TRK - Analysis

Visualization of indicators associated with 5 perspectives: Works, Operating Stations, Operations, Operators and Equipment. Contains 3 analysis metrics:

- **Evolution:** visualization of information in graphic form (with evolution and distribution of information from different perspectives for different indicators)
- **Macro - Analysis**: visualization of information in the form of a schedule (with detail at the process level)
- **Micro - Analysis**: visualization of information in table form (with details of all content associated with the works)

All displayed information is based on unclosed and published works and, in this universe, all works that contain planned activities with associated references.

NOTE 1:From the Works perspective, when viewing indicators related to "structuring weight" and for its calculation, the types of structuring elements of the work (Assemblies + Elements + Accessories + Miscellaneous) are considered. In the rest, all types of reference are counted.

NOTE 2: The information is updated in all possibilities of analysis at the beginning of the day (that is, taking into account the registrations made until 07:00 of the current day).

Metrics - Evolution

Information distributed by some types of indicator such as:

- State - indicators related to execution states
- Hours - indicators related to planned and executed hours
- Temporal Evolution - indicators related to executions, quantities, weights and areas executed and execution hours distributed over time (in months)
- Planning - indicators related to planning deviations
- Quality - indicators related to quality

These options appear available in the perspectives where they are applicable. In each graph displayed, information is provided in a table (below the graph) and each graph contains a set of applicable filters depending on the displayed indicator. General structure of layouts:

Available graphics

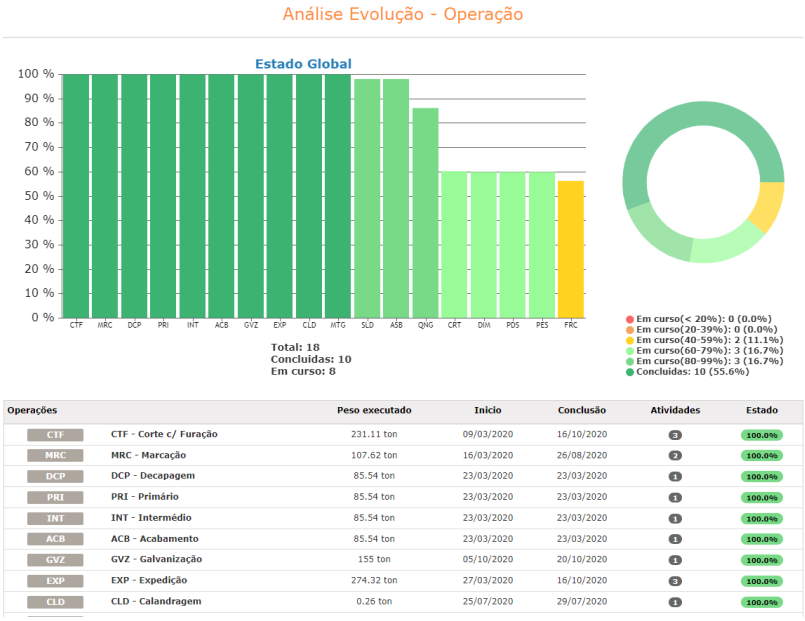
State - Perspective

Presents the global status of works in progress and published[1] and the operations associated with them[two]. Allows you to view works by client[1]and operations by work, entity or process2.

Provides the following indicators:

- State of execution of works[1] and operations[two];
- Total number of works[1] and operations[two];
- Number of works[1] and operations[two] completed and to be completed;
- Period (with start and end date)
- No. associated activities
- Structuring weight[1]and executed[two]
- owner of work[1]

1 – Work perspective, 2 – Operation perspective



Operações		Peso executado	Inicio	Conclusão	Atividades	Estado
CTF	CTF - Corte c/ Furação	231.11 ton	09/03/2020	16/10/2020	3	100.0%
MRC	MRC - Marcação	107.62 ton	16/03/2020	26/08/2020	2	100.0%
DCP	DCP - Decapagem	85.54 ton	23/03/2020	23/03/2020	1	100.0%
PRI	PRI - Primário	85.54 ton	23/03/2020	23/03/2020	1	100.0%
INT	INT - Intermédio	85.54 ton	23/03/2020	23/03/2020	1	100.0%
ACB	ACB - Acabamento	85.54 ton	23/03/2020	23/03/2020	1	100.0%
GVZ	GVZ - Galvanização	155 ton	05/10/2020	20/10/2020	1	100.0%
EXP	EXP - Expedição	274.32 ton	27/03/2020	16/10/2020	3	100.0%
CLD	CLD - Calandragem	0.26 ton	25/07/2020	29/07/2020	1	100.0%

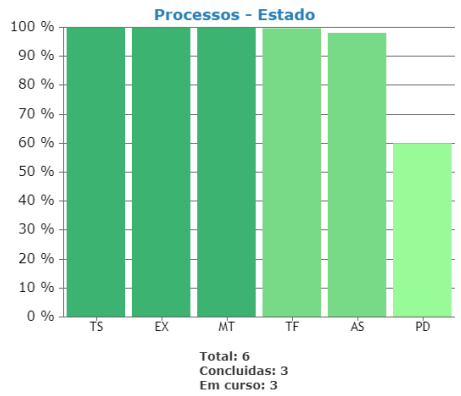
State - Processes

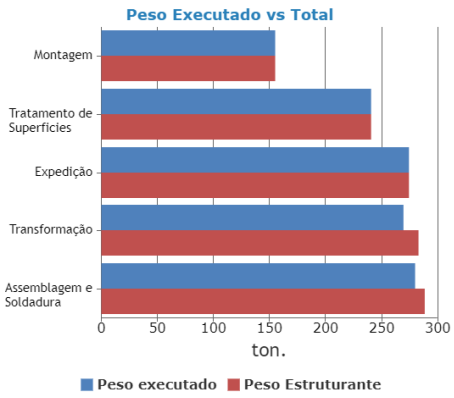
It presents the global state of the processes in the factory in the universe of works in progress and published[1] and the operations associated with them[two]. Allows you to view the status of processes for a selected job[1] or selected operation[two]as well as for a specific entity. Provides the following indicators:

- State of execution of works processes[1] and operations[two];
- Period (with start and end date)
- No. associated activities
- Executed and total weight associated with the process;
- Weighted weight associated with the process based on the weights assigned to the work activities[1].

1 – Work perspective, 2 – Operation perspective

Análise Evolução - Operação



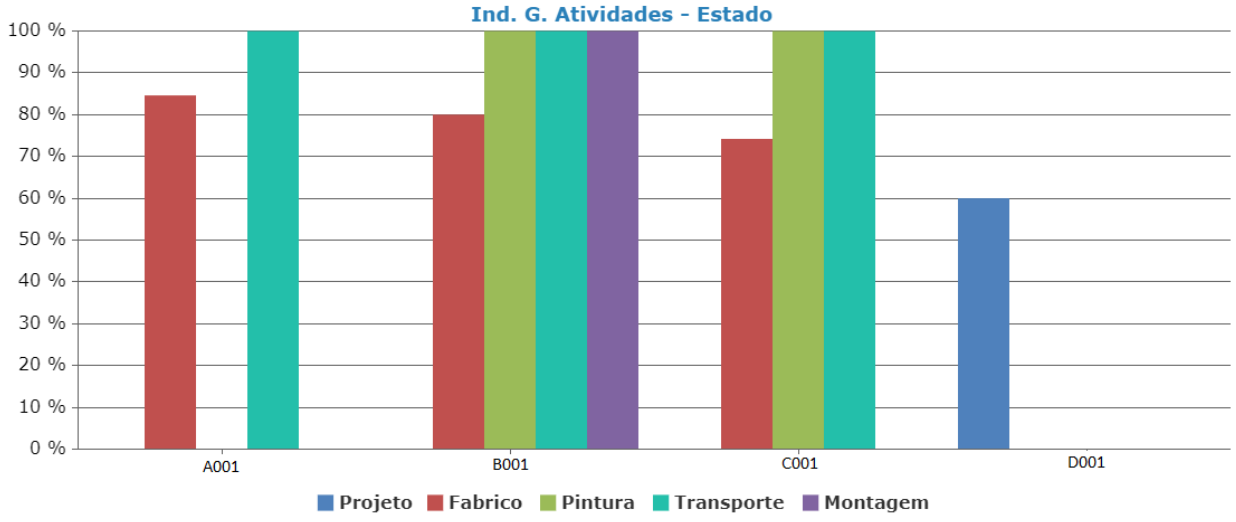


Processo		Peso executado	Peso Estruturante	Inicio	Conclusão	Atividades	Estado
TS	TS - Tratamento de Superfícies	240.58 ton	240.58 ton	23/03/2020	20/10/2020	2	100.0%
EX	EX - Expedição	274.32 ton	274.32 ton	27/03/2020	16/10/2020	3	100.0%
MT	MT - Montagem	155.04 ton	155.04 ton	10/10/2020	13/11/2020	1	100.0%
TF	TF - Transformação	269.42 ton	282.85 ton	09/03/2020	16/10/2020	3	99.7%
AS	AS - Assemblagem e Soldadura	279.82 ton	288.40 ton	16/03/2020	16/10/2020	3	98.1%
PD	PD - Projeto / Detalhe	0 ton	0 ton	17/06/2020	08/09/2020	1	60.0%

State - Indicators

It presents the global status of the global activity indexes associated with the works with the possibility of selecting a work and/or a specific entity.

Análise Evolução - Obras

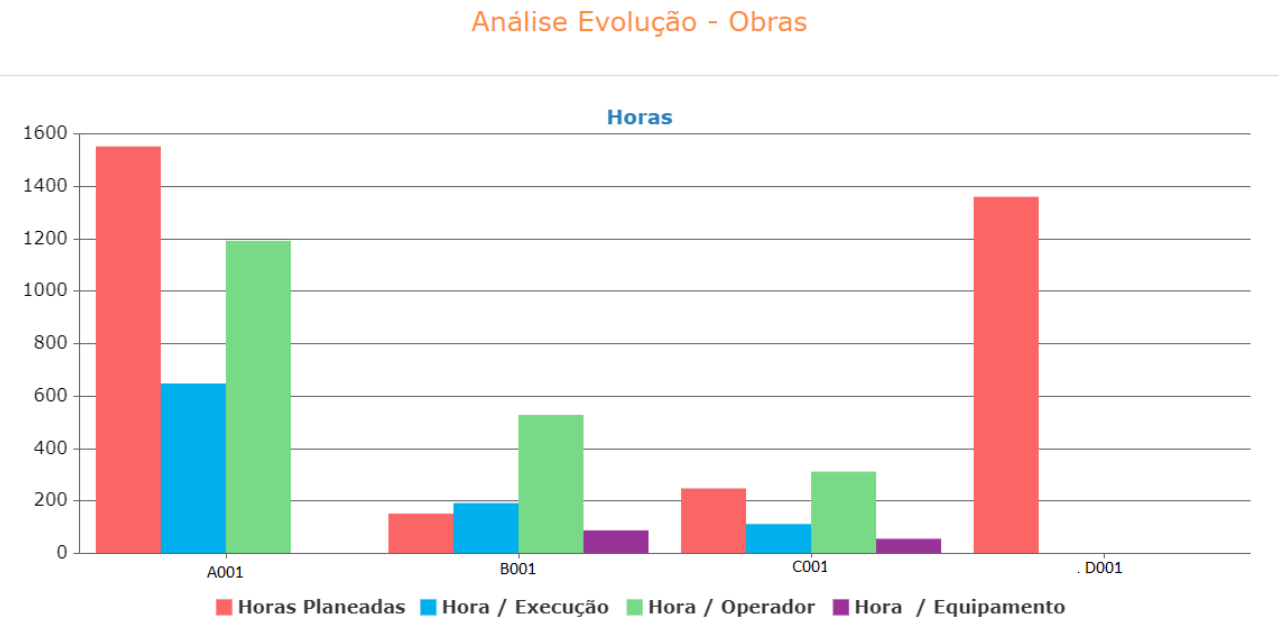


Obra		PRJ	FAB	PNT	TRP	MTG
A001	Obra A	0.0%	84.6%	0.0%	100.0%	0.0%
B001	Obra B	0.0%	80.0%	100.0%	100.0%	100.0%
C001	Obra C	0.0%	74.2%	100.0%	100.0%	0.0%
D001	Obra D	60.0%	0.0%	0.0%	0.0%	0.0%

Hours - Perspective

It shows the hours planned, executed, number of executions and execution rate compared to what was planned by items from different perspectives. With the possibility of selecting an entity, a process or a specific item from the chosen perspective. Provides the following indicators:

- Planned hours (sum of the difference in days of activities related to the chosen perspective, where 1 day is considered to be 8 effective hours of work, that is, 1 activity that has a duration of 1 day is equivalent to 8 hours of work)
- Hours performed (sum of hours associated with the executions associated with the perspective)
- Hours / operator (sum of the hours associated with the executions associated with the perspective, multiplied by the number of operators associated with the executions, that is, 1 execution with 8 execution hours and 2 associated operators is equivalent to 16 hours / operator)
- Hours / equipment (sum of the hours associated with the executions associated with the perspective, multiplied by the number of equipment associated with the executions, that is, 1 execution with 8 hours of execution and 2 associated equipment is equivalent to 16 hours / equipment)
- Number of executions
- Execution rate versus planned (percentage ratio between the number of hours executed and the number of hours planned)



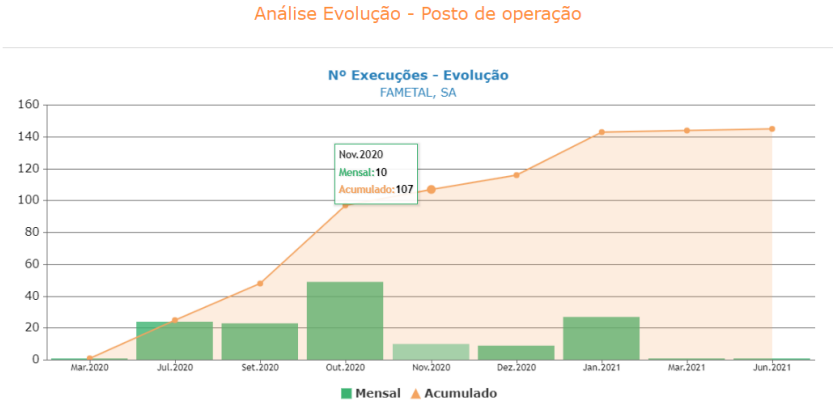
Obra		Horas Planeadas	Hora / Execução	Hora / Operador	Hora / Equipamento	Execuções	T. Exec / Pln.
A001	Obra A	1552.00	648.08	1192.36	0.00	95	41.8 %
B001	Obra B	152.00	192.07	528.11	88.01	31	126.4 %
C001	Obra C	248.00	112.01	312.03	56.00	17	45.2 %
D001	Obra D	1360.00	0.01	0.01	0.00	2	0 %

Hours - Processes

It shows the hours planned, executed, number of executions and execution rate compared to what was planned by items from different perspectives, distributing the same indicators by processes (associated with activities related to the chosen perspective). With the possibility of selecting an entity or a specific item from the chosen perspective. Provides the same indicators described above.

Temporal Evolution - Executions

Shows the temporal evolution of the number of executions associated with activities from the chosen perspective. The temporal distribution is presented monthly and it is possible to choose a specific year or an entity or a specific process. It also presents an accumulated that goes by the sum of the number of executions for each month.



Ano	Mês	Mensal	Acumulado
2020	Março	1	1
2020	Julho	24	25
2020	Setembro	23	48
2020	Outubro	49	97
2020	Novembro	10	107
2020	Dezembro	9	116
2021	Janeiro	27	143
2021	Março	1	144
2021	Junho	1	145

Temporal Evolution - Quantity / Weight / Surface Area

Displays the temporal evolution of the executed quantity, executed weight or executed surface area associated with executions of activities from the chosen perspective. The temporal distribution is presented monthly and it is possible to choose a specific year or an entity or a specific process. It also presents an accumulated that goes by the sum of the amount of hours executed in each month. To make the monthly distribution of these indicators, the formula used is as follows:

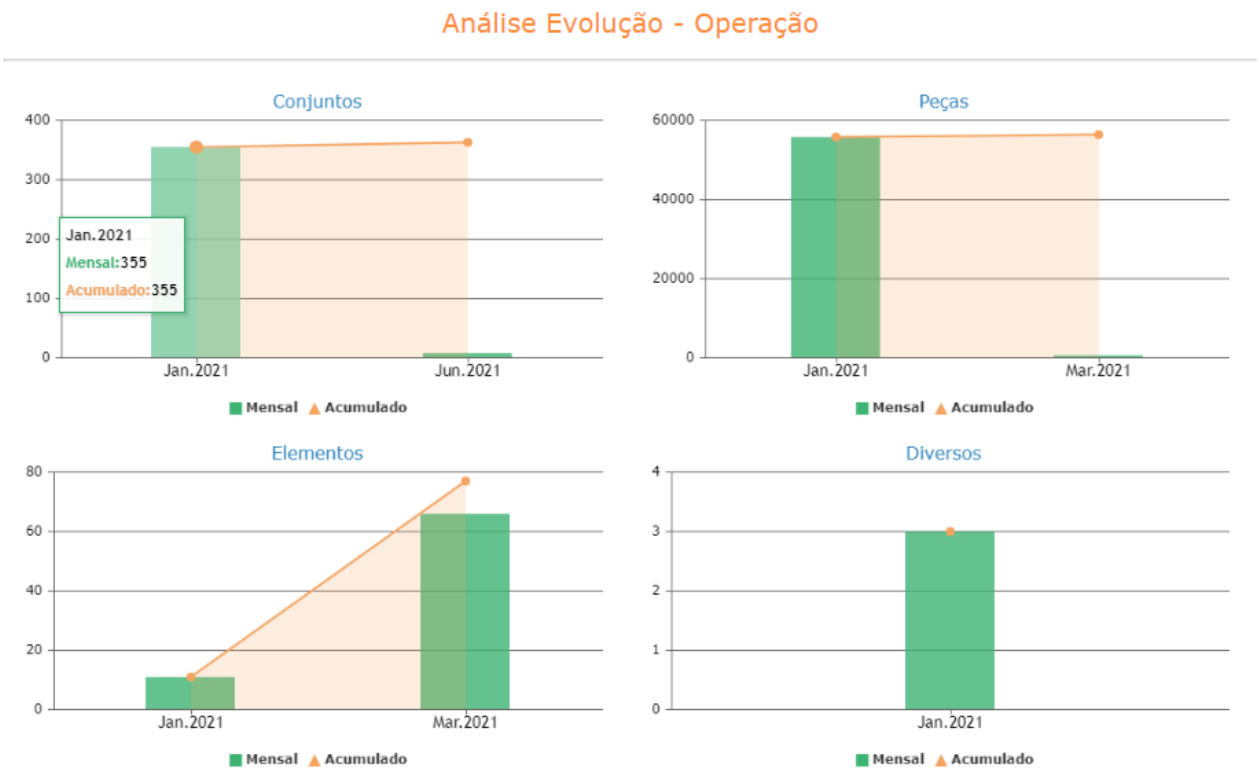
- Quantity executed: average of the quantity executed taking into account the different operations present in the scheme of operations associated with the execution (if we have a scheme of operations with 2 operations, the reference and respective quantity, it is only executed in its entirety when, for each operation, that quantity is reached , if not, an average is taken to obtain a percentage value between the total executed by operations and the number of operations). Example: 1 execution of a reference with operation scheme with 2 operations in which only one is executed in its entirety in this execution, the quantity carried out will be 0.5).

  In case the Operations perspective is chosen, the quantity executed is the direct value executed per operation.

- Weight performed:reference unit weight * the executed quantity obtained by the above formula.

- Surface area executed:unit surface area of the reference * the executed quantity obtained by the above formula.

In this type of indicators, the information presented in the graphs is divided by type of element.



Ano	Mês	Tipo	Mensal	Acumulado
2021	Janeiro	**Conjuntos**	355 un	355 un
2021	Junho	**Conjuntos**	8 un	363 un
2021	Janeiro	**Peças**	55787 un	55787 un
2021	Março	**Peças**	632 un	56419 un
2021	Janeiro	**Elementos**	11 un	11 un
2021	Março	**Elementos**	66 un	77 un
2021	Janeiro	**Diversos**	3 un	3 un

Temporal Evolution - Hours

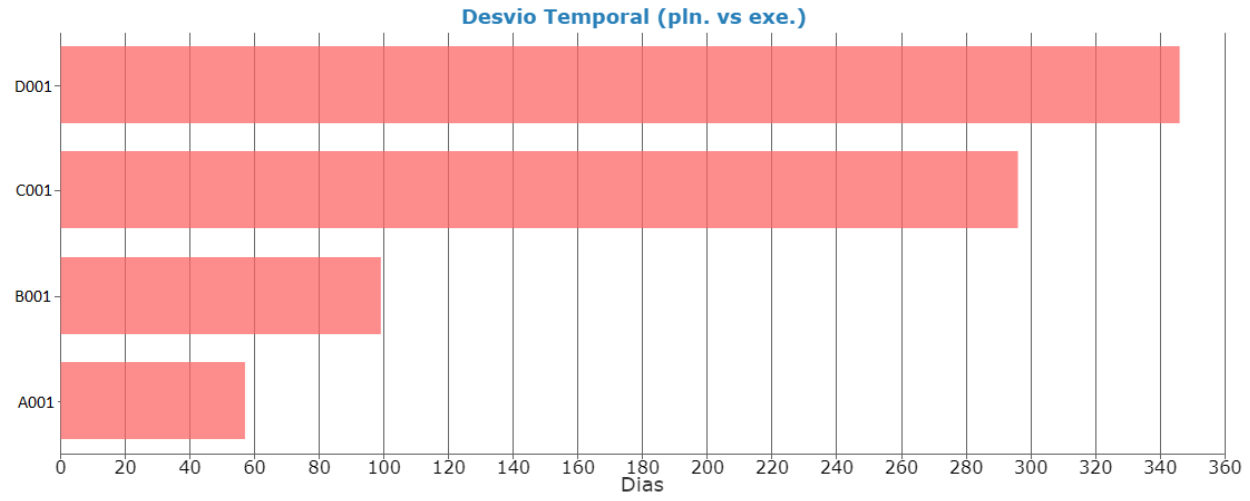
Displays the temporal evolution of the number of hours of execution associated with executions of activities from the chosen perspective. The temporal distribution is presented monthly and it is possible to choose a specific year or an entity or a specific process. It also presents an accumulated that goes by the sum of the amount of hours executed in each month.

Planning - Perspective

It shows the temporal deviation between planned and executed dates for the items from the chosen perspective (Work or Operation). Provides the following indicators:

- Planned start date of the oldest activity
- Planned end date of most recent activity
- Difference between the above mentioned dates (temporal duration of planning)
- Earliest run start date
- End date of most recent run
- Difference between the above mentioned dates (time duration of executions)
- Deviation start date (which occurs when the most recent execution date is greater than the latest planned date, the day after the most recent planned date being considered as the start of the deviation)
- deviation end date (which occurs when the latest execution date is greater than the latest planned date, and the most recent executed date is considered as the end of the deviation)
- Difference between the above mentioned dates (temporal duration of the deviation)

Análise Evolução - Obras



Obra		Previsto			Executado			Desvio		
		Inicio	Conclusão	Duração	Inicio	Conclusão	Duração	Inicio	Conclusão	Duração
A001	Obra A	25-07-20	13-11-20	112	14-09-20	09-01-21	118	14-11-20	09-01-21	57
B001	Obra B	17-06-20	05-10-20	111	12-01-21	12-01-21	1	06-10-20	12-01-21	99
C001	Obra C	20-07-20	31-08-20	43	22-07-20	23-06-21	337	01-09-20	23-06-21	296
D001	Obra D	05-03-20	28-03-20	24	05-03-20	09-03-21	370	29-03-20	09-03-21	346

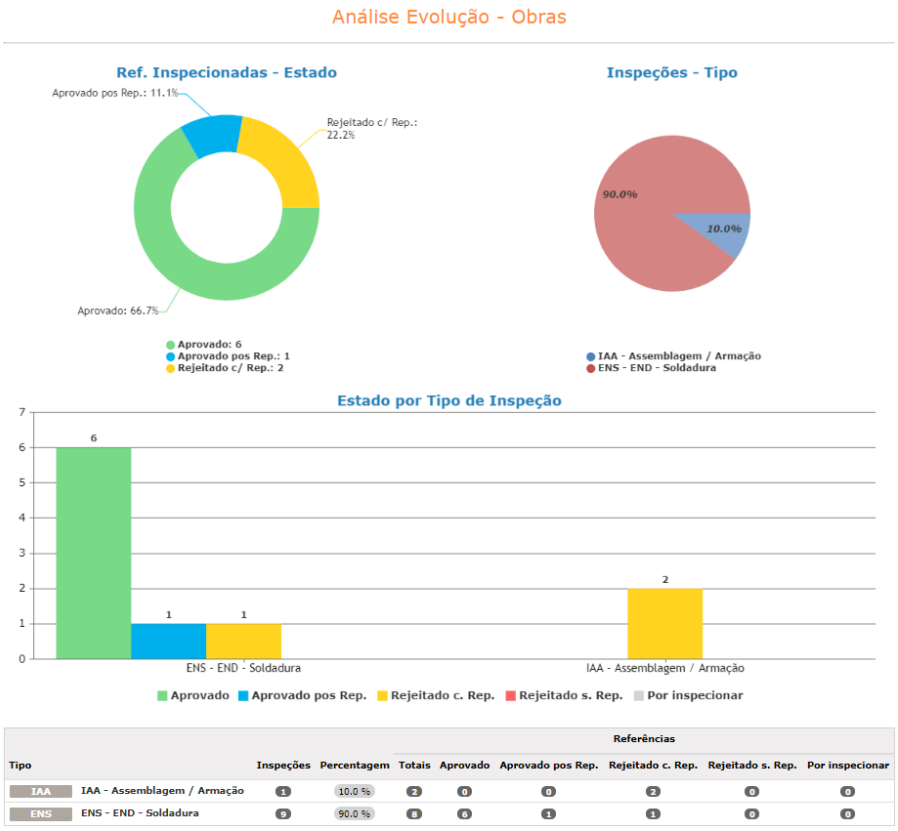
Planning - Processes

It shows the temporal deviation between planned and executed dates for the processes associated with the items from the chosen perspective (Work or Operation). It provides the same indicators described above by process.

Quality - Perspective (Work)

It presents a set of information associated with the quality and works in progress and published by the factory. Allows you to view the indicators for a specific audited entity and/or for a specific work. Provides the following indicators:

- Inspection status of references that were associated with inspections of a work or factory and their percentage proportion
- Total number of references and inspections by inspection status
- Percentage ratio of total references inspected by state compared to total references for inspection
- Number of inspections and associated references by type of inspection of a given work or for the total factory per audited entity or for all
- Percentage ratio by type to total
- Distribution of reference quantities by inspection status associated with inspection types



				Referências					
Tipo		Inspeções	Percentagem	Totais	Aprovado	Aprovado pos Rep.	Rejeitado c. Rep.	Rejeitado s. Rep.	Por inspecionar
IAA	IAA - Assemblagem / Armação	1	10.0 %	2	0	0	2	0	0
ENS	ENS - END - Soldadura	9	90.0 %	8	6	1	1	0	0

In all graphs it is possible to select the year to filter the information by year, taking into account the following conditions:

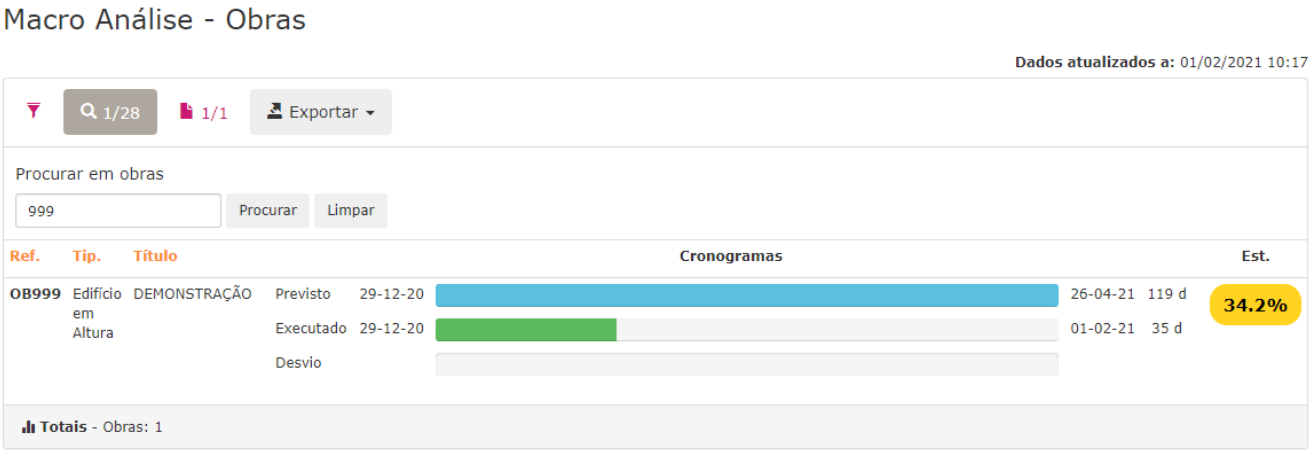
- Graphics related to State – year filters by decoration date. The data filtering condition applies to the current status of the base information that enters the selected period (the status reflected as planned activities for the period depending on the information associated with these of forecasted quantity and executed calculation of their status).

- Charts related to Hours and temporal evolution - year filters by execution date
- Charts related to planning and deviations - year filters by planning dates
- Graphics related to Quality - year filters by inspection date

Macro Metrics - Analysis

It provides the schedule of the work planned, executed and any deviations depending on the selected perspective. The dates accounted for and presented in each perspective are related to the activities associated with that perspective. In the case of the work perspective, they are activities of the work, in the others they are activities to which the perspective is associated (eg activities by post, corresponding to activities where the executions present in them are associated with a specific post). In this metric, it is possible to previously select the entity (supplier) and the temporal metric for which the data is to be visualized.

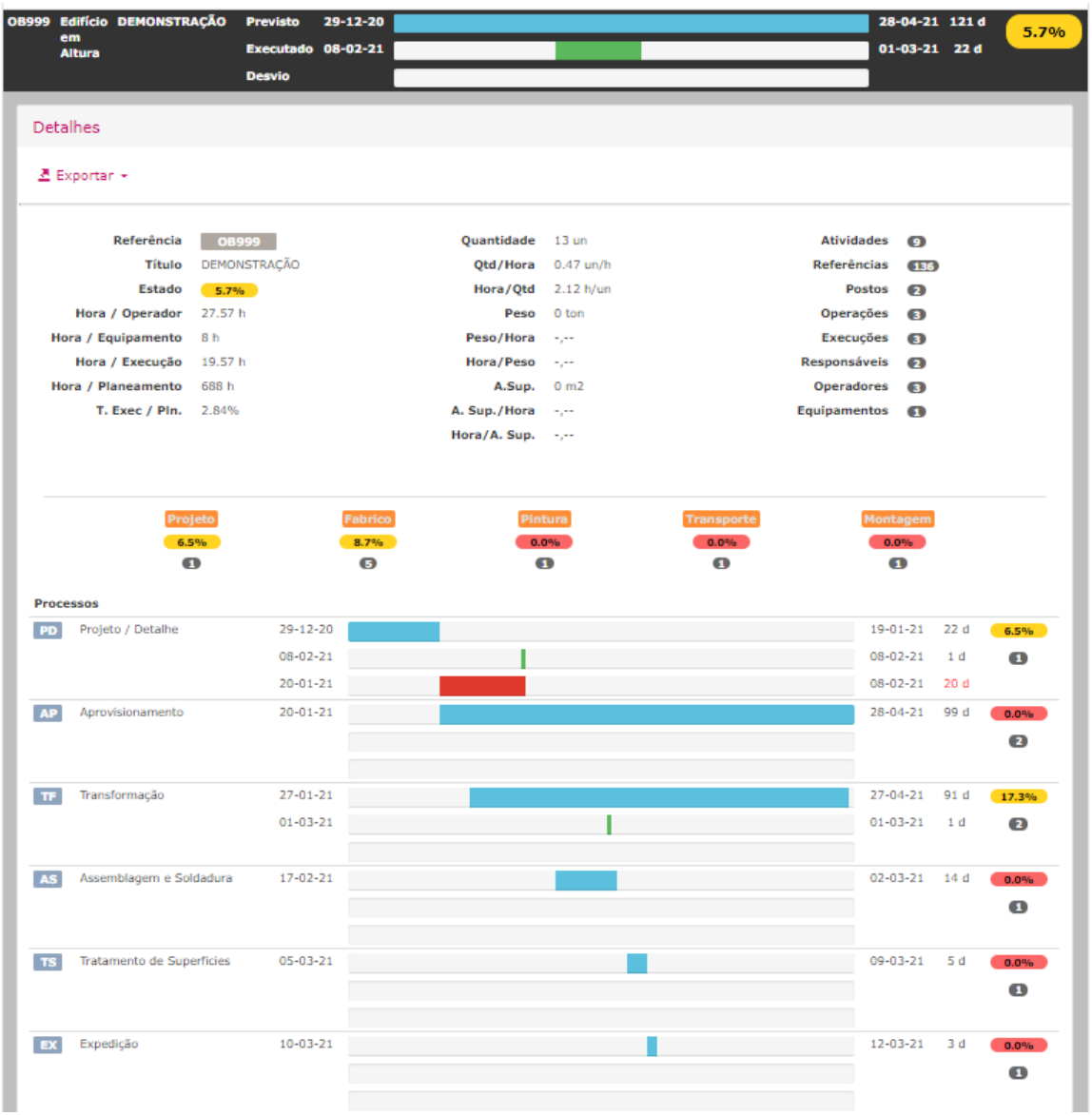
- Expected schedule: interval of days between the earliest start date and the most recent completion date of the prospect's activities.
- Schedule run: interval of days between the earliest start date of a run and the latest finish date of a run associated with the activities in the perspective.
- Deviation Schedule: Occurs when the most recent execution date is greater than the most recent planned date of the activities and is defined as the interval of days between:
    - Latest planned date of the prospect's activities (considered as the start of the deviation)
    - Most recent date of execution of activities from the perspective (considered as the end of the deviation)

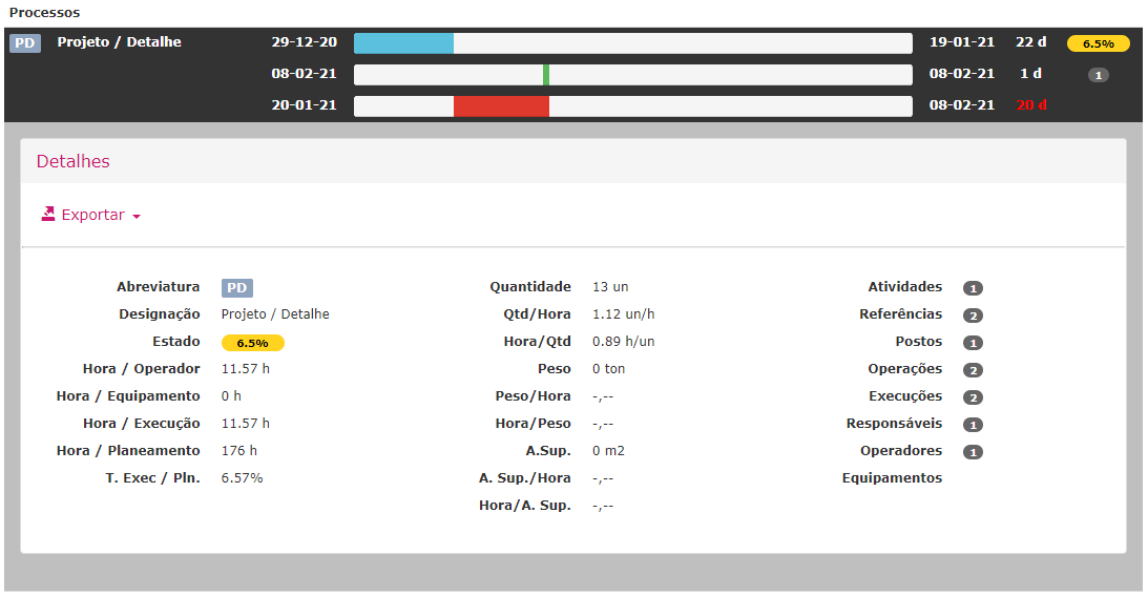


The main list shows the schedule as well as the status of the perspective item (in the case of works and operations). Status varies if available filters are applied:

- Entity filter: state corresponds to the state of the set of activities of this entity
- Temporal metric filter: status corresponds to the status of the set of activities whose planning is within the selected temporal period

Each item from the perspective of the main list contains the details (when selected) that allow you to follow the series of associated indicators. In addition to the indicators, it also presents the time schedule per process within the perspective item, taking into account the processes to which the activities of that item belong (for example, in the Works perspective, it illustrates the planned, executed times and possible deviations from the processes associated with the activities of that work using the same calculations for the deviation described above used for the work itself). When selecting a specific process, you can view the same group of indicators but taking into account the activities of that process in perspective.


OB999 Edifício em Altura DEMONSTRAÇÃO
Previsto 29-12-20 28-04-21 121 d
Executado 08-02-21 01-03-21 22 d
Desvio
5.7%
Detalhes
Exportar
Referência OB999
Título DEMONSTRAÇÃO
Estado 5.7%
Hora / Operador 27.57 h
Hora / Equipamento 8 h
Hora / Execução 19.57 h
Hora / Planeamento 688 h
T. Exec / Pln. 2.84%
Quantidade 13 un
Qtd/Hora 0.47 un/h
Hora/Qtd 2.12 h/un
Peso 0 ton
Peso/Hora -,--
Hora/Peso -,--
A.Sup. 0 m2
A. Sup./Hora -,--
Hora/A. Sup. -,--
Atividades 9
Referências 136
Postos 2
Operações 3
Execuções 3
Responsáveis 2
Operadores 3
Equipamentos 1
Projeto 6.5% 1
Fabrico 8.7% 5
Pintura 0.0% 1
Transporte 0.0% 1
Montagem 0.0% 1
Processos
PD Projeto / Detalhe 29-12-20 19-01-21 22 d 6.5%
08-02-21 08-02-21 1 d 1
20-01-21 08-02-21 20 d
AP Aprovisionamento 20-01-21 28-04-21 99 d 0.0% 2
TF Transformação 27-01-21 27-04-21 91 d 17.3%
01-03-21 01-03-21 1 d 2
AS Assemblagem e Soldadura 17-02-21 02-03-21 14 d 0.0% 1
TS Tratamento de Superficies 05-03-21 09-03-21 5 d 0.0% 1
EX Expedição 10-03-21 12-03-21 3 d 0.0% 1


Processos
PD Projeto / Detalhe 29-12-20 19-01-21 22 d 6.5%
08-02-21 08-02-21 1 d 1
20-01-21 08-02-21 20 d
Detalhes
Exportar
Abreviatura PD
Designação Projeto / Detalhe
Estado 6.5%
Hora / Operador 11.57 h
Hora / Equipamento 0 h
Hora / Execução 11.57 h
Hora / Planeamento 176 h
T. Exec / Pln. 6.57%
Quantidade 13 un
Qtd/Hora 1.12 un/h
Hora/Qtd 0.89 h/un
Peso 0 ton
Peso/Hora -,--
Hora/Peso -,--
A.Sup. 0 m2
A. Sup./Hora -,--
Hora/A. Sup. -,--
Atividades 1
Referências 2
Postos 1
Operações 2
Execuções 2
Responsáveis 1
Operadores 1
Equipamentos

- Description of the perspective/process item
- Perspective/Process Status
- Hour / Operator (sum of the hours associated with the executions associated with the perspective, multiplied by the number of operators associated with the executions, that is, 1 execution with 8 hours of execution and 2 associated operators is equivalent to 16 hours / operator)
- Hour / Equipment (sum of the hours associated with the executions associated with the perspective, multiplied by the number of equipment associated with the executions, that is, 1 execution with 8 hours of execution and 2 associated equipment is equivalent to 16 hours / equipment)
- Time / Execution (sum of the hours associated with the executions associated with the perspective)
- Time / Planning (sum of the difference in days of activities related to the chosen perspective, with 1 day being considered to be 8 effective hours of work, that is, 1 activity that has a duration of 1 day is equivalent to 8 hours of work)
- Execution rate versus planned (percentage ratio between the number of hours executed and the number of hours planned)
- Quantity executed (calculated as follows: sum of the quantity executed per execution / expected quantity of execution * total quantity of the reference / by the number of executions associated with the reference)
- Average amount executed per hour
- Average of executed hours spent for a unit of quantity executed
- executed weight
- Average of weight executed per hour (calculated as follows: unit weight of the reference * the sum of the quantity executed per execution / expected quantity of execution * total quantity of the reference / by the number of executions associated with the reference)
- Average run hours spent for a unit of weight run
- Executed surface area (calculated as follows: unit reference surface area * the sum of the executed quantity per run / expected run quantity * total reference quantity / by the number of runs associated with the reference)
- Average surface area run per hour
- Average run hours spent for an run surface area unit
- Counters of number of works, activities, references, posts, operations, executions, persons in charge, operators, equipment (available according to the chosen perspective)
- Global Activity Indiceswith the description of the index and respective accounting of activities and status for each index where applicable.

Date and Metric Filter Applied

When the temporal metric filter is applied and the respective option selected:

- Diary - start and end date
- Monthly - month and year
- Quarter - quarter and year
- Semester - semester and year
- Annual - year

All of the above mentioned indicators are updated based on activities whose dates are “within” the selected viewing period. The filtering criteria are the dates associated with the executions in the works. In the case of visualization by process, the filter is applied to the planning dates (and only in this case) for better visualization of information between planned and executed.

Micro Metric - Analysis

Provides the most detailed information from each perspective. It contains the same macro analysis indicators (with the same applied formulas) and also adds all the information associated with each perspective with listings of all the content associated with each item of the selected perspective. It provides information with the possibility of selecting the entity (supplier associated with the activities from the perspective), by typology (from the works perspective), by time metrics and by process (from the operations perspective).

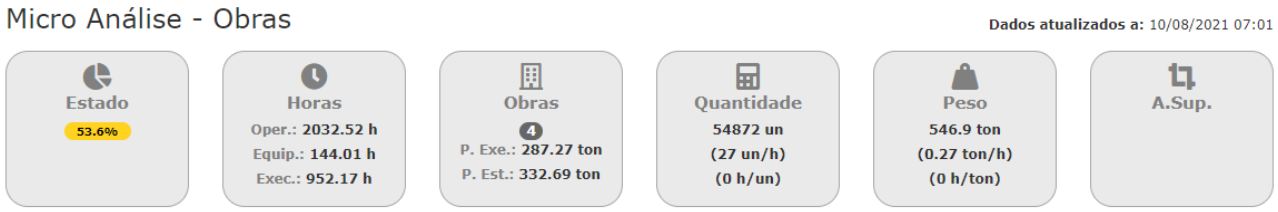
Date and Metric Filter Applied

When the temporal metric filter is applied and the respective option selected:

- Diary - start and end date
- Monthly - month and year
- Quarter - quarter and year
- Semester - semester and year
- Annual - year

All information is updated based on the planning and execution dates comprised in the chosen time period.

Global indicators



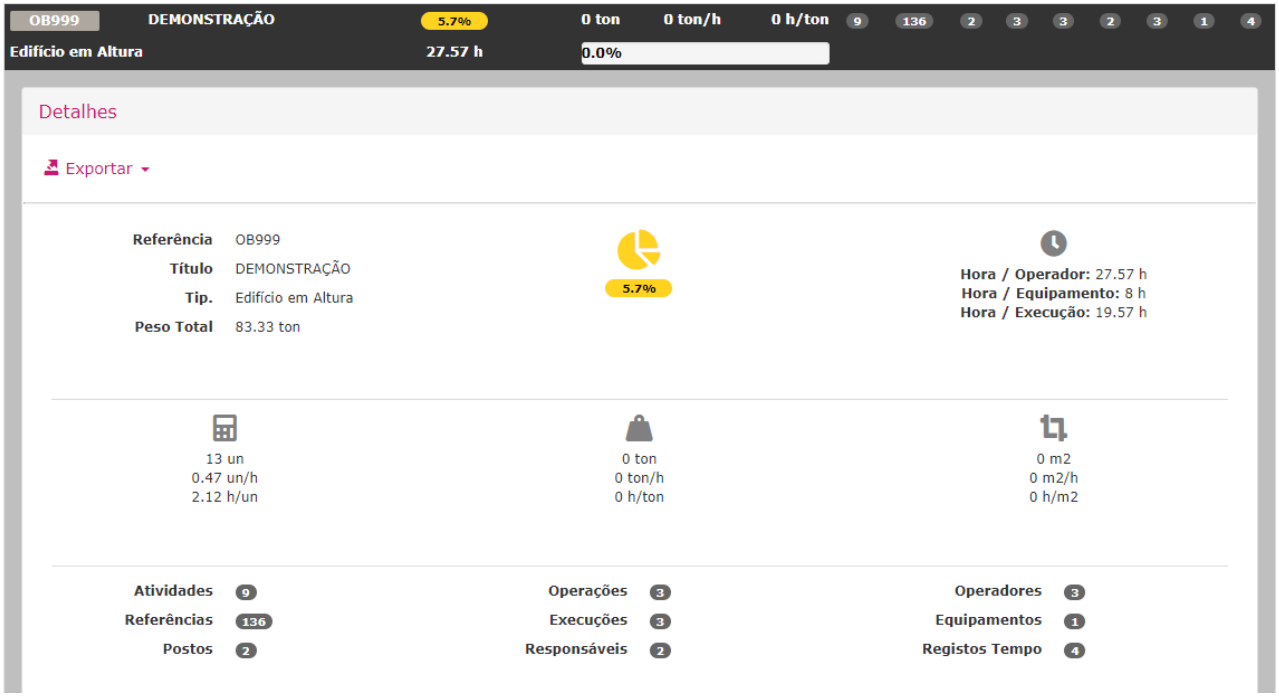
- **state**: shows the overall status of the factory's works, taking into account the status of each work and its activities.
- **Hours:** sum of hours performed, hours per operator and hours per equipment associated with the entire universe of factory works
- **Ex.:** sum of structuring executed weight (work perspective)
- **P. Est.:** sum of the structuring weight of the work (work perspective)
- **Quantity and averages:** sum of the quantities executed in the universe of factory works (taking into account the formula described in the macro analysis)
- **Weight and averages:** sum of the weight executed in the universe of factory works (taking into account the formula described in the macro analysis)
- **Surface area and averages:** sum of the surface area executed in the universe of factory works (taking into account the formula described in the macro analysis)

Item perspective (for example: work perspective, a selected work - Main list

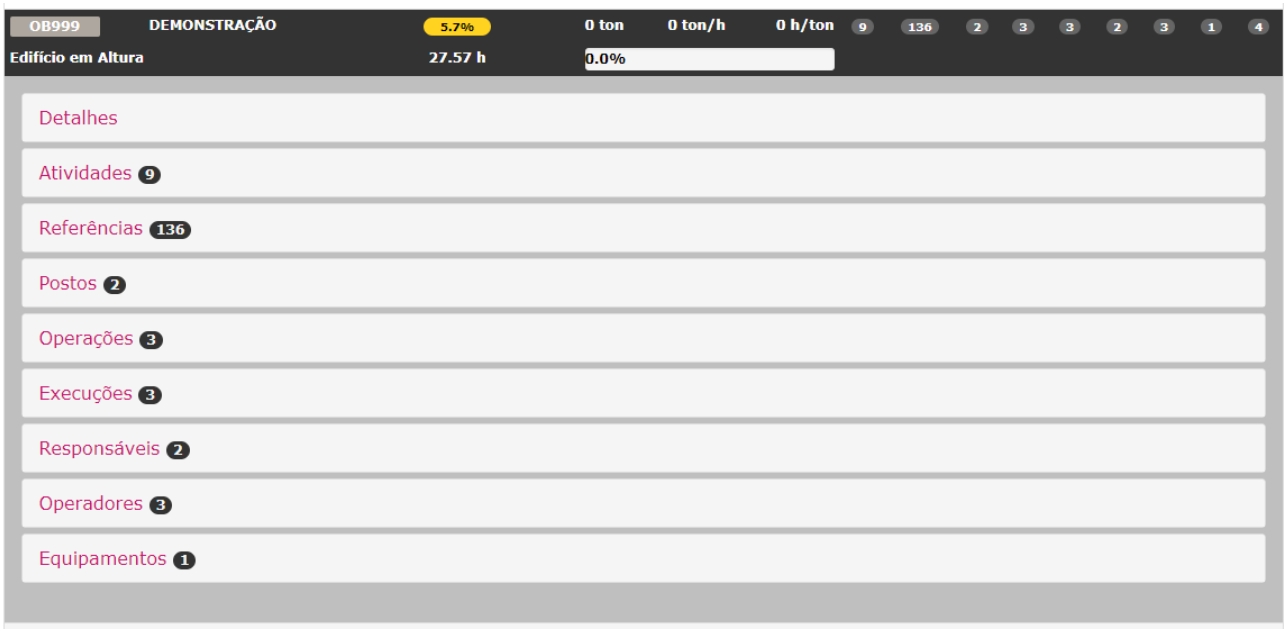
All indicators listed are "adapted" to the entity filter (if selected) and the temporal filter. The following indicators are available in the main list:

- Description of the work (or item from the chosen perspective)
- Status (in the work or operation perspective)
- Time / operator
- Weight
    - The displayed percentage corresponds to the percentage ratio between the weight being displayed against the total present in the level above (for example: if a work has 20% it means that the executed weight of the work is 20% of the total weight of the factory works, then when we go into the detail of the work, when selecting an activity, for example, the % present corresponds to X% against the 20% above which are the total work)
- Counters of number of works, activities, references, posts, operations, executions, persons in charge, operators, equipment (available according to the chosen perspective)
- Executed structuring weight and total structuring weight of the work (when only one value appears, it means that all structuring weight is executed)

Item perspective - Detail



Panel with indicators mentioned above by perspective item.



Separator - Works, Activities, References, Stations, Operations, Executions, Responsibles, Operators, Equipment

Second level of observation with the above mentioned indicators distributed by the dimension selected in the tab (ex: tab – activities, the indicators are displayed by activity). Afterwards, each tab contains a 3rd level that corresponds to the detail of the information present in the indicators (ex: an activity has 4 references, the references tab within the activity provides a list of the 4 references associated with the activity).

NOTE 1: In Macro and Micro Analysis metrics, the amount executed is counted according to the selected perspective:

- Work – accounting for "final product" (that is, taking into account the quantity of the element, the value presented is calculated based on the quantity executed against that total quantity).
- Remaining perspectives – accounting for actual executed quantity per operation (accumulated). Visualization in the universe of execution.

NOTE 2: The counts (sums) of the content of the work against the selected metric filter (that is, with date filter) are obtained taking into account the content:

- Works, activities, references and operations: filter applied to planning dates
- Executions, stations, operators and equipment: filter applied to execution dates

NOTE 3: In Macro and Micro Analysis metrics, 3 execution states are available:

- Status by executed quantity (vs forecast quantity).
- Status by executed weight (vs predicted weight).
- State by executed surface area (vs predicted surface area).

In the Evolution metric, the status shown, for now, is the first one described above (by quantity executed).