

UNIVERSITY OF ALBERTA

# ALTA – THERM INDUSTRIES LTD.

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OPERATIONS MANAGEMENT PROJECT

**Submitted To**

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## EXECUTIVE SUMMARY

Alta-Therm is an Edmonton based fiberglass window manufacturing company. The company has been operating by building customized residential windows on a per customer basis. Now into their second year of operations they are looking to expand into larger projects within the Edmonton area. Alta-Therm sees larger projects as a way to standardize the product therefore lowering costs associated with operations and gaining more control and predictability over production.

Due to Alta-Therm still operating in the infancy stages of business they are unable to facilitate a move to a larger building due to both financial and contractual constraints. The issue of space plays into the move towards expanding into larger projects because Alta-Therm would need to increase their production to meet the larger demands. The owner currently oversees daily activities in addition to growing the company, which does not provide a good balance because the owner cannot provide the necessary attention that both elements deserve.

Based on operational analysis two main recommendations to Alta-Therm have been presented. In order to address the space issue and need for more production it was recommended that a night shift be added to operations. In addition, the recommendation to hire an Office Coordinator and appoint a Shop Manager would give the owner the time to address larger operational issues such as sales.

Alta-Therm is a small company with major limitations at this time and it is a dilemma that many small companies are faced with. The opportunity to grow exists; however positioning is often difficult for smaller companies due financial and capacity constraints. In conclusion, Alta-Therm offers a product that is suited for the Edmonton climate and if the operational strategies listed in this document are reviewed and employed they could position themselves in order to capitalize on the opportunity.

## 1.0 COMPANY BACKGROUND

Alta-Therm Industries Ltd. manufactures windows with a current focus on residential projects. Currently, they lease a bay in the south side industrial area located in Edmonton, Alberta. Alta-Therm is in their second operating year with a staff of seven shop employees plus the owner who oversees daily operations and administrative tasks. Due to the business still in the infancy stages of operation they have not invested money into external advertising and have built to the level they are at through the owner's previous industry connections and by providing a window product built for the Edmonton climate.

Alta-Therm window frames are made out of fiberglass. Fiberglass is known as a superior insulator that can stand up to most extreme climates. It is a natural insulator that does not conduct heat or cold and will not expand or contract. Some of the advantages include; strength, low maintenance, non-corroding and environmentally friendly. The windows can be painted to any color and designed to any specification for new construction or renovation.

Still in the early stages of operating Alta-Therm produces windows on a per job basis. Each project is customized to the customer order. Customizing each order was a necessary business step in the beginning because Alta-Therm is a relatively newer company and they needed to not only pay the bills but also gain reputation in the industry. This was not the intended direction the owner wanted to take the company but in starting a new business the direction taken is often where the money comes in immediately.

Now that Alta-Therm has established their position in the Edmonton construction industry as providing a demanded product and delivery on their promises they are finally in a position to move in the direction the owner originally wanted to go. Alta-Therm sees opportunity in bidding on larger projects within the City of Edmonton.

It is important to note that Alta-Therm does not currently install the finished product so they are looking to team up with builders and/or contractors.

## 2.0 ISSUE IDENTIFICATION

Alta-Therm would like to bid on larger projects because of the advantages of moving from customized to standardized jobs. Larger projects would allow for them to capitalize on economic raw materials ordering, effective flow of production, long term work projects, incoming cash flow. However, they have run into a few issues that they must resolve in order to see if they would even be able to complete the larger projects. As reputation is very important to the owner and the long term viability of Alta-Therm the owner does not want to overestimate their abilities and risk the fallout associated with doing so.

- They are under lease in their current location and do not have the financing available to move in order to accommodate more shop space;
- Would like to standardize their production to capitalize on more predictable costs (economic ordering etc.) but require larger orders to do so;
- The owner is attempting to do all the major elements that are required in operating a company however by doing everything from answering the phone to monitoring shop production and workforce it does not leave enough time for sales. The owner should be focusing attention on the general overview of the company instead of getting involved in every little detail.

Alta-Therm must first determine what their current production rate is and then see if they are able to increase it. Since the owner has experience within the industry previous to starting Alta-Therm he knows where they need to be in order to accommodate the larger project demands.

## 3.0 OPERATIONAL DEFINITION

After reviewing Alta-Therm's issue of wanting to expand into larger projects in order to cut costs, stabilize work and increase revenue the following operational theories are highlighted:

1. Project Management
2. Sales and Operations Planning
3. Scheduling
4. Production Planning Strategies

Due to Alta-Therm only being in their second year of operations they are not in a position to focus on their inventory control or the production time components associated with manufacturing. However, the importance of both these topics is very important and small steps are made daily by management to control them best as possible given their current state. The

owner would like to create quality procedures and inventory control processes in the future but that is not one of the company's immediate concerns at this time.

### 3.1 Project Management

Alta-Therm currently follows the *Pure Project* model where one project manager has the full authority over the project. The pure project is advantageous because team members report to one person, decisions are made quickly and team motivation is high. The disadvantages associated with the pure project structure include; duplication of resources, organizational goals and policies are ignored and team members worrying about life after the project do not apply to Alta-Therm. Because Alta-Therm is producing a product and the project itself is the next job coming in the employees do not need to worry about life after any one project. The one disadvantage of pure projects that is relative to Alta-Therm would be the duplication of resources. The shop is setup in a flow where each employee has a station they work on. If one station is lagging behind it is difficult for another employee to help the slower station for two main reasons; (1) depending on what station is slower there may not be the technical knowledge of how to help and (2) each station is dependent on the previous and next station so product would end up stopped at the down station.

### 3.2 Sales and Operations Planning

By definition, sales and operational planning refers to the process that helps companies keep demand and supply in balance. Alta-Therm is not a large enough company to be able to separate into departments like; finance, product development, sales, and operations however each of those elements are addressed daily, just in a smaller setting. While having your sales focus based on a per job customized order basis it is often difficult to keep both supply and demand in balance, because one is always reacting to the other. Alta-Therm would benefit from both intermediate-range and long-range planning offered by sales and operations planning. Securing larger projects would allow for more structure in the forecasting and planning phase of business because the next job would not be unknown.

### 3.3 Scheduling

Each station within the shop area at Alta-Therm is a work center. The concept of infinite loading applies to the current production flow in the shop because each station is assigned a step in the manufacturing of the window based on what is needed. The stations process orders based on a first come, first served basis however, each station is dependent on receiving product from the previous station to complete the work. Due to their size of operations it is not financially feasible to employ an expensive scheduling system. The close proximity of the stations allows for communication among members.

### 3.4 Production Planning Strategies

The three production planning strategies; *Chase Strategy, Stable Workforce, Level Strategy* all have a fit within manufacturing. The decision to employ one strategy over another would involve a detailed overview of what you are producing, how much, and include any external variables that were applicable. The chase strategy is not a viable option for Alta-Therm because it is often hard to find the skilled labor when it is required as well being that they are a small company the team morale would really be affected. A combination of the stable workforce and level strategy fits well with the organizational ethics as well as operations. Alta-Therm would like to keep output fixed and production constant however if need be they would vary the work hours to suit the production required.

## 4.0 RECOMMENDATION

Alta-Therm currently works an eight hour shift during the day, Monday through Friday. Taking into account one half hour lunch and two 15 minute breaks along with setup at the start of the shift and clean up at the end, the total work time equals six and a half hours per day with seven employees – one at each station. Attachment one outlines each station along with the task to be completed at that station and quantity of units per hour that can be completed. Currently, at the end of the six and a half hour work day the seven stations can produce 162 window units multiplying that by five work days the weekly total is 810 window units. The owner knows that in order to successfully bid on larger projects production must be able to incorporate the large orders plus any additional customer orders that come in. It should be noted that Alta-Therm would like to move away from the customized per customer job orders and focus only on large standardized orders, so they will be phasing out the customized ordering within three months of successfully signing an agreement.

Due to the financial and space constraints it is recommended that Alta-Therm add a night shift to assist production and increase finished window units. Attachment one also highlights the added number of completed window units that would result from adding a night shift. The numbers for the night shift are also based on the six and a half hour work time period, five days per week. By adding the night shift Alta-Therm would not need to move to another location to add more shop space because the night shift would share the same equipment as the day shift. The night shift would only work on the critical path, as identified as being station 2 – station – 4 – station 5, therefore allowing more flexibility for the day shift. The night shift would also carry the responsibility of maintenance of the equipment.

The primary issue facing Alta-Therm consisted of; *can we produce enough completed window units in order to bid and successfully complete larger projects?* If Alta-Therm adds the night shift to their operations the answer to this issue is - yes.

#### 4.1 Advantages of adding the Night Shift

- Increased production;
- Ability to bid and successfully delivery on larger projects;
- Movement towards the goal of producing standardized windows versus customized;
- Lowering ordering costs due to bulk ordering of raw materials;
- Minimizing the effect of raw material price fluctuations.

#### 4.2 Disadvantages of adding the Night Shift

- Increased personnel – increased payroll;
- Increased operational costs – heat, insurance for night shift, electricity, equipment life span;
- Retention of employees in production downtime.

#### 4.3 Operational Application

Alta-Therm will continue to manage projects following the pure project model because it is the only model that fits with the dynamics of the company at this time. Scheduling at each work station is crucial in any manufacturing situation.

With the addition of a night shift Alta-Therm will need to spend more time on scheduling because two shifts will ultimately be working on the same project but not at the same time. Also, direct communication cannot take place between the day and night shift because of timing. As stated the company is not in a financial situation to invest in any specialized scheduling programs so an alternative is to post job boards and set production guidelines for certain time periods which are shift specific. This way each shift knows what is required during their work period.

One of the disadvantages to adding a night shift is retention of employees during downtime. If the industry demand decreases for any set amount of time Alta-Therm could be faced with a number of employees who are capable of meeting production requirements but have no demand to fill the supply. The level strategy is a favorable strategy because the output is fixed and the employees are constantly working. However, this strategy is not always employable because if output is fixed but demand has decreased the company could end up with surplus inventory. Currently, Alta-Therm is pressed for space so increased inventory is not an option. With the stable workforce strategy Alta-Therm would be able to vary the employee hours and



production to fit with industry demand. They would use a mixed strategy of level and stable in order to keep the employees they have. At times it is easy to look at the cost associated with payroll but in order to make an informed decision the following must be taken into consideration; time to train employees, employee morale, team commitment, pool of applicants, investment of skills and industry knowledge.

The owner of Alta-Therm requires more time to manage the company from a general overview rather than being involved in the daily detailed activities. To address the issue of the owners focus the recommendation of hiring an Office Coordinator to assist with administrative duties and appointing a current shop employee to act as Shop Manager would allow the owner to pursue larger projects and more work. Once production and administration are addressed the owner is available to prioritize and set intermediate-range and long-range plans.

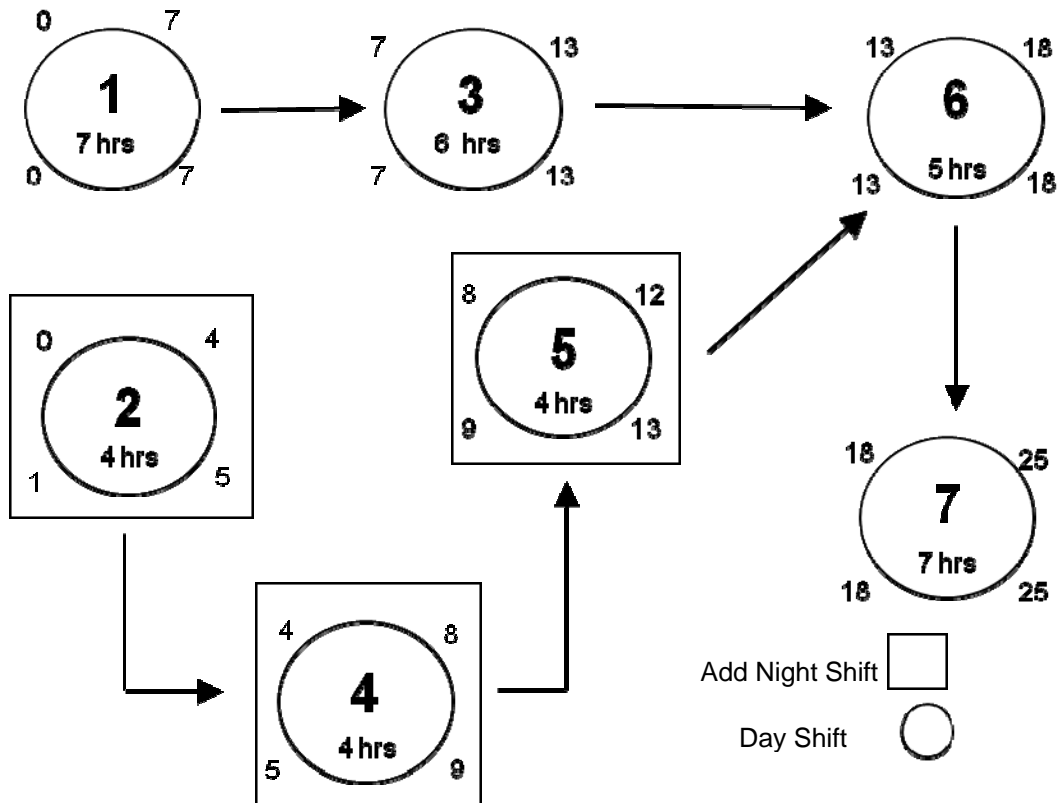
## **5.0 CONTINGENCY PLAN**

If Alta-Therm is not successful with larger projects due to their current capacity and financial limitations it would be in the best interest of the company to continue with only the day shift for manufacturing and filling customer orders as required. However, the recommendation to hire an Office Coordinator and appoint a Shop Manager should be followed through on. As stated, this will allow the owner the time and attention required to grow Alta-Therm.

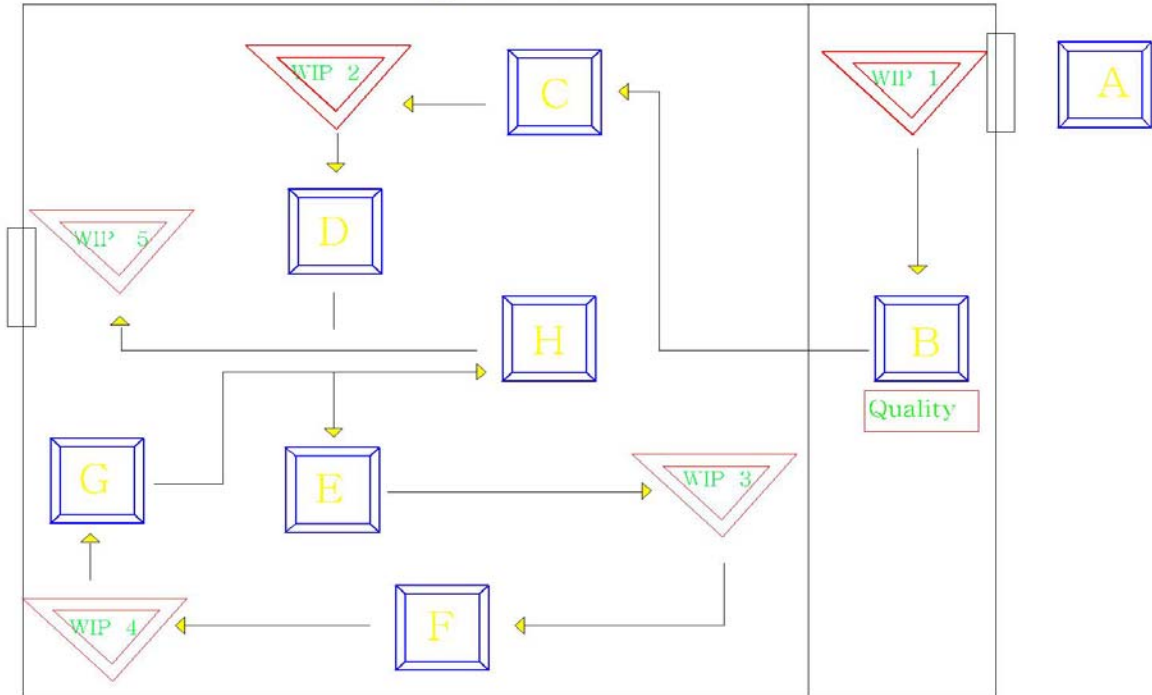
Once Alta-Therm has had the opportunity to grow within the industry and within their internal practices the attempt to expand to larger projects could take place then.

**ATTACHMENT ONE: Production Flow and Critical Path**

| ACTIVITY # | ACTIVITY                                    | ACTIVITY # THAT PRECEEDS | QUANTITY PER HOUR |
|------------|---|--------------------------|-------------------|
| 1          | cut pieces for picture windows to assemble  | 0                        | 7                 |
| 2          | cut pieces for opening windows to assemble  | 0                        | 4                 |
| 3          | assemble pieces for picture windows         | 1                        | 6                 |
| 4          | assemble pieces for opening windows         | 2                        | 4                 |
| 5          | add hardware for opening windows            | 4                        | 4                 |
| 6          | cut stops, add tape for picture and openers | 3, 5                     | 5                 |
| 7          | add glass to picture and opening windows    | 6                        | 7                 |



PLANT DESIGN  
ALTA THERM  
Day Shift



**ATTACHEMENT TWO: Day Shift Production**

## REFERENCES

Jacobs, F., Chase, R., & Aquilano, N. (2009). *Operations & Supply Management* (12<sup>th</sup> ed.). New York: McGraw-Hill Irwin.