SANDVIK

STEEL BELT CONVEYORS

STEEL BELT COOLING, FLAKING and PROCESSING UNITS

ENGINEERED TO MEET YOUR REQUIREMENTS

SANDVIK engineers design and build complete units to fit specific applications. They can be provided as individual conveying units or incorporated in other processing equipment such as ovens, dryers, freezers, evaporators, etc. Belt, idlers, drive, complete supporting structure, plus controls and attachments are included. In addition to complete conveyors, Sandvik supplies "packaged" components such as the tension end assembly, drive end assembly, steel belt assembly, and discharge ploughs and devices for installation on your own structure.

WIDE RANGE OF SIZES

SANDVIK Conveyors range from small work-table units to complete materials-handling systems. Conveyors are built to any length. Standard widths range from 4 to 48 inches in 4-inch increments. Belt thickness ranges from 0.016 to 0.063 inches. For sizes over 48 inches, belts can be longitudinally joined to provide practically any width.

CARBON OR STAINLESS STEEL BELTS

Belts can be of cold-rolled, hardened and tempered, high carbon steel or of cold rolled stainless steel, depending upon the application. Belts can be given a surface polish. They can also be supplied perforated for special application, providing up to 40% open area to allow air flow through the belt for heating, baking, drying, cooling or freezing operations.

AUTOMATIC DISCHARGE AT SEVERAL POINTS

SANDVIK Conveyors can be fitted with flat or V-type automatic discharge ploughs or devices that scrape off material at any point along the line or from any part of the belt.

CONVEYOR WORK-TABLES

Complete conveyor work-tables can be supplied either for progressive assembly operations or mounted on wheels for portable services. Such "in transit" assembly-line manufacturing includes filling containers, cans, bottles, etc. in packaging operations . . . assembling, painting, testing, etc. in piece goods operations, etc.

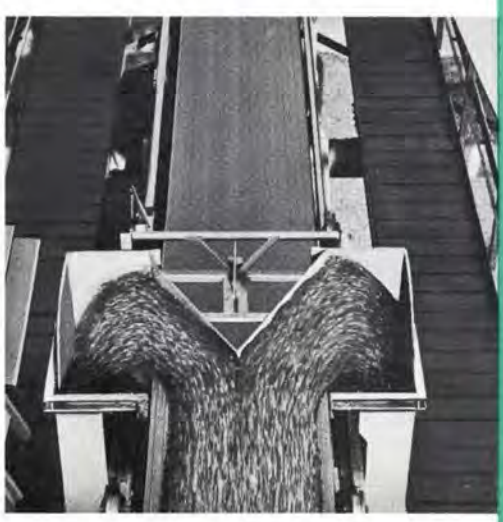


COMPLETE ENGINEERING SERVICE

Design. Installation. Follow-up. Ask for an engineering proposal for your hot processing, cooling, or conveying problem.



At take-off end of a Sandvik Cooler a breaker attachment breaks ammonium nitrate sheet into conveyable chips.



Bulk materials being discharged from a Sandvik steel belt conveyor by a "V" scraper plow.

BASIC ADVANTAGES

of a flat, continuous band of steel for materials handling

The belt used on SANDVIK units is not a mesh or linked-plate belt, but a one-piece, continuous, unbroken flat band of steel. Here are some of its inherent advantages–

- **Has smooth, hard, impervious surface**
- **Withstands heat and sub-zero cold**
- **Resists corrosion and abrasion**
- **Is fireproof and non-flammable**
- **Is easy to clean**
- **Has high load capacity**
- **Has permanent high strength**
- **Will not stretch**
- **Loads and unloads at any point**
- **Gives long service life**
- **Smooth operation, no jolts or vibration**

WIDE FIELD OF APPLICATIONS

SANDVIK steel belt units are widely used for handling hot, wet, sticky, oily, powdered, abrasive, or sintered materials. These include: chemicals, aluminum sulfate, ammonium nitrate and sulfate, sodas, sulfur, superphosphate, clay, cement quartz, glass, limestone, sand, gravel, slate, coal, coke, charcoal, clinkers, ashes, grain, mash, dough, animal fats, meat, margarine, ice cream, chocolates, minerals, ores, slag, paper pulp, plastics, resins, foam rubbers, pitch, asphalt, tars, rocks, wood shavings, chips, sawdust, etc.

HANDLING HOT MATERIALS

SANDVIK units without water-bed arrangements have been successfully used to carry chemicals and other materials through various types of ovens, for continuous baking, drying, heat-treating, or annealing operations.

SANDVIK Continuous

CONTINUOUS PROCESSING of "HOT" CHEMICALS

SANDVIK Water-Bed Cooling Units are used for cooling and solidifying a molten mass of different materials which are formed on the belt itself—such as: alumina, alum, chocolates, fertilizers, gelatin, glue, grease, insecticides, paraffins, phosphates, pitch, soap, silicates, synthetic resins, sulfur, tar, waxes, etc.; in such operations as heating, cooling, evaporating, flaking, crystallizing, sheet forming, cutting, etc. Materials with temperatures up to 1900°F. are being successfully handled. Tests indicate the possibility of handling even hotter materials.

SANDVIK Patented Water-Bed Belt Cooler and Flaker

This unit carries your product on a solid stainless steel belt that passes over a trough of circulating water. The surplus water overflows into gutters which collect and return the water for recirculation. There's 100% coolant contact with the underside of the belt. No water gets on top of the band to mix with product. The entire conveying belt can be arranged to run inside a metal duct through which a suction fan pulls a continuous draught of clean cool air.

When required, tapered neoprene strips can be fitted to the edges of the belt to hold liquid chemicals on the belt surface. Molten chemicals poured onto one end of the belt can be taken off in strip form at the opposite end.

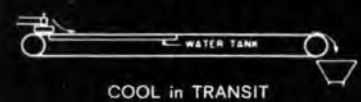
This SANDVIK Processing Unit Facilitates:

1. **Close Control of Cooling Rate** — The water-bed trough is sectionalized, permitting control of coolant temperatures in specified sections along the length of the belt.
2. **Continuous Cooling of Materials Requiring a Long Cooling Time** — This makes possible the continuous processing of many materials formerly handled by batch operation.
3. **Regulating Thickness of Material while Cooling** — Various thicknesses can be cooled. This permits the formation of continuous ribbons, strips, or sheets of a predetermined size.

Some Examples of SANDVIK Water-Bed Cooler Capacity

MATERIAL	FEED TEMP., °F.	DISCHARGE TEMP., °F.	CAPACITY, LB./HOUR	BELT WIDTH, INCHES	COOLING LENGTH, FEET
Ammonium Nitrate	400	160	7800	32	36
Chlorinated Wax	300	100	1000	20	12
Coal Tar Pitch	350	130	4000	32	72
DDT Insecticide	212	130	2400	32	50
Epoxy Resins	425	100	2800	32	36
Hydrocarbon Resins	400	100	6000	32	84
Phosphate Glass	1900	200	500	20	12
Sodium Metasilicate	158	85	3000	32	72
Sulphur	290	150	25 tons/hr.	32	250
Synthetic Resin	300	90	5400	32	48
TNT	180	140	2200	32	12
Vinyl Resins	285	100	6000	32	72
Wood Rosin	450	130	5000	32	120
Wood Rosin	285	100	6000	32	72

WITH A SANDVIK WATER-BED BELT COOLER YOU CAN:



COOL in TRANSIT


CONTROL TEMPERATURE in ZONES


REGULATE THICKNESS and COOL



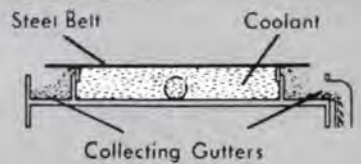
CUT MATERIALS to DESIRED SIZES while COOLING


COOL and STRIP OFF GELATINOUS MATERIALS in SHEET FORM


COOL LOOSE and PULVERIZED MATERIALS


COOL SOLIDS in SHEET FORM


COOL MATERIALS in LAYERS



Schematic view shows how Sandvik Steel Belt Water Bed Cooler operates. Solid steel band "floats" on water-bed tank of circulating water or other coolant. Coolant pressure assures 100% contact with bottom of belt.

Steel Belt Conveyor-Coolers

Advantages of SANDVIK Continuous Steel Belt Coolers Over Drum Type Coolers or Flakers

The SANDVIK patented water-bed, steel-belt cooler gives you these advantages:

- **UNLIMITED COOLING AREA**

  —Belts up to 48" wide—any length.

- **CONTROLLED ZONE COOLING**

  —Water-bed under belt can be sectionalized to permit zone by zone control of cooling (or heating) rate.

- **CONTROLLED FLAKE THICKNESS**

  —Made possible by flat, horizontal surface of belt. For thicker material, side skirts can be applied at the belt edges.

- **UNIFORM COOLING**

  —Assured by total contact of coolant with underside of belt.

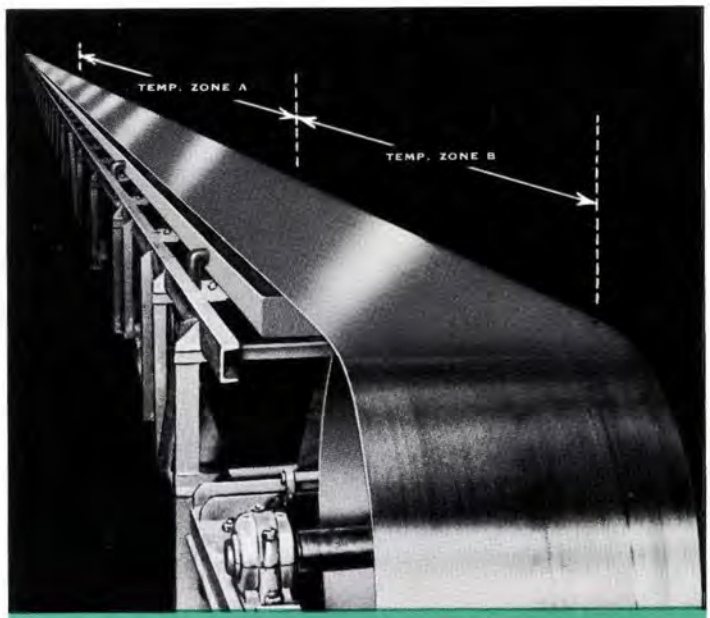
- **CONVEY WHILE COOLING**

  —Facilitates processing efficiency. Material can be discharged directly into crusher.

- **EASY SEPARATION**

  —Most materials cooled on the horizontal belt surface separate readily when belt curves around pulley, even without scraper blades, as illustrated below.



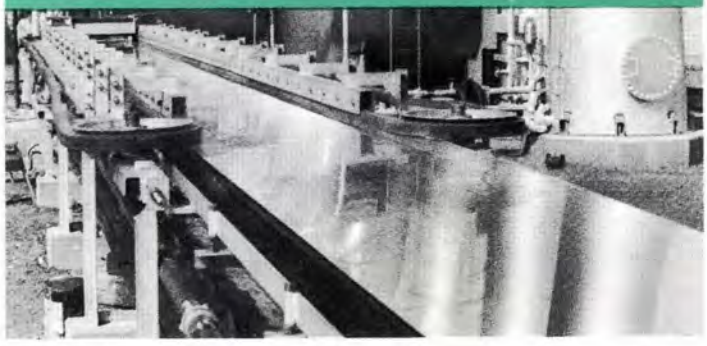


With a Sandvik steel-belt cooler, you can regulate cooling rate to suit the requirements of your process. This important Sandvik feature is being used today in the continuous solidification and flaking of aluminum sulphate and other materials. By controlling the temperature of the coolant under various sections of the belt, the desired cooling rate is achieved.



▲ The close-up view above shows how traveling Neoprene skirts retain liquid sulphur on steel belt until solidified in ⅜" thick sheet.

Below is overall view of outdoor installation of Sandvik Steel Belt Water-Bed Cooler for continuous solidifying of molten sulphur. ▼



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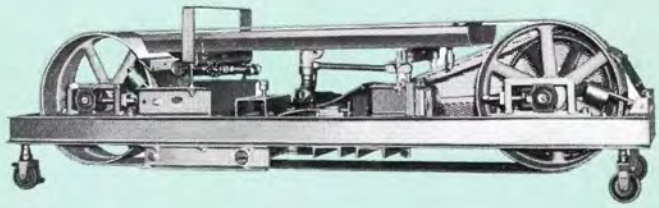
Experimental Units Are Available for Test and Pilot Runs in Your Own Plant

Sectional test tanks and complete experimental water-bed conveyors are available to enable you to determine cooling rates and other pertinent data in your own plant. The sectional test tank measures 2′ long x 1′4″ wide x 6″ high. The complete operating Pilot Scale Water-Bed Experimental Unit measures 14′9″ long x 2′8″ wide x 2′5″ high. Other sizes also available.

Water-bed section test tank



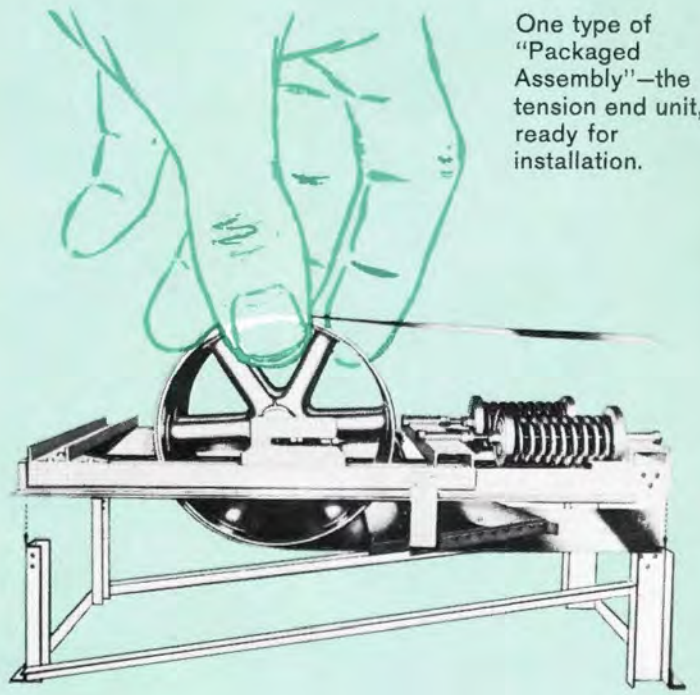
Complete Experimental Water-Bed Cooler



SANDVIK

Pre-Engineered "Packaged" Component Assemblies Also Available

In addition to complete, custom-engineered steel belt conveyors and cooling units, Sandvik supplies conveyor components in packaged unit assemblies. For example, you can buy the tension end assembly, drive end assembly, steel belt and discharge device from Sandvik and install them on your own supporting structure with a minimum of redesign. The pre-engineered components simplify your engineering and facilitate successful operation.



One type of "Packaged Assembly"—the tension end unit, ready for installation.

SANDVIK

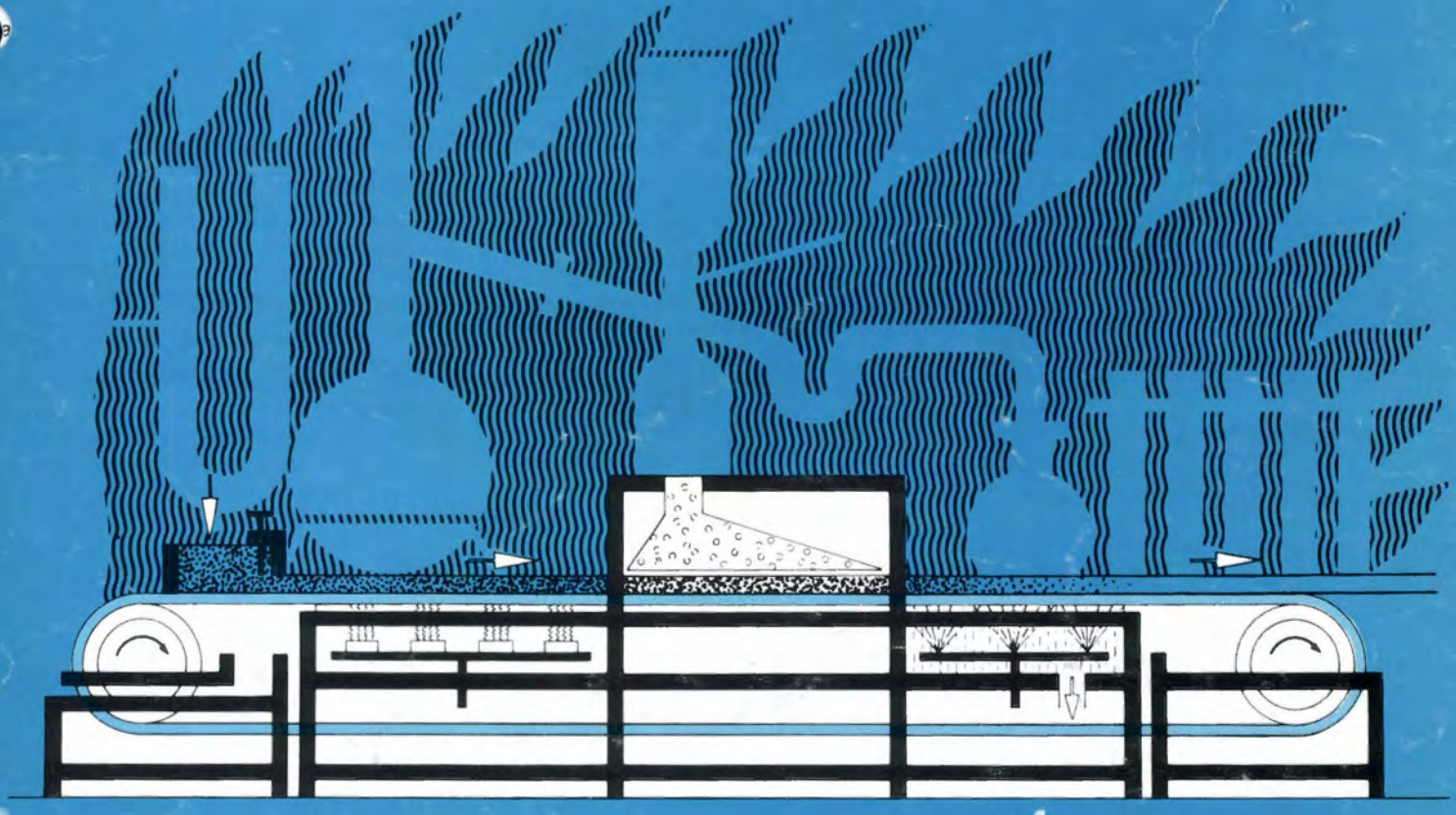
Manufacturers of Steel-Belt Conveyors for Over Forty Years

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Steel Belt Systems

Cooling
Flaking and Crushing
Heating and Drying
Reacting
Dropforming
Continuous Film Casting
Cooling in Layers
Heating and Cooling
Freezing
Magnetic Memory Sorting and Delivery



SANDVIK's Solution To Processing Problems

SANDVIK Steel Belt Systems for Continuous Processing

This system carries your product on a solid stainless steel belt over a trough of circulating water or other coolant. A series of nozzles spray the coolant against the bottom of the belt. This system provides continuous total coolant contact with the underside of the belt; no coolant reaches the surface of the belt. The water-cooled belt can be enclosed to run in an air-cooled chamber when the product requires simultaneous cooling from above. When required, tapered strips can be fitted to the edges of the belt to hold liquid chemicals on the belt surface as they cool and solidify.



Schematic End View of Sandvik unit illustrates cooling arrangement.

Some Basic Advantages of the SANDVIK Cooling System.

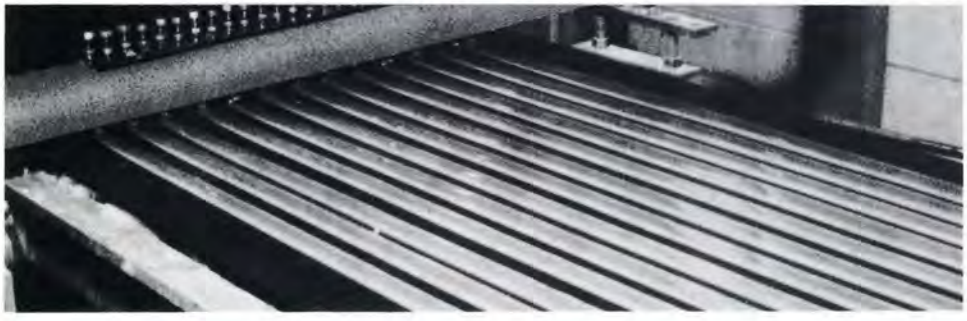
CONTINUOUS COOLING
The high labor cost of handling trays and pans is eliminated along with the yield loss and possibility of employee injury by spillage of hot product.

CONTROLLED PRODUCT THICKNESS
Provides the flake thickness your product and your customer require.

AN "IN-LINE" SYSTEM
Material goes from reactor to cooler to cutter or flaker to your packaging equipment without intermediate handling.

These photos show how the Sandvik belt cooling system produces up to 1000 pounds per hour of hot melt adhesive for the Peter Cooper Corp. This system takes molten adhesive at 350° to 375°F and, with a steam jacketed extruder, forms individual strips of selected width and thickness on the continuous steel belt. While still in process, these strips are cooled and solidified under controlled temperature conditions, then cut to the required length and discharged directly into the shipping container.





Another Sandvik continuous cooling and flaking system for various types of powdered coatings, employs a set of metering rolls to control the molten mix as it is extruded on the belt to give more efficient cooling and the desired flake thickness in the solidified product. At the discharge end of the cooler, a flaker unit produces the proper particle size for final grinding.



Dropforming Systems

A Sandvik Steel Belt Cooler equipped with dropforming devices can change molten chemicals into dustless, solid, free-flowing pellets, automatically. Drop forming is a continuous process (patented) by which molten chemicals are deposited in controlled drops on a moving, solid, steel belt and rapidly cooled into solid free-flowing pellets which fall into the discharge chute as the belt flexes over the terminal pulley.

A wide variety of products with a broad range of melting points and viscosities can be dropformed. Included are organic chemicals such as maleic anhydride, synthetic rubber and resins, waxes and glues, and high melting inorganic chemicals such as sodium hydroxide and potassium cyanide.

Totally enclosed, gas-tight dropforming/cooling units can be supplied to process hazardous materials.



PRODUCT FORM
You can choose the product form (flakes, pastilles, strips) that is best suited to your requirements.

CONTINUOUS, EFFECTIVE BELT CLEANING
Fast product change-over is possible without risk of contamination to make your production scheduling more responsive to your customer's needs.

TEMPERATURE ZONED COOLING
Provides the precise cooling curve required for quality and high production rates.

RELIABILITY
Belt systems require little maintenance and give years of trouble-free service.

EASE OF RELEASE FROM COOLING SURFACE
Most material separate readily when the belt curves around the pulley.

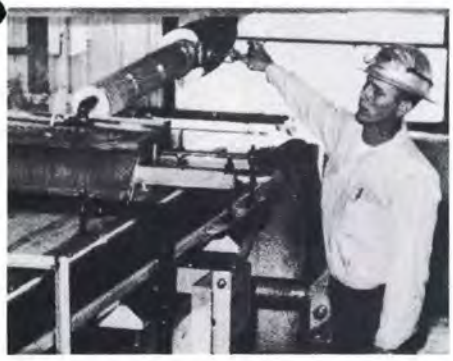
Reduces yield loss and results in fewer fines —especially important when cooling toxic or flammable materials. Crusher or breaker attachments can be furnished to reduce solidified material to desired particle size.



This Sandvik flaker, now in operation at a southern chemical company, cools and flakes up to 11,000 pounds of resin per hour —7000 pounds per hour more than a 5 ft. by 12 ft. drum flaker. By utilizing the Sandvik test center facility, a combined processing system of underbelt water spray and overhead air circulation proved most efficient.

Flaking Instead of Prilling

Southern Nitrogen Co. uses three, 35 foot long Sandvik Steel Belt Water-bed Coolers to solidify urea into continuous thin sheets which are broken into flakes by crushers. The urea flows onto the belts from weir feeders and is contained by side skirts. At the end, the solidified sheet separates from the belt and feeds into the crushers. Each Sandvik cooler processes up to 40 tons per day. Initial cost was 75% less than a prilling tower.



Some Examples of Sandvik Belt Cooling System Capacity

Product	Thickness	Feed Temp	Discharge Temp	Capacity
Resins				
Phenolic	.062"	275°F	110°F	46 lb./hr./sq. ft.
Phenolic	.048-.051"	280°F	92°F	56.8 lb./hr./sq. ft.
Sulphur	0.25"	290°F	150°F	55 lb./hr./sq. ft.
Tetrachlorobenzene	0.06"	320°F	70°F	90 lb./hr./sq. ft.
Asphalt	.125"	425°F	125°F	18.5 lb./hr./sq. ft.
Urea	.093"	375°F	140°F	39 lb./hr./sq. ft.
Ammonium Nitrate	.063"	400°F	160°F	90 lb./hr./sq. ft.
Chlorinated Wax	.063"	300°F	100°F	62 lb./hr./sq. ft.
Sodium Acetate	.125"	180°F	100°F	37.5 lb./hr./sq. ft.
Butyl Phenol	.050-.068"	230°F	97°F	46.5 lb./hr./sq. ft.
Hot Melt Adhesive	.436"	330°F	103°F	14.4 lb./hr./sq. ft.
Wax Blend	.024"	270°F	85°F	26.4 lb./hr./sq. ft.
Epoxy Resin	.040"	350°F	100°F	40 lb./hr /sq. ft.

Casting or Extruding Systems

Plastic films and sheets, foam rubber, some of the rubber-like plastics, and many other materials can be cast or extruded onto the Sandvik steel belt. Materials can be cast on a single belt or between two belts.

Because of the hard smooth surface of the belt, there is no pattern transfer to the material. Bright polished belts are frequently specified to impart a glossy finish to the cast product. Belts with special finishes can be provided to suit specific needs.

Heating, cooling, and other material treatment can be accomplished on the Sandvik belts without transferring the material to single-purpose equipment.

Shown in the photo is a wide mirror-polished belt used for casting of plastic film.



The SANDVIK Test Center

to develop the continuous processing system for your product

The Sandvik Test Center is located at the company's headquarters in Fair Lawn, N.J. Its purpose is to determine for customers and prospective customers the commercial feasibility of continuously processing specific products on Sandvik belt systems.

A prototype of full scale production

The Test Center is more than a laboratory facility. It is fully instrumented and equipped to establish precise, projectable production rate and utility consumption data, and thereby predetermine the design and cost requirements of a full scale operation.

The Test Center will furnish design data for a system that meets all your production and quality objectives.

Develop the handling techniques necessary for maximum yield of saleable product.

Provide a sample of finished product for your evaluation.

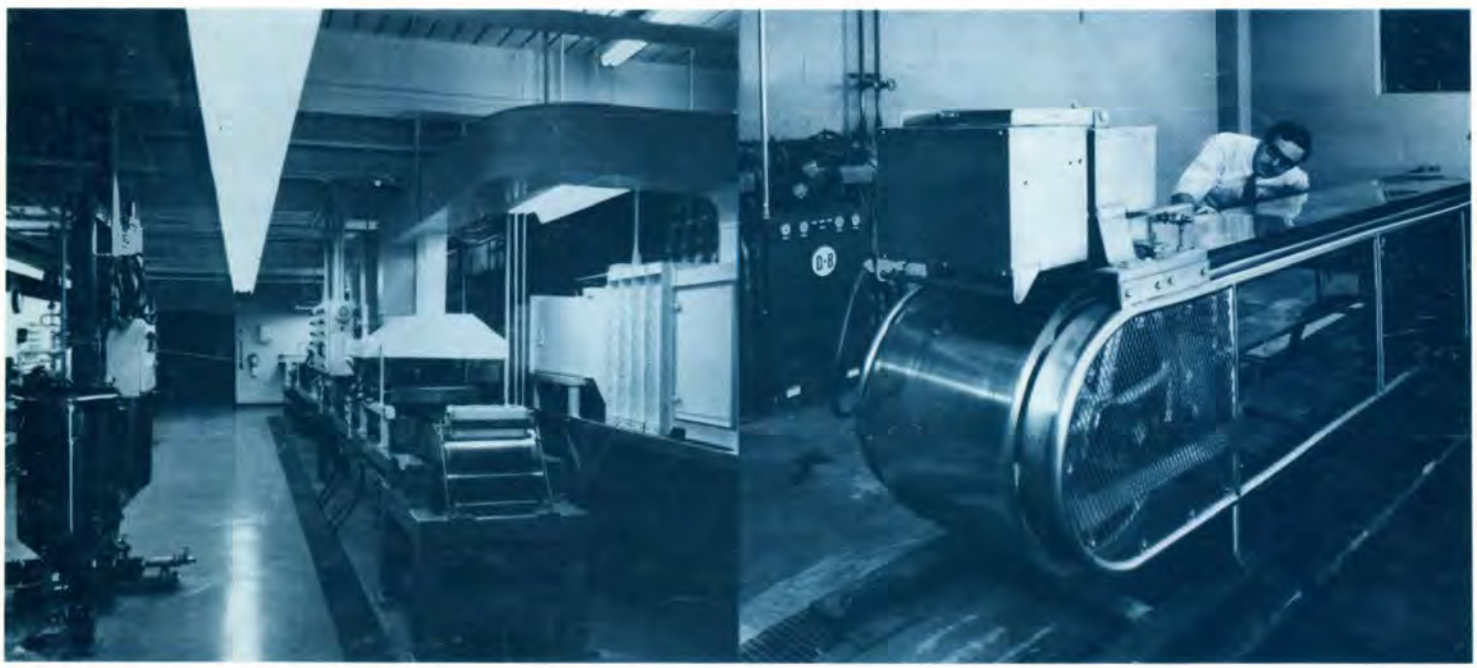
Determine the heat transfer characteristics of your product.

Check the release characteristics of your product.

Define utility consumption you will need.

Three basic systems

The Sandvik Test Center has three basic, completely independent processing lines; one for heating, drying and reacting, one for cooling and another for freezing. Each system has as its primary component, a solid, endless steel belt operating over pulleys. All lines are also equipped with various means of feeding material to the belt, controlling its thickness on the belt and removing it at the desired point.



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