-generation lignosulfonate, the second-generation Naphthalene series to the third generation polycarboxylic type, MUHU produces them all. To meet the needs of different project requirements, working conditions and environments, MUHU produces admixtures for the purposes of set accelerators, set retarders, air-entraining admixtures, pumping aid agents, anti-freezing products, and many more.

No.	Product Name	Type	Description
1	Polycarboxylate Superplasticizer (PC)	PC-P, solid content 98% PC-F (High Water Reduction), solid content 50% PC-R (High Slump Retention), solid content 50% PC-R (Super Retarder), solid content 40% PC-E (High Early Strength), solid content 52%	1. Polycarboxylic technology based high performance superplasticizer. 2. Standard compliance: ASTM C 494, Type E, F and G standard for high range water reducer. 3. Technical cooperation services on heatless and automatic system for - local production.
2	Naphthalene Sulfonate Formaldehyde (SNF/NSF/PNS)	UNF-5 (sodium sulfate content 18%) FDN (sodium sulfate content 5%)	1. High performance superplasticizer 2. Standard compliance: ASTM C 494, Type F standard for high range water reducer. 3. Specialized production line of naphthalene-based superplasticizer powder (turn-key project)
3	Sulphonated Aminophenol Based Superplasticizer (AS)	AS powder	1. Low dosage superplasticizer for slump retention and high strength concrete 2. Standard compliance: ASTM C 494, Type F standard for high range water reducer. 3. Manufacturing know-how transfer of AS superplasticizer powder (Turn-key Project)
4	Sulfonated Acetone-formaldehyde Based Superplasticizer (AK)	AK (powder) AK liquid (solid content 38%)	1. High range super plasticizer for high initial workability and high slump retention, no crystallization in extremely cold weather 2. Complies with ASTM C 494, Type F standard for high range water reducer. 3. Manufacturing know-how transfer of AK superplasticizer powder (Turn-key Project)
5	Sulphonated Melamine Formaldehyde (SMF)	SM-P (solid content 95%) SM-L (solid content 42%)	1. Low dosage high range water-reducing plasticizer, suitable for use in dry mortar, plain concrete and cement products. 2. SMF complies with ASTM C 494, Type F standard for high range water reducer. 3. Manufacturing know-how transfer of melamine-based superplasticizer powder (Turn-key Project)

No.	Product Name	Type	Description
6	Water Reducing Plasticizers	Calcium Lignosulfonate	1. Water Reducing Plasticizer / Retarder for Concrete, extracted from pure wood pulp waste. 2. Standard compliance: ASTM C494 Type D
		Sodium Lignosulfonate	
7	Set Accelerators	MNC-A1	1. Water Reducing Plasticizer / Retarder for Concrete, extracted from pure wood pulp waste. 2. Standard compliance: ASTM C494 Type D
		MNC-B	MNC-B is a Concrete Steam Curing Agent that is not air-entraining or retarding. When used in concrete, the water reducing rate is18% and air content is as low as 1.9%. Early strength reaches over 160% in 1st day, 150% in 3rd day and 145% in 7th day. It has no corrosion to steel bars.
		MNC-CB	MNC-CB is an antifreeze type that can be used when ambient temperatures are minus 15 Celsius degrees at lowest. It has early strengthening and water reducing effect without air-entraining and retarding. It facilitates steam curing at low temperatures.
8	Set Retarders	MNC-BS	1. It is made of selected corn starch and is commonly used as a retarding agent for construction materials. 2. MNC-BS complies with the requirement of ASTM C494 Type B standard
		MNC-TG	1. Set retarding concrete admixture made of molasses. 2. It complies with the requirements of ASTM C494 Type B & D standard
		MNC-HHJ	1. It's specially designed for ready mix plants. 2. It complies with the requirements of ASTM C494 Type F & G standard 3. MUHU provide technical services for automatic production lines.
9	Air-Entraining Admixtures	MNC-AE1	MNC-AE1 neutralized vinsol resin admixture is used for entraining air in concrete.
		MNC-AE2	MNC-AE2 is a light-yellow powder product designed to generate specification-quality air systems. Based on a high-grade saponified formulation.
		PC-AE	PC-AE is a special air-entraining admixture for polycarboxylate concrete is in a liquid form.
		K12	It complies with the requirements of ASTM C 260, AASHTO M 154 and CRD-C 13.
		MNC-AJ	1. MNC-AJ is an Air Entraining and Water Reducer, whose water reducing rate is up to 10%. 2. We prepare samples according to customer project requirements for test.
		MNC-HAJ	1. High Range Water Reducing and Air-Entraining Admixture 2. We prepare samples according to customer project requirements for test.

No.	Product Name	Type	Description
10	Pumping Aid Agent for Ready Mix Concrete	MNC-BV 50	MNC-BV 50 is a liquid based on modified lignosulphonate, complex polymers designed for use in Ready Mixed concrete to increase workability and reduce water content.
		MNC-P2	1. MNC-P2 is a ready-to-use, high range water-reducing admixture designed to produce high slump concrete with workability retaining properties. 2. High Range Water Reducer and Set Retarding concrete admixture 3.It complies with the requirements of ASTM C494 Type F & G standard
		PC-USAL	1. PC-USAL is a third generation retarding polycarboxlate superplasticizer. 2. Complies with the requirements of ASTM C494 Type F & G standard
11	Superplasticizer for Cold Weather	MNC-C10/C15	1. Superplasticizer for extremely cold weather. It's designed for use at temperatures around minus 20 degrees Celsius. 2. MNC-C complies with the requirements- of ASTM C494 Type A & Type F standards.
		PC-C15	1. Polycarboxylate based highly efficient antifreeze is applied at minus 15 to 20 degrees. 2. Its recommended dosage is 2.5% of cement amount. 3. PC-C15 complies with the requirement of ASTM C494 Type A & F standards
12	Color Concrete Tile Brightening Agent	MNC-CZ	1. MNC-CZ is widely applied in concrete colored brick. It has high performance in early strength and final strength, greatly improves concrete surface finishing and decoration. 2. It complies with the requirement of ASTM C494 Type F standards.
13	Shotcrete Accelerator Admixtures	MNC-Q1(powder)	1. MNC-Q1 is a special admixture for shotcrete. It has powder form. 2. It can make concrete set within several minutes; thus, it's mainly used in shotcrete, refractory concrete project and leakage stoppage project. It has the best workability when used together with ordinary Portland cement. For use with other cement, trial mixes should be done first. 3. MNC-Q1 is the major admixture for underground construction.
		MNC-Q2(Liquid)	1. MNC-Q2 is a high-performance alkali-free rapid accelerator for sprayed concrete. It is a liquid form which dosage can be varied according to the designed setting and hardening times. 2. MNC-Q2 is suitable for all applications, where high and early strength, good final strength and extremely thick layers are required.

No.	Product Name	Type	Description
14	Non-explosive Demolition Agent	MNC-SCA	MNC-SCA, short for non-explosive demolition agent, is weaker in demolition and longer in time compared with explosives. Thus, for mining in large and complicated areas, the working scheme should combine SCA with mechanical methods, or explosives to improve efficiency.
15	Mortar Plasticiser	MNC-E1 MNC-E2	MNC-E1 and MNC-E2 are masonry mortar plasticizers. They're non-lime admixtures that are designed to improve mortar workability by adding into masonry mortar mixtures. With advantages like water saving, pro-environment and good workability, they're substitutes of lime in masonry mortar.
16	Concrete Form Mould Release Agent	MNC-T6 (oil-based)	Oil-based Concrete Mould Release Agent (MNC-T6) can be diluted by water before use at the ratio of 1:3-1:6. MNC-T6 is a water-soluble mould release agent for fair faced concrete. It has perfect mould release effect and helps reduce or eliminate all kinds of pinholes and honeycomb phenomenon. It's suitable for all kinds of forms made of wood, metal, polymers or plywood. It's ready to use.
		MNC-TL (Wax-based)	Wax-based Concrete Mould Release Agent (MNC-TL) is a mould release agent specially designed for bridges.MNC-TL is pure white wax-based agent which is used in mould release of concrete products such as large bridge beams and railway sleepers.
		MNC-TS (Wax-based)	Wax-based Concrete Mould Release Agent for Rail/sleeper (MNC-TS) is widely used in processing track sleepers, bridges, pipes, power-line poles, metro, tunnels, bridge-piers, cylinder cement casts.
17	Concrete Foaming Agent	MNC-FP	MNC-FP is a new generation multifunctional foaming agent condensed from high molecular components. It features bigger foaming capacity, high fineness and stability.
18	Sulfate Corrosion-resistance Admixture for Concrete	FFS-1	When added during concrete mixing, it is resistant to sulfates and aggressive substances, and improves the durability of concrete. It is called sulfate corrosion-resistance admixture for concrete. Its abbreviation is sulfate corrosion inhibitor.

No.	Product Name	Type	Description
19	Grounding Resistance-reducing Agent	MNC-JV	It is used in the overall solution of lightning protection, especially for lightning protection of mountains, islands, radar stations, microwave stations and communication stations, and ground connection in complex geological conditions.
20	Defoaming Agent	MNC-XP	Special defoamer for dry mix mortars is in a powder form. Its hydrophilic group is non-ionic polarity base-hydroxl and ether base, thus it has high stability and is not influenced by the pH value of mediums and the electrolyte.
		PC-XP	Special defoamer for polycarboxylate Concrete is in a liquid form.
21	Gypsum Retarder		Gypsum Retarder aims to slow down the gypsum setting time which in a low addition rate and good set retarding effect. It can be widely applied in Plaster Gypsum. Glue Gypsum, Prefabricated Gypsum components, Gypsum Stuffing, Gypsum Model Broad and Gypsum Decoration Coating, etc.
22	Shrinkage Reducing Admixture	SR	SR shrinkage-reducing admixture was developed specifically to reduce drying shrinkage of concrete and mortar, and the potential for subsequent cracking. SR admixture functions by reducing capillary tension of pore water, a primary cause of drying shrinkage. SR admixture meets ASTM C 494/C 494M requirements for Type S, Specific Performance, admixtures.
23	Non-dispersible Underwater Concrete Admixture	MNC-UWB	MNC-UWB is suitable for all kinds of underwater concrete projects. Owing to strong dispersion resistance and good fluidity, it makes underwater concrete self-leveling and self-compact. It restrains dispersion of cement and aggregates in the underwater conditions so as not to pollute waters. Underwater concrete with UWB in it gets over 70% of the compressive strength of above ground concrete when it's 0.3m-0.5m below water level.

No.	Product Name	Type	Description
24	Mineral Admixtures	Fly Ash Silica Fume Ground Granulated Blast Furnace Slag	Mineral admixtures (fly ash, silica fume [SF] (purity: 92% and above), and slags) are usually added to concrete in larger amounts to enhance the workability of fresh concrete; to improve resistance of concrete to thermal cracking, alkali-aggregate expansion, and sulfate attack; and to enable a reduction in cement content.
25	Cement Grinding Aid	ZYS (General type) ZYS-2 (Increased compressive strength type) ZYS-3 (Increased production type)	1.Comprised of silicate and inorganic mineral components, cement grinding aid embodies its significant effect in areas of enhancement of cement intensity, increase of cement production, optimization of cement property, acceleration of rotary soundness, reduction of clinker use, dosage increase of mixed material like waste solid, saving of resources and reduction of energy consumption. 2.By using this product, cement manufacturers can achieve the goals of production increase, quality upgrading, cost reduction and profit increase, without additional investment in equipment or alteration of production tech. This is also in line with the general requirement of construction of saving-oriented society and harmonious environment.
26	Iron Oxide Pigments	Yellow Green Black Red	It's an inorganic pigment with good coverage and strong coloring ability. Meanwhile, because of good dispersion, light endurability and anti-weathering ability, it's extensively used in construction, rubber and painting industry.

PC-P

Polycarboxylate Superplasticizer

Description

PC-P is a free flowing and spray dried powder of a new generation poly-carboxylate based polymer, used as a superplasticizer for cement-based materials. It is also an excellent dispersion plasticizer suitable for gypsum, and other mineral materials.
PC-P also is a superplasticizer for high performance concrete, high strength concrete, high volume fly ash/slag concrete and grouting/self-leveling screed/mortar. It complies with ASTM C 494, Type F specifications.

Specifications

Items	Specification
Visual Appearance	Light Yellow Powder
Bulk Density, kg/m^3	510±10
Drying Loss, %	2.0 ± 1.0
pH (23℃), at 20% solution	9.0 ± 0.5
Solid Content, %	98.0 ±1.0
Solubility	Water soluble
Performance	Dosages for P.O 42.5 Standard Cement: (wt% of cement)
	0.2±0.02
Cement Paste Flow	≥240
Water Reducing of Mortar	≥20

Special Features

Comparing to naphthalene and melamine-based superplasticizers, PC-P has superior characteristics of
- High-efficient water reduction up to 30%
- Excellent stability, providing long working time
- Unique homogeneous plasticizing property, thus preventing segregation and bleeding
- Good disperser for various types of cement, gypsum, and minerals.

Uses

-Self-levelling
-Structure grout
-Cable grout
-Repair mortar
-Floor screed / thin-overlay
-Cement coating / paint
-Gypsum, ceramic products
-Products containing silica fume, silica flour, pigment, and other ultra-fine particles
-Architectural products

Test Data Sheet:

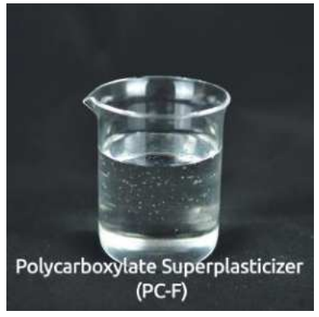
Test Items		Actual Results
Water Reduction, %		31
Air Content, %		5.2
Slump Retention (60min), mm		195
Compressive Strength Ratio, %	1 day	198
	3 days	177
	7 days	162
	28 days	135
Bleeding Ratio, %		33
Shrinkage (28 day), %		88
Setting Time Deff.	Initial(min)	-90~+120
	Final(min)	

Dosage

The recommended dosage of PC-P for various applications is 0.02 to 0.3% of cementitious binder.

PC-F

Polycarboxylate Superplasticizer of High Water Reduction



Description

PC-F Polycarboxylate Superplasticizer for high water reducing has been developed primarily for applications in the ready-mix and precast concrete industries where high durability and performance are required.

Standard Compliance

Polycarboxylate Superplasticizer for high water reducing complies with the requirements of the following standards: ASTM C 494, Types A & F.

Typical Properties

Items	Specification
Visual Appearance	Light Yellow Liquid
Solid Content (%)	50.0±2.0
Density (23℃) (kg/m^3)	1.09±0.02
Solubility	Completely soluble

Usage

1) PC-F for high-water reducing is suitable for long-distance transported pumping concrete, high fluidity concrete, self-leveling concrete, plain concrete, free vibration self-compacting concrete, and high strength concrete, etc.
2) PC-F for high water reducing can be widely used in hydraulic projects, electric power, ports, railways, bridges, roads, and other various projects.

Advantages

1) PC-F water reduction is up to 30% and its concrete slump is not lost in one hour.
2) PC-F has good storage stability, no precipitation or lamination at low temperatures.
3) PC-F can be blended into 10% solution with water and can be used as a pumping aid agent.
4) Production clean degree is high: Due to formaldehyde, industrial naphthalene, acetone or other flammable and toxic chemicals not being used in the production process, PC-F meets every environmental production standard. This new production technology is a fully automated process without heat production.
5) Safety: This product is non-toxic, non-radioactive or non-flammable. There is no harmful material for steel and aggregate. There are no formaldehyde or other harmful aromatic residues. PC-F meets every requirement of indoor and outdoor environments.

Dosage

- The optimum dosage of PC-F to meet specific requirements should always be determined by trials using the actual materials and conditions that will be used.
- Dosage range: C × 0.3% ---- 1.0%
- Recommended dosage: C × 0.5% (calculated according to PC-F). Before using or when replacing cement, determine the optimal dosage through concrete testing.

PC-R

Special Set Retarder for Polycarboxylate Superplasticizer

Description

PC-R is a new generation superplasticizer for concrete. It contains polycarboxylate ether polymers and is specially formulated for ready-mix concrete where slump retention, high strength and durability are required for hot climates. It is chloride-free, meets SS EN 934, set retarding/high range water reducing/ super-plasticizing admixtures, and ASTM C 494 requirements for Type D, F and G and it is also compatible with all cements meeting ASTM standards.
PC-R is the ideal admixture for the ready-mix concrete industry. The ability to work with low water /cement ratios and still obtain extended slump retention allows for the manufacture of high-quality concrete.

Typical Properties

Items	Specification
Visual Appearance	Clear Transparent Liquid
Solid content, %	50.0±2
Density (g/cm^3)	≥1.05
pH value	8±2

Usage

- Concrete with less water content than conventional admixtures
- Faster mixing logistics during large jobs
- High flowability concrete
- Highly durable concrete
-Ready-mixed concrete
-Mass concrete
-Long distance transport requirements
-Pumped concrete
-Hot weather concreting

Dosage

- The optimum dosage of PC-R to meet specific requirements should always be determined by trials using the materials and conditions that will be used during actual use.
- Dosage range:0.3%--0.8% weight of cementitious material.
- Recommended dosage: 0.5% weight of cementitious material. Concrete lab tests for optimal dosage are required before usage or cement changes.

PC-E

Polycarboxylate Superplasticizer of High Early Strength

Description

PC-E is a polycarboxylic ether (PCE) based superplasticizer that has super retention technology. PC-E provides exceptional quality early strength development. While conventional admixture for high early strength concomitantly suffers from high workability loss over time and eventually lower final strength, PC-E overcomes this dependency and provides much improved slump retention and vastly increased final strength concrete.

PC-E Polycarboxylate Superplasticizer of High Early Strength is suitable for making precast concrete elements with Rheoplastic concrete having fluid consistency, no segregation and low water cement ratio and, high early and long-term strengths.

Standard Compliance

PC-E Polycarboxylate Superplasticizer of High Early Strength complies with the requirements of the following standards: ASTM C 494, Type E & F. BS EN 934-2.

Typical Properties

Items	Specification
Visual Appearance	Light Yellow Liquid
Solid Content (%)	50.0±2.0
Density (23℃) (kg/m^3)	≥1.05
pH value	8±2
Solubility	Completely soluble

Special Features

PC-E offers the following benefits for the precast concrete industry to:

- Extremely high-water reduction
- High early strength development
- Shorter demoulding time
- Energy-saving (reduced steam curing)
- Produce Rheoplastic and Rheodynamic concrete having a low water cement ratio
- Optimize curing cycles by reducing curing time or curing temperatures
- Eliminate heat curing
- Eliminate the energy required for placing and compaction and curing
- Increase productivity
- Improve surface appearance
- Produce durable precast concrete elements as per EN 206-1

As compared to the traditional superplasticizers, the engineering properties such as early and ultimate compressive and flexural strengths, bond to steel, modulus of elasticity, shrinkage, creep, and impermeability are improved.

Typical Applications & Advantages:

This product is mainly used to formulate early strength concrete. Its main features are as follows:

(1) High water reducing rates: The dosage range is 0.3 -- 0.8%. The recommended dosage is 0.5% of cementitious material. According to ASTM C 494 type E & F "Concrete Admixtures" standard test, water reducing rate is above 28%. Water reducing rate can be above 30% under optimal dosage (confirmed by lab tests). Cement saving rate is 15-20%.

(2) High early strength: concrete compressive strength ratio is above 180% after 1 day, above 160% after 3 days, 150% after 7 days, and 40% after 28 days, if our product is used under optimal dosage. Concrete long-term strength will also be enhanced.

(3) Long durability: PC-E, with low chloride and alkali content can decrease concrete long-term air shrinkage and shrinkage crack. Concrete shrinkage ratio will be less than 110%. Suitable air content and foaming structure will ensure long concrete durability if MUHU product is used. It is far beyond the post-performance of both traditional naphthalene and acetone sulfonate formaldehyde early strength superplasticizers.

(4) Production clean degree is high: Due to formaldehyde, industrial naphthalene, acetone or other flammable and toxic chemicals being not used in production process, it meets cleaning production standard. This new production technology is a fully automated process without heat production.

(5) Safety: non-toxic, no radiation, non-inflammable, no corrosion for steel bar or aggregate, and no formaldehyde, or aromatic residues harmful for human. Our product complies with the current environmentally friendly standards for interior and exterior construction.

Dosage

1) Dosage range:0.3%--0.8% weight of cementitious material. (calculated according to PC-E)

2) Recommended dosage: 0.4% weight of cementitious material (calculated according to PC-E). Concrete lab test for optimal dosage is required before usage or changing cement.

SNF/NSF/PNS

Naphthalene Sulfonate Formaldehyde

Description

Naphthalene Sulfonate Formaldehyde (NSF) is a naphthalene-based superplasticizer, also named Naphthalene Sulfonate Formaldehyde Condensate and Poly Naphthalene Sulfonate (PNS) etc. It is a high range water reducer, commonly referred to as superplasticizer. It is a chloride free product that's supplied as a brown powder to be instantly dissolved in water. It's used to effect substantial water reduction to concrete without influencing normal setting time.

- Powerful plasticizing action with improved initial workability.
- Reduces water cement ratio to the maximum which allows production of high strength concrete while saving cement use.
- Improved cohesion and particle dispersion minimizes segregation and bleeding and improves pumpability.
- Long haul and hot weather concreting.
- Gains early strength with very high slump retention.

Standards Compliance

Naphthalene Sulfonate Formaldehyde (SNF/NSF /PNS) complies with the requirements of the following standards: ASTM C 494, Type F; ASTM C 1017.

Uses

- To provide initial workability especially with low water cement ratio.
- To significantly improve the initial workability of site mixed concrete without increasing water demand.
- To provide improved durability by increasing ultimate strengths and reducing concrete permeability.
- To have high slump retention with early setting time.
- Typical Applications & Advantages

Typical Properties

Items	Specification			
	UNF-5	FDN-5%	FDN-3%	
Appearance	Light Brown Powder	Dark brown Powder		
Specific Gravity	1.24	1.24		
Sodium Sulfate Content, %	18.0 max.	9.0 max.	5.0 max.	3.0 max.
pH value	8–10	7 -9		
Solid Content, %	92 min	92 min		
Moisture, %	8.0max.	8.0max.		
Fineness (0.315mm remains), % <	15	15		

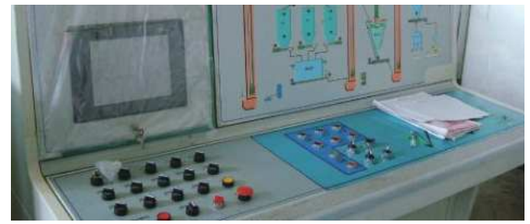
Dosage

The optimum dosage of Naphthalene Sulfonate Formaldehyde (SNF/ NSF /PNS) to meet specific requirements should always be determined by trials using the materials and conditions that will be experienced in use.

Items	Specification	
	UNF-5	FDN
normal dosage ranges	0.5 to 1.0 kgs/100 kg of cementitious material	0.4 to 1.0 kgs/100 kg of cementitious material

Dosages outside the normal range quoted above can be used to meet particular mix requirements. Contact MUHU for advice in these cases.

Drying Tower



Automation and Control System

Superplasticizer Spray Drying System

Liquid Production Line

AK

Sulfonated Acetone Formaldehyde Based Superplasticizer

Description

Acetone-formaldehyde resin（AK）, is a kind of anionic aliphatic macromolecular surface active substance which is derived from acetone, formaldehyde and sulfonating agent with alkalic catalysis. AK is a high range water reducer, commonly referred to as a superplasticizer. AK contains no added chloride.

Standards Compliance

AK complies with ASTM C494, Type F standard for high range water reducer.

Typical Properties

Items	Specification	
	AK Powder	AK (38%)
Visual Appearance	Dark Brown Color	Dark Brown Color Liquid
Moisture, %	8.0 max	---
Fineness (0.315mm remains), %	15.0 max	
pH value	8 – 10	
Chloride Content, %	0.1max	
Na2O+0.658K2O (%)	5.0 max	
Cement Paste Flow, mm	240	
Solid Content ,%		38%

Applications

1. Used for projects such as skyscrapers, wide bridge, ocean oil drilling platform, which requires high performance concrete with property of high strength, elasticity, fluidity, and impermeability.
2. AK is especially applicable to following types of concrete: flowable and plastic concrete, autotrophic or steam curing concrete, impermeable and waterproof concrete, durable and anti-freeze/thaw concrete, anti-sulphonate-corrosion concrete, steel-bar enforced concrete, and pre-stress concrete.
3. Used to make high strength concrete pipe (PHC) C80, ready mixed concrete (C20-C70), pumping concrete, high performance concrete, self-compacting concrete, water-proofing and large volume concrete.
4. Used in all kinds of Portland cements and steam curing concrete.

Features and Benefits

1. AK is alkalescent and has a high-water reducing rate of 15-25%.
2. When it's added, 25-30% of cement can be saved without sacrificing strength and slump loss compared with plain concrete.
3. AK has significant early and post-strengthening ability. Concrete added with AK can reach to 60-70%, 100% of designed strength in 3 and 7 days respectively. Thus, its strength is enhanced by 30-40% compared with plain concrete in 28 days.
4. AK has high plasticity. Concrete added with AK has less slump loss. It almost has no slump loss in 60 minutes and only loses 10-20% in 90 minutes.
5. AK is applicable to a variety of cement. It improves workability and plasticity. It works well with other admixtures.
6. AK can improve anti-freeze/thaw ability and impermeability of concrete. It protects concrete from sulphonate corrosion and improves physical performance in many other aspects.
7. AK is nontoxic, nonflammable and noncorrosive to steel bars.
8. AK effectively reduces the reaction with alkaline aggregates and has no crystallization from sodium sulphate in winter.

Performance Data

Items		Actual Results
Water Reduction, %		20.2
Air Content		1.6
Compressive Strength Ratio (%)	1 day	200
	3 days	172
	7 days	161
	28 days	136
Bleeding, %		77
Shrinkage (28days)		125
Steel-bar Corrosion		None

Dosage

The optimum dosage of AK to meet specific requirements should always be determined by trials using the materials and conditions that will be experienced in use. When AK is applied in the form of powder, normal dosage ranges from 0.4% to 1.2% of the weight of cementitious material, while the suggested rate is 0.6% taking technical and economic factors into consideration.

SM-P

Sulphonated Melamine Formaldehyde


Sulphonated Melamin Formaldehyde (SM-P)

Description

SMF is a soluble melamine formaldehyde resin-based superplasticizer with no air-entraining. SMF is a chloride free admixture based on melamine formaldehyde and is formulated for the production of Rheoplastic concrete. Available as a liquid or in powder form that must be dissolved in water prior to use.

Rheoplastic concrete is a fluid, but cohesive mix with a slump value of at least 200mm. It is virtually self-compacting but at the same time free from segregation and with a water-cement ratio as a no-slump concrete admixture.

Standards Compliance

SMF complies with the requirements of the following standards: ASTM C 494, Type F.

Application

1. SMF can be used to make self-leveling flooring materials and grout for the base of casting equipment.
2. SMF can also be used to make high strength gypsum and gypsum products.
3. It is suitable for ready-mixed concrete, pumping concrete, flowing concrete, high strength and high-performance concrete, self-compact concrete, and high strength mortar.
4. SMF can also be used to make refractory concrete, steam curing concrete, plain concrete, decorative concrete, and pigmented concrete.
5. It could be applied as super dispersant for oil-well cement in casting and strengthening.
6. It is one of major components of water proofing materials for improving impermeability of concrete or mortar. It also can be used as a component with admixtures like expanding admixtures to produce structural self-waterproofing concrete.
7. Precast concrete.
8. Concrete with white cement.

Typical Properties

Items	Specification	
	SM-P (Powder)	SM-L (40%)
Visual Appearance	White Powder	Colorless transparent or pale yellow liquid
Sodium sulfate content (%) ≤	3.0~4.0	--------
Solid Content (%)	------	≥40±1
Chloride Content (%)	0.3~0.4	
pH Value	7~9	
Moisture (%) <	4	-----
Cement Paste Flow, (mm) ≥	220	
Solubility	Completely soluble	

Dosage

The optimum dosage of SMF to meet specific requirements should always be determined by trials using the materials and conditions that will exist and be used in actual production.

Items	Specification	
	SM-P (Powder)	SM-L (40%)
dosage normally ranges	0.4 to 1.2 kgs/100 kg of cementitious material	3.0 to 5.0 kgs/100 kg of cementitious material

PC-XP

Special Defoamer for Polycarboxylate

Composition

polyether

Product properties

Items	Specification
Active content	about 100%
Appearance at 20 Celsius	Colorless or pale-yellow liquid, slightly turbid
Ionic	Nonionic
Density at 20 Celsius	about 0.96g/cm^3
PH of 1% solution	about 7
Solubility at 20 Celsius	Can be directly dissolved in water to form a turbid liquid
Flash point	100 Celsius
Solubility	Completely soluble

Application

PC-XP is a multi-use defoamer and is applicable to a variety of construction uses, especially for defoaming in polycarboxylate superplasticizer. This product has very good solubility with polycarboxylate superplasticizers. It has very good control of air content in polycarboxylate superplasticizers.

Recommended dosage

0.01-0.1% of polycarboxylate superplasticizer

Storage

At room temperature, unopened PC-XP is stable for at least 2 years. During transport and storage, avoid direct exposure to cold air. If directly exposed to the air, PC-XP's performance will have a reversible change. If it becomes turbid, viscous, or frozen, it can be dissolved at room temperature, you can use it after stirring until homogeneous.

SILICA FUME

Description

Silica fume primarily consists of amorphous (non-crystalline) silicon dioxide. The average particle diameter is 0.08 um; specific surface area is about 4500 m2 /kg; and bulk density is 200 - 250kg/m3. Silica fume has extremely high surface activity with unformed spheroidal silica dioxide particle, the particle size is 1% of cement particle size. It will fill fully into the gaps among cement particles and create gel when reacts with hydrate compound.

Usage

Silica fume may be applied with general concrete to enhance mechanical properties by:
1. Improving concrete durability.
2. Enhancing concrete compressive strength and pumpability.
3. Making high anti-crack, waterproofing concrete which been used in the subways, tunnels, and basements of high-rise structures.
4. Used in maritime work and chemical industry. Owing to its compactability, it can effectively prevent sulphate and chloride ion from permeating and eroding. It prohibits steel corrosion in reinforced concrete resulting in longer lifespan of concrete.
5. Used in underwater construction such as piers, huge dams, and drilling platforms.
6. Used in concrete surfaces for highways and large-scale bridges.
7. Used in the production of refractory and porcelain.

Chemical Composition

Items	SiO_2	ZrO_2	Fe_2O_3	Al_2O_3	Na_2O	K_2O	TiO_2
Content (%)	75 ~ 95	6 ~ 10	≤0.4	≤0.5	≤0.05	≤0.02	≤0.05

Following are three types of silica fume according to different silica dioxide content:

Grades	Characteristics
Super-fined silica fume	SiO_2 ≥90%, white powder form, applied in ornamental concrete.
Grade silica fume	SiO_2 ≥88%, grey powder form, applied in high-strength non-shrinkage grouting materials.
Grade silica fume	SiO_2 ≥85%, dark grey powder form, applied in high-strength commercial concrete.

Package, Storage & Handling

1. Packed in woven fabric bag with plastic liner. Net weight:15kg +/-0.13kg
2. Silica fume should be stored in a warehouse that is well-ventilated and dry. It remains effective for two years. At the expiration, re-use is allowed if the testing results fall within the established range. In case of humidity, re-use is allowed after drying and crushing.

PC-USAL

Pumping Aid Agent for Ready Mixed Concrete

Description

PC-USAL is a 3rd generation polycarboxylate based superplasticizer with set retarding effect, It has been formulated to comply with ASTM C-494 Type F& G.

Uses

PC-USAL is suitable for the production of site-mixed as well as ready-mix following types of concrete:
-Concrete with highest water reduction
-High strength/High performance concrete
-Excellent and retained workability concrete
-Flowable to Self-Compacting Concrete

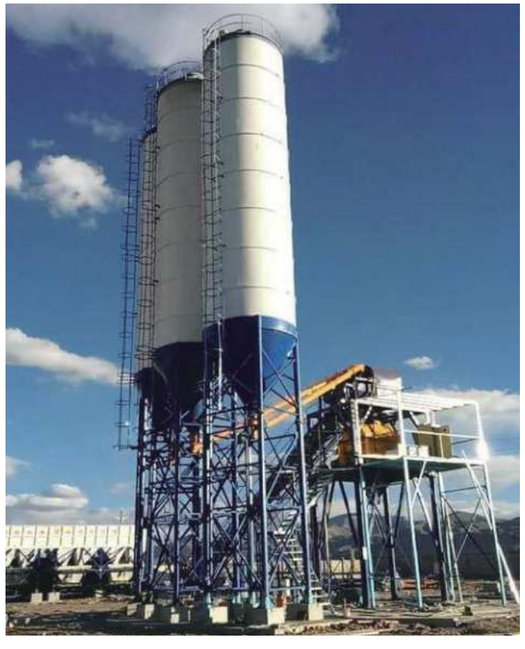
Advantages

PC-USAL combines different modes of actions resulting in optimum dispersion of the binder and at the same time improves cohesion of concrete.

PC-USAL has the following advantages:
- Extremely high water reduction, consequently durable concrete providing high density concrete, high strength can be produced
- Thanks to high water reduction and optimum cement dispersion, it improves shrinkage and creep behavior
- Provides an excellent workability that can be retained for up to 2 hours.
- Increases early and final strengths that can allow substantial cement reduction.
- Improves impermeabilty of concrete by reducing water/cement ratio.
- Increases cohesion without segregation that facilitates pumping
- Can be used at low dosages

Typical Properties

Items	Specification
Appearance	colorless transparent or pale-yellow liquid
Specific Gravity	1.065-1.085kg / liter
pH value	4.50-6.00



LAB TESTING EQUIPMENT

MUHU supplies a complete set of lab testing machines and apparatus for the cement industry such as automatic pressure machine, curing cabinet and box, vibrator, concrete mixer, electronic balance, and sieve shaker. Our unit complies with the ASTM C 1565-03 standard test method for determination of pack-set index of Portland cement.

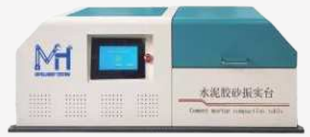
Mixer for Cement Paste (MH-16A)

Mixer for Mortar Paste (MH-20A)

Cement Paste Consistency Testing Device (MH-VKY-5A)

Intelligent Cement Mortar Consistency Device (MH-MCA-01I)

Intelligent Constant Temperature Water Curing Control System (MH-HWC-5L)



Cement Mortar Compaction Table (MH-MST-20A)

Intelligent Ambient Temperature and Humidity Device (MH-TAH-01I)

Constant Stress Pressure Testing Machine (MH-DYE-2000S)

Special Spray Dryer for Polycarboxylate Superplasticizer Powder(MH-DYE-2000S)

TECHNICAL KNOW-HOW TRANSFER

In order to provide one-stop service to customers,
Besides supplying products, MUHU also offers know-how transfer.

The coverage of technology know-how transfer :

- Designing a production line based on customers' technical requirements and physical site conditions. Conducting a preliminary feasibility analysis.
- Providing essential equipment specifications, assisting equipment purchase, and instructing equipment installation and commissioning
- Transferring product formulation and manufacturing processes.
- Training employees to produce top quality products.
- Designing and setting up laboratories.
- Training lab workers so that they can independently test finished products and raw materials.

Certificates Patent of MUHU

EQUIPMENT INTRODUCTION

MH-PCT-01M(3L)

Lab Pilot Production Instrument of Polycarboxylate Superplasticizer
(3Liter/batch)

MH-PCS-02AS (5T)

Large Scale Production Line for polycarboxylate superplasticizer
(5ton/batch)

MH-BM-01M (500 grams)

Lab Scale Automatic Admixture
Batching and Mixing Device

MH-BM-02AS(5T)

Automatically Controlled Mobile Blending Equipment for
Concrete Admixtures
(5ton /batch)

MH-BM-02A(5T)

Automatically Controlled Mobile Blending Equipment for
Concrete Admixtures (5ton /batch)

MH-PCM-02A(5T)

Large Scale Production Line for polycarboxylate superplasticizer
(5ton/batch)

Fully Automatic Dry Mixed Mortar Production Line (8-10 tons/hour)

LAB PILOT PRODUCTION INSTRUMENT OF POLYCARBOXYLATE SUPERPLASTICIZER

Overview

For manufacturers of polycarboxylate superplasticizers, they often encounter the problem of changing the production formula or raw materials suppliers, which affect the stability of product quality.

Based on our production experience, MUHU company developed a set of Lab Scale System to produce Polycar-boxylate Ether(PCE) Superplasticizer. With this equipment, lab technician can easily experiment their new production formulas and improve the production process of PCE Superplasticizer. Similarly, production workers can use this equipment to perform pilot or test production in case of the raw material change prior to batch production to get stable and high quality finished products.

Watch this video (https://www.youtube.com/watch?v=etYpdoUqtZw) for detailed information of lab scale production system for PCE Superplasticizers.

Products To be Produced

The equipment can be used to produce high water reducing type PC-F (polycarboxylate superplasticizer) and special set retarder for PCE superplasticizer type PC-R(50%) at ambient temperatures. No heating system is needed.

Scope of Use

- Laboratory synthesis
- Test production in plants

Features

- Intelligent Production

PLC control, touch screen operation, displaying material dripping time and real -time reaction temperature chart ;

- Unique Design with Stainless Steel

- Special material feeding design for large quantity of powder products

Special material feeding design for large quantities of powder products, making it easy and fast to input TPEG/HPEG monomer material;

- Accurate Measurement

The measuring system can meet both needs of laboratory for micro material and regular scaling for typical materials such as large monomer and water. Quantity measurement ranges from 0.01g to 5000.00g.

- Precise Automatic Dripping Control

Step motor operated the peristaltic pump is used for material dripping. The pump is controlled by PLC with self- memorizing and correction function, which satisfies the precise drip addition for different material.

- Precise Automatic Temperature Control

Accurate control of material initial temperature and constant temperature, the accuracy is 0.1 ℃ ;

- Large Production Range

Any quantity from 2Liter to 5Liter can be produced normally.

- Integrated Power Source

As the result of highly integrating, only one power cord can be used by several equipment and devices.

- Convenient and fast discharging

Convenient and fast discharging through the valve at the bottom.

Automatically Controlled Production System for
Polycarboxylate Superplasticizer Synthesis Equipment

Polycarboxylate Superplasticizer Ether (50%)
Stainless Steel Type
MH-PCS-02AS(5T)

MULTIFUNCTIONAL PRODUCTION UNIT FOR POLYCARBOXYLATE SUPERPLASTICIZER

Overview

After continuous improvement and innovation to previous equipment, MUHU engineers developed this mobile and integrated production unit. This new system is featured with heatless production and automated control, which is a break-through in the industry in China. It offers environmental protection with zero waste emission and discharges.

This equipment has the following unique features

Eliminating the traditional platform. Ground-floor material feeding and operation decreases the requirement to the production setting (5m for workshop height), and increase safety.

Removable and modular-based. The installation and disassembly is fast and easy, which makes it convenient to produce in different locations. Thus, it greatly reduces the cost of shipping materials to different stations.

Automatic control and smart production. The system is designed with touch-button control, intelligent production with all feedback signal automatic control, and entire process monitoring. The system can automatically adjust mixing time and materials adding speed based on the chemical reaction temperature in the production. Therefore, product quality is guaranteed.

Automatic temperature compensation. In order to make the monomer easy to dissolve and have stable chemical reaction in winter season or in low ambient temperature, MUHU engineers designed this temperature compensation feature.

Space Requirements

1) The plant: height 6 meters; equipment floor is 200 SQ meters
2) Required power: 30KW
3) Water consumption: 5 to 30 tons/day

LAB SCALE AUTOMATIC ADMIXTURE BATCHING AND MIXING DEVICE

Overview

With the rapid development of automation and intelligence in today's world, laboratory testing instruments are undergoing rapid and nearly daily changes. In the basic work within any laboratory, there has always been problems with the accuracy in measurements of diverse liquid materials, puzzling most laboratory personnel. This mandate for accuracy not only wastes energy, but also requires laboratory personnel to have unique operating skills in the measurement processes. After long-term Research and Development and testing, MUHU researchers have successfully developed a highly accurate and reliable automatic admixture batching and mixing equipment system for the laboratory. This batching system utilizes touch-screen operations, while allowing up to six types of liquid materials being automatically measured and mixed, with high precision and fast batching speeds resulting in assurances of the reliability of experimental data. This new equipment better meets the actual work requirements of the laboratory and becomes the best choice for laboratory personnel.

Product characteristics

1. High quality 304 stainless steel is formed by laser cutting, with mirror technology, resulting in durability and cost savings;
2. Intelligent human-machine interfaced touch-screen design with precision touch control, high stability, and simple operation;
3. This machine utilizes a variety of automatic suction pumps, with larger flow, acid and alkali corrosion resistance, no residue in the pipe, and stable and reliable quality;
4. Innovative design, perfect combination of magnetic mixing and automatic measurements, low noise, stable operations, and precise mixing effect;
5. Automatic preparation of a variety of liquids (6 liquids +3 powders), easy to operate;
6. This machine is compact, durable, powerful and easy to operate.

Ideal for Concrete Batching Plants

AUTOMATICALLY CONTROLLED MOBILE BLENDING EQUIPMENT FOR CONCRETE ADMIXTURES

Background knowledge

With the improvement of people's living conditions and the progress of our society, field workers have stronger expectations for better production settings, especially for less pollution and lower labor intensity. Construction contractors have more and more stringent requirements for project quality. This requires that the admixture performance is better, the production processes are more environmentally friendly, and the quality is impeccable.

MUHU have developed a new generation of automatically controlled superplasticizer blending equipment. This equipment is multi-purpose admixture blending and can be used in concrete production enterprises and admixture blending plants.

Characteristics

Ergonomic engineering design

1. Automatic control allows one button touch to complete the entire production. From start to finish only one worker is needed.
2. This equipment has changed the traditional top-feeding mode production. The operator now stands on the ground floor to complete the feeding task safely and efficiently.
3. This equipment has a dust collector that results in a cleaner environment and protection for the workers' health.
4. This equipment can blend polycarboxylate admixtures, naphthalene admixture, or other powders and liquids.

Unique high-pressure spray dispersion equipment

The unique hybrid technology and the high-pressure spray dispersion technology are adopted to effectively solve the long mixing time of compulsory mixer. High-pressure spray equipment can make materials dispersed evenly. Compared with traditional mixing, efficiency is greatly improved.

Mobile and modular-based

The installation and disassembly is fast and easy, which makes it convenient to produce in different locations. Thus, This greatly reduces the costs of shipping materials to different stations.

Multiple protection prompts, more secure and reliable production

1. Buzzer prompt: When workers manually input the powder materials or when production is completed to allow discharge, different sound is used to remind.
2. LCD display, formula edit/save/ selection function: Through the relevant text prompts on LCD screen, the user can easily edit, save and select the formula, without reading the operation manual.
3. Recovering from emergency and power failure: The electronic control system not only allows to edit/ store superplasticizer blending formula, but also to saves and tracks each step in the production process. In the event of emergency (power outage), the program can be stopped by pressing a button. After the status is recovered, one key pressed can continue the production. There are no quality reductions.
4. Operation security setting: in order to ensure the confidentiality of production formula and the safe operation of equipment, different passwords can be set for each operator and formula editor.

Space Requirements

1. The plant: height 3.5 meters; equipment floor area 5-8 SQ meters
2. Required power:7.5 KW
3. Water consumption:30 tons/day.

NAPHTHALENE BASED SUPERPLASTICIZER PRODUCTION LINE

Overview

Naphthalene superplasticizer is the most widely used product. In addition to keeping certain workability of fresh concrete, it reduces water consumption of cement, saves cement and enhances fresh concrete fluidity.
MUHU is an enterprise, who early developed and produced naphthalene superplasticizer in China and has the production experience of more than 36 years. MUHU's technical staff continuously improves the naphthalene superplasticizer production process and production equipment to form a unique feature and obtain a number of invention patents. Currently, there are many domestic and foreign enterprises, which successfully transfer the production technology and equipment from MUHU.

In the project design focused on the following several characteristics

1. High level of automatic control:80% of the production process is automatically controlled. As a result, the product quality is high; labor intensity and costs are very low.

2. High-level of pollution control:The waste emission receives high attention in the production.The entire production process is enclosed.There are no emissions of waste water or solid waste in the entire production plant. The emission of waste gases meets the requirement stipulated by the government in China.Our process makes the business development sustainable and environmentally friendly.

DRY MORTAR PRODUCTION LINE

MUHU has produced dry mortar products for over 36 years, including masonry mortar, plastering mortar, thermal insulation mortar, high-strength non-shrink grout, self-leveling mortar, tile adhesive mortar, repair mortar, etc.

Based on customers' requirements, MUHU engineers designed a wide range of mortar production equipment with output from 3 tons to 100 tons per hour. MUHU equipment has following features:
- Product quality is assured by automatic control.
- Pollution is reduced with enclosed production.

Our production efficiency has increased but labor intensity has dropped is lowered because of automatic materials handling.
MUHU provides a wide range of services including the product formula, equipment fabrication, installation and commissioning.

Hoist

Work station

Sand dryer

Material storage bin

Mixing machine

Automatic packaging machine

Dust collector

RAW MATERIAL PRODUCTS

In addition to product formula and production equipment, MUHU also provides raw materials for production based on customers' specific requirements. Using MUHU products and raw materials has many advantages:

1. MUHU has been working together with reliable major raw material suppliers for a long-term. Bulk procurement can assure stable quality, but at a much lower costs.

2. MUHU has a strong inspection technology and quality assurance system, which ensures the quality of each batch of raw material to reach production requirements. Thus, MUHU's partners save inspection processes and costs.

3. MUHU owns warehouses with over 10,000 SQ meters. Product inventory is high and variety is diverse. The comprehensive inventory can ensure reliable supplies in a dynamic supply market.

4. MUHU's logistics team can safely deliver raw materials to customers on time and at lower costs. Based on the product formulas, customers may easily place orders. MUHU provides one-stop shopping to help customers improve their cash flow.

List of Raw Materials for Synthetic and Blending Production	
Raw Materials for Synthetic Production	Polyethylene large monomer (HPEG/TPEG)
	Acrylic Acid
	Catalyst
	Stabilizer
	Oxidizing Agent
Raw Materials for Blending Production	PC-F(50%) - High water reducing
	PC-R(50%) -High slump retention
	PC-AE -Air Entraining agent
	PC-XP Defoamer
	MNC-BS