

Setting standard fixed costs in WP1



Production fixed costs (= CNPs + AMOs) are costs incurred for the manufacturing of products that, within certain output or turnover limits, tend to be unaffected by fluctuations in the level of activity.

Another term that can be used to refer to a fixed cost is a period cost. This highlights the fact that a fixed cost incurred according to the time elapsed, rather than to the level of activity.

Standards are set at attainable levels which assume efficient levels of operation, but which include allowances for factors such as losses, waste and machine downtime.

Standard fixed costs budget

1. Content of standard fixed costs



Fixed costs are made up of all costs either managed or contracted by the enterprise incurred for the manufacturing of products. They include costs directly managed by the plant but also costs managed by other functions that are necessary for the production process.

Costs that are not involved in the production process should not be included (CNP others etc.)

Production fixed costs are accounted on direct or indirect production cost centers.

They are allocated to finished product cost using machine hours and related hourly rate. These hourly rates are defined once a year. In the course of the year, they should be reviewed only in the event of a major change to the structure or the activity.

Distinction between variable costs (CP) and fixed costs is based on the destination cost centers of the expense (and not on the nature of the expense). Fixed cost centers should be codified as follows (where PPPP stands for the plant code, but can be replaced in some cases by the company code and "x" sequence numbering of cost centers corresponding to the definition.).

PPPP-1xxx - Direct Charges and depreciation: directly used by the cost centers corresponding to manufacturing workshop (**compulsory codification**).

1. Direct labor refers to the work done by those employees who actually make the product on the production line. This includes all employees costs (compensation, social / tax charges) or, for employees hired through an interim agency, the amount billed by that agency.

Part of the costs may have to be estimated and spread over the financial year for instance, vacation, annual bonus, pension costs relating to active employees.

When the actual amount can not be determined before the closing, an estimate has to be accrued. The difference between the estimate and the actual will be charged to costs in the subsequent period.

2. Direct maintenance costs (including sub-contracting).

3. Fixed cost portion of utilities consumed cost by workshop.

4. Fixed cost portion of cost of processing effluents and wastes that can be sold or recycled.

5. Depreciation of workshops' assets: buildings, technical installations, equipment and tools.

PPPP-2xxx - Indirect Charges and depreciation (**compulsory codification**)

PPPP-20xx - Common utilities fixed costs (optional codification)

PPPP-21xx - Connected workshop (optional codification)

PPPP-22xx - Factory structure costs (optional codification)

1. Common costs / Site direction

- Factory management and administration,
- Common technical and service departments: security, reception, facility management, facilities for the usage of production staff (changing rooms, showers, etc.) when their costs are not directly linked to the workshops,
- Head office costs and services,
- Depreciation common plant's assets.

2. Taxes & Insurance

- Land taxes and other taxes linked to non-current assets,
- General insurance policies (fire, theft, third-party liability, miscellaneous risks).

3. Quality Control Laboratory

- Quality control and analysis costs (raw materials, finished products, works in progress.

4. Health Safety Environment & Training

- Fire / Safety

PPPP-23xx - Maintenance costs (optional codification)

- Indirect maintenance costs (including sub-contracting) on maintenance cost centers and/or work orders,
- Spare part warehouse,
- Maintenance costs of planned shutdowns can be estimated and spread over the financial year. Fixed costs related to idle manpower and assets are expensed during the period when the shutdown occurs.

PPPP-24xx - Production common costs (optional codification)

1. Raw material and packaging procurement

Fixed costs of the raw material storage silos and warehouses (depreciation and rental of buildings, depreciation and rental of equipment, insurance, staff, etc.)

2. World class manufacturing (WCM)

3. Technical assistance on production (Process engineer...)

2. Allocation of indirect costs



Indirect costs and depreciation are allocated to all production costs according to keys that should be as relevant as possible, and validated by the plants director. Costs that are not involved in the production process should not be included (CNP others etc.)

3. When standard cost budget is different from budget “spring”



The “standard fixed cost budget” has to be calculated in a consistent manner with the yearly “normal capacity”

When it is planned to saturate a plant, the “standard fixed cost budget” is equal to the budget “spring”.

But it is possible to have a production loss due to market constraints. In this case the “standard fixed cost budget” can be different from the budget “spring”. In case of significant difference, it is necessary to estimate the additional costs that would be lead by an additional production.

Standard fixed costs budget	Additional Costs
	= mainly labor, maintenance & laboratory costs that would be necessary to saturate the plant
= budget « spring » + additional costs	Budget « spring » = Costs necessary to produce forecasted sales



The estimation has to remain simple, formalized (documentation can be requested by internal / external audit), and in constant manner from one year to the other. Changes from one year to the next one should be driven only by inflation and modifications in the plant costs structure or manufacturing process.

4. Validation



The standard fixed cost budget and the allocation keys have to be validated by the plant director and the business controller(s) and filled in WP1 following the WP1 procedure (see [Manage product costing](#))

Normal capacity

1. General rule

The “normal capacity” is the total number of machine hours in a year decreased by the number of hours lost because of technical constraints and for which recipe production time doesn't include any allowance.

It should be based on OEE data:

- t1. External causes stoppages: lack of sales, lack of supplies due to suppliers' failures (material and energy), force majeure, general strike (i.e. not specific to the site like national strike).
- t2. Planned Maintenance and annual shutdowns.
- t3. Intercampaign changeovers
- t4. Breakdowns
- t5. Process / Operations: low speed / cycle time not respected, lack of supplies due to internal failures (missing orders, wrong planning...), local strike (i.e. specific to the site or to the workshop)
- t6. Quality: scrap, and non-sellable without rework or recycling product

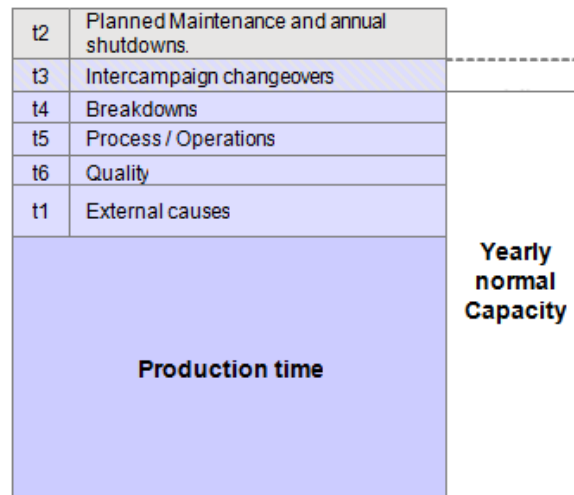
All information on the OEE can be found [here](#)

The “normal capacity” has to be calculated with OEE data of the last twelve months:

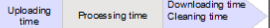
- Excluding the nonrecurring events
- Except planned maintenance (t2), that must be based on forecast for the next year



It corresponds to the total time (365 days x 24h) without causes (t2) and (t3) if (t3) has not been taken into consideration in product recipes.



Note that it is possible to include (t3) in the recipes' production time. In that case, these times are also included in the “normal capacity”

	Production time (h / unit of product) (in product recipe)			Yearly normal capacity
Example 1				Total yearly time – t2 (planned maintenance time) – t3 (intercampaign changeovers time) = Yearly normal capacity
Example 2				Total yearly time – t2 (planned maintenance time) = Yearly normal capacity

2. Other constraints

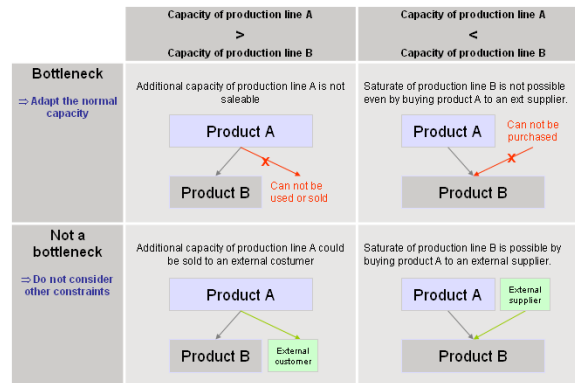
The normal capacity can be decreased by other constraints such as legal constraints or production bottleneck.

Definition of a production bottleneck

A production bottleneck is a stage in a process that causes the entire process to slow down or stop.

Example: There are two stages A and B in the production process of a finished product B. One unit of product A is necessary to produce one unit of product B. If the capacity of production A is different from capacity of product B, there is a bottleneck.

This bottleneck has to be taken into account in the calculation of the normal capacity of line A & B in certain condition.



In which cases a bottleneck has to be taken into account in the calculation of the normal capacity?

- In cases 1 & 2, it is proved that a bottleneck has to be taken into account in the normal capacity
- In the case 1, the normal capacity of the upstream production line (A) has to be reduced to be in coherence with the normal capacity of the downstream production line (B).
- In the case 2, the normal capacity of the downstream production line (B) has to be reduced to be in coherence with the normal capacity of the upstream production line (A).
- In the case 3 and 4, the bottleneck should not be taken into account.

3. Validation

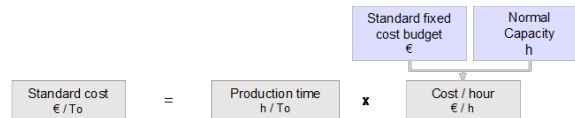


The normal capacity has to be validated by the plant director and the business controller(s) and filled in WP1 following the WP1 procedure (see [Manage product costing](#))

4. Definition of unit standard fixed costs – general rule

The standard unit fixed cost is a production time multiplied by an hourly rate:

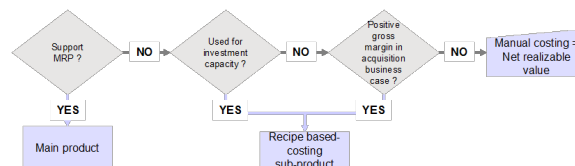
- The hourly rate is the “standard fixed cost budget” divided by the “normal capacity”
- The production time is the time necessary to produce one unit. It is defined in the recipe of each material.



5. Definition of unit standard fixed costs – Sub-products

When a production process results in two products or more:

- The product used for material requirement planning (MRP) is called main product,
- Other products that need valuation are either “recipe-based costing” sub-products, “manual costing” sub-products, off-specification products or marketable wastes.



“Recipe-based costing”

Recipe-based costing sub-product absorbs fixed costs because it participated to the justification of:

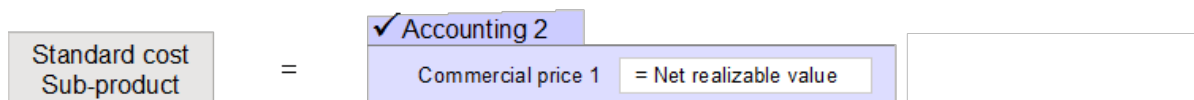
- The investment, driving the capacity of the installation which manufactured it,
- The plant acquisition, having a positive gross margin in the business plan supporting that acquisition.

If not, it is a "manual costing" sub-product: see below the rule for valuation.

"Manual costing"

They don't absorb any fixed costs. Their valuation is based on their net realizable value that is the average net selling price decreased by variable selling expenses.

When using WP1, that value is keyed in the field [Rules - Material Commercial price](#) of the material master data (transaction [MM02 - I change the costing & accounting view - General](#)). Frequency of the up-date of that valuation depends on volatility of the net selling price and the materiality of the revenue.



 The list of "manual costing" products is validated in the frame of [IAC Internal controls](#)

6. Definitive production line shutdown: costing of remaining inventories (WP1)

It can happen that a production line was definitely stopped. As there are no more costs allocated to this line, it has no sense to calculate a standard cost based on a budget for the remaining inventory.

In this case, it is possible to flag "do not cost" in view "costing1" of the material master data. The material will be valued with the last known costing.

7. Nature of expenses / activity type

A fixed cost center can allocate up to 3 different natures of expense, depending on the type of activity used:

- Activity type MANHO for labor cost
- Activity type AMO for depreciation
- Activity type MACHI (that is sometimes replaced by activity type CNP) for other manufacturing fixed cost

Hourly rate can be different depending on the activity type, based on cost elements used to enter the standard fixed cost budget **but there is only one normal capacity for MACHI and AMO, based on machine time.**

Regarding MANHO: for single-product production line and or for production line where staff is fixed regardless of product, reference capacity should be the normal capacity. Otherwise, the number of hours for MANHO rate calculation should be: **normal capacity x (last 12 month man hours/last 12 months machine time)**

Each cost element is link to a type of activity based on the cost splitting structure table.

Here are cost elements recommended to enter budget for each activity type:

- Activity type MANHO: 98320100 PS SALARIES
- Activity type AMO: 98340100 Depreciation-tangible assets
- Activity type MACHI: 98300104 SC OTHER SERV

For more detailed budget input, any primary (starting with 98) cost element of the following groups can be used:

- Activity type MANHO: ZRCS-10 Labor
- Activity type AMO: ZRCS-ACAM (Period Depreciation)
- Activity type MACHI: All groups under ZRCS-AC (Period CNP) except ZRCS-10 Labor

8. Inventory revaluation

The 1st of January, the inventory is re valued with the new standard cost.

$$\text{Revaluation} = [\text{Standard cost (Y)} - \text{Standard cost (Y-1)}] \times \text{Quantity 01/01/Y (00h00)}$$

Note that the CP portion of that revaluation should be reversed on January 1st and posted on Dec 31st. For entities using WP1, the split between CP, CNP and AMO of the inventory revaluation is available with transaction [Monthly Closing - ZWFA100A - Processing Stock revaluation reverse](#).

9. Illustrative example

Let's assume that you have to prepare the costing of two products Alpha () and Beta () that can be produced in one production line.

At the end of 2009, using the best information at hand, you compile the following data to use as standards for 2010.

- OEE given by industrial function

Due to lack of demand, there is a loss of production of 3 000 h / year. The forecast (spring) is based on this assumption.

The equipment is not saturated, the normal capacity is therefore different from the capacity used for the yearly or quarterly forecast, which is built on assumptions of likely activity and resources needs, consistent with sales anticipations.

2009 YTD				
tmax	Available time	= 365 days x 24 h	8 760	H
t1	1. External Causes	(No demand / idle equipment)	3 000	H
t2	2. Planned Shutdowns		120	H
t3	3. Changeovers		500	H
t4	4. Breakdowns		300	H
t5	5. Performance		1 500	H
t6	6. Quality		80	H
	Production time	= tmax- t1- t2- t3 -t4 -t5 -t6	3 260	H
	OEE	= Production time / tmax	37%	
	net OEE	= Production time / (tmax – t1)	57%	

- Alpha and Beta Recipes filed by production department

Note that in this plant, it was chosen not to include changeovers time (t2) in product's recipes.

Display Master Recipe: Operation					Display Master Recipe: Operation				
Material	Alpha				Material	Beta			
Base Quantity	1 000 kg				Base Quantity	1 000 kg			
Resource	LINE A				Resource	LINE A			
Machine time (h)	1,2	H	MACHI		Machine time (h)	1,0	H	MACHI	
Labor time (h)	1,2	H	MANHO		Labor time (h)	1,0	H	MANHO	
	1,2	H	AMO			1,0	H	AMO	

Costing for 2010

- Budget normal capacity

Budget normal capacity = Budget spring + additional costs (labor costs & maintenance)

- As there is only one production cost center, indirect costs centers are allocated at 100 % to cost center PPPP-1000.

Cost center		Spring	Additional costs	Budget normal capacity
PPPP-1	Direct costs	1 000 k€	300 k€	1 300 k€
	- Direct labour	600 k€	200 k€	800 k€
	- Maintenance	300 k€	100 k€	400 k€
	- Other supplies	100 k€	0 k€	100 k€
PPPP-2	Indirect costs	600 k€	100 k€	700 k€
PPPP-2201	Prod. Direction	150 k€	0 k€	150 k€
PPPP-2202	Common production	150 k€	0 k€	150 k€
PPPP-2203	Lab & Quality mgt	50 k€	0 k€	50 k€
PPPP-2300	Maintenance	150 k€	100 k€	250 k€
PPPP-2999	Function allocation	100 k€	0 k€	100 k€
Total CNP		1 600 k€	400 k€	2 000 k€

- Yearly Normal Capacity

$$\text{YNC} = 365 \text{ days} \times 24 \text{ h} - 120 \text{ h (t2)} - 500 \text{ (t3)} = 8\,140 \text{ h}$$

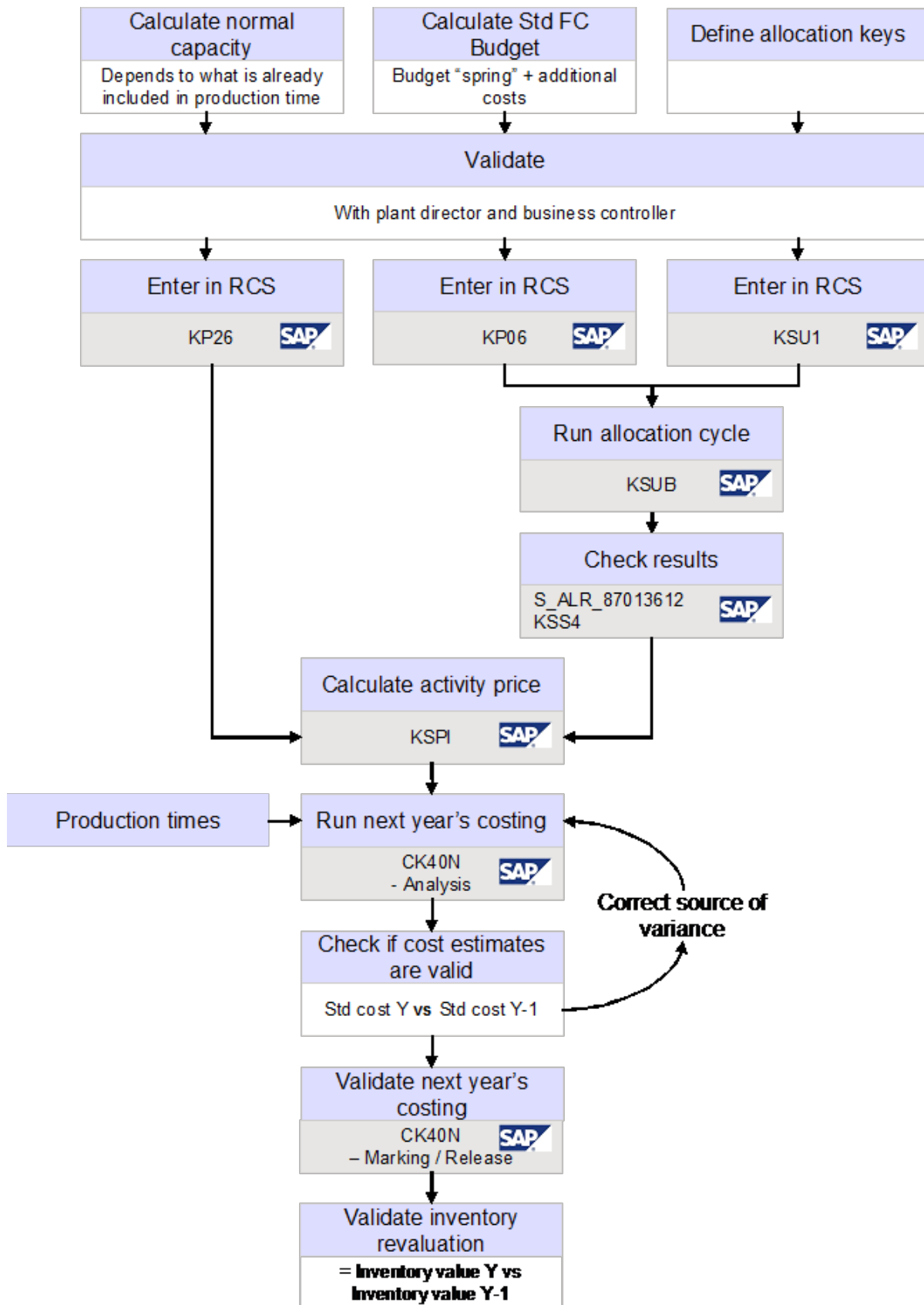
- Standard cost Alpha

$$\text{Standard cost } \alpha = \frac{1,2 \text{ h / To}}{1,2 \text{ h / To}} \times \frac{2\,000 \text{ k€}}{8\,140 \text{ h} = 245\text{€}} = 1,2 \times 245\text{€} = 295\text{€}$$

- Standard cost Beta

$$\text{Standard cost } \beta = \frac{1,0 \text{ h / To}}{1,0 \text{ h / To}} \times \frac{2\,000 \text{ k€}}{8\,140 \text{ h} = 245\text{€}} = 1,0 \times 245\text{€} = 245\text{€}$$

10. Costing process synthesis



11. Frequently asked questions

Yearly normal capacity is given by production managers based on OEE data and maintenance schedule.

If the throughput of a production line increases, the production time has to be updated. The standard cost will be automatically up-dated.

There is no problem to manage multi-product production line as the cost driver is based on time.

There is no need to forecast the production and the production allocation.

Production department can use several recipes but only one is used for the costing of the month.

The previous procedure was referring to net OEE based on the assumption that recipe production time wouldn't include any allowance for inter-campaign changeovers, quality... Today, it appears it is not always the case so we have to adapt the definition, but we keep the same principle of a normal capacity based on existing equipment only limited by technical constraint. If we change from full capacity to normal capacity, it is only to avoid confusion with maximum capacity (24/7) Therefore, there is no change in our accounting method.

Full absorption costing may be requested by customs authority, or tax authorities when reviewing transfer pricing. For financial reporting, under IFRS, only cost related to production can be included in inventory and cost of sales.

Yes, at least at the level of the first digit (-1xxx for direct production cost centers and -2xxx for indirect cost centers).

If the shutdown is postponed to another year, what should we do? We should reverse all accruals related to that maintenance, correct the MACHI rates impacted and book an inventory revaluation.