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 Tutorial for System Specification Worksheet

**Build a Multi-Shifter System**

1. **Putting Together a System Quotation**
2. **Putting a system proposal together has 3 steps.** First, you must fill out our 4-page System Specification Worksheet, or as we call it the "Spec Sheet".
3. Next the Spec Sheet is sent to Multi-Shifter.
4. In 2 to 3 work days you will have a system quotation complete with cad layout drawings.
5. **This a Tutorial that will help complete The System Specification Worksheet**. The information in the Spec Sheet must be accurate and complete. It is the Salesperson's responsibility to insure this is done correctly. The 4-page Spec Sheet prevents us from making any mistakes due to battery and charger dimensions, lift truck specs, floors, and any other application concerns.
6. **Page by Page Instructions for filling out the System Specification Worksheet**

**Page 1** of the spec sheet begins by asking all the typical customer information such as name, location, phone number, and contacts. Then the completing party is asked to provide the Dealer company name, salesperson involved, phone number, and fax number.

The next questions are for the salesperson:

* What type of quotation/layout is needed?
* What is the probability of getting the purchase order?
* What is the expected close date?

The bottom half of Page 1 deals with Equipment and Battery Descriptions. This is essentially an inventory of Forklifts, batteries, and chargers.

Let’s talk about the forklifts first. The number of each model of forklift in the customer’s fleet must be listed. The number of these different models is then added together to obtain the total number of forklifts in the fleet.

*(Different models of forklifts have different characteristics during battery changes. For example a simple reach truck battery change is quite different from changing an order-picker with guide-rollers and a wide platform.)*

Next the number of batteries per truck model is calculated. Normally, a 2-shift operation will have 2 batteries per forklift, and 3-shift operations have 3 batteries per shift.

Next the number of batteries stored is calculated. Let’s assume the customer has 25 forklifts. Running a 2-shift operation would require 2 batteries per truck, or 50 batteries. Since 1 battery is always in each truck the customer would need to store 25 batteries.

**Number of Forklifts 25 x 2 (Shifts) = 50 total batteries………..25 Stored**

Let’s look at the same 25-truck fleet running 3 shifts.

**Number of Forklifts 25 x 3 (Shifts) = 75 total batteries………...50 Stored**

In summary, 2-shift operations store 1 battery per forklift, and 3-shift operations store 2 batteries per forklift.

**Page 2** covers a checklist of 17 application questions. Let's review each question.

**1. Can trucks that are not currently configured for side-removal be modified?** In many cases this question is redundant, since most modern fleets have side mount trucks. If not, see explanation below:

*Multi-Shifters battery changing vehicles extract the battery out the side of the forklift. So, the battery must rest on a roller strips or poly strips, so it can be moved laterally. Generally speaking, Narrow-Aisle Forklifts such as Reach Trucks, Order-Pickers, Stock-Pickers, Turret Trucks, Sideloaders, Pallet Trucks, come from the factory with battery side-removal as a standard specification. Usually, a roller bed is used in conjunction with a side gate.*

*If a truck is not configured for side extraction, a side-gate must be cut in the side of the truck's battery compartment. This modification is not a problem with 4-wheel counterbalance forklifts. However, it can be a problem with 3-wheel counterbalance trucks. 3-Wheel trucks have a battery compartment that is much closer to the floor than 4-wheel forklifts. As a result, the battery sits down in a well. Cutting the side of a 3-wheel truck's battery compartment takes out the steel that supports the structural integrity of the truck. Essentially, by cutting that much out of the side of the truck, it would cause the truck to collapse. 3-Wheel trucks can be modified but the expense can be up to $2000.00 per truck. That can turn a project from a battery-handling vehicle project into a Gantry project.*

**2. Are poly-inserts required for any trucks? If yes, how many?**

*Any forklifts that have batteries resting directly on the bed of the battery compartment will need poly-inserts or roller-inserts for the battery to move across the compartment. Poly-Inserts are used for batteries up to 3000 lbs. Roller-Inserts are used for batteries over 3000Lbs.*

**3. If trucks to be modified are sit-down counterbalance models, remove the battery, inspect the compartment, and view the motor access opening. Consider whether the Poly-Slide or inserts will span over the motor opening. Note the access dimensions on the Multi-Shifter terminology page (page 4).**

*Many times, in the battery compartment there is open space above the drive motor. This creates a hole the inserts must span across. The inserts must be reinforced with steel bar so the insert will not collapse as the battery moves across the open space.*

**4. What is the overall length of the longest truck in the system including forks or attachments?**

*We need this dimension so we can properly size the Change Area in the system. The Change Area is the parking space for the lift truck during a battery exchange. It is usually located at one end of the system.*

**5. Are there any Sideloaders, 4-Directional, or 3-Wheel trucks in the system?**

*These types of trucks require some special options to work successfully in a side-extraction battery-handling system.*

**6. What are the numbers of shifts worked per day?**

*As we previously discussed, the number of shifts determine the number of batteries stored, which determines the amount of battery stands needed to store the batteries. It also determines the number of battery changes per day*

**7. What type of battery wash equipment is required? Auto-Washer? Power Wash Cabinet? Manual Wash Stand?**

*Auto-Washers*

*Auto-Washers are fully automatic. After the Multi-Shifter vehicle loads the battery on the feeder section. The start button engages the feeder section, and the battery is then positioned inside the Auto-Washer. The doors then automatically close and the wash cycle begins. After washing, air is used to remove excess water form the battery. The doors open automatically and the battery is positioned on the feeder section for pickup by the Multi-Shifter vehicle. They are used by customers with large fleets of 150 or more forklifts.*

*Power Wash Cabinets*

*PWC's are fed the battery by a Multi-Shifter vehicle. The operator then pushes a toggle switch to lower the door. Then the start button is pushed and the wash/air blow-off cycle begins. After the cycle is done, the operator uses the toggle switch to open the door. The Multi-Shifter vehicle removes the battery and the cycle is complete. The PWC is the most popular model of washer we make.*

*Manual Wash Stand*

*The Manual Wash Stand is simply a battery stand with splash-guards on three sides. The Multi-Shifter vehicle loads and unloads batteries in the Manual Wash Stand. The battery is washed manually while sitting in the stand. Manual Wash Stands range in price from $1,200.00 to $2,500.00.*

**8. Is a Waste Water Filtration System required?**

*Does the customer have a water treatment program for his battery wash water? Lead leeches off a battery every time it is washed. The EPA considers lead on the “Big 7” toxic waste materials. That means they consider it as dangerous as plutonium.*

*The* ***Filter-5 Waste Water Filtration System*** *is the only system that traps lead and all other heavy metals. Independent laboratories and Douglas Battery have tested the Filter-5 and verified all of our performance statements.*

*In addition, Multi-Shifter and Culligan partnered to design the Filter-5 . Culligan is a trusted name in waste- water filtration.*

*The most important part of our Filter-5 system is the disposal of the trapped heavy metals. Normally, the generator of the waste water (in this case the owner of the battery) is responsible from “Cradle to Grave” for the proper disposal of the waste water. Multi-Shifter and Culligan remove that liability by having the toxic material recycled by a federally licensed waste processor.*

*Considering that EPA fines can reach $10,000.00 a day for improper handling of toxic waste, the price of the Filter-5 is very reasonable. See our section on the Filter-5 for a full overview of the product and its benefits*.

**9.What type of system is desired? Single Level – AC or DC? Double Stack ? Triple Stack ?**

*Our Sale Engineer and Sale Coordinator will assist you in finding the best alternative for the customer.*

*To see the general guidelines for what to quote see our “Help for Sales People” section.*

**10. What type of Battery Stands are required? Poly-Glide or Roller ?**

*Multi-Shifter's Poly-Glide stands are the most space efficient in the industry. They store more batteries per square foot than any of our competitors. We accomplish this by storing the batteries just 2.5 inches apart. With Poly-Glide stands the battery rests on 2 strips of Ultra-High-Molecular-Weight-Polyethylene. The front of the strip has a booster roller to assist the battery across the strip. This simple design is nearly “maintenance free”. There are no rollers, bearings, axles, or hog rings as with roller stands. The Poly-Glide strips carry a 5 year warranty.*

*So, to summarize, Poly-Glide stands store more batteries in less space than any other method. Their “maintenance free design” gives them a low cost of ownership. Rollers, bearings, axles, and hog rings don't have to be replaced.*

*Roller stands come in fixed widths with the battery resting on a roller bed. Roller Stands are 10% to 20% less expensive than Poly-Glide Stands.*

**11. What is the maximum depth of the chargers to be used with the system?**

*The standard charger depth is 24 inches. So, the standard depth of our charger tops is 24”. However, some special chargers are 30 inches deep. For these chargers we can make 30 inch charger tops.*

*Please provide quantities and dimensions of chargers to assure placement in the design of the system.*

*Charger placement is important. The length of a battery-storage system is determined by the width of the batteries being stored. The battery stand design stores the charger above the battery. (see fig 1.) If the batteries are narrower than the chargers, you run out of room to store your chargers above the batteries. In this case the chargers will have to stacked 2 or 3 high. (see fig 2.)*

*Charger placement is especially important in Multi-Level Systems. Systems 2 to 4 levels high can store the chargers on top of the stands or special shelves can be made to store the chargers on the backside of the battery stands. (see fig 3.)*

**12. Can the chargers be stacked on top of one another?**

*As discussed in Question 11, many times chargers will need to be stacked. If they cannot be stacked we must make accommodations by using wall-mounted charger shelves or making a rack to store the chargers themselves.*

**13. Do covered batteries require space on the sides for cable clearance when being charged? Yes? No?**

*If the answer is yes we must make sure there is room between batteries for the cables. Regular Poly-Glide stands store batteries only 2.5 inches apart. In this case we make a special storage base that allows more room for the cables. Roller Stands can be specified to allow for extra room between batteries for cables.*

**14. Do covered batteries require that their covers be open during the charging operation? Yes? No?**

*If the answer is yes, what is the height of the tallest batteries with the covers raised? We ask these dimensions to be sure the clear space between the roller and the underside of the charger top is tall enough for the cover to be opened.*

**15. Are the lift trucks used in a freezer or refrigerated facility?**

*Trucks that go in and out of freezers or cold storage have a tremendous amount of condensation due to the dramatic temperature changes. The trucks and the batteries literally sweat.*

*This condensation makes the bottoms of batteries very rusty and scaly. As a result the batteries do not work well with Poly-Glide Stands because the scaly bottom tends to gouge the poly strips.*

*Roller stands should be used in freezer or cold storage applications.*

**16. Is factory installation desired? Yes? No?**

*If yes: Full or Supervisory*

*Full Factory Installation is best. Especially when multi-level systems are involved. However, if your service people work with us on several installations they can become proficient at installing single-level systems.*

**17. What is the space allotted for the battery changing system? What is the clear vertical height of the proposed area?**

*This is very important. We usually ask for drawings of the area if the customer has them.*

*Even if the customer has drawings, you must measure the area and survey the area to verify all dimensions.*

*Look for drains in the floor, doorways, travel aisles, and walkways. Look for overhead obstructions such as pipes, ductwork, and wiring. Also, look for wall mounted obstructions such as electrical panels, piping, conduit, and meters.*

*The floor spec is ¼ inch in 10. This means the floor should not vary more that ¼ inch in 10 feet.*

*Check the floor visually to see if it has any dramatic dips. If so, pull a tape measure out 10 feet and look for gaps under the tape. If there are gaps call us. We have floor experts to help you.*

*We have methods to level stands and travel path of the vehicle on problem floors.*

**Page 3** is divided into 2 sections. The top section deals with system justification. The bottom half is concerned with the competition involved in the deal.

**System Justification**

**The information gathered here enables us to calculate a Return on Investment for the customer**. Multi-Shifter battery handling systems usually pay for themselves in 2 years or less.

*We ask for the customer’s investment in forklifts, batteries, and chargers.*

*The hourly labor rate lets us calculate the dollar value of the time saved by quicker battery changes.*

*We need to know how long it presently takes the customer to change a battery. This compared to Multi-Shifter’s change time to derive a time savings per battery change.*

*The average pallet movement time is documented so we can calculate how many more pallets can be moved per shift with faster battery changes.*

*The cost per square foot of the warehouse space is used to calculate the space savings associated with Multi-Shifter’s systems.*

*Finally, we ask for the area of the present system to show how much space a Multi-Shifter system can save.*

*All these elements combine to furnish the customer with a realistic ROI for his Multi-Shifter project.*

**Competitive Information**

We want to know the following:

 *Is there competition in this deal?*

 *If so, who is the competition?*

 *What kind of battery handling vehicle is being quoted?*

 *Is the vehicle quoted AC or DC powered?*

 *What type of battery stands are being quoted?*

 *What type of washer is being quoted?*

 *Is waste water filtration being quoted?*

 *Are Poly-Slide inserts for trucks included in price?*

These questions help us assure our quotation vs. the competition is apples to apples. That way can show we have the best competitive edge.

 **Page 4** has four drawings. The top two drawings are top and side views of a narrow aisle truck. The bottom two drawings are the top and side views of a sit-down counterbalance forklift.

*At the bottom of the page there are 7 critical measurements to be made for each type of forklift. A separate copy of page 4 must be filled out for each type of forklift.*

*These dimensions help us make sure that the Multi-Shifter vehicle can access the battery in the truck for a successful change.*