SERVICES WE PROVIDE:

Consulting:

Technical Support
Problem Solving
Development of Powder Formulations
Formulation of Resins
Formulation of Curatives

Sales of Raw Materials

Sales of Lab Equipment

www.danickspecialties.com
ph: (850) 897-3152
Fax: (850) 897-0393
cd05/11/2010

Polyester Synthesis

Polyester Synthesis Lab

Designed by
Danick Specialties & Support, Inc.

Products for Powder Coatings

(Imported for DS&S Inc. by Chori-America, Inc.)

Staphyloid impact modifier AC4030

LH grade Barium Sulfate

B- Hardener 5B-55 for Intermediate gloss

B-Hardener 6B-68 for Matt Finishes

MH 1174 Glycoluril Curative

cd 03082016

www.danickspecialties.com
Phone: (850) 897-3152
Fax: (850) 897-0393

Staphyloid AC 4030

Staphyloid AC 4030 is an impact and flexibility modifier for powder coatings.

AC 4030 is easily dispersed into resins of powder coatings.

AC 4030 can improve impact resistance and increase flexibility of powder coatings when added to the pre-mix step of the powder mfg process.

AC 4030 does not have a negative effect on weatherability.

Staphyloid AC 4030 Typical Properties:

• Agglomerated particle size	25-30 Microns
• Appearance:	White free flowing powder
• Structure of particle	Core Tg: - 40C; Shell Tg: 100C

Usage Levels:

Start evaluating Staphyloid AC 4030 at 3% of the total formulation.

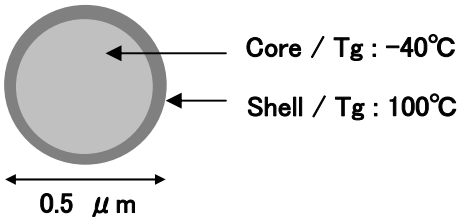
www.danickspecialties.com
Phone: (850) 897-3152
Fax: (850) 897-0393

STAPHYLOID AC-4040

STAPHYLOID AC-4040 is a modifier for powder coatings.
AC-4040 is grade for thin coats.
AC-4040 is dispersed easily into the resin of powder coatings.
This surface condition is excellent in the thin coats.
AC-4040 can improve impact strength and increase flexibility of coats.
AC-4040 does not deteriorate the weather ability of matrix resin.

Typical property

【Primary particle】



Agglomerated particle size	Notes
18 μm	For thin coats. Easy to disperse.

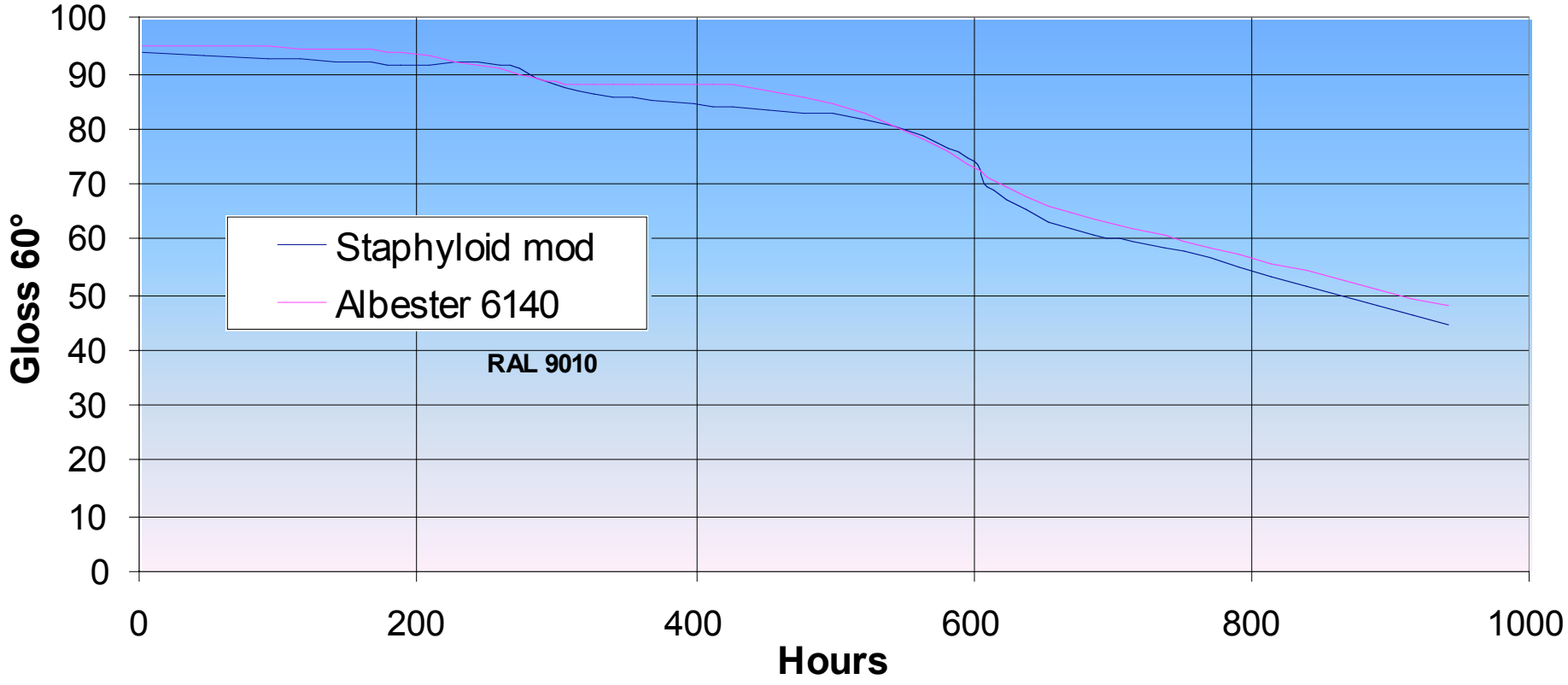
Typical property of powder coating modified

	Contents of STAPHYLOID AC-4040			
	0 wt%	5 wt%	10 wt%	15 wt%
Appearance	Good	Good	Good	Good
Erichsen (mm)	8	8	＞8	＞8
Impact strength (cm)	40	50	50	50
Flexibility (φmm)	6	2	0	0

Surface condition / Film thickness		50 μm	80 μm	100 μm	120 μm
STAPHYLOID	AC-4040	○	○	○	○
	AC-4030	△	△○	○	○

・Cold-rolled Steel Plate : 0.8t × 70 × 150mm
・Resin : Finedic M-8050 (Polyester)
・Cure agent : B-1530 (Blocked isocyanate)
・Resin / Cure agent / AC-4040 = 84.2 / 15.9 / [0 ～ 15] (wt%)
・Pigment : Titanium dioxide (40wt% of coatings)
・Cured for 20 min at 190℃
・Method of measurement
Erichsen : JIS K 5400 8.2.2 / Impact strength : JIS K 5400 8.3.2 / Flexibility : JIS K 5400 8.1 (0.8t × 50 × 150mm)

UVB: 60°C-UV + 50°C-Condensation



POWDER COATING EVALUATION

DATE: 01-07-07	RESIN White Super-Durable		TEST No.

FORMULA			**EVALUATION PURPOSE:**
Raw material	**Wt**	**Wt%**	Check performance of Staphyloid AC 4030
Super durable polyester	302.5	58.738	
TGIC	22.5	4.37	
Benzoin	2	0.388	
Resiflow PV-88	5.4	1.049	
Kronos 2160 white	167.6	32.54	
Staphyloid AC4030	15	2.913	
			EXTRUDER (MP-19MM)
			SETTING
			TEMP. 20 FEED:
			TEMP. 90 RPM: 300
			reading
TOTAL WEIGHT	515.0	100.00	TEMP. 100 °C Load %: 65-80
POLYESTER / CROSSLINKER:			TEMP. 110 °C
PIGMENT / BINDER:			TEMP. 3 °C

Curing Schedule 10' @ 200C									
Thickness (Microns)	60-70								
Appearance	good								
Flow PCI	7								
Gloss 60°/20°	95/85								
Conical Mandrel	pass								
Impact Dir.	160								
Rev.	160								

COMMENTS:

cd092003

POWDER COATING EVALUATION

DATE:01-07-07	RESIN White Super-Durable	RIF.	TEST No. 10988/89/11009/10

FORMULA	B		**EVALUATION PURPOSE:**
Raw material	**Wt**	**Wt%**	Check performance of Staphyloid AC 4030
Albester 6140	308.75	59.951	
Primid XL-552	16.25	3.16	
Benzoin	2	0.388	
Resiflow PV-88	5.4	1.049	
Kronos 2160 white	167.6	32.54	
Staphyloid AC4030	15	2.913	
			EXTRUDER (MP-19MM)
			SETTING
			TEMP. 20 — FEED:
			TEMP. 90 — RPM: 300
			reading
TOTAL WEIGHT	515.0	100.00	TEMP. 100 °C — Load %: 65-80
POLYESTER / CROSSLINKER: 95/5			TEMP. 110 °C
PIGMENT / BINDER:			TEMP. 3 °C

Curing Schedule 10' @ 200C									
Thickness (Microns)	60-70								
Appearance	good								
Flow PCI	7								
Gloss 60°/20°	95/85								
Conical Mandrel	pass								
Impact Dir.	160								
Impact Rev.	160								

COMMENTS: Full impact resistance was achieved at the 4.7% level based on resin.

cd092003

Product Information

Precipitated Barium Sulfate

CHORI and Barium sulfate

CHORI is a leading trading house in Japan. Industrial Chemical department has been handling barium salt, produced by our long-term partner manufacturer in China. Our manufacturer is world largest barium salt manufacturer. our manufacturer has their own Barite mining which is a raw material of Barium Sulfate. The other raw material, Sulfuric Acid, is deprived as bi-production of Barium Carbonate, which are the main productions of our manufacturer . In short, our manufacturer can produce Precipitated Barium Sulfate from its raw material to end product consistently by themselves. This is why we can confirm stable supply, quality and price to our valuable customers.

The Products

Our Barium Sulfate is a synthetic barium sulfate produced from high purity solutions in a defined growth process.
It is resistant to water, acid, alkali and organic solvents as well as to light and to industrial waste gases (e.g. sulfur dioxide).

Applications

Precipitated Barium Sulfate with main application as filler in paints, coatings, pigments and plastics, and as functional additive in batteries.).

Storage

Keep the product unstacked in dry and closed rooms at normal temperature and air humidity.
To achieve best possible results, we recommend storage under the conditions stated above and use within 12 months from delivery.

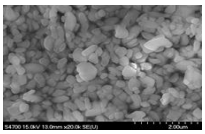
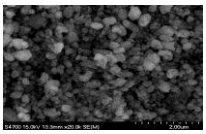
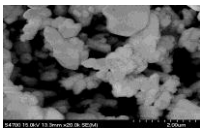
CHORI AMERICA, INC.
30 Montgomery Street, Suite 1230,
Jersey City, N.J. 07302 U.S.A.
Tel: (1)201-234-8899, Fax: (1)201-234-8897

Product Information

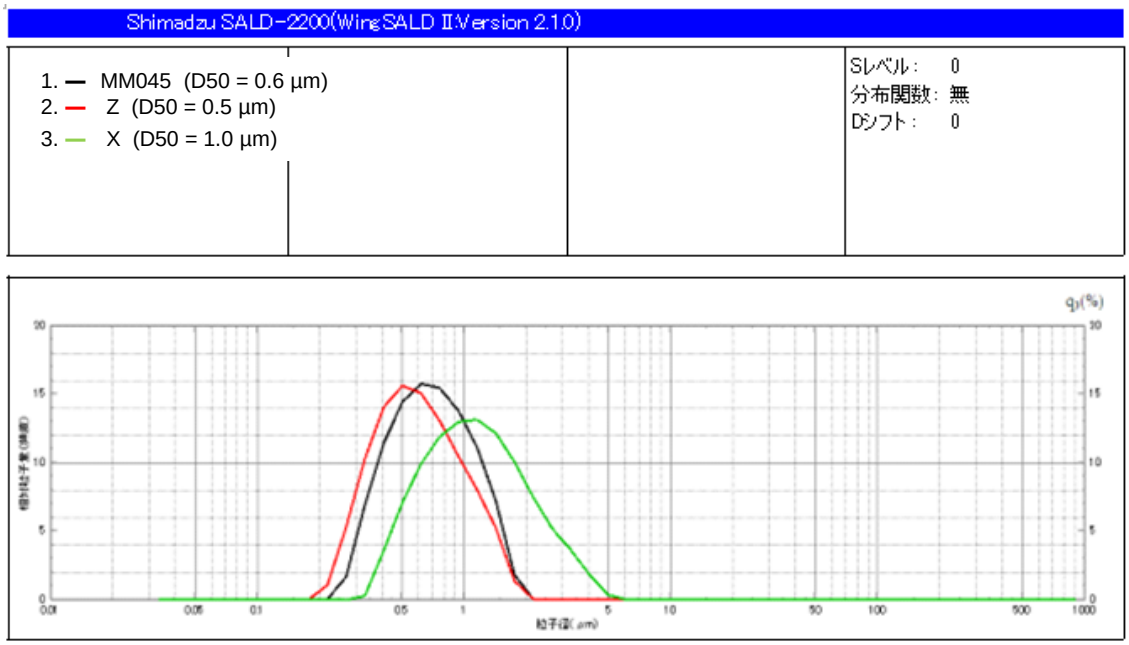
Precipitated Barium Sulfate

Current LH Grade

Technical Date

Grade		MM045 ☆	Z ☆	X ☆
BaSO4	% min	98.0	98.0	98.0
H2O	% max	0.10	0.30	0.30
Warter soluble matter	% max	0.10	0.20	0.30
Oil absorption	ml/100g	18-24	13-20	10-30
pH	-	7.0-9.0	7.0-9.0	6.5-9.5
Whiteness	min	98.0	98.0	95.0
Average Particle size D50	µm	0.5-0.6	0.5	1.0
Capacity	mt/year	2000	12000	18000
Applications		Autmotive paint, Battery, Plastic	Paint, Ink, Plastic, Buttery	Powder paint, Plastic
Competing goods		SachtofineP, Sakai B100	SachtofineP	HD80 BlancFixe, Blanc FixeF
				

Particle Size Distribution Data



CHORI AMERICA, INC.
30 Montgomery Street, Suite 1230,
Jersey City, N.J. 07302 U.S.A.
Tel: (1)201-234-8899, Fax: (1)201-234-8897

MH 1174

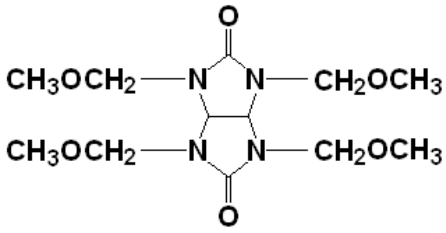
Chemical Name:

Tetrahydro-1,3,4,6-tetrakis(methoxymethyl)-Imidazo[4,5-d]imidazole-2,5(1H,3H)-dione
1,3,4,6-tetrakis(methoxymethyl)Glycoluril, tetrakis(methoxymethyl)-Glycoluril

CAS Registry No.: **17464-88-9**

Molecular Formula: **$C_{12}H_{22}N_4O_6$**

Molecular Weight: **318**



Specifications:

Appearance:	**white to pale yellow crystal powder**
Melting Point:	**100-120℃**
Content:	**85% min.**
Formaldehyde:	**0.05% max.**
Loss on drying:	**0.5% max.**

Characteristics:

Density:	**1 324 kg/m3 at 25℃**
Solubility in water:	**145 g/L at 25℃**
Stability/Reactivity:	**Stable**

Applications:

Crosslinker for powder coating.

Storage and handling:

Store in a tightly closed container in a cool, dry place.

www.danickspecialties.com
Phone: (850) 897-3152
Fax: (850) 897-0393

B Hardener 5B55
POWDER MATTING HARDENER
TECHNICAL DATA SHEET

DESCRIPTION: **B Hardener 5B55**, A modified cyclic amidine, used as a gloss reducing hardener for pure epoxy or polyester/epoxy hybrid powder coatings. Films cured with B Hardener 5B55 exhibit good flow and leveling characteristics, while maintaining uniform gloss readings below 70 @ 60º angle.

Physical Properties	Typical
NVM	99.8 Min.
Melt Range ºC	200-225
Nitrogen Content	8.0-8.5% by Wt.
Color	White to slight off-white
Appearance	White to slight off-white fine powder

Features	
Chemical Resistance	High Reactivity
Film Hardness	Good Mar Resistance
Adhesion	Humidity Resistance
Very Low Gloss	Water Resistance
Excellent Flow	

Coating Applications	
Automotive	FRP
Architectural	Hybrid Plastics
Appliance	Coil

www.danickspecialties.com
Phone: (850) 897-3152
Fax: (850) 897-0393

B Hardener 6B68
POWDER MATTING HARDENER
TECHNICAL DATA SHEET

DESCRIPTION: **B Hardener 6B68**, A modified cyclic amidine, used as a matting hardener for pure epoxy or polyester/epoxy hybrid powder coatings. Films cured with 6B68 exhibit good flow and leveling characteristics, while maintaining uniform gloss readings below 10 @ 60º angle.

Physical Properties	Typical
NVM	99.8 Min.
Melt Range ºC	210-235
Nitrogen Content	6.7-7.5% by Wt.
Color	White to slight off-white
Appearance	White to slight off-white fine powder

Features	
Chemical Resistance	High Reactivity
Film Hardness	Good Mar Resistance
Adhesion	Humidity Resistance
Very Low Gloss	Water Resistance
Excellent Flow	

Coating Applications	
Automotive	FRP
Furniture	Hybrid Plastics
Appliance	Coil

www.danickspecialties.com
Phone: (850) 897-3152
Fax: (850) 897-0393

Products for Powder Coatings

Catalysts, Hardeners & Accelerators

Curaid WT-P	50% Active Sulfonic acid for wrinkle PE
Curaid Tin-D-P	60% Active Dibutyl Tin Dilaurate
Curaid DMS-P	67% Active Dimethyl stearyl amine
Curaid 246TA-P	65% Tertiary amine
Curaid 2PI-P	65% 2-Propyl imidazole
Curaid 2MI-P	65% 2-methyl imidazole
Curaid DMLA-P	65% Dimethyl Lauryl amine
Curaid TBAB-P	65% Tetra Butyl Ammonium Bromide
Curaid BTA-50-P	50% Boron trichloride amine cplx, wrinkle epoxy
Curaid C2-P	60% Choline Chloride
Curaid 2HDA100-P	100% active Heptanedioic Acid Curative
Curaid BisOct-P	60% Active Bismuth Octoate
B-Hardener 6B68	Low Gloss Curative
B-Hardener 5B55	Medium Gloss Curative
MH 1174	Alternative to Powderlink 1174
Staphyloid AC4030	Improves Impact resistance esp. in Super-Durable Powders
LH Grade Barium Sulfate	Blanc Fixe Grade Barium Sulfate

Flow Modifiers

Floaid MAPS-P	60% Polysiloxane
Floaid FC-4	70% Flurochemical Surfactant
Floaid AG50-P	50% Active Ant-graffitti additive
Floaid MS71-P	70% Dimethyl Polysiloxane

Wetting & Dispersing Agents

Disperzaid A6-P	65% Ethoxylated Wetting Agent
Disperzaid AT65-P	**65% Active Dispersing Agent**

Anti-Static Agents

Stataid Q-60-P	50% Quarternary salt

www.danickspecialties.com
Phone: (850) 897-3152
Fax: (850) 897-0393

cd03082016

Curaid WT-P powder catalyst, designed to provide texture and wrinkle finishes when used in polyester resin based powder coating formulations in conjunction with a cross linker.

PROPERTIES:

• Appearance:	Free Flowing Powder
• Odor:	Mild
• Color:	White
• Volatiles Content:	Less than 4%
• Active level:	50%

APPLICATION:

- The Product can be used in polyester coating for decorative indoor or outdoor applications.
- Dosage levels are in the range of 1% to 2% on resin content.
- A small amount of epoxy, 1-3%, may be necessary to achieve desired wrinkle effect.

www.danickspecialties.com
Phone: (850) 897-3152
Fax: (850) 897-0393

CURAID Tin-D-P

CURAID Tin-D-P is a high active powder dispersion of dibutyl tin dilaurate. This product is more easily and effectively dispersed in the manufacturing of polyester powder coatings than liquid dibutyl tin dilaurate, which has been used in the past as a catalyst.

PROPERTIES:

- Appearance: Free flowing powder
- Color: White
- Activity: 60%
- Odor: Mild

APPLICATION:

Use of **CURAID Tin-D-P** will reduce the formation of over catalyzed compound areas in the production of polyester powder coatings. This is due to the improved dispersion characteristics of the powder through the batch in contrast to poor distribution of liquid dibutyl tin dilaurate.

www.danickspecialties.com
Phone: (850) 897-3152
Fax: (850) 897-0393

CURAID DMS-P

CURAID DMS-P is a powder catalyst, which has been specifically developed to speed the cure rates of carboxylated polyester resins/epoxy hybrid powder coating systems.

TYPICAL PROPERTIES:

- Appearance: Free Flowing Powder
- Color: White
- Odor: Mild
- Activity: 67%

PROPERTIES & APPLICATIONS:

- This product lowers the cure temepratures of carboxylated polyester resins/epoxy hybrids while maintaining high flow and gel times.
- It can also serve as a de-block accelerator in urethane durable coating systems.
- Typical dosage ranges are from 0.1 to 0.5% in relation to the total powder formulation.

www.danickspecialties.com
Phone: (850) 897-3152
Fax: (850) 897-0393

CURAID 246TA-P

CURAID 246TA-P is a high active powdered version of CURAID 246TA-Liquid. This powdered form has been developed to aid dispersion into epoxy coating compounds. It is an effective curing accelerator for epoxy or hybrid systems utilizing a polyamide or anhydride hardener.

TYPICAL PROPERTIES:

- Appearance: Light brown powder
- Activity: 65 %
- Odor: Mild
- Solubility: Soluble in organic solvents, slightly soluble in water.

APPLICATIONS:

- This product is a tertiary amine, which may be used as an accelerator or hardener for epoxy coatings.

- It is FDA approved under 21 CFR 175.300.

www.danickspecialties.com
Phone: (850) 897-3152
Fax: (850) 897-0393

CURAID 2PI-P

CURAID 2PI-P is a powdered curing accelerator, which utilizes 2-propylimidazole as the active ingredient, onto a silica carrier. It provides higher heat distortion temperature in cured coatings versus conventional tertiary amine accelerators. This powdered curing accelerator was developed for ease of compounding into powder coating formulations.

TYPICAL PROPERTIES:

- Appearance: Light Tan Powder
- Active Ingredient: 65%
- Odor: Mild

APPLICATIONS:

Used as a hardener for molding powders and as a curing accelerator for powder coatings. Powder coatings formulated with Joncryl® 820 or Joncryl® 822 for acrylic hybrid powder coatings can be further accelerated with Curaid 2PI-P.

www.danickspecialties.com
Phone: (850) 897-3152
Fax: (850) 897-0393

CURAID 2MI-P

CURAID 2MI-P is a powdered curing accelerator, which utilizes 2-methyllimidazole as the active ingredient, onto a silica carrier. Dosage levels may vary from 0.1% to 2.4% on resin levels.

TYPICAL PROPERTIES:

• Appearance:	Free flowing powder
• Active Ingredient:	65%
• Odor:	Mild
• Color	White
• Storage	Store in a dry container. Protect from moisture and light

APPLICATIONS:

The product may be used as an accelerator for use with dicyandiamide epoxy hardeners.
The product may be used for formulating epoxy resins for adhesives and powder coatings.

www.danickspecialties.com
Phone: (850) 897-3152
Fax: (850) 897-0393

CURAID DMLA-P

Curaid DMLA-P is a specialized amine of the Di-Methyl Lauryl type, on a silica carrier.

Typical Characteristics:

Appearance	Free flowing powder
Color	White
Activity	65%
Odor	Mild with light amine
Non-Volatile	95% Minimum

www.danickspecialties.com
Phone: (850) 897-3152
Fax: (850) 897-0393

CURAID TBAB-P

CURAID TBAB-P is designed as a catalyst for Epoxy, Hybrid and TGIC Polyester systems.

TYPICAL PROPERTIES:

· Appearance:	Free flowing powder
· Color	White
· Activity	65%
· IMO 2 Solids Content:	98.5 % Minimum.
· Volatiles:	1.5 % Maximum.

APPLICATION AREAS:

- A catalyst for Epoxy, Hybrid and TGIC Polyester systems.
- A non-yellowing catalyst, used in I.R. cure systems.
- A higher reactive catalyst in comparison to Tertiary Amine catalyst types.
- Can lead to “reverse impact property” improvements.

Dosage levels are usually in the region of 0.4 to 2.0 phr.

www.danickspecialties.com
Phone: (850) 897-3152
Fax: (850) 897-0393

CURAID-BTA50-P

CURAID-BTA50-P is a powdered latent curing agent/accelerator which utilizes a boron trichloride amine complex as the active ingredient. This powdered curing agent was developed for ease of compounding into powder coating formulations and improvement of occupational safety and health.

PROPERTIES:

Appearance:	Free-flowing Powder
Activity:	50%
Odor:	Pungent
Storage:	Keep in tightly closed dry container. Avoid contact with moisture.

APPLICATIONS:

1. May be used either as a latent catalytic curing agent for epoxy resins or as a latent accelerator for anhydride cured epoxy systems.
Major applications are casting, encapsulation, and molding electrical tapes.

2. Provides the following benefits:
Exceptional latency at temperatures up to 80° C.
Highly reactive at temperatures above 120° C.
Stabilizes pre-accelerated resins and hardeners.

DOSAGE LEVELS:
Amounts to use will depend on the parameters of the application and may vary from 0.5% to 6% in relation to the weight of resin in the epoxy system.

www.danickspecialties.com
Phone: (850) 897-3152
Fax: (850) 897-0393

CURAID C2-P

CURAID C2-P **is a 60% active Choline Chloride on a support carrier.**

Choline chloride is often used as a catalyst or component of a catalyst system in various coating formulations.

CURAID C2-P, being a powdered form of choline chloride, is ideally suited for applications in powder coatings.

TYPICAL PROPERTIES:

- Choline Chloride: 60% ± 1%
- Appearance: White free flowing powder

CURAID C2-P is FDA compliant under 21 CFR 175.300.

www.danickspecialties.com
Phone: (850) 897-3152
Fax: (850) 897-0393

FLOAID MAPS-P

FLOAID MAPS-P is a 60% active powder version of a methyl alkyl poly siloxane for powder coatings. It can be incorporated in the powder coating formula to impart slip mar resistance properties to the final coating, as well as improve gloss level and surface coating lubricity.

TYPICAL PROPERTIES:

- **Appearance:** **White, free-flowing powder**
- **Odor:** **Mild**
- **Activity:** **60 %**

APPLICATIONS:

- It is an additive, which has been developed to improve the flow and leveling of powder coatings.
- Its surface-active properties make it possible to improve the slip mar resistance of the surface coating.
- Its active ingredient's demonstrate excellent thermal stability even when subjected to 305°C for eight hours.

Store in dry, moisture free area.

www.danickspecialties.com
Phone: (850) 897-3152
Fax: (850) 897-0393

FLOAID FC4-P

FLOAID-FC4-P is an excellent resin flow modifier for industrial powder coatings. It is designed to improve flow-out and leveling of powder coatings, by reducing the surface tension of the finished film.
Floaid FC4-P is to be used for applications that require extraordinary performance etc. (Contaminated substrates and so on....)
Usage levels range from 0.1% to 0.7% based upon active material.
Epoxy, polyester, acrylic and urethane powder coatings are the main systems that this product can be applied to.
The chemistry is of a non-ionic fluorochemical surfactant nature.

PROPERTIES:

- Appearance: Free-flowing powder
- Color: Off White
- Active ingredient: 70%

APPLICATIONS:

- Excellent leveling, wetting and flow control characteristics.
- Does not contain silicone and, therefore, does not adversely affect adhesion.
- Improves coating surface wetting characteristics and reduces tendency of coatings to pinhole.

www.danickspecialties.com
Phone: (850) 897-3152
Fax: (850) 897-0393

DISPERZAID-A6-P

DISPERZAID-A6-P is a wetting emulsifying or dispersing agent in powder form.

Properties:

□	Appearance:	Free Flowing Powder
□	Color:	Off-White to White
□	Activity:	65%

Applications:

Due to the nonionic nature of its active ingredient, **DISPERZAID-A6-P** is compatible with anionic, cationic and nonionic materials and is stable in acid and alkaline systems.

www.danickspecialties.com
Phone: (850) 897-3152
Fax: (850) 897-0393

STATAID Q60-P

STATAID Q60-P is a very effective for imparting anti-static or conductive properties to various polymer systems. It is especially effective in polyurethane, polystyrene and PVC polymer systems. It is recommended to be used at levels of 2% to 8% of the total polymer system.

TYPICAL PROPERTIES:

- Appearance: White Powder
- Activity: 50% Active
- Toxicity: Moderate
- Note: **STATAID-Q60-P** will withstand temperatures up to 400° F for short periods of time but care should be taken to avoid exposing the product to excessive heat history before processing.

www.danickspecialties.com
Phone: (850) 897-3152
Fax: (850) 897-0393

Danick Specialties & Support, Inc. provides sales and technical support for Strand Mfg lab equipment for powder coatings.

The Strand Mill

"Laboratory Preparation of Powder Coatings"

Introduction

Laboratory development time is critical to any industry. Therefore, to maximize the effort the best tools need to be used. In the development of powder coatings, there are many pieces of equipment that have been developed to reproduce large scale production. Included in this equipment are various laboratory grinders used in an attempt to match the particle size distribution achievable with an ACM (air classifying mill), common to most powder production lines. however, none of these devices have been found to be as effective, low cost, or efficient as the Strand Mill portable table top grinder. This review will compare the efficiency, ease of use, and ultimate particle size achievable with some of the common pieces of equipment used in the laboratory preparation of powder coatings.

Types of Mills used to match a production ACM mill

The most common pieces of equipment used in the laboratory preparation of powder coatings including the following: coffee grinder, Vitamix, Brinkman, Bantam, and a bench top ACM mill. This equipment ranges in price from $25 for a coffee grinder up to $30,000 for a bench top ACM. A simple coffee grinder consists of fixed blades, a small stainless bowl, and a plastic top. It is limited in capacity, inefficient, and includes plastic parts which cannot be solvent cleaned. Overall, contamination and durability is poor. Another common grinder is stainless steel Vitamix. A Vitamix is no more than a high speed blender, It' odd shaped container with corners, and small blade to height ratio is very inefficient for grinding dry powders. A more expensive option is a Brinkman SR3 mill. This mill grinds with a hammer tooth ring and a classifying screen. The product is ground by the hammers until it is small enough to pass through the screen. These mills are very difficult to clean and generate a lot of heat which frequently fuses the powder. Another choice is a Bantam mill. In principle, the Bantam mill works much like the Brinkman mill, however, it comes with a liquid nitrogen accessory which enables cooling during grinding. The Bantam contains many parts, is difficult to clean, and is not practical for fast evaluations or small samples. The final option is a bench top ACM mill known as the ACM-1. In principle an ACM-1 duplicates the mechanics of a production ACM mill. Although production particle size can be matched, cooling is a problem, it is not difficult to clean, and settings do not always coincide with production equipment.

Coffee Grinder	25-100	20-30%	Poor	Too Coarse
Vitamix*	350-450	20-40%	Excellent	Too Coarse
Strand Mill	1,200-1,700	40-50%	Excellent	Slightly Coarse
Brinkman	13-14,000	70-90%	Poor	Too Coarse
Bantam	20,000+	80-90%	Poor	Too Coarse
ACM-1	25,000+	75-95%	Poor	Excellent

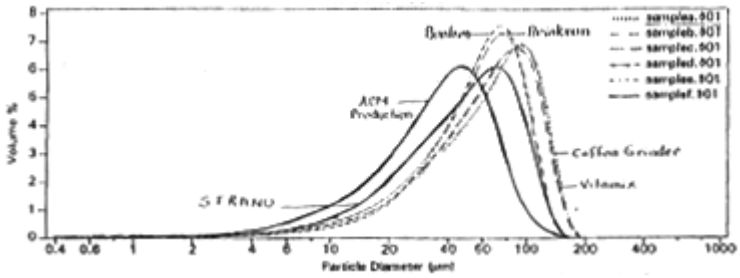
*Note Stainless steel versions are no longer available, only available in polycarbonate.

What is the Strand Mill

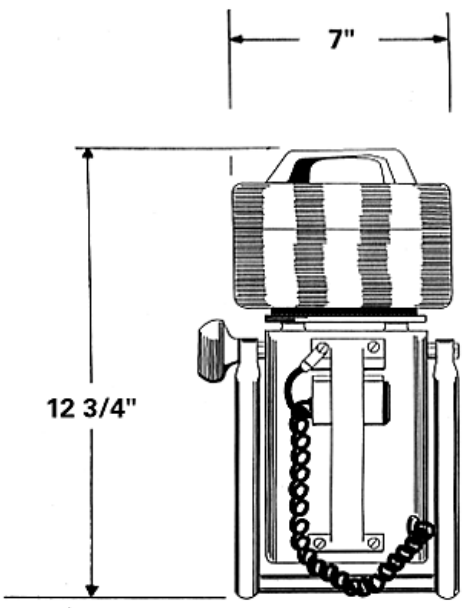
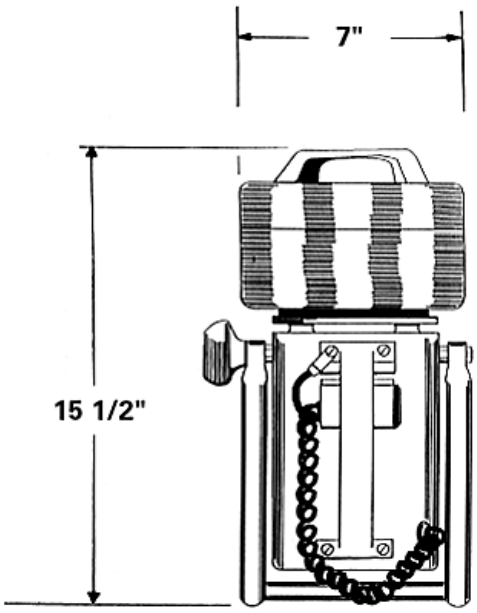
Non of the above options enables the fast, efficient, cost effective, preparation of laboratory samples of powder coatings. However, now there is a solution, The Strand Mill. The Strand Mill is a unique portable table top grinder that can quickly reduce flake into powder in less than 10 seconds. The mill consists of a motor housing, stainless steel bowl, two blades, and a stainless screw on top. The key to the Strand Mill is the construction of the blades and the geometry of the container which creates a unique mixing action. With this unit, it is possible to grind up to about 150 grams of flake at a time. Cleanup is easy, and it has been found to most accurately duplicate the particle size distribution of a production ACM mill. No other laboratory piece of equipment can match the easy of use, efficiency, and results of the Strand Mill.

Particle Size Comparison

In order to compare the performance of the Strand Mill with the other equipment, a standard 50/50 polyester epoxy hybrid was extruded using a Buss PLK-46. The sample was split and ground on the five different pieces of laboratory equipment. All samples were then sieved using a 140 mesh screen, and analyzed for particle size using a Coulter LS-130. The following graph is an overlay of the particle size distributions for each piece of equipment.



Note: It was assumed that the laboratory ACM-1 could match the ACM production particle size and there it was not run. Comparing the other pieces of equipment it can be seen that the Strand Mill comes close to duplicating an ACM production mill. The following table compares approximate costs, efficiency, ease of cleaning, and particle size for each unit.

SMALL LAB GRINDER MODEL #S-101	LARGE LAB GRINDER MODEL #S-102
Bowl Capacity - 150 Grams Weight - 7.3 KG	Bowl Capacity - 350 Grams Weight - 9.5 KG
	
110 volt 10 amps	110 volt 15amps

Starting Material

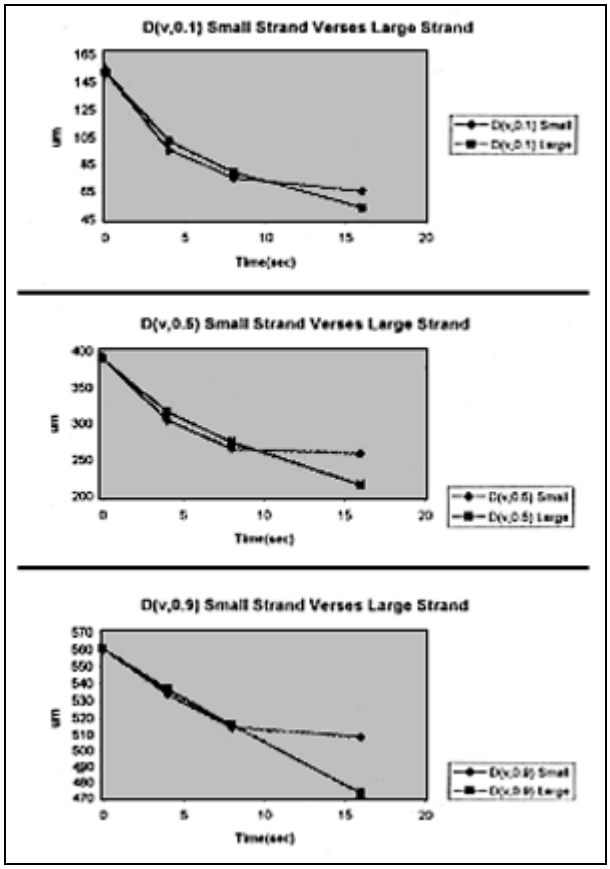
1	153.3900	393.5000	561.37
2	147.0700	383.2500	559.53
3	156.8100	397.5800	562.22
average	152.4233	391.4433	561.04

Small Strand Grind

time	D(v,0.1) S	**time**	D(v,0.5) S	**time**	D(v,0.9) S
0	152.4233		391.4433		561.04
4	96.1600		304.9900		534.32
8	74.9900		266.2400		514.69
16	65.0700		256.6300		508.70

Large Strand Grind

time	D(v,0.1) L	**time**	D(v,0.5) L	**time**	D(v,0.9) S
0	152.4233		391.4433		561.04
4	102.5700		316.4700		537.04
8	79.2200		275.7400		516.24
16	53.5500		216.0900		473.52



STRAND LAB GRINDER
Replacement Parts List


110V

Strand Manufacturing Company, Inc.

MANUFACTURING AND CUSTOM MACHINE WORK

Home
Chill-Rolls
Conveyor-Kibbler
Grinders
Contact Us

STRAND CHILLROLL MODEL S-813

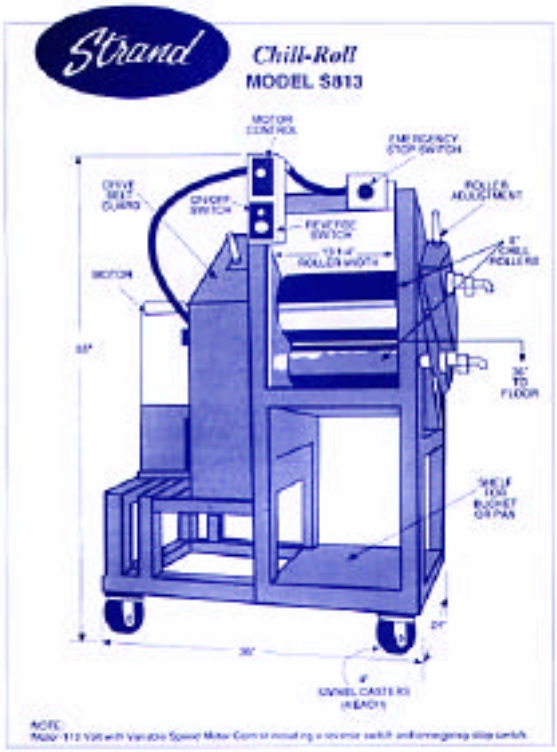
Rollers are 13 inch face x 8 inch diameter, variable speed from 0 to 10 rpm's with adjustable clearance of up to 1/2 inch.

Electrics are 110 volt (unit comes with a cord with a plug).

Coolant is liquid — some customers use tap water with hose for hookup — best results are achieved by using a chiller with temperature around 31 degrees F.

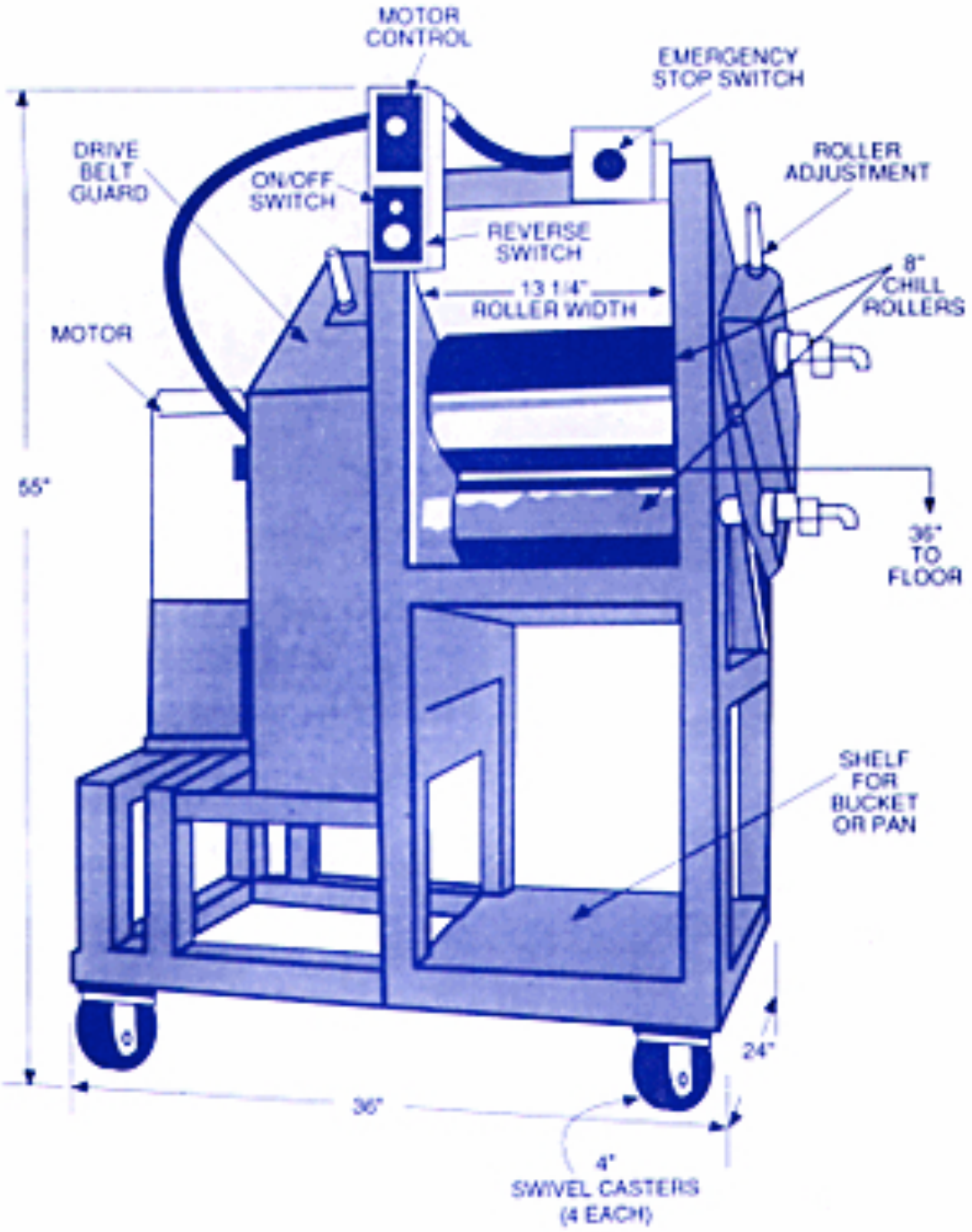
Original equipment warranties apply on all OEM items (motors, controllers, gearbox, etc.). One year warranty on all items manufactured by strand and not subject to abuse.

Machine is mounted on caster wheels with brakes for mobility.



Strand

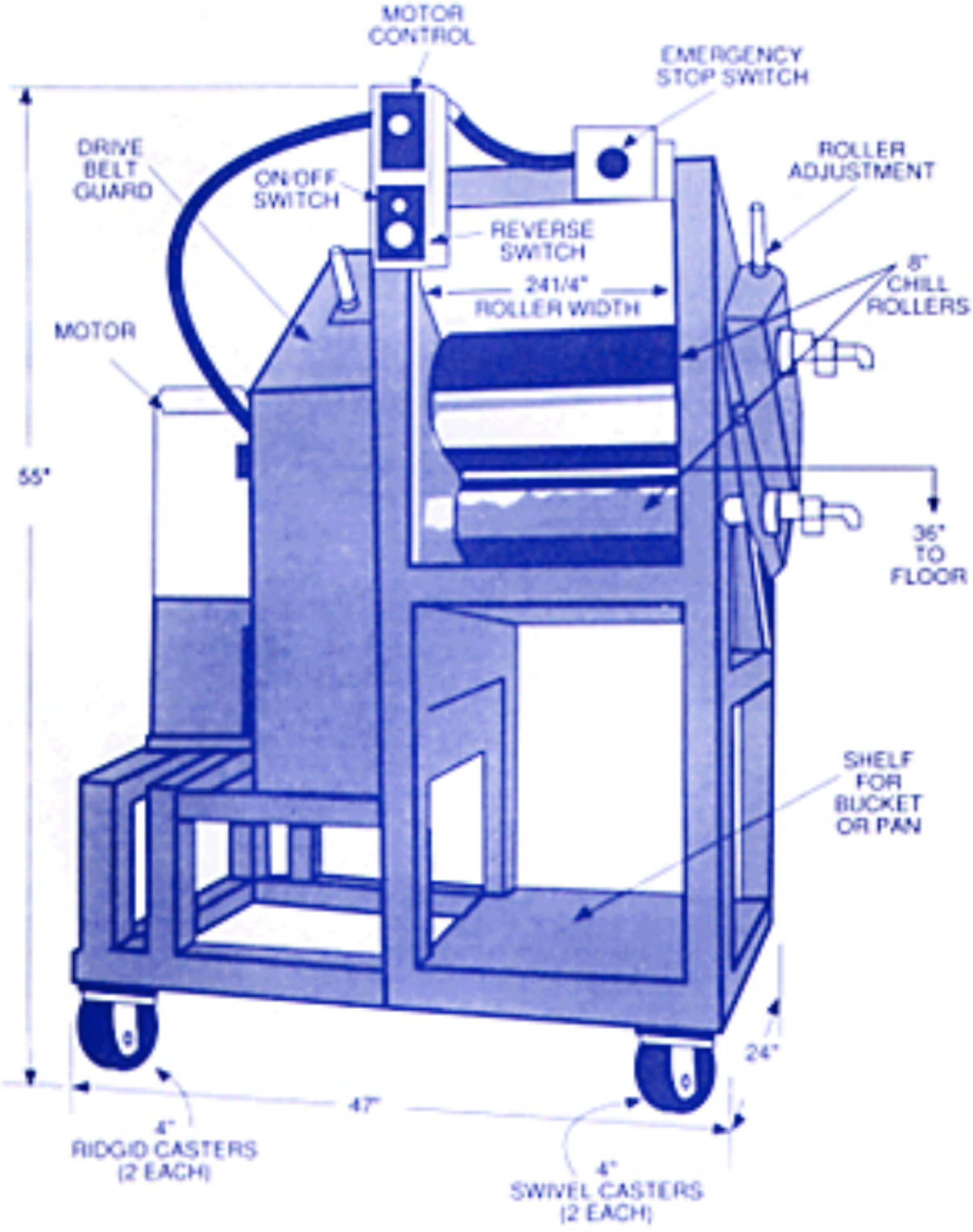
Chill-Roll
MODEL S813



NOTE:
Motor-110 Volt with Variable Speed Motor Control including a reverse switch and emergency stop switch.

Strand

Chill-Roll
MODEL S824



NOTE:
Motor-110 Volt with Variable Speed Motor Control including a reverse switch and emergency stop switch.


HAND
HAZARD!

Strand Manufacturing Company, Inc.

MANUFACTURING AND CUSTOM MACHINE WORK

Home
Chill-Rolls
Conveyor-Kibbler
Grinders
Contact Us

CONVEYOR & KIBBLER

Conveyor belt is seamless polyurethane (Temperature range of -30 to +80 Celsius).

Conveyor support constructed of stainless steel for easy cleaning.

Spring loaded Teflon scraper to ride against Chill-Roll roller.

Serrated stainless steel kibbler roller breaks your product into small flakes (Top roller pivots up for easy cleaning).

Stainless steel chute under kibble rollers to guide product into containers.

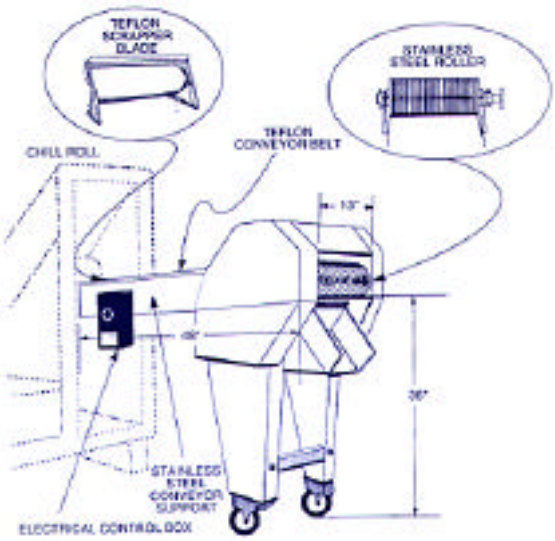
Stainless cover for kibbler rollers has a "power interupt" safety feature that shuts off power when cover is removed.

110 volt electrics with variable speed motor control.

Machine is designed to attach to *Strand Chill-Rolls* as an "add-on".

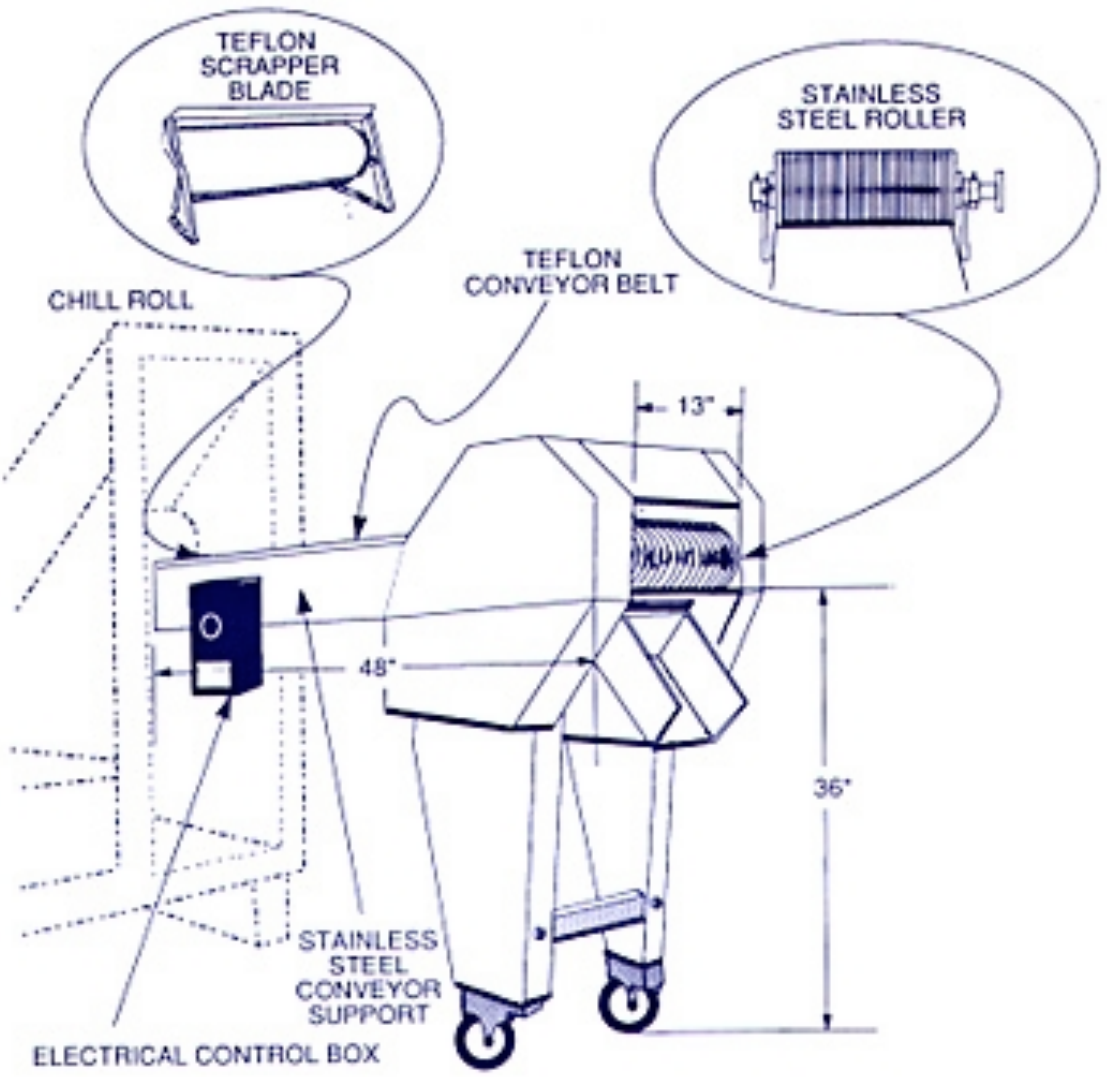
Caster wheels on machine for mobility.

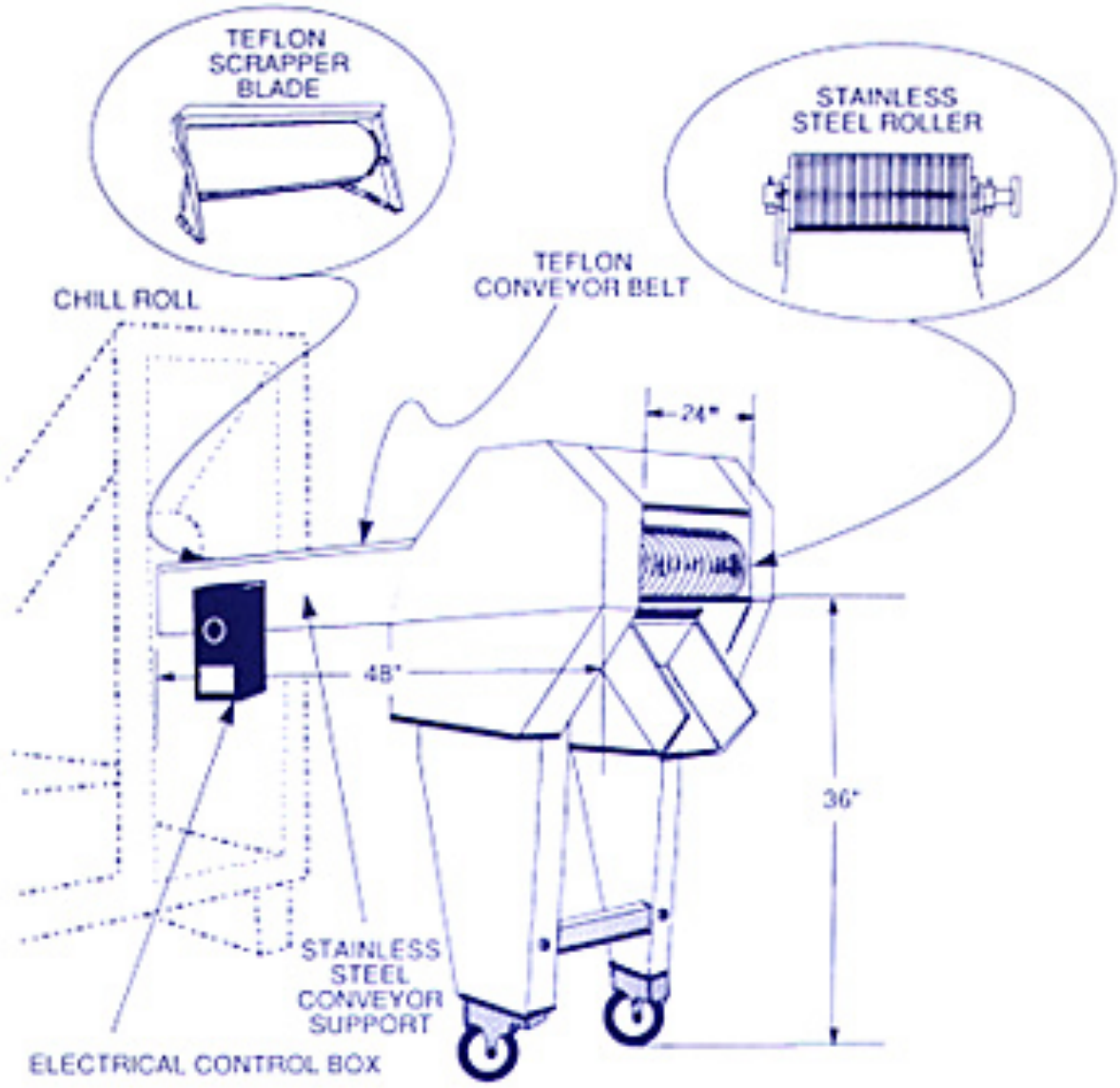
CONVEYOR & KIBBLER MODEL CON-13X48



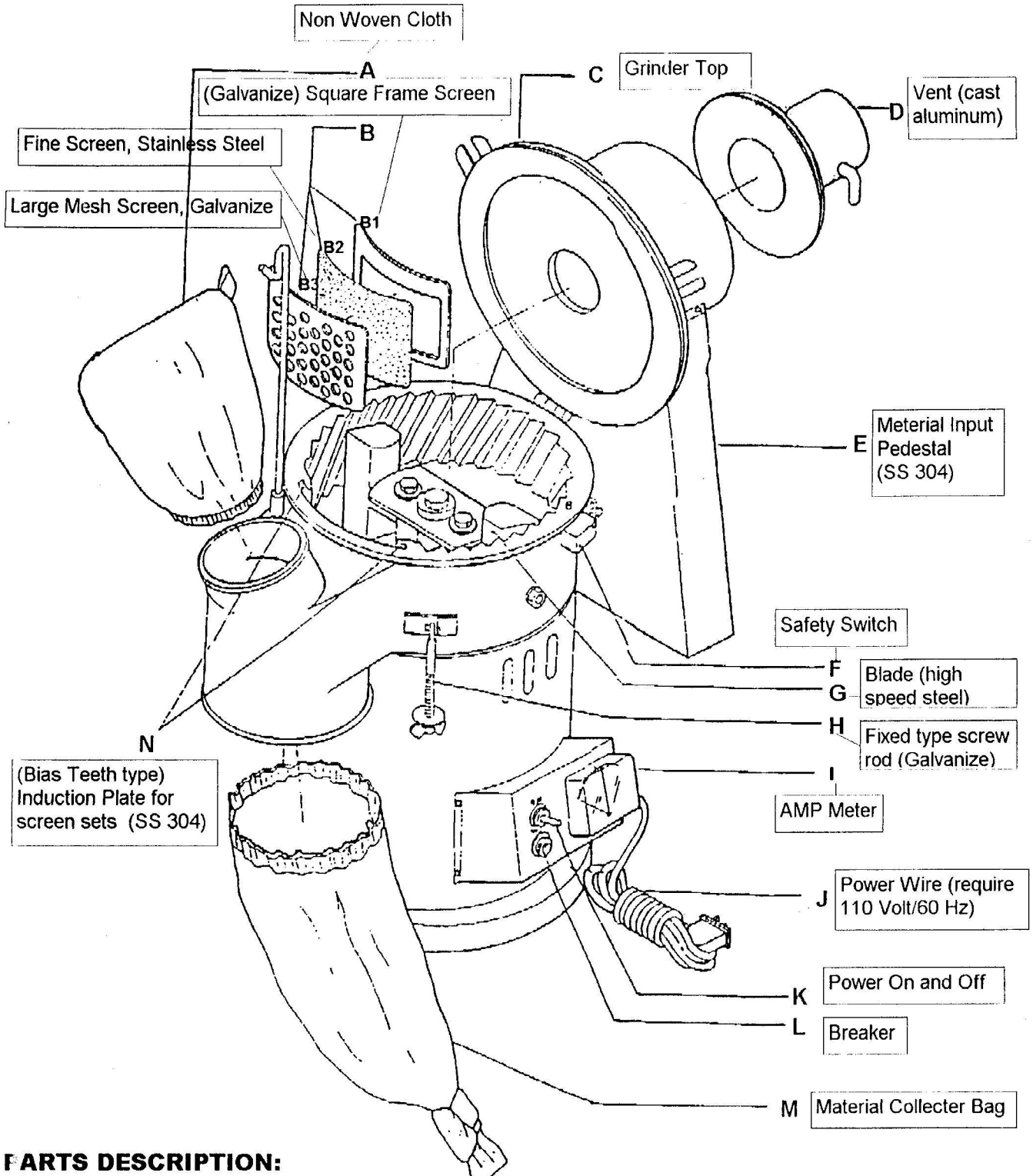
| Home | Chill-Rolls | Conveyor-Kibbler | Grinder | Contact Us |

Strand Manufacturing Inc. 1515 5th Street South #C Hopkins, MN 55343
Phone: 952-935-8699 Fax: 952-935-8799 Email: rkates7353@aol.com


TEFLON
SCRAPPER
BLADE
STAINLESS
STEEL ROLLER
TEFLON
CONVEYOR BELT
CHILL ROLL
13"
48"
36"
STAINLESS
STEEL
CONVEYOR
SUPPORT
ELECTRICAL CONTROL BOX


TEFLON
SCRAPPER
BLADE
STAINLESS
STEEL ROLLER
CHILL ROLL
TEFLON
CONVEYOR BELT
24"
48"
36"
STAINLESS
STEEL
CONVEYOR
SUPPORT
ELECTRICAL CONTROL BOX

S-104 Lab Hammer Mill



PARTS DESCRIPTION:

A : Non Woven Cloth	E: Material Input Pedestal (SS304)	L: Breaker
B1: Square Frame Screen (Galvanize)	F: Safety Switch	M: Material Collecter Bag
B2: Fine screen (Available in 120 mesh/100 mesh/80 mesh)	G: Blade Set (Hight speed steel)	N: Induction Plate (also refer as Bias Teeth type for screen sets (SS 304)
B3: Large mesh screen (Galvanize)	H: Fixed type screw rod (Galvanize)	
C : Grinder Top	I: AMP Meter	
D : Vent (Cast Aluminum)	J: Power wire (Require 110 Volt, 60 Hz)	
	K: Power On and Off	