



ADVANCED MANUFACTURING TECHNOLOGY

EST. 1996

2020 AMT CAN
CONVEYOR PRODUCT
LINE

ANYSIZE[®]
AUTHORIZED
DISTRUBTOR



AMT SNAPSHOT

- Established 1996
- 100 employees
- 40,000 ft² company owned buildings
- \$15M-\$20M Annual Revenue
- \$4M Assets, \$1M Revolving Credit
- Woman Owned Business (WBENC)



AMT HISTORY

Company Founded 1996

- 3,500 ft² facility
- Tom Ingraham, Luanne Mullen, Rod Talbot

2008 – Anysize™ Technology

- Anysize technology is introduced on AMT neck ring air conveyor – combination becomes dominant for self-man
- Anysize expands to case conveyor and tabletop conveyor in 2009-2010

2018 – Anysize for Top Covers, AMT becomes a leader in Can Conveyance for Filling Plants

1996

1998 - 2002

2008 - 2010

2012

2013

2018

2019

1998 - Patented Sequencing Damper Technology

- Moved to 8,000 ft² facility
- Reached \$8M sales - primarily blow molding customers
- Expanded into high speed conveyance for can manufacturing

2012 - Anysize Patent Awarded

- Anysize available for neck guides
- Compact Anysize design developed for case conveyor applications
- Surpassed \$20M Sales

2013 - WBE Certification

- AMT Certified as a Women's Business Enterprise

AMT INNOVATION

The collage includes several patent documents with the following titles and dates:

- United States Patent** (Patent No. US 7,210,572 B2) - **Ingraham** (Date of Patent: May 1, 2007)
- ADJUSTABLE GUIDE FOR A BOTTLE REMAINING SYSTEM** (Date of Patent: May 1, 2007)
- United States Patent** (Patent No. 6,998,858) - **Ingraham** (Date of Patent: Dec. 14, 1999)
- ADJUSTABLE GUIDE FOR A BOTTLE REMAINING SYSTEM** (Date of Patent: Dec. 14, 1999)
- United States Patent** (Patent No. US 6,241,872 B1) - **Ingraham** (Date of Patent: June 5, 2001)
- BOTTLE REMAINING SYSTEM** (Date of Patent: June 5, 2001)
- United States Patent** (Patent No. US 6,589,408 B1) - **Ingraham** (Date of Patent: Jan. 8, 2004)
- ADJUSTABLE GUIDE FOR A BOTTLE REMAINING SYSTEM** (Date of Patent: Jan. 8, 2004)
- United States Patent Application Publication** (Pub. No. US 2010/018210 A1) - **Parvizi et al.** (Pub. Date: May 26, 2010)
- ADJUSTABLE GUIDE FOR A BOTTLE REMAINING SYSTEM** (Pub. Date: May 26, 2010)
- United States Patent** (Patent No. US 7,578,453 B2) - **Ingraham** (Date of Patent: May 12, 2009)
- ADJUSTABLE GUIDE FOR A BOTTLE REMAINING SYSTEM** (Date of Patent: May 12, 2009)

- Numerous Patents and 100's of inventions since 1996
- AMT is a custom engineering company; most projects require at least one new invention.
- Partnerships with customers to invent improved methods for conveyance
- Ranked by the Northern Colorado Business Report as one of the top technology companies by patents earned in Northern Colorado.

The collage includes several patent documents with the following titles and dates:

- United States Patent** (Patent No. US 2010/018644 A1) - **Parvizi et al.** (Pub. Date: Aug. 4, 2010)
- PRE-DETERMINED LED POSITIONING CONVEYOR SYSTEM** (Pub. Date: Aug. 4, 2010)
- United States Patent** (Patent No. US 6,596,144 B1) - **Ingraham** (Date of Patent: Oct. 28, 2001)
- ADJUSTABLE GUIDE FOR CONVEYING FLAMMABLE AND CORROSIVE SYSTEMS** (Date of Patent: Oct. 28, 2001)
- United States Patent** (Patent No. US 6,132,665 B2) - **Ingraham** (Date of Patent: Mar. 15, 2002)
- ADJUSTABLE GUIDE FOR CONVEYING FLAMMABLE AND CORROSIVE SYSTEMS** (Date of Patent: Mar. 15, 2002)
- United States Patent** (Patent No. US 7,578,453 B2) - **Ingraham** (Date of Patent: May 12, 2009)
- ADJUSTABLE GUIDE FOR CONVEYING FLAMMABLE AND CORROSIVE SYSTEMS** (Date of Patent: May 12, 2009)

ADVANCED MANUFACTURING TECHNOLOGY

EQUIPMENT DESIGN OVERVIEW

General Equipment Features:

Easy field assembly

- **Equipment bolts together and may be installed by standard industrial equipment installers.**

Mechanically complete systems:

- **Unless specified, conveying systems include blowers, filters, silencers, drive motors, and any other standard mechanical components required for operation.**

Gentle product handling:

- **Equipment is designed not to dent, scuff or otherwise damage products.**

Continuous operation:

- **All systems are designed for continuous operation, 24 hours per day, 7 days a week, and require less than 1-week cumulative maintenance per year.**

Easy to maintain:

- **Equipment is designed for easy maintenance, cleaning, and replacement of wear items (i.e., drive belts, drive chains, bearings, sprockets, and filters).**

CAN AIR CONVEYOR

- Mass air conveyor
- High speed single filers
- Can diverters
- Tunnel track
- Custom



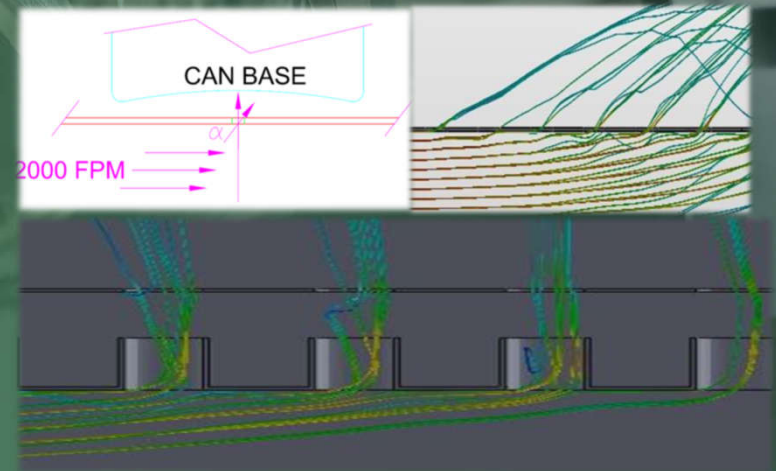
AMT CAN AIR CONVEYOR BENEFITS

Engineered Systems Approach

- Engineered for optimal flow based on empirical data and fluid modeling
- Plenums designed for smooth and efficient internal flow
- Deck stiffeners designed to reduce turbulence
- Custom engineered deck louvers and lifting holes based on product conveyed

Consistent Can Speed, Gentle Handling

- Extremely flat decks
- Single or groups of cans move at the same rate



AMT CAN AIR CONVEYOR BENEFITS

- Punched stainless steel decks, beveled edges
- Deck Stiffeners, spot welded or engineered Adhesive for optimal flatness.
- Interlocking deck joints, always favor flow
- Interlocking stainless steel top covers

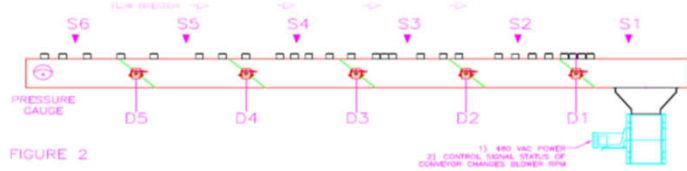


FIGURE 2

INPUT	INPUT CONDITION							OUTPUT CONDITION
	1	2	3	4	5	6	7	
SENSOR 1 (S1)	U	C	E	E	E	E	E	
SENSOR 2 (S2)	U	U	C	E	E	E	E	
SENSOR 3 (S3)	U	U	U	C	E	E	E	
SENSOR 4 (S4)	U	U	U	U	C	E	E	
SENSOR 5 (S5)	U	U	U	U	U	C	E	
SENSOR 6 (S6)	U	U	U	U	U	U	C	
COVERED	U= UNCOVERED			E= EITHER				

OUTCOME	OUTPUT CONDITION						
	1	2	3	4	5	6	7
BLOWER STATE	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
DAMPER 1 (D1)	O	C	O	O	O	O	O
DAMPER 2 (D2)	O	O	C	O	O	O	O
DAMPER 3 (D3)	O	O	O	C	O	O	O
DAMPER 4 (D4)	O	O	O	O	C	O	O
DAMPER 5 (D5)	O	O	O	O	O	C	O
	O= OPEN			C= CLOSED			

Sequencing Dampers for Cup Conveying

- True two pressure systems
- High pressure when cups are accumulated
- Low pressure when cups are in free flow

VACUUM CONVEYOR AND DEVICES



- Mass and single lane vacuum conveyor
- Mass vacuum elevators, S elevators
- Vacuum twist conveyor and custom vacuum
- Vacuum Star wheels and custom transfer devices
- Vacuum transfers
- Demisting Systems

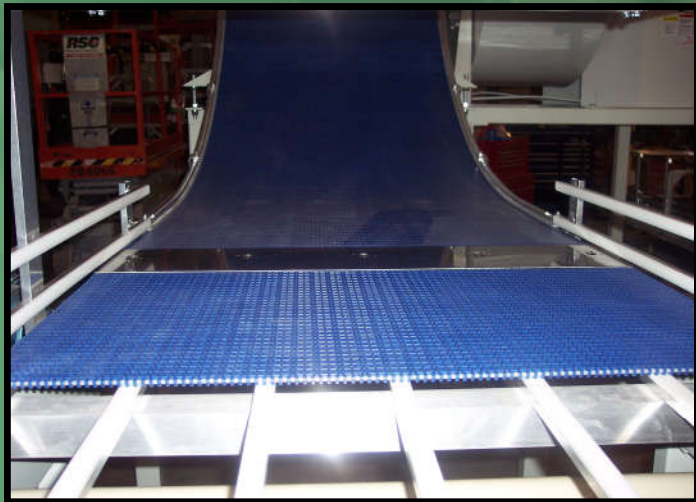


ADVANCED MANUFACTURING TECHNOLOGY

VACUUM CONVEYOR AND DEVICES

Quality Components

- Painted or 304 Stainless Construction
- 12 ga or greater on vacuum devices
- Internal stiffeners



Precise Pressure Control

- Easy to adjust dampers standard on all critical can pick up and drop off zones
- 3 Zone damper control standard on vacuum transfers
- VFD standard on motors <5hp



MECHANICAL CONVEYOR

- Single lane tabletop conveyor
- Mat top mass conveyor
- Bi-Di and Fi-Fo accumulation tables
- Mechanical single filers
- Mass and single lane magnetic devices
- Pin Strippers
- Gravity track



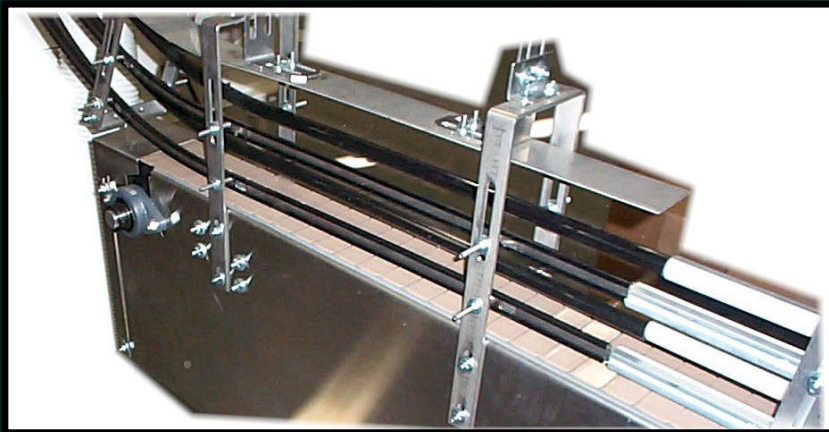
Options:

- Self-clearing or live transfers
- Stainless drip pans
- Dust covers

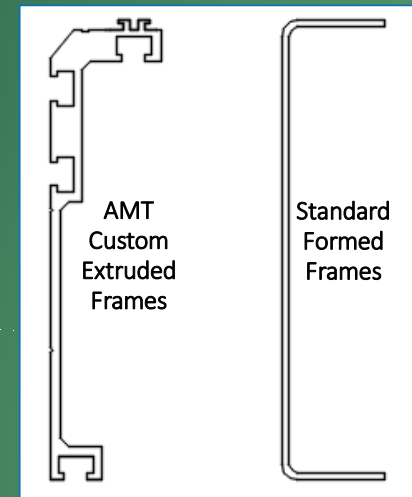


MECHANICAL CONVEYOR

- Standard heavy duty 1-3/16 shafts drive and tail shafts
- Sealed roller bearings
- Standard Nord drives, optional SEW Movigear
- Equipment designed for ease of access



- Formed standard 12ga SST frames
- AMT custom extruded frames



CAN AIR RINSERS



- High speed empty can ionized air rinsing
- Single lane or multi-lane configurations
- Adjustable for multiple can sizes
- Alarms for system status and filter replacement
- For new lines or retrofit on existing lines
- High quality rinser manifold and pressure blower by Paxton

Featuring
PAXTON
An ITW Company **PRODUCTS**

FLEXIBILITY

**ANY CAN.
ANY TIME.
ANY SIZE.**

Stay ahead with automated changeover technology

Don't waste valuable man-hours, money, and production time on slow manual changeover adjustments for ever-expanding size formats. With Anysize™ top cover solutions, you get easy, infinite, automated top guide positioning for any type and size can within a four-inch positioning range. No frustrations. No limitations. Just the ease and efficiency of innovative automation.

Accurate
Top cover accuracy
±1mm at 4" range

Cost Effective
Affordable and easy to
 retrofit to an existing system

+100
Proven
Over 100,000 installed,
no failures to date

Explore the solutions at Anysize.com/TopCover

ANYSIZE®



Anysize Side Rails

- Side rail positioner for full range of can diameters

Anysize Top Guides

- Single or Mass Can Conveyor
- Run any cans within a 4 inch height range
- Retrofittable

Manual or 2 position adjustment

- Economy option
- Option for retrofit ready brackets

Recipe Based

- Individual bottle recipe includes Anysize setting and blower speed, high and low

Simple

- Plant can add /Modify cans

SUSTAINABILITY



Power

- Plenum design, flat decks and sequencing dampers = 50% - 65% power savings
- Engineered vacuum systems provide consistent vacuum with lower power requirements

Maintenance

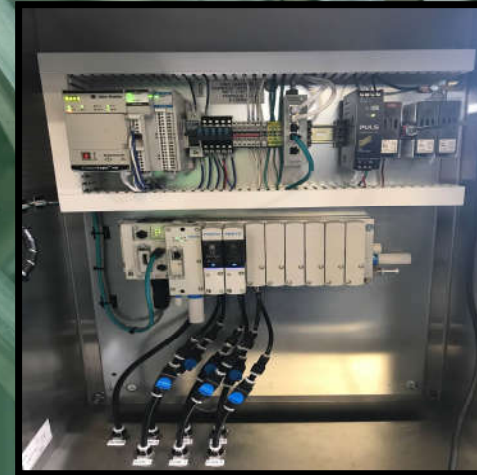
- Less blowers require fewer filters to change = less maintenance

Noise

- Fewer blowers = quietest air systems on the market

CONTROLS

- AMT builds complete control panels and AnySize Regulated Air Distribution (RAD) Boxes in-house
- UL Certified Panel Shop
- Allen-Bradley, Siemens, or customer specified components



AMT SERVICE

30 person department with 100s of years combined packaging industry experience

Mechanical
and Electrical
Installation or
Supervision

Problem solving
and Line Audits

Programming
service



CAN TESTING

- **AMT maintains a fully flexible can air conveyor demonstration equipment for quick testing of your product at our Loveland factory**
- **A written report and video will be provided if cans are sent in, or customers are welcome to visit our facility in person**



KEY PEOPLE

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ADVANCED MANUFACTURING TECHNOLOGY

GENERAL EQUIPMENT DESIGN DETAILS

General Equipment Features:

Guide rails

- Valu-Guide VG-A600 (aluminum extrusion) with VG-P813 (UHMW cover), VG-SSR for washdown applications. Radiused rail to prevent creasing
- Dual rails positioned at the top and bottom of cans to prevent body denting
- Air conveyor systems equipped with Anysize adjustable top guides adjust the top rail so there is always a rail on the top and bottom chime of the can
- Guide rail is adjusted 1/16 in on bright can systems

Dust Covers

Optional for all conveyor systems including air

- Tool-less removal, either drop in place or hinged
- Structurally supported to prevent sagging, flexing, or slippage
- Sloped, water shedding options for washdown applications

Support Legs

- Standard Plastic Footpads, Metal footpads for equipment >250#, ± 2 in. threaded rod height adjustment

EQUIPMENT COMPONENTS

Conveyor belting and components

- **Rexnord or Intralox chain and belting (Optional Habisat, Sysplas, etc)**
- **System Plast and Spriltex wear strips, guide rail, and components**
- **Conveyor Drive Motors**
- **Nord Gearmotor or SEW Movigear (capable of integrating any motor spec)**

Electrical

- **Hubble or ABB Disconnects**
- **Allen Bradley VFD's or DanFoss**
- **Allen Bradley PLC's, or Siemens**

CAD Software

- **AutoCAD – Plant scale layouts, installation drawings**
- **SOLIDWORKS – parts, equipment assemblies, installation equipment details**

BLOWER DESIGN DETAILS

Blowers

Blowers

- New York Blower, backwards inclined airfoil impellers
- Marathon Premium efficient motors

Air Conveyor Blowers

- 2 in. filters for fan inlets with expanded metal backing to prevent filter elements from being pulled into the fan, tool-less replacement.

Vacuum Blowers

- Optional, Fan discharge silencers, 14 ga sheet metal, 4 feet tall, 1" thick sound absorbing foam contained in expanded metal screen.
- Silencers designed to exhaust air away from can flow.
- Optional Demisting systems for wet can applications

AIR CONVEYOR DESIGN DETAILS

Air Conveyor

Air Control

- Standard sequencing dampers every 10' on bright can systems
- Independent damper control of single filer split at 2 can point.
- Magnehelic series 2000 pressure gauges

Decks

- 16 gauge 304 stainless steel with internal stiffeners for flatness

Plenums

- 14 gauge 304 stainless steel construction
- Internal stiffeners for mass air designed for smooth air flow
- Clean inside, minimal internal weld nuts, bracketry mounted externally with weld studs.
- Optional, access panels every 10' section.
- Designed for minimized air leaks.

Interfaces

- Feathered interfaces from air to mechanical (bird beaks) or parallel transfer.
- Optional, nose overs to trackwork

AIR CONVEYOR DESIGN DETAILS

Air Conveyor

Top Covers

- Flatness exceeds 1/32 in. per foot.
- Tool-less removal, designed for installation in correct orientation only
- Mechanical assist options for top covers that exceed the OSHA single employee lifting limit.
- Smooth flow design, no catch points between covers sections or edges. Beveled air relief perforations. of perforations.
- + ½ in. adjustment on fixed top covers. Optional Anysize adjustment for larger range of adjustment.

Horizontal Single Filers

- Guide rails designed for tipped can ejection
- Damper and guide rail adjustment at two can point
- Independent VFD controlled blower
- Formed single file guide rails for stiffness

Waterfall Single Filers

- 11 gauge 304 stainless steel waterfalls, 0.005 in. hard-chrome on can contact surfaces.

AIR CONVEYOR DESIGN DETAILS

Air Conveyor

Tunnel Track

- + 1/16 in. adjustment on fixed can size tunnel track
- Anysize, Cylinder, or spacer adjustment options for multiple can sizes
- 16 gauge 304 stainless steel decks
- 16 gauge ducts and manifolds, stainless for formed, painted carbon steel for tubing.
- Minimal use of flex hose, hard ducting wherever possible
- Nolu heavy duty snap on #NSS-0104D continuous throughout the length of the air tunnel track.

VACUUM DESIGN DETAILS

Vacuum Conveyor

Air Control

- Independent damper control of infeed, tapering field and optional damper on discharge vacuum zones.
- Lockable slide or rotary type dampers with position indicator.
- Magnehelic pressure gauges visible from damper adjustment on all zones.
- Engineered vacuum chambers to provide smooth internal air flow with minimal turbulence.

General

- Fully enclosed return belt to OSHA height clearance
- 48" minimum nose over/under radius on single lane vacuum
- 60" minimum nose over/under radius on mass vacuum
- Optional oil De-misting systems available

Wear Strips

- Oil impregnated UHMW standard on mass vacuum, oil impregnated wood for high speed vacuum applications

MECHANICAL CONVEYOR DESIGN DETAILS

Mechanical Conveyors

Wear Strips and Returns

- Removable, full mat width free-rolling return rollers on mat-top conveyors.
- UHMW Serpentine returns on table-top conveyors.
- Valu-Guide VG-A600 with VG-P813F UHMW wear strip material, 6 in. centers supported at 30 in intervals, secured at one end.

Transfer plates

- 7ga. thick, 304 SS, mirror polished, optional industrial hard-chromed, min. 0.0003 in max 0.005 in. 0.015 in. flatness, max length 24 in. (multiple plates for conveyors wider than 24 in.) Phenolic and other material options for Washer and I.B.O.
- Top accessible adjustment, $\pm 3/32$ in. height and tilt adjustment, $\pm 1/4$ in length

Live Transfers

- Standard, jack-shaft driven by mass conveyor drive, independent drive options.
- 16 ga. thick 304 SS, highly polished self clearing transfer plate, 0.015 in. flatness
- Top accessible adjustment, $\pm 3/32$ in. height and tilt, $\pm 1/4$ in length
- Nose-bar wear strip hardness is greater than the belting to prevent grooving of the wear strip.

Drip Pans- when required

- Stainless steel oil recovery drip pans, mounted to conveyor frame. Designed to flow in the direction of can flow towards the washer or designated recovery point.

MECHANICAL CONVEYOR DESIGN DETAILS

Mechanical Conveyor

Conveyor Drives

- Easily accessed, removable motors and gearboxes. Anti-seize lubricant applied for ease of installation and removal.
- Gearboxes that may leak lubricant are side mounted or equipped with drip pans.
- 1.0 gearbox service factor on motors 1-10 hp, 1.25 for motors greater than 10hp.
- Keyed shafts, Taper loc or QD bushings for all rotational shaft connections.
- Optional, single point adjustment take-up for all of chain and/or timing belts.
- Osha Standard Safety Yellow guards, All pinch points between conveyor mat and conveyor frame guarded in accordance with all OSHA regulations.

Dive Zones

- Standard 30' drive zones on mass conveyor unless otherwise specified
- Engineered chain pulls based on turns, rates, and mass for single lane conveyor
- Standard 1-3/16 diameter drive and tail shafts
- Sealed roller bearings with eccentric locking collars for drive and tail shafts
- Center mounted bearings for conveyor shafts on mat widths greater than 48 in.
- Minimum number of sprockets recommended by belt manufacturer or greater.

GRAVITY TRACK AND MAGNETIC CONVEYOR DESIGN DETAILS

Magnetic Conveyor

General

- Tapered magnetic fields at infeed and discharge.
- Magnets center cans on single file conveyor.
- Stainless (non-magnetic) magnet support brackets
- UHMW Wear Strips

Gravity Track

General

- 5/8" half round 304 Stainless Steel, high polish finish. Optional, open end guide hard-chromed to $\pm .003$ to $\pm .005$ thickness, polished to mirror finish.
- UHMW plastic covering VG-P58HR on non open-end rails
- 10 gauge formed 304 stainless flanges and center bands, min 24" spacing.
- ¼ -20 UNC, 304 stainless steel weld studs
- 1/32 in. or less gap between half round joints at flanges
- Detailed QC to verify all edges are free of sharp edges and burrs.
- Adjustable for minor changes in can height and can diameter.
- Automatic track work adjustment options available.



THANK YOU