

## THAYER SCALE LOW DENSITY MODEL M WEIGH BELT

Thayer Scale's Model "M" Low Density Feeder line has been specifically designed for weighing bulk materials having densities under 10 lb/ft<sup>3</sup>. These feeders find applications in tobacco, forest products (OSB & MDF), textiles, cereals and snacks (chips and flakes). Without question, Thayer Scale has more experience than any other manufacturer in weighing these low density materials. With an outstanding performance record in over 1,000 installations, the THAYER Model "M" Low Density Weigh Belt Feeder represents the standard to which all others are compared. Many of these feeders have been in operation for more than 30 years with the only modifications being instrumentation upgrades to better suit the interconnection needs of modern-day automation schemes, or re-rating of either the load or speed-sensing range to accommodate line capacity changes.

Low density weighing requires considerable attention to design details that influence the accuracy and stability of the specific belt-loading measurement ("pounds per linear foot"), which is dependent on the interaction of various conveyor operating factors and alignments throughout the weighing region of the conveyor.

An important rule of "low density" belt weighing is to maximize "scale" loading, minimize belt tension, minimize belt "beam" stiffness and eliminate as much idler misalignment as possible. Because of the need to address all four of these objectives when dealing with low density applications, the well-engineered low density feeder will look substantially different than the more conventional designs typically used in moderate to high density applications (i.e. cement industry feeder). A conventional feeder capable of weighing heavier products (typically 50 lb/ft<sup>3</sup> and above) to an accuracy of 1/2% under limited weekly calibration attention, is likely to achieve no better than 3-4% accuracy when weighing material having a density of 5 lbs/ft<sup>3</sup>.

### SPECIFICATION

#### MODEL "M" LOW DENSITY

##### Feed Rate:

- Up to 462 Tons/hr. @ a bulk density of 10 lb/ft<sup>3</sup>.

##### Density Range:

- 0.5 to 10 lb/ft<sup>3</sup>.

##### Particle Size:

- Up to 8", CHIPS, FLAKES & FIBERS

##### Volumetric Capacity:

- 18" - 17,500 lbs/hr @ 70 ft/min
- 24" - 42,000 lbs/hr @ 70 ft/min
- 30" - 77,000 lbs/hr @ 70 ft/min
- 36" - 122,500 lbs/hr @ 70 ft/min
- 42" - 178,000 lbs/hr @ 70 ft/min
- 48" - 245,000 lbs/hr @ 70 ft/min
- 54" - 322,000 lbs/hr @ 70 ft/min
- 60" - 409,500 lbs/hr @ 70 ft/min
- 72" - 560,000 lbs/hr @ 70 ft/min
- 84" - 731,500 lbs/hr @ 70 ft/min
- 96" - 924,000 lbs/hr @ 70 ft/min

##### Weight Measurement System

- Mass-counterbalanced LVDT Load Cell. (optional strain gauge load cell available)

##### Speed Measurement System:

- Direct coupled digital pulse transmitter mounted to tail pulley shaft.

##### Non-contact Material:

- Enamel painted mild steel (epoxy paint optional).

##### Motor:

- 0.5 to 2.0 HP, 180 VDC Arm, 200V Field, TENV, 230 or 460 VAC, 3ph, 50/60 hz. Optional motors available.

##### Turndown Range:

- 20:1

##### Drive Reducer:

- C faced, coupled to motor, right angle, worm & gear type, service factor 1.5, complies with A.G.M.A standards.

##### Drive Connection:

- Roller chain & sprocket, service factor 1.5, totally enclosed chain guard.

##### Weigh Belt Enclosure:

- Frame completely surrounding flow channel with top panel (removable side panels, total enclosure, drag chain clean out, hinged drop doors on bottom optional).

##### Contact Material:

- 304 Stainless Steel

##### Temperature Limits:

- Ambient 0° - 130°F (-18° - 54°C)
- Process Material 0° - 200°F (-18° - 93°C).

##### Accuracy (Combined Error):

- 0.25-1.0% of set rate (@ 2 sigma) based on a minimum sample of 1 minute or 2 circuits of the belt, whichever is greater.

##### Belt:

- Tobacco: 2-ply polyester carcass with polyolefin top cover, rated for material temperature of 140° F.
- Wood Products: 2-ply polyester carcass with either urethane or PVC top cover, rated for material temperature of 158° F, 176° F or 212° F.
- Food: 1-ply polyester/polyurethane impregnated carcass with FDA approved polyurethane top cover, rated for material temperature of 176° F.

##### Options:

- Explosion proof design.
- Automated Test Weight Lifter (ATWL)- provides for completely automatic zero and span calibration.
- Total enclosure, drag chain clean out or hinged drop bottom doors.
- Bearing lubrication manifold.
- Return side belt "V" plow.
- Counter-weighted load leveling plate.
- High temperature, oil resistant, static conductive belting.

# THAYER SCALE

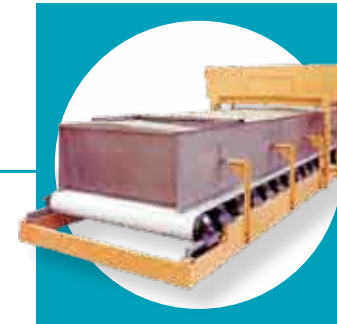
PROCESS MEASUREMENT & CONTROL EQUIPMENT

## Model "M" Low Density Weigh Belts

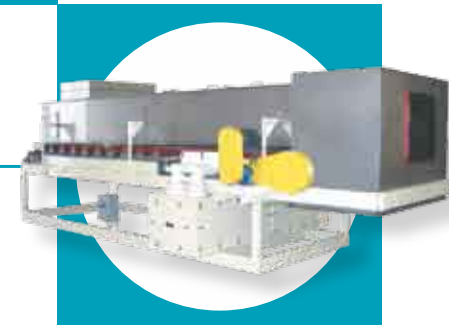
HIGH ACCURACY  
PRECISE MEASUREMENT



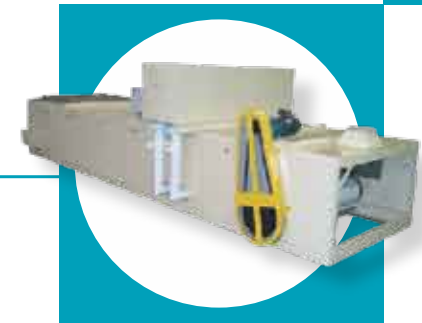
EXTREMELY RUGGED  
DURABLE



EASY TO MAINTAIN  
LOW MAINTENANCE



SIMPLE OPERATION  
EASY CALIBRATION



MADE IN USA

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# MODEL M The Worlds Most Accurate Low Density Weigh Belt

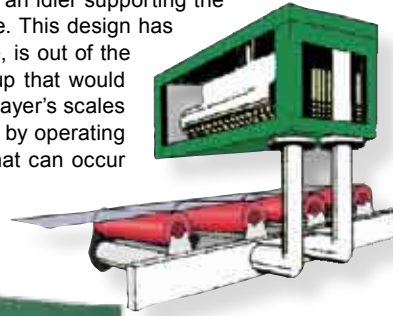
## INLET CHUTE:

A major factor in achieving uniform withdrawal from storage bins. THAYER takes very carefully consideration of the inlet section design based on a given material density, particle size and handling characteristics. The correct design allows for maximum efficiency and low energy consumption.



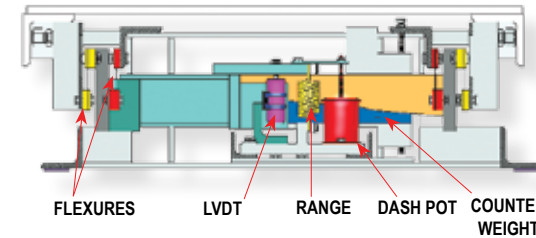
## SCALE LOCATED OUTSIDE THE MATERIAL HANDLING AREA:

Thayer's scale is not mounted between the strands of the belt, but in a location outside of the material handling area such that an idler supporting the belt (the weigh idler) transmits the load to the scale. This design has several benefits. The scale is not prone to damage, is out of the way for cleaning, and is not subject to tare build-up that would change the weight, causing incorrect calibration. Thayer's scales can take high load direct overloads that are caused by operating personnel or by the occasional particle pinching that can occur between the conveyor and the side skirt.



## THAYER FLEXURE PLATE SUSPENSION SCALE Laboratory Accuracy in Industrial Environments

The Basic THAYER Flexure-Plate Suspension system utilizes a series of steel flexure plates to transmit gravimetric loads vertically from the load receiving element through levers to the specifically selected controls. The combination of mass counterbalancing against tare loads, frictionless flexure-mounted levers and a high resolution transducer produces a force measuring system beyond compare. Of significance is the fact that infinite weighments may be made without maintenance or calibration, regardless of atmospheric or factory conditions. In many instances, THAYER Flexure Plate Suspension Systems placed in operation in 1950 are still working without maintenance or adjustment.



## DRIVE SYSTEM:

Horse power requirement calculations are performed by computer. Also computerized is the selection of shafts, drive chain, gear box and motor. Head and tail pulley are selected in accordance with CEMA standards, with lagging as required.

## WELDED FRAME, QUICK REMOVAL ACCESS PANELS:

THAYER weigh belts are of welded, not bolted, construction. A rigid, welded and box frame construction resists deflection and deformation under heavy loads. Frame distortion adversely affects scale measurement performance. Easy removable covers for access, designed to meet EPA and OSHA standards. Side panels, if included, are removed with quick-release fasteners (no tools required).

## FULL LENGTH ADJUSTABLE SKIRT BOARDS:

Installation of skirt boards along the entire length of the conveyor totally confines the material flow channel which helps control dust. Skirt boards are tapered and flared from the inlet to the discharge to prevent pinching of material between the skirt and the belt.

## PRECISION HEAVY-DUTY IDLERS:

Precision scale idlers are mounted on individual CEMA brackets, permitting removal to either side without major framework disassembly or belt removal. Idler alignment is critical to minimize transmission of any belt tension force to the scale.

## BELT TRAVEL PULSER:

Speed sensing is digital and accurate over an infinite speed range. Rugged speed sensor is coupled directly to the feeder tail pulley not the drive pulley and measures belt speed and belt travel.

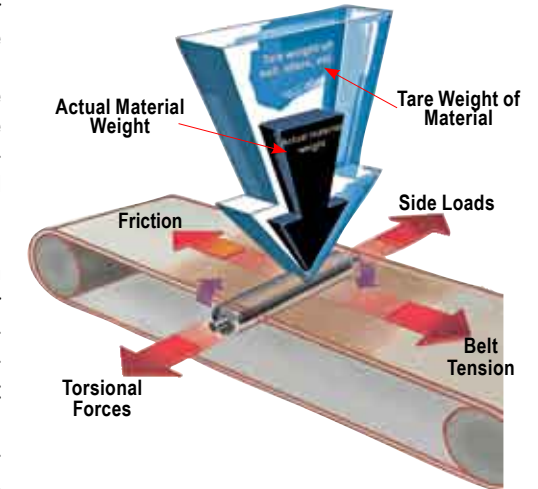


Weigh Belt shown with optional drag chain scavenger and external idler and pulley lubrication manifold.



## "FMSS" FORCE MEASUREMENT SUSPENSION SYSTEM Unique technology provides isolation from all force vectors except material weight.

- A load sensor cannot distinguish between the "meaningful" force of material weight and other forces. THAYER Weigh Feeders are engineered to isolate the load sensor from these other forces for highly accurate material weighing.
- Weight sensing system is totally enclosed and requires no maintenance.
- Weight sensing system has infinite over-load protection (mechanical stops) and weight sensor (LVDT) cannot be damaged by shock loads.
- Weight signal represents only material load; the dead load (belt & idler) is completely mass counter-balanced.
- Excessive belt tension forces are eliminated by our head pulley drive and low deflection scale. Friction is defeated by using precision rollers instead of slider decks. Torsional forces, caused by off center loading and side forces, are decoupled from the true force transmission by our weigh scale.
- **Load Cell Utilization Factor >80%**  
Because THAYER manufactures the load cell, we can provide a load cell with a capacity that is closely matched to the actual maximum material weight. The tare weight of the weigh idler and belt are mass counterbalanced. We design our scales such that the maximum material weight is always > 80% of scale capacity. This results in the best possible signal resolution. This flexibility is not possible with strain gauge load cells, which tend to be available in standard capacities of 10, 50, 100, 200, 500 lb., etc. Thayer's rugged load cell design assures reliable operation for the life of the weigh belt. Because our load cells never fail, they are not a recommended spare part. Unique technology provides isolation from all force vectors except material weight.
- Force vector isolation is a Thayer Scale technological advantage. It is one of the best reasons to buy from the weigh feeder experts at Thayer Scale.



Low Density Model M Scale Over, open design



Special Low Density Model M Scale Under open design, inclined

