



Project Simulation C Line.

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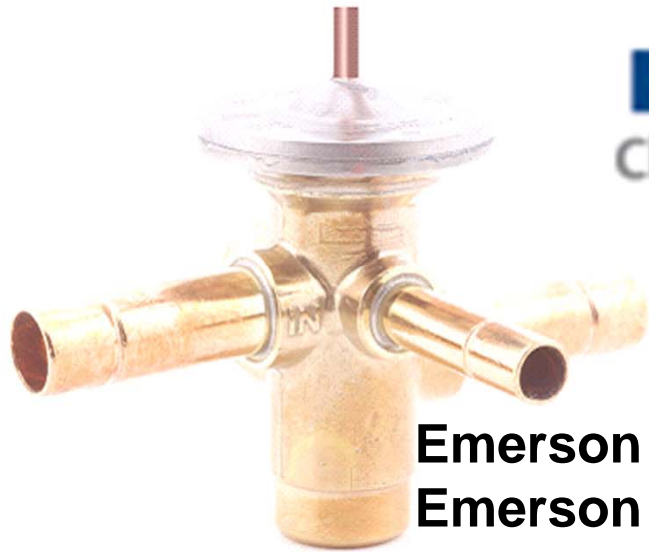


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Management**





Emerson Climate Technologies is a company of Emerson Group

The Facility is located in Guadalajara, Mexico

Emerson Climate produce valves and control devices for air conditioning equipment (industrial, residential, commercial)



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Emerson Location Decision

Emerson Climate Technologies has decided to concentrate the operations in one facility in Mexico

In 2010, Emerson Climate Technologies closed the operations of the facility located in Reynosa City , Mexico

Emerson have move the operations and equipment to the facility in Guadalajara




EMERSON
Climate Technologies



Emerson estimated the demand for period 2010 to 2012

Annual Demand By Month

2010 - 2011

	Total CE FY11	Days/Month	Takt Time (2T)	Takt Time (3T)
Oct	60500	22	20.29090909	30.10909091
Nov	60500	22	20.29090909	30.10909091
Dec	60500	22	20.29090909	30.10909091
Jan	84700	22	14.49350649	21.50649351
Feb	84700	22	14.49350649	21.50649351
Mar	96800	22	12.68181818	18.81818182
Apr	133100	22	9.223140496	13.68595041
May	157300	22	7.804195804	11.58041958
Jun	157300	22	7.804195804	11.58041958
Jul	145200	22	8.454545455	12.54545455
Aug	96800	22	12.68181818	18.81818182
Sep	72600	22	16.90909091	25.09090909
Total	1,210,000.00			

2011 - 2012

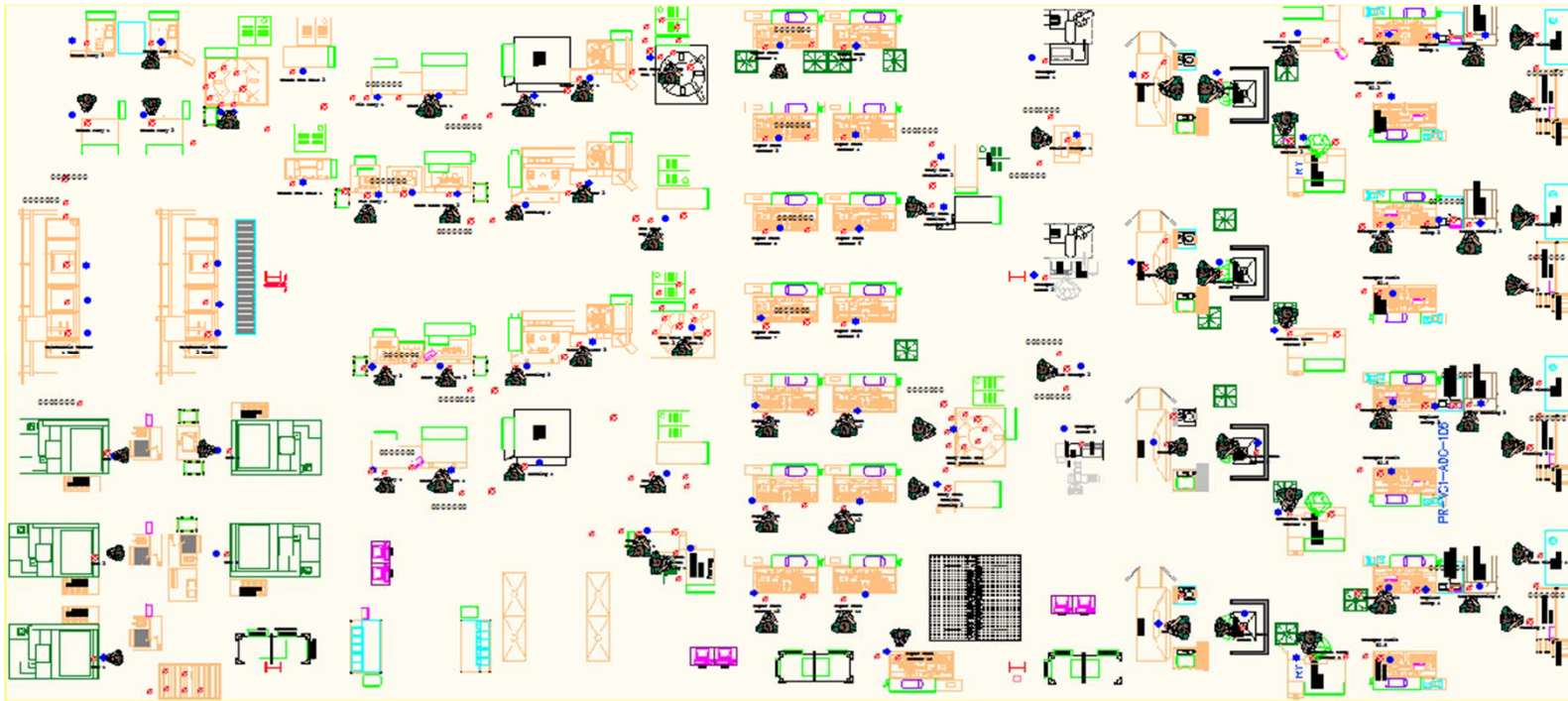
	Total CE FY11	Days/Month	Takt Time (2T)	Takt Time (3T)
Oct	105500	22	11.63601896	17.26635071
Nov	105500	22	11.63601896	17.26635071
Dec	105500	22	11.63601896	17.26635071
Jan	147700	22	8.311442112	12.33310765
Feb	147700	22	8.311442112	12.33310765
Mar	168800	22	7.272511848	10.79146919
Apr	232100	22	5.289099526	7.848341232
May	274300	22	4.475391907	6.64090412
Jun	274300	22	4.475391907	6.64090412
Jul	253200	22	4.848341232	7.194312796
Aug	168800	22	7.272511848	10.79146919
Sep	126600	22	9.696682464	14.38862559
Total	2,110,000.00			

Emerson proposed a new layout incorporating the Reynosa operations and new equipment

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Emerson manufacture 4 types of valves

Check Non Adjustable

Check Adjustable

Non Check No Adjustable

Non Check Adjustable

EMERSON
Climate Technologies

Process Flow

The equipment has the same sequence for the 4 valves.

The process differences are:

Both Non Check Adjustable and Non Adjustable do not need Check Assembly and Check Induction Soldering operations



The Super Heat Setter, Body Seal Induction and Body Seal Orbital Forming operations have different sequence for each valve

Emerson Proposal

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Contains:

The number of equipment installed for each process

The average time and standard deviation for each process

The number of shifts and the total hours available per shift

The yield for each valve





Simulation Model Characteristics

For each iteration Emerson define:

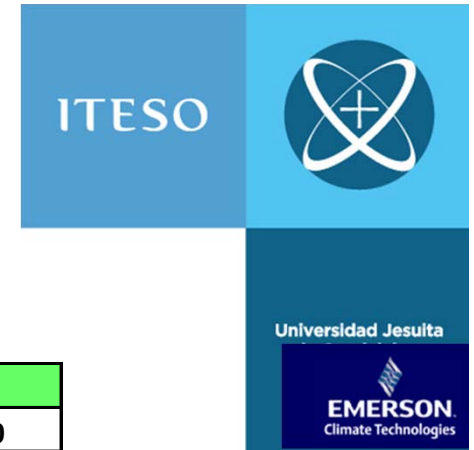
**Forecast demand and percentage of
valve mix**

Valve assignment by production run

Production batches by valve



The model operate as a Capacity Planning Tool and require the next information:



Forecast	760
Units to Produce	1080
Time Available	540

Product

Unit/batch	Check - Non Adjustable	432
	Check - Adjustable	216
	No Check - No Adjustable	216
	No Check - Adjustable	216
Mix	Check - Non Adjustable	50%
	Check - Adjustable	20%
	No Check - No Adjustable	15%
	No Check - Adjustable	15%
Order Assigment	Check - Non Adjustable	3
	Check - Adjustable	2
	No Check - No Adjustable	1
	No Check - Adjustable	4
Number Batches	Check - Non Adjustable	1
	Check - Adjustable	1
	No Check - No Adjustable	1
	No Check - Adjustable	1





Scenario 1

Demand Forecast 3241 valves

Demand Mix

Check Non Adjustable	50%
Check Adjustable	20%
Non Check Non Adjustable	15%
Non Check Adjustable	15%

Production Assignment

- Non Check Adjustable
- Check Adjustable
- Check Non Adjustable
- Non Check Non Adjustable

Batches by Valve 4

Results

Check Non Adjustable	3018
Check Adjustable	1323
Non Check Non Adjustable	946
Non Check Adjustable	890





Scenario 2

Demand Forecast 760 valves

Demand Mix

Check Non Adjustable	50%
Check Adjustable	20%
Non Check Non Adjustable	15%
Non Check Adjustable	15%

Production Assignment

- Non Check Adjustable
- Check Adjustable
- Check Non Adjustable
- Non Check Non Adjustable

Batches by Valve 1

Results

Check Non Adjustable	864
Check Adjustable	432
Non Check Non Adjustable	432
Non Check Adjustable	432





Benefits

Emerson evaluated the real capacity for the new layout based in a forecast demand for 2 years, then decided to install less equipment to improve the line balance

Emerson can decide how many equipments turn off by shift to know if there are enough capacity to reach the demand forecast by valve

Emerson define the bottlenecks in the process



Thank You

