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«KOOLANCEL» company was established in 2008 as the first manufacturer of cellulose pads in the Middle East. In 2010, «ENERGY» Company started its cooperation with KOOLANCEL Company as a business partner, and this company joined as a member of «ENERGY Holding». The result of this partnership and cooperation has been the increasing development and turning into the largest producer of cellulose pads in the Middle East, as well as joint investment in Pakistan and the setup of the «SUPERKOOL» company with the aim of better coverage of the attractive market of the region. In 2017, KOOLANCEL Company developed the brand «NADPOLYMER» to produce unsaturated polyester, phenolic and acrylic resins per the customers' needs. KOOLANCEL'S approach has always been to produce high-quality products in line with the customer's needs and provide a superior value proposition. KOOLANCEL is the pioneer of the evaporative cooling industry for various applications in Iran.

Advantages

The competitive edge of KOOLANCEL Company rests upon its dynamic research and development unit, poised to design and manufacture an array of unsaturated polyester resins in response to customer requisites. Additionally, a seasoned marketing and sales team adeptly promotes products in both domestic and international markets.

NADPOLYMER products offer a constellation of advantages, including:

1- Consistent Quality: A hallmark of stability. **2- Tailored Solutions: Customized products intricately shaped to fulfill individual customer needs.** **3-Timely Deliveries: Punctuality in meeting commitments.**

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Unsaturated Polyester Resins

Unsaturated polyester resins are among the most significant and industrially versatile thermosetting materials and are used in a wide range of applications, including composite products. These materials act as a matrix that retains the fibers and transmits external loads to them. NADPOLYMER products are used to manufacture the following parts and products:

1- Pipes, fittings, and pultrusion;
2- GRP tanks;
3- Marine Industries;
4- Construction industry: Bathtub, sink, artificial stone, prefabricated pool, and fiberglass sheet;
5- Polymer concrete pipe;
6- Decorative industry;
7- Sports and recreational equipment;
8- Auto parts (SMC/BMC process).

Pipes, Fittings, and Pultrusion

The assortment for pipes, fittings, and pultrusion encompasses a quartet of products primed for producing pipes across a spectrum of sizes, employing continuous and batch processes. A significant contributor to the -polymer export portfolio, these products have garnered the favor of contented clientele. The perpetuated procurement of these offerings underscores the steadfast quality assurance associated with them.

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Products Model	Resin Type	Gel Time (min)	Acid Value (mgKOH/g)	Viscosity (CP)	Solid Content (%)	Tensile Strength (MPa)	Flexural Strength (MPa)	Hardness (Barcol)	HDT (C)
NAD-1102	Ortho	10-20	<25	200-300	55-62	70±5	125±5	45-50	70-75
NAD-1103	Ortho	10-20	18-25	360-420	60-65	70±5	110±10	40-45	75±5
NAD-1104	Ortho	10-20	20-30	350-450	60-65	65±5	110±10	40-45	60±3
NAD-1201	Iso	10-20	15-22	360-420	60-65	75±5	120±5	40-45	85±5
NAD-1202	Iso	10-20	15-25	350-450	60-65	75±5	125±5	40-45	75±5

- The gel time and viscosity of all products can be adjusted for the customers.
- Achieving curing involves 0.1 phr of cobalt (10%) and 1.5 phr of MEKP catalyst.
- The additional curing time for mechanical tests is 3 hours at 80°C.
- The HDT test is performed in about 5 hours at 105°C.

GRP Tanks and Stores

The Nadpolymer resins which are produced for GRP Tanks have high HDT and hardness and are suitable for cold water storage.

UNSATURATED POLYESTER RESIN

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NAD-1102	Ortho	10-20	<25	200-300	55-62	70±5	125±5	45-50	70-75
NAD-1103	Ortho	10-20	18-25	360-420	60-65	70±5	110±10	40-45	75±5
NAD-1201	Iso	10-20	15-22	360-420	60-65	75±5	120±5	40-45	85±5
NAD-1202	Iso	10-20	15-25	350-450	60-65	75±5	125±5	40-45	75±5

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Marine Industries

High tensile and flexural strength as well as reasonable prices and HDT have led to building high-quality and reliable yatchs.

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NAD-1201	Iso	10-20	15-22	360-420	60-65	75±5	120±5	40-45	85±5
NAD-1202	Iso	10-20	15-25	350-450	60-65	75±5	125±5	40-45	75±5

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Construction Industry: Bathtub, Sink, Artificial Stone, Prefabricated Pool, and Fiberglass Sheet

Diverse product variations cater to the construction industry. 1119 resin, distinguished by transparency and flexibility, emerges as a prime candidate for producing fiberglass sheets. Meanwhile, 1114 Resin excels in its capacity to incorporate powder materials, offering elevated hardness ideal for crafting assorted artificial stones. Model 1112 surges ahead with enhanced tensile and flexural strength, particularly suitable for composite part fabrication. Lastly, the 1111 resin, accentuated by its transparency and acrylic modifications, finds purpose in crafting sinks and washstands.

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NAD-1111	Ortho	10-20	20-30	350-450	60-65	75±5	120-140	45-50	58-62
NAD-1112	Ortho	10-20	<40	450±100	64±3	50-60	105±5	39-41	50±5
NAD-1114	Ortho	10-20	<40	450±100	62-67	45±5	90±10	39-41	50±5
NAD-1119	Ortho	10-20	15-25	250±100	62-67	30±5	90±10	-	40±5

- The gel time and viscosity of all products can be adjusted for the customers.
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Polymer Concrete Pipe

1104 resin is a very suitable option for the producers of this sector due to its high compatibility with concrete compounds and very suitable processability in the production of polymer concrete pipes. Also, the very reasonable price of this product has made this resin very popular among customers.

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NAD-1102	Ortho	10-20	<25	200-300	55-62	70±5	125±5	45-50	70-75
NAD-1103	Ortho	10-20	18-25	360-420	60-65	70±5	110±10	40-45	75±5
NAD-1104	Ortho	10-20	20-30	350-450	60-65	65±5	110±10	40-45	60±3
NAD-1201	Iso	10-20	15-22	360-420	60-65	75±5	120±5	40-45	85±5
NAD-1202	Iso	10-20	15-25	350-450	60-65	75±5	125±5	40-45	75±5

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Decorative Industry

When creating grand decorative pieces like expansive statues, towering columns, and majestic capitals, the 1112 resin takes the stage with finesse. Complementing this, the 1114 resin gracefully sculpts smaller statues, intricate sculptures, and captivating decorative works.

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NAD-1111	Ortho	10-20	20-30	400±50	60-65	75±5	120-140	45-50	58-62
NAD-1112	Ortho	10-20	<40	450±100	64±3	50-60	105±5	39-41	50±5
NAD-1114	Ortho	10-20	<40	450±100	62-67	45±5	90±10	39-41	50±5

- The gel time and viscosity of all products can be adjusted for the customers.
- Achieving curing involves 0.1 phr of cobalt (10%) and 1.5 phr of MEKP catalyst.
- The additional curing time for mechanical tests is 3 hours at 80°C.
- The HDT test is performed in about 5 hours at 105°C.

Sports and Recreational Equipment

The products of this group are suitable for the production of children's toy equipment and Aqua-Parks.

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Products Model	Resin Type	Gel Time (min)	Acid Value (mgKOH/g)	Viscosity (CP)	Solid Content (%)	Tensile Strength (MPa)	Flexural Strength (MPa)	Hardness (Barcol)	HDT (C)
NAD-1112	Ortho	10-20	<40	450±50	64±3	50-60	105±5	39-41	50±5
NAD-1114	Ortho	10-20	<40	450±100	62-67	45±5	90±10	39-41	50±5
NAD-1104	Ortho	10-20	20-30	350-450	60-65	65±5	110±10	40-45	60±3

- The gel time and viscosity of all products can be adjusted for the customers.
- Achieving curing involves 0.1 phr of cobalt (10%) and 1.5 phr of MEKP catalyst.
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Auto Parts (SMC/BMC process)

The 1118 model, characterized by its formidable mechanical specifications, serves as an ideal candidate for crafting automobile components, including fan trays, headlights, and parts sculpted through the SMC process. Notably, the 1112 and 1102 models seamlessly facilitate the production of various automobile parts through a meticulous hand layup process, extending their utility to the cabins of both lightweight and heavy-duty vehicles.

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Products Model	Resin Type	Gel Time (min)	Acid Value (mgKOH/g)	Viscosity (CP)	Solid Content (%)	Tensile Strength (MPa)	Flexural Strength (MPa)	Hardness (Barcol)	HDT (C)
NAD-1102	Ortho (BMC)	10-20	<25	200-300	55-62	70±5	125±5	45-50	70-75
NAD-1112	Ortho (BMC)	10-20	<40	450±100	64±3	50-60	105±5	40±1	50±5
NAD-1118	Ortho (SMC)	10-20	20-30	900-1200	60±3	60±5	80±10	50±2	95±5

- The gel time and viscosity of all products can be adjusted for the customers.
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Water-Based Acrylic Resins

Nowadays, according to environmental conditions and requirements, the use of water-based resins is increasing rapidly. Based on the used monomer, water-based acrylic coatings are divided into groups of the pure acrylic homo polymer, acrylic-styrene copolymer, and vinyl acetate emulsions. An emulsion is a mixture of two immiscible liquids, one of which is the sprayed phase that is sprayed as separate droplets in the other phase (continuous phase). In the case of emulsion polymerization, the continuous phase consists essentially of water and is therefore called the aqueous phase. These resins are prepared by radical polymerization. In the industry, the final products of emulsion polymerization are called emulsion or latex.

WATER BASED ACRYLIC RESIN

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Products Model	Resin Type	Application	PH	Viscosity (CP)	Solid Content (%)	Tg (C)
KC-301	Acrylic Styrene	Adhesion cellulose Pads	6±1	13000-18000	40±1	<3
KC-302	Acrylic Styrene	Textile Industry	6±1	100-250	31±1	0
KC-303	Acrylic Styrene	Adhesion cellulose Pads	6±1	13000-18000	40±1	<3
KC-403	Acrylic Styrene	Outdoor and indoor paints	7-8.5	25000-40000	50±1	10-12
KC-503	Acrylic Styrene	Concrete waterproofing	6±1	25000-40000	50±1	-19

The KC-301 acrylic resin finds its niche as a robust adhesive or final coating for wood and paper applications. Its resolute resistance to water, commendable flexibility, permeability, adhesive strength, and elasticity collectively underpin its utilization across diverse fronts. From the production of cooling system cellulose pads to pre-coolers for gas turbines, greenhouse pads, and poultry pads, this versatile resin plays a vital role.

Phenolic Resins

Phenolic resins are divided into 2 types, Resol and Novolak, based on the molar percentage of formaldehyde to phenol and the alkaline or acidic medium used during production. Resols are thermoset resins that are cross-linked and networked due to heat or acidic or basic catalysts. Their storage period is also limited. Novalacs are thermoplastic resins that have a long storage time.

Products Model	Resin Type	Application	PH	Viscosity (S)	Solid Content (%)	Free Formaldehyde	Density
KC-201	Resol	Cellulose Pad	10-11	20-30	49±1	<0.5	1.15-1.18
KC-204	Resol	Rock wool and glass wool binder	9-9.5	10-14	40±1	-	1.16±0.01
KC-205	Resol	HPL sheets	8.8-9.3	14-17	54-56	<1.5	1.15-1.18
KC-207	Resol	Abrasives	6.5-7.5	600-800	70-75	-	1.2±0.05

The industrial landscape for Resoles unfolds in three variations: water-soluble, solvent-soluble, and solid. Among these, the Resole NADPOLYMER resins take center stage, serving as a water-soluble liquid to encapsulate cellulose cooling pads and rock wool, epitomizing functional fluidity in their application.
The viscosity of DIN cup four is measured at 25°C.

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