



## BAGGAGE HANDLING SOLUTIONS

Airlines and airports recognize the passengers' desire for a more efficient and safer baggage service, in terms of no mishandling and able to handle baggage with high friction surface (e.g. wrapped in the protection plastic film or with rubber parts), with irregular shape, with sticking out wheels and laces and flabby bags. New regulations require higher security standards for the passengers and the baggage. IATA resolution 753 requires the full tracking of all the baggage during the entire trip.

Moreover, the airport authorities are looking for solution that can give more value to the investments, in terms of longer lifetime and lower operation and maintenance cost of the systems.

With an experience of more than 25 years and a worldwide presence, Leonardo is one of the main players in the market of the Baggage Handling Systems, and answers to these market requests with a suite of products designed to define the standards of a new generation of baggage handling systems.

### KEY FEATURES

Leonardo offers reliable, efficient and complete baggage handling solutions that include:

- Sorters Cross Belt and Tilt Tray
- Upstream conveyors, diverters and all the other components
- Make-up and reclaim carousels
- ATR (Automatic Tag Reader), with optional integrated RFID or OCR
- Integration with HBS (Hold Baggage Screening)
- EBS (Early Baggage Storage) solution and integration
- Control systems (SAC and SCADA)
- BRS (Baggage Reconciliation System)
- Integration with Airport IT.

## SORTERS CROSS BELT AND TILT TRAY

Leonardo provides an innovative reliable BHS solutions based on the Multisorting Baggage Handling System (MBHS®), a cross-belt sorter which is the preferred technology for baggage processing, as it ensures optimum handling for all articles, including objects that are fragile, have prominent wheels, have high friction surfaces or are irregular in shape.

Advanced technologies, like linear motors, inductive power distribution and WiFi data transmission, give to this product an extremely high reliability, a sorting capacity up to 10.000 baggages per hour and an operational flexibility that allows a significant saving in O&M cost. Intrinsic redundancy and lower footprint demand also allow the design of more efficient BHS systems.

The same technologies are also available in the Multisorting Tilt-Tray System (MTTS®), part of the suite of Leonardo products.

### Reliability

While designing the MBHS and MTTS architecture, and when selecting the components, a particular attention has been paid to the reliability and the lifetime of the entire systems and of each of the parts.

MBHS and MTTS are fully gearless mechanisms. Linear motors are used for the movement of the continuous train of cells; inductive power distribution and WiFi data transmission eliminate any contact between the moving and the fixed parts of the machines except the

rolling wheels. Motor rollers on the MBHS and curved linear motors on the MTTS are used for the load and unload of the baggage over the cells, without any leverage, gear or drive belt. The aluminum rails are coated with stainless steel in order to minimize the friction with the rolling wheels, maximizing their life. The control system allows modulating the speed of the sorters according to the required throughput.

These solutions reduce the friction and the wear out of the mechanical parts. In terms of precision and smoothness of the handling, the cross belt technology guarantees that no baggage can get stuck due to hanging of straps or stick due to high adherence of the surfaces. All these features give a remarkable decrease of the maintenance effort, eliminating de facto the operational stops out of the preventive maintenance periods.

### Operational and Maintenance Saving

The reduction of the maintenance effort, the absence of extra costs due to the possible damage of the baggages or mishandling and the possibility to reduce the speed of the sorters in the periods of low throughput demand, allow a considerable saving in the operational and maintenance cost, including the reduction of the power consumption. Independent studies evaluate this saving being around 20%.

### Flexibility

Due to the adopted technical solutions, MBHS can be configured with chutes in the curves. Download precision allows the use of more narrow chutes, reducing the overall size of the sorting plant.



MBHS is available in two models, with cell pitch of 950 and 1200 mm; the size of the sorted object is 900x700x500 mm (object longer than 900 mm can be loaded on two cells).

The adoption of other different technological characteristics define the entire range of possible configurations:

- Use of motor-wheels, instead of linear motors for the motion of sorter loop,
- Use of brush-and-bars for the transfer of the power to the cells, instead of induction based mechanism
- Use of steel rails, instead of aluminum.

## CONVEYORS, DIVERTERS AND OTHER COMPONENTS

The Leonardo catalogue includes a number of baggage handling products:

- Check-in belts with scales
- Conveyors
- Vertical and horizontal diverters
- Pushers.

All these components of the baggage handling systems have been designed according to the reliability and maintainability criteria defined for the entire products' line. Special components of baggage handling systems from top market manufacturers can be integrated in the solutions according to the specific layouts.



## MAKE-UP AND RECLAIM CAROUSELS

Overlapping flaps carousels, flat and inclined, are parts of the Leonardo suite of products dedicated to the baggage handling. These carousels can be configured with stainless steel or painted steel body and are suitable for the use at the make-up, in departure sorting systems, or at the baggage reclaim, in the arrival halls.

## ATR (AUTOMATIC TAG READER), WITH OPTIONAL INTEGRATED RFID OR OCR

Leonardo solution includes advanced products for the automatic reading of the baggage tags using standard barcode readers, RFID readers and OCR (Optical Character Recognition). This solution is based upon primary market OEM components. In particular, OCR ATR can read the characters printed on the tag and identify the destination flight even if the barcode is not read or the BSM is not present. This allows a significant reduction of the manual coding operations and of the baggage mishandling.

## INTEGRATION WITH HBS (HOLD BAGGAGE SCREENING)

Being the security of the air transport the top priority of all the airport authorities and airlines, Leonardo paid a particular attention to the study of the solution for the integration of the last generation baggage screening machines (Standard 3).

The design of the layouts of the baggage handling systems always keeps in account both the requirements for the security related "waiting times" and the needs for a fast flow of the "clean" baggage, in order to achieve the higher possible throughput with the maximum security level.





## EBS (EARLY BAGGAGE STORAGE) SOLUTION AND INTEGRATION

An EBS solution is available in Leonardo portfolio and products from market manufacturers can be integrated.

A special attention is dedicated in the design phase to the selection of the best solution to fulfill the requirements in terms of process flexibility and expandability.

## CONTROL SYSTEMS (SAC AND SCADA)

The suite of Leonardo products is completed by the main control systems needed for a full turnkey solution:

- SCADA, for the command and control of all the single devices and the entire plant;
- SAC (Sorting Allocation Computer) for the management of the sorting and the complete tracking of the baggage.



## BRS (BAGGAGE RECONCILIATION SYSTEM)

BRS (Baggage Reconciliation System) is a part of the tracking process implemented by the Leonardo solution (including ULD manifest preparation).

This product is ready for the implementation of the IATA Resolution 753, which requires to all the subject involved in the baggage handling process to keep an accurate inventory of all the handled baggage and trace all the acquisition and delivery phases among the subjects themselves.

## INTEGRATION WITH AIRPORT IT

All the control systems, and the Baggage Reconciliation system, are ready for the integration with the upper-level IT systems of the airport information technology infrastructure. The standard set of messages defined in the IATA recommendations is implemented by the Leonardo IT components. The SCADA is based on a top level commercial platform and is ready for the integration with global airport monitoring systems through standard protocols.

## A COMPREHENSIVE OFFERING

The innovative range of offered baggage handling products, combined with the expertise in airport processes, make Leonardo the ideal partner for airport operators. Leonardo provides both complete BHS turnkey solutions and single products suitable for the integration in wider solutions. Specialized baggage handling simulators are used to support customers in defining the most effective and best adapted solution for the specific airport.

Leonardo's wide experience in the field of the sorting systems includes a number of implementations of "open heart" projects, where the building and the integration of the supplied systems does not interfere with the operation of the existing ones.

Leonardo also has an offering in the Airport Security sector, with consolidated perimeter control systems, attendance logging and access control using biometric recognition techniques.