

Tuesday - October 19, 2021

Background - Walco design process:

Walco's design process is to determine (through a series of conversations or emails) each exact system safety, operational and production requirements; presenting a detailed written proposal to meet those requirements.

 Walco's 20+ standard laminators, coaters and converters have literally hundreds of different modules available, allowing the system design customization Walco is world renown for.

Your team's responsibility is to review this document carefully, and modify as needed to meet your requirements, for you know your needs and processes substantially better than Walco.

- This document is our mutual agreement to what is required of your new Walco system, and is used to design, quote, fabricate and quality check prior to shipment.
- Any changes or modifications once ordered must be in writing no exceptions.

Walco guarantees each and every system a full year – doing exactly what was agreed the system will do prior to ever leaving our facility.

- Each system is fully tested with your own materials, insuring all is working as planned.
- Yet, even with over 60+ years of building laminating, coating and converting systems, hiccups have occurred during testing, with Walco footing the entire bill to ensure the machine does exactly what we have both agreed it will do, before it ever leaves.
- Startups are virtually a non-event with your new Walco, making the work at your end very simple.
- 1. **s** to apply a PSA style permanent film to the top only of up to 96.0-inch wide, clean, dry, flat and rigid glass.
- 2. The film is to be applied evenly* resulting in a smooth, no wrinkle or bubble finish.
 - a. uses individual 12.0-inch-long film rolls, stacked flush to each other as needed for processing.
 - i. Standard laminating processes utilize a single length roll of film, allowing best unwind tension control.
 - ii. Walco has quoted a single differential air shaft per unwind station, using a single tension control (air brake or motor) to control all 12.0-inch roll stack's film tension on that individual unwind station.
 - b. **CAUTION*:** Using rolls of different outside diameter can result in wrinkling, with Walco advising all rolls to have similar outside diameters +/- 0.0625-inch OD.
 - i. <u>Differential air shafts</u> here is what is finalized so even consistent tensions are maintained on each individual film and rewind roll.
 - 1. Rewind.
 - a. Differential air shafts are used to make up film thickness differences between different webs, ensuring they are wound up with similar tensions to the core.
 - b. Crown's rewind's application is used to simply store the scrap liner, removed just prior to lamination of the primary film.



- c. Because the liner is technically a scrap product, not to be used in another unwind process later, it is determined that the differential air shafts quoted are overkill.
- d. A standard lug-style airshaft is suitable for the application, providing each scrap rewind operation starts with a clean, 6.0-inch OD plastic core tube, keeping the wind-up diameters the same, keeping tensions the same for all rolls mounted on that shaft.
 - 6.0-inch cores are necessary for the long, cantilevered air shaft to support it's own weight when unsupported at the end, during roll changeovers.

2. Unwind.

- a. In an unwind application, the differential air shaft provides the largest OD film roll accurate air pressure to maintain the correct tension of that individual roll.
- b. Any roll on the same differential shaft that has a smaller outside diameter will receive less tension control.
- c. The differential air shaft is used to solve the problem of "how-the-rolls-were-originally-wound", knowing not all rolls are wound perfectly to the next.
- d. Using film rolls with the same OD (as detailed in the Walco proposal), and a differential air shaft, unwinding film tensions remain correct through each of the individual rolls mounted to the shaft.

3. **Summary:**

- a. Rewind stations will use standard air shafts and a new plastic 6.0" core tube for each scrap take-up operation.
- Unwind stations will use a differential air shaft with 6.0" plastic cores, and must always use rolls with very similar ODs (+/- 0.0625-inch OD).
- 3. The nip is to automatically open and the drive is to stop with any E-Stop activation.
- 4. Variable speed control, with Start / Stop / Forward / Reverse and Speed controls.
- 5. Dual E-Stops plus entry end safety pull cable across entire width.
- 6. **Film**:

a. Width: 12.0 to 96.0-inch maximum.
 b. Thickness: 5 - 20 mil, (0.005 - 0.020 inch).

c. Liner: Protective liner to be removed immediately before lamination.

d. Cores: 6.0-inch plastic core tubes.

e. OD: Maximum 16.0 inch outside diameter.

f. Weight: Maximum 150 pounds.

g. Tension: Maximum 1.75 pounds per linear inch (PLI).

h. Type: Polyester – 0.5 – 1.5 lbs./inch/mil

a. Worse case = 1.5 lbs. x 96.0 x 0.020 inch = 2.88 PLI

7. Glass:

a. Width 36.0 to 96.0 inches.
 b. Thickness
 c. Length 48.0 to 144.0 inches.

8. Laminator:

a. Walco's 812 series as per attached specification sheet, including:



- i. Heavy-duty nip rollers x 60A shore hardness.
- ii. Variable speed drive 3 43 fpm maximum.
- iii. Safety air cylinders nip automatically opens with any E-Stop activation.
- iv. Single handwheel nip gap adjustability.
- v. Safety pull cord across nip entry.
- vi. Manual push-button controls.
- vii. Optional: Bowed roll(s) to help eliminate wrinkles.
 - Please note: Bowed rolls pull / stretch the film from the laminator centerline outward.
 - a. Crown Electrokinetics is using individual 12.0" length film rolls, which will likely inhibit or cancel the abilities of the bowed roller.

9. Unwinds:

- a. Two (2) CANTILEVERED (side-loading) unwind stations, both capable of maximum 96.0-inch-wide film rolls, however Crown is electing to use small 12.0" length rollers, on each roll as needed for the "staggering process".
 - i. Maximum 16.0-inch OD rollers.
 - ii. Cantilevered, side-loading and unloading only.
 - iii. Areas not covered by a film roll will need an empty cardboard tube slide over airshaft, preventing airshaft grip assembly blow out.
 - iv. Please note: Lateral adjustability not available with Cantilevered.
- b. Each include:

i. One (1) 96-inch width capacity CANTILEVERED airshaft for <u>6.0-inch</u> plastic cores.



Shown OPEN



Shown CLOSED.

- ii. One (1) manual unwind tension control differential motor drive (turning slightly slower than the laminator drive) and proportional air control valve to accurately control each unwinding film roll.
- iii. Unwind stations will use a differential air shaft with 6.0" plastic cores, and must always use rolls with very similar ODs (+/- 0.0625-inch OD).
- iv. Safety interlocks to ensure arms are properly latched prior to operation.
- v. Safety red-handle-locking-clamps to hold arms in position while running.





10. Rewinds:

- a. Two (2) CANTILEVERED (side-loading) powered rewind stations, both capable of maximum 96.0-inch-wide film rolls, however Crown is electing to use small 12.0" length rollers, on each Unwind shaft as needed.
 - i. Maximum 16.0-inch OD rollers.
 - ii. Cantilevered, side-loading and unloading only.
 - iii. Areas not covered by a film roll will need an empty cardboard tube slide over each airshaft, preventing airshaft grip assembly blow out.
 - iv. Two (2) separation bars, plus two (2) anti-static bars.
 - v. Rewind stations will use standard air shafts and a new plastic 6.0" core tube for each scrap take-up operation.

b. Each includes:

- i. One (1) 96.0-inch width capacity CANTILEVERED airshaft for <u>6.0-inch</u> plastic cores only.
- ii. One (1) Air clutch.
 - 1. Manual air pressure control, with air pressure gauge and on/off air control valve fixed panel mounted with placard.
 - 2. Selector valve REW1 / REW2 / BOTH select ability.
- iii. Safety interlocks to ensure arms are properly latched prior to operation.

11. Infeed - Sticky roller top side incoming glass lites.

- a. Helps clean the incoming flat glass just prior to lamination via sticky roll technology reducing post lamination dust and debris under the laminate or film.
- b. Top only.

12. Convevors:

- a. Walco is supplying both Infeed and Outfeed, gravity-style (manual, not powered) conveyors:
 - i. Walco rollers are 2.9-inch OD rolls x nylon covering.
 - ii. Walco ball table rollers are 360-degree x non-marring nylon.
 - iii. Rollers are set at 6.0-inch centerlines.
 - iv. Definitions:
 - 1. X-Axis is up and downstream travel only.
 - 2. Y-Axis is across-the-width travel only.
 - 3. Z-Axis is up and down travel only.

b. <u>Infeed:</u>

- i. Ten (10) foot long x 96.0-inch maximum glass width.
- ii. Duplicate the pop-up ball transfer table video shown below.
 - 1. Video Walco Manual Cross Feed Conveyor.
 - 2. Pneumatic controls raise and lower the ball-transfer table in the Z-Axis only.



- 3. The ball transfer table allows the glass to be easily manually maneuvered in the X and Y-Axis'.
- iii. Gravity style rollers (x-axis only), with pop-up ball table underneath.
- iv. Operator control panel with a "Raise / Lower" pushbutton.
- v. Fixed, soft rolling edge guide on Operator / right side.
 - 1. Operator side is the right side as you face the entry.
 - 2. Drive side is the left side as you face the entry.



c. Outfeed:

- i. Ten (10) foot long x 96.0-inch maximum glass width.
- ii. Stationary ball transfer table only, no rollers.
- iii. No edge guiding provided on Outfeed conveyor.



13. Operator control station:

- a. Manual, push-button controls including:
 - i. E-Stop x 32mm, illuminated.
 - ii. Start / Stop / Forward / Reverse / Variable speed pot.
 - iii. Infeed ball transfer table Raise / Lower.
 - iv. Power available lamp.
 - v. System running lamp.
 - vi. Two (2) unwind tension control stations, including:
 - 1. Drive Motor speed control adjustable via speed control pot.
 - 2. Proportional air control regulator.
 - 3. Air pressure gauge.
 - vii. Two (2) rewind tension control stations, including:
 - 1. Air pressure gauge
 - 2. Air pressure regulator
 - 3. On/Off valve.
 - 4. Selector Switch REW1 / BOTH REW2.

viii. Placard.

b. Operator side: Standing and facing the entry end of your new Walco, the operator control station is to be fixed and mounted on the right side.



- 14. This is a stand-alone operation.
- 15. Pass through (Working) height is 36.0 inches +/- 0.75 inch.
 - a. Pass through is measured from the floor to the bottom of the incoming glass.
- 16. No heat is required.
- 17. Ambient operating temperatures prevail.
 - a. Temperatures do not exceed 110 degs. F., or fall below 38 deg. F.
- 18. Standard power is 220 VAC / 1 Phase / 60 Hz
- 19. There are no known height, length, width and / or weight restrictions on the new machine's footprint.

Optional - In line operation with Walco powered infeed, cross feed and exit conveyors.

Optional - Automatic separation cutting - Stop-to-cut, or cut-on-the-fly

- o HOT wire or knife leaves small film flap
- o Flush cut to leading and trailing edges.

Optional - PLC / HMI operations -Allen Bradley or Siemens.

Optional - Automatic unwind and rewind tension controls.

Optional - Automatic edge alignment.

Optional - Automatic quality control camera inspection and certification labeling.

Optional – Additional unwind stations or bottom laminating.

Optional - Overhead work platform with automatic splicing and splice removal.

Walco Solution:

Crown Electrokinetics has not provided the actual protective film type, the needed lamination cycles per day or line speeds; however, for the extremes of the glass industry and to meet the system requirements herein, Walco strongly recommends the 812T-98-CANT permanent film to glass, heavy duty powered laminator.





As shown above: Walco's 812-TO series, HD powered protective film laminator with two (2) top cantilevered unwind stations, air brakes, single point nip gap adjustment module, safety air cylinders, variable speed control and powered 20-foot-long Infeed and Outfeed conveyors.

Walco's 812TO-98-CANT applicator series has been specifically designed for applying pressure sensitive papers, vinyl and laminates, to the top and / or bottom simultaneously to clean, dry and flat substrates.

<u>Important Notes on laminating – please read carefully for your application:</u>

- a. **Laminating / Application** is done best in a continuous batch process meaning 25+ foam blanks of the same thickness and widths.
 - Continuous means each sheet is fed into the nip / laminating area end-to-end.
 - Start-stop laminating / application is acceptable; however, a "line" may be seen across the width, where the stop occurred.
 - Switching back and forth from different thickness and / or widths involves resetting the proper nip gap and loading the proper width PSA peel-coat or protective films. This is time consuming.
 - With any start-stop application, it is suggested a "dummy" sheet or blank is used after all lamination is completed.
 - i. The "dummy" is fed in behind the last actual sheet and is used to hold the film in tension and ready for the next batch.
- b. All paper film applications require smooth idler rolls and static bars.
 - All unwind / payoff stations would include static bars, with on/off switch and power on lamp (green).
 - Lateral unwind edge adjustment capability is normally needed for all paper applications.
 - Lateral unwind edge adjustment has not been requested and is not included in this proposal.



- c. Vinyl laminates tend to wrinkle coming off the laminate roll.
 - Bowed rolls literally stretch the vinyl from the laminator centerline outwards, prior to nip entry, helping to eliminate wrinkles.
 - If applicable, both top and bottom nip stations would include bowed rolls.
 - Bowed rolls have not been requested and are not included.
- d. Heat is sometimes needed with vinyl laminates; one heater option has not been requested.
 - All heater applications require silicon lamination rolls.
 - Heat is not included.
- e. **Some film lamination** may require higher than standard 15 psi nip pressures.
 - If higher pressures are required, larger OD nip rolls are necessary for nip pressures between 16 and 55 psi, and can be provided for an additional cost.
 - Standard OD rolls (15 pounds per linear inch maximum) are provided with this proposal.
 - i. **Crown Electrokinetics has confirmed** and agrees that 15 psi is sufficient for their film / tape application and that higher nip pressure is not needed.

End of	laminating notes
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Your new Walco 812TO-98-CANT was selected and designed based upon specifications given by Crown ElectrokineticsTM. All the details of this system, its requirements and proposed functionality are provided in good faith. These details are to remain confidential between your company and ours.

Overall summary of Specifications:

- 1. Robust and reliable construction.
 - o Rolls are all heavy walled construction for no deflection for years!
 - Frames are 3 x 3 x .25 wall and 3 x 12 x 0.25 wall square steel tubing, welded, with all seams ground to smooth, ready for power coating.
 - Bearings are rated for over 4 times their projected loads.
 - o Steel is used whenever possible.
 - o Unwind tension is controlled by drive motor and proportional air pressure.
 - Rewind tension is controlled by an air clutch.
 - All feet include hold down bolt access holes and height adjustability through +/-0.75 inches.
 - Every portion of a Walco is built for parallelism, structural integrity and literally decades of reliable service.
 - Walcos are legendary!
- 2. <u>Safety</u> Walco believes "it is all about safety" and includes many <u>standard</u> safety features with all Walcos. These include:



- Operator control station E-Stop stops the drive motor from turning while the safety air cylinders automatically open the nip gap to their full capacity within ½ second – releasing anything caught in the nip area.
 - i. Extra E-Stops can be easily provided.
- Nip entry Safety Pull-Cord Tied into the E-Stop circuit, killing the motor drive, opening the safety air cylinders and sending an alarm back to your remote Operator control station.
- Nip Guards Where possible, clear Lexan or expanded metal guards cover the nip entry, exit, top and bottom areas of your new Walco.
 - i. Your Operations team can easily view the coating / laminating process, yet robust to keep them operational for years.
- Mechanical guards OSHA Orange, powder coated metal enclosures with clear Lexan faced guards cover the end points of the main rotating nip area, including all drive chains, belts, sprockets, etc.
- Safety Cantilever arm interlocks ensuring all is in place before operations begin.
- Air brake / clutch guards. If applicable, air brake / clutch guards protect the airbrake / Airclutch end of all rotating unwind shafts. Keeping your team safe.
- Main power lockout disconnects.
 - i. Other Optional safeties available include:
 - 1. Light barriers cross the light barrier and all power is killed.
 - 2. Floor mats step on this and all power is killed.
 - 3. Additional mechanical guard electrical interlocks.
 - 4. Three (3) color lamp stands showing green, yellow or red.
 - 5. Remote alarm contacts for remote activation.
- 3. <u>Powder Coating</u> Unlike paint, powder coating is electrically applied to all exposed steel surfaces giving your equipment an extremely long lasting, hardened finish.
 - o For years, your new laminator will shine as "new".
 - o All Walco frames are gloss black RAL Code 7021.
 - o All Walco mechanical steel guarding is OSHA Orange RAL Code T009-OG26.
 - o Specific colors can be requested, after all this is your new system.
- 4. <u>Plating</u> High gloss, gold zinc plating is used to protect most machined finishes, including rotating shafts.
 - By protecting each and every component, your Walco lasts years and years.
- 5. <u>Lamination Rolls</u> All rolls are built using Walco's propriety roll construction techniques, adding to Walco's legendary "length-of-life" reputation.
 - All rolls are sized for years of deflection free service and include Walco's proprietary, application specific coverings.
- 6. Electrical Every Walco is built to UL standards.
 - Liquid tite conduit and connectors are used throughout.
 - o NEMA 12 rated enclosures, with safety power disconnects.
 - o 220VAC / 1P / 60Hz / requirements.
 - 24VDC control voltage.
- 7. <u>Testing Process</u> Walco tests all new systems with your exact web and substrate materials onsite at Walco's facilities prior to shipment.
 - No Walco ever leaves the plant without proof positive that it is working exactly as required for your application.
 - o Please provide:
 - i. Acrylic: Ten (10) x 72.0-inch-wide by 96.0-inch-long x .25-inch thick.
 - ii. Six (6) new rolls of permanent film to be used x 12.0" wide x 6.0" plastic core tubes.



- iii. Two (2) 6.0" x 96.0" wide plastic core tubes (for liner removal).
 - 1. Please note: Walco returns all sample materials with system shipment.
- 8. <u>Owner's manual</u> A comprehensive owner's safety and operational manual is included with every Walco system.
 - o Systems, electrical, setup, installation, and safety, safety, safety are all covered.
 - With a Walco manual, your Operator's have a clear, easy-to-follow reference on how to properly use your Walco.
 - O Downloadable copies are always available if you lose one. At no charge to you!
 - Walco can provide manuals in most languages, for additional cost.

Remember - Your team's responsibility is to review this document and all attachments carefully, contacting Walco with any needed clarifications or changes.

- ANYTHING CAN BE CHANGED to fit your operational and safety requirements.
- Walco can teleconference, video chat or meet in person to discuss your project.
- This document is our mutual agreement of the requirements of your new Walco system, and is used to design, quote, fabricate and quality check prior to shipment.

Walco 812T-98 Laminating System	\$ 68,504.00 USD
 per Walco spec sheet attached. REV-C: Upgrade from 72.0 to 96.0 width capacity, laminator and tables, including credits for Rewind diff shafts replaced with standard rewind shafts - details herein. 	\$ 56,635.00 USD
REV-D (10.19.2021): Upgrade from standard top-loading to CANTILEVER (Side) loading for both Differential Unwind and Standard Rewind air shafts, including: Four (4) HD swing-away arms, Four (4) safety interlocks, All airshafts reconfigured for CANTILEVERED operations. Cantilevered HD Frame Assembly.	\$ 41,550.00 additional Included Included Included Included Included Included



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One (1) additional top Unwind & powered Rewind station-detailed herein.	\$ 13,845.00 additional
Two (2) lateral adjustability – Unwinds only - +/- 0.75 inches	< -\$ 2,675.00 additional ea.>
Overside (16.0 inch OC) film rolls (standard is 14.0") – four (4) stations.	\$ 375.00 additional each
Single handwheel nip gap adjustability.	\$ 3,717.00 additional.
Differential (not cantilevered) Airshafts – allowing multiple film roll loading. • 3.0 core tube capacity – Rewinds. • 6.0 core tube capacity - Unwinds.	\$ 16,145.00 each (2 needed) \$ 28,273.00 each (2 needed)
Two (2) Anti-static bars and controls – see page 5 for details, cautions.	\$ 5,817.00 each
Sticky Roller – Infeed – Glass top only.	\$ 11,781.00 additional
Infeed pop-up ball transfer table and gravity style roller table, with rollilng edge guide – 10 foot x 98.0 inch width capacity.	\$ 14,873.00 additional Included
Outfeed ball transfer table – 10 foot x 98.0 inch width capacity.	\$ 5,775.00 additional
Optional - In line operation with Walco powered infeed, cross feed and exit conveyors.	\$ 107,000.00 additional Included
Optional - Automatic separation cutting – Stop-to-cut, or cut-on-the-fly OHOT wire or knife – leaves small film flap OFlush cut to leading and trailing edges.	\$ 17,855 to \$ 69,875.00 TBD TBD
Optional - PLC / HMI operations -Allen Bradley or Siemens.	\$ 63,871.00 additional
Optional - Automatic unwind and rewind tension controls.	\$ 26,995.00 each
Optional - Automatic edge alignment.	\$ 27,891.00 each
Optional - Automatic quality control camera inspection and certification labeling.	\$ 16,785.00 additional Included
Optional - Overhead work platform with automatic splicing and splice removal.	\$ 67,000 - \$ 147,000.00
Crating (required)	\$ 1,135.00
TOTAL	\$ 319,785.00 USD +
Optional items noted above are NOT included in total.	



- *COVID, Force Majeure and other world-wide related events over the last seven (7) months, have resulted in raw material and finished goods prices, delivery timelines and exchange rates escalate by factors of 35% and in some cases, even higher! Based upon these and other unforeseeable events, Walco must quote based upon the timing of any new purchase order and expected deposit, with this quote being valid for twenty-five (25) days, and to be revised as needed.
- Pricing valid for 25 days +.

Terms/Delivery +

- 30% deposit with Purchase Order.
- 40% with frame completion.
- 25% due, at ship date
- 5% net 30 days.
- FOB is factory.

Please note:

- All herein is quoted based upon Walco's attached Terms and Conditions, and standard industry specific build codes.
- o Any changes will result in higher costs.

Additional

• Freight, installation supervision, sales tax, if applicable.

Warranty

Walco warrants the systems for a full year, parts and labor.

This system is selected and built specifically for Crown Electrokinetics and as such, the system may not be returned or credited. Any changes, modifications and/or upgrades from this proven system will incur additional investments.

- Walco estimates a shipping date delivery of 16 19 weeks upon receipt of order and deposit +.
- When
- + Please note: Walco makes every effort to ship systems prior to their due date. With that said, delays can and may occur, but rest assured, no Walco system ever ships without complete confidence that it will do exactly what has been agreed to here.

Start-up / Onsite assistance:

- Walco can provide a technician to assist in onsite operational, safety and maintenance training for one (1) day on-site.
 - If needed, additional days can be added at a fee of \$ 1,460.00 per day M-F, 7:30 am to 4:30 pm**.
 - Alternate times and days are billed per Walco's standard labor rate sheet (available on request).
 - ** Due to the ever-changing nature of these costs, travel time, airfare, car rental, and associated travel expenses are not included.

Definitions:

I. <u>All drawings</u> submitted (if applicable) to Crown Electrokinetics for approval will be overall dimensional drawings, one side and top views only.



- a. Assembly drawings are not provided.
- II. <u>Testing Process</u>: To ensure your success, Walco tests all new Walcos with your exact laminate and substrate onsite at Walco's facilities prior to shipment.
 - a. Please provide:
 - i. Acrylic: Ten (10) x 72.0-inch-wide by 96.0-inch-long x .25-inch thick.
 - ii. Six (6) new rolls of permanent film to be used x 12.0" wide x 6.0" plastic core tubes.
 - iii. Two (2) 6.0" x 96.0" wide plastic core tubes (for liner removal).
 - 1. Please note: Walco returns all sample materials with system shipment.
- III. <u>Startup and runoff</u> (if required) can also be completed at the Crown Electrokinetics' location.
 - a. Walco ships the new laminating system in easy-to-assemble sections and can be onsite to assist with Crown Electrokinetics' offloading, alignment, leveling and connections.
 - i. \$ 1,460.00 per day, 2-days minimum (includes travel days).
 - ii. Additional time is billable under Walco's standard labor rate sheet.
 - iii. Crown Electrokinetics is responsible for installation and all incoming power connections.
 - 1. Due to the ever-changing nature of these costs, airfare, car rental, and associated travel expenses are not included.
 - iv. As full testing was already proven on site at Walco's facility prior to shipping, the testing at the Crown Electrokinetics's location will include:
 - 1. Similar 1 2 hours run of samples
 - 2. Operational and Safety training.
 - 3. Safety Training

Summary

Years and years of successful glass laminating are easily yours with a Walco system. Walco's' legendary safety, operational ease and robust manufacturing insure an extremely quick payback. Over 10,700 systems shipped to over 60+ countries say it all. Walco's' reliable, safety conscious and extremely robust systems to do the work needed for years and years.

Proposal # CE-9221, REV-C x 96 x CANT-6.

Agreed and accepted with your Purchase Order and / or authorization here:

Attachments:

- Walco 812 Specification Sheet
- Walco Warranty
- Walco Terms and Conditions

