

Automated Aluminum & Steel Stacking
Solutions



Overview

Atlas Technologies blank stacking systems reduce manual handling, improve surface finish quality and increase production of cut-to length operations and stacking of sheet metal blanks as they exit a blanking press or trapezoid shear.

Atlas stackers can handle rectangular, trapezoid, patterned, contoured or irregular shapes and are designed for use by the automotive, appliance, contract stamping, steel service centers, toll processors and other metal forming industries. Quality improvement benefits are achieved when a stacking system is used for handling exposed metal or pre-painted steel, because the features of our stackers help to prevent marring of the surface finish and the contaminants that are introduced to processing when manual operations are in place.

Double station stacking systems allow for continuous, high speed stacking by alternating the two stations. This provides uninterrupted production while stacks are removed. Triple station stacking systems incorporate the continuous stacking capability while also allowing a reject or inspection station. Atlas also offers side stacking systems for the collection and protection of offal.

Atlas offers systems utilizing magnetic rolls and magnetic belts for ferrous steel blanks and vacuum based stackers for non-magnetic, hybrid aluminum/steel blanks. Robotic systems may be used for both ferrous and non-magnetic applications.

Configurations

A typical stacking system includes:

- A run-out conveyor that moves the part away from the coil material being fed for the next stroke
- A magnetic belt or roller conveyor to position the part for stacking
- An adjustable stacking box

Many stackers also include:

- A lift table that adjusts the height of the stack as the blanks accumulate, to achieve a constant drop distance and a more even stack. It also lowers the stack for clearance so it can be conveyed or transported away.
- An exit conveyor or cart that moves the full stacks out and empty pallets into the system.



Single Station Stackers

Atlas single station stackers are designed and built to accommodate situations where floor space is limited and required production speeds exceed robotic stacking capabilities. Although each Atlas stacking system is built to suit each customer's exact requirements, the following is a common system concept.

Material will be coil fed into the press where the cut-off operation is completed. The blank is placed onto the run-out conveyor which will advance the blank from the press to the overhead magnetic belt or magnetic roll conveyor.

The overhead magnetic conveyor carries the blank to the stacking station. When the blank is above or slightly before the stacking station, the pre-programmed zone of electro magnets will be de-energized, releasing the blank from the overhead conveyor, into the stack box onto the pre-positioned pallet.

Adjustable stack boxes consist of two side guides (one with a pneumatic tamping function), one shock absorbing front stop (equipped with a pneumatic tamper) and one rear stop. As the height of the stack increases, the stack is lowered via a scissors lift table, to maintain a relatively constant distance for the blank to drop to the top of the stack. When the desired stack height has been attained (based on quantity, height or weight), the stacker can be programmed to stop production during pallet change.

While any dunnage may be used with an Atlas stacker, provided they are of a specified thickness range and are equipped with locating pockets, Atlas recommends the use of their precision pin pallets, which may accommodate 1 to 3 stacks per pallet depending on blank size. This allows for fewer pallet exchanges and improves production rates.

When the stack is full, the lift table will lower the pallet carrier (with pallet and stack of blanks) the remaining distance. A cranesaver conveyor will move the pallet carrier from the stacking station to an unload area for removal by forklift or overhead crane. An empty pallet is loaded onto the pallet carrier. An operator arms the cranesaver by pressing a button so the pallet carrier will automatically move into the stacking station upon demand. The next stacking operation will begin upon demand.

Single Station Stacker



Dual Station Stackers

Atlas double stations stackers allow for continuous run capacity and are able to provide up to four modes of operation. As with our single station stackers, both magnetic belts or magnetic roll options are available. Although Atlas builds stacking equipment to our customers exact requirements, the following is a typical equipment concept.

The cut blank will be moved along the runout conveyor belt and then transferred onto the overhead magnetic belt or roll conveyor to one of the designated stacking stations. When the blank has reached a certain point, just ahead of the stacking station, the permanent magnets in the rollers or belts are actuated, rotating the magnetic force away from the blank, separating the blank from the belt or rollers and drops the blank into the stack box.

The inertia of the blank moving along the belts/rolls continues to carry it forward after it has been released from the magnetic field. The blank is carried forward to a cushioned stop which restricts the forward motion and absorbs the impact of the blank and reduces damage. As the blank falls into the stack box it is tamped back. A back stop is utilized to prevent the blank from traveling in a direction opposite of normal flow and side guides are utilized to effectively create a four sided stacking box and a high degree of stack accuracy.

The blanks are stacked onto the pre-positioned pallet on a lift table in the designated stack box. As the height of the stack increases, the pallet is lowered to maintain a consistent distance. When the desired stack height has been reached, the dedicated pallet carrier is lowered and placed onto a cranesaver conveyor which will simultaneously move the full stack and pallet out and a new pallet into location.

Modes of Operation

Mode 1: Automatic

Automatic mode directs the blanks to go to stacking station 1 until a selected quantity of blanks has been attained. The control functions change the operation automatically to direct the blanks to go to station 2. This mode reduces downtime associated with stack changeover and is used for high production applications.

Mode 2: Alternating Stacking

This mode automatically alternates between the two stacking stations, allowing blanks to be separated by trapezoid angle and/or right and left hand blanks in separate and alternating stacks. In this mode, when the stack height has been attained the stacker controls will signal the press to stop and initiate the pallet change.

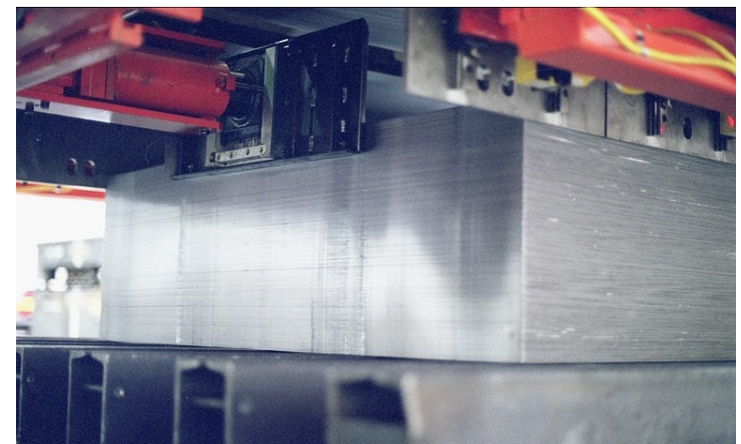
Modes 3 & 4: First or Second Station

This mode allows the stacker to direct blanks to go to either stacking station 1 or 2. This allows for the ability to interrupt automatic operations to run a small quantity of blanks or a partial stack.

Mode 5: Blank Inspection

This mode allows for operator inspection of all blanks as they are processed. Rejected blanks can be directed to a station at the end of the line to a reject tray for gathering purposes.

Dual Station Stacker with Reject Inspection



Dual Station Stacker with Offal Collection



Atlas has introduced a stacking system that includes a traditional end blank stacker integrated with a new side stacker that collects offal for subsequent destacking and stamping operations.

The objectives:

1. Reduce sheet metal scrap, maximizing the number of stampings that can be produced from every coil.
2. Improve quality by reducing damage to all blanks, including the offal

Previously, punch-outs such as those produced to make window apertures were commonly dropped down the scrap chute with slugs and trimmed material. It was money down the drain. With an Atlas offal collection system, all stampable material may be used as secondary metal.

Three scenarios of recovery:

1. Convey and stack pieces that are ejected at pass height
2. Capture pieces that are run out from the upper die on a buck conveyor
3. Recover pieces from a blank-through die where the material is passed through a cut-out in the die and falls down a scrap chute

The Atlas side stacker is engineered to handle blanks, offal and scrap with the same ability to queue, fill and convey pallets as an end stacker.

How it works....

In this application, blanks for large body panels (up to 156 inches long) are stacked by the end stacker, via overhead magnetic belt conveyor, into Atlas pin pallets that are indexed out on a pallet conveyor. The side stacker is used to stack offal in the same manner.

Via the main control panel, two automatically indexable belt conveyors are moved to wherever the blanks or offal will exit the dies and the press. Conveyors can be used independently and can be indexed in any of three axes, including height at the press, to interface with scrap chutes, or they can be used together to convey extremely wide pieces.

The offal is typically dropped to a stacking box for subsequent destaking operations. Each Atlas pallet can hold multiple stacks side by side which minimizes interruptions for pallet changeover. Changeover time from part to part is typically six minutes, including both die change and stacking system setup.

The system is capable of both “drop-on-the-fly” and “stop-and-drop” modes of operation.

Dual Station Stacker with Offal Collection



Aluminum Stackers

With the increased use of aluminum blanks in the automotive, aerospace, agricultural and several other industries, Atlas has developed stacking systems to efficiently process non-ferrous materials. As with our steel blank stacking equipment, each system is configured to our customers exact requirements. As an example of the capabilities of these systems, the following is an overview of a recent installation for a value added processor.

The application called for the ability to stack aluminum blanks from a coil feed line which would vary from 48" by 60" up to 110" by 480" in size, running in a continuous operational mode. Some of the blank stacks would then need to be stretch wrapped, while others would not. The customer also had scrap shed that was collected and utilized in a separate process which required a paper liner between each blank to prevent marring.

Atlas answered the customers needs with a system that presented the aluminum blanks to a track mounted runout conveyor from the existing shear operation. The blanks were then conveyed to the blank stacking system where a series of retractable style feed roll assemblies transferred the blank to the appropriate stacking station. Once the full stack height was attained, the roller assemblies retracted to allow the blank to drop into the stack station. Side tampers cycled to insure the blanks met the aligned stack requirements. No pallets were utilized during the stacking operations.

During multiple stacking operations with both stacking stations in use, the lift table and transfer equipment operated independently. When the secondary station is used, the primary stations front and back stops are retracted to allow the blanks to pass unimpeded. When the large blanks are run, both the primary and secondary stations are used together and the retractable style feed roll assemblies function in unison.

Atlas supplied two idle stations, one with a stretch wrap station and one without and a two tiered conveyor that allows for the processing of large blanks on the upper level and the processing of the scrap shed onto a pop-up style conveyor to a manual stacking station.

Aluminum Stackers



Steel & Aluminum Stackers

One press line....two materials! Our customers have requested a stacking system capable of processing both steel and aluminum and Atlas has delivered a concept to meet their needs. Not only will our dual gantry stacker process both materials, it also has a footprint that is manageable for most stamping press lines and will process blanks that are a minimum of 12" by 12" and a maximum of 132" by 72" at 15 to 30 strokes per minute based on 250 – 300 feet per minute line speed. As with our steel blank stacking equipment, each system is configured to our customers exact requirements.

The Atlas System Configuration:

- One (1) Multi-lane run-out belt conveyor
- One (1) Two lane pivoting belt conveyor
- One (1) Visual inspection platform
- One (1) Two lane upper belt conveyor
- One (1) Two lane lower belt conveyor
- Two (2) Vacuum cup pick-up head assemblies
- Two (2) Two (2) axis over head stacking gantries
- Four (4) Power adjustable stack boxes with tampers
- Four (4) Scissor style lift tables
- Four (4) Cranesaver chain conveyors with pallet/stack carriers
- One (1) Reject station

How it Works....

The gantry style blank stacker will receive blanks coming out of the press from a multi-lane run-out belt conveyor and a pivoting two lane belt conveyor. The parts then pass through a visual inspection area where an operator may accept or reject the part with the push of a button. The accepted blanks will alternately convey onto either the upper or lower two lane belt conveyor.

The two lane belt conveyors will convey the blanks to the “pick-up” stations. Overhead vacuum cup assemblies mounted on a two axis gantry will pick up the blank from the “pick-up” station, transfer it perpendicular to material flow (sideways) and deposit it into an adjustable stack box.

The stack boxes are power adjustable to accommodate variations in part sizes and are equipped with pneumatic tampers which accurately locate the blanks. The stacks of blanks will be stacked by the overhead gantry shuttle onto a pallet/stack carrier located on a hydraulic powered scissor lift table. The lift table automatically lowers as the stack as it is being made in order to keep the top of the stack within the stack box guides.

Each of the four (4) cranesaver chain conveyors will run perpendicular to material flow and will have two (2) stations – one stacking station and one load/unload station. One pallet/stack carrier is included with each cranesaver chain conveyor.

As the stacks on the left side of the system reach their desired volume, the right side of the system stands at the ready. Changeover from left to right sides is automatic, thereby providing continuous stacking operations. During right side stacking operations, the left side scissor lift table lowers and the full stacks are conveyed to the end of the cranesaver chain conveyors and picked up by fork truck. The emptied pallet/stack carriers are then conveyed back into position, ready to receive blanks. Operations are identical for ferrous and non-ferrous materials.

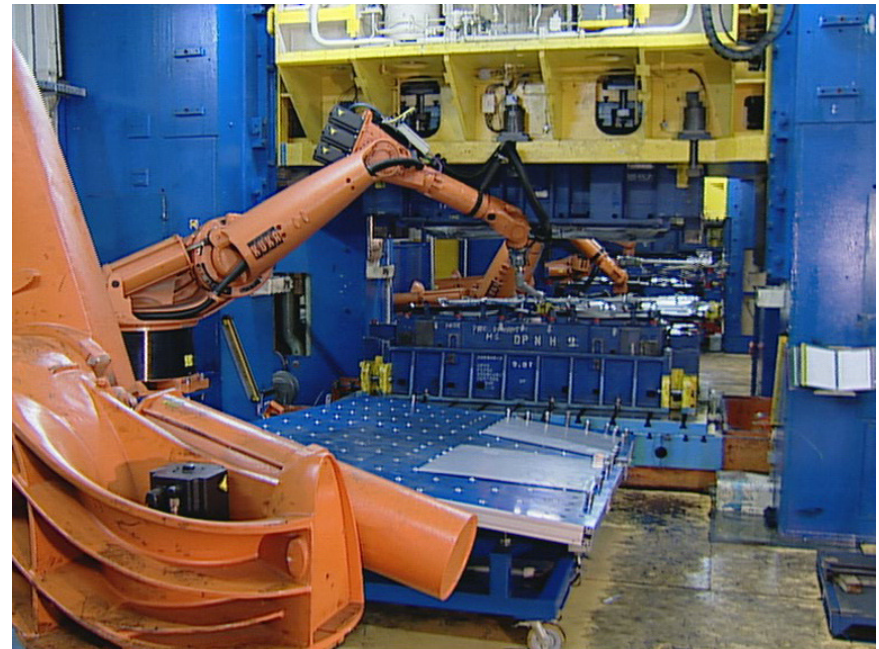
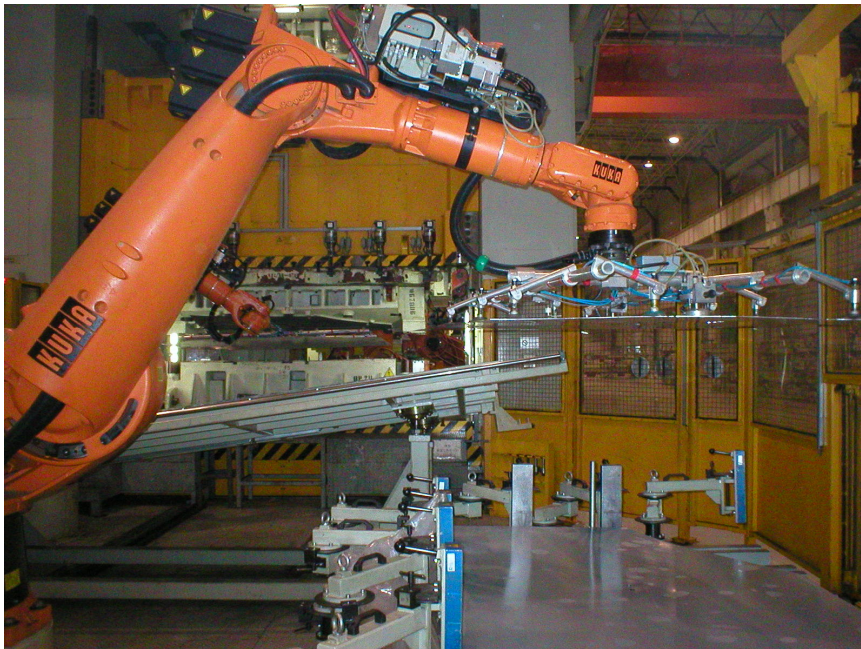
One press line. Dual capability. Brilliant.

Robotic Integration

For press lines that require a high degree of flexibility or stamping operations that require lower cost investments to automate their processes, Atlas offers robotic stacking solutions. Available in virtually unlimited configurations, Atlas works with the customer to obtain the highest production rate possible.

Atlas engineers will evaluate the ability of your process equipment, the best utilization of your floor space, the types and sizes of your parts as well as the configuration and condition of our containers. We will discuss your goals and develop an end of the line solution which best optimizes your production today and one that can adapt to the production needs of the future.

We are experienced with every major robot supplier and our engineers are trained to perform reach and cycle time studies as well as vision systems. What ever your stacking application calls for, Atlas will find the best possible solution and then back it up with 24-7-365 service support...the best in the industry.



Die Handling Automation • Robotic Integration • Sheet Metal Handling • Tri-Axis Transfers
System Integration • AS/RS • Washer & Oiler Systems • Automation Tooling

Why Atlas?

Our Promise....Atlas listens to you, the customer.

We embrace your vision and understand your motivation.

It's our culture of total commitment that allows us to conceptualize solutions tailor made to fit your specific applications...creating world class material handling systems that will exceed your expectations.



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