**Management Principles and Human Resources**

**Collection of exercise – MANAGEMENT ACCOUNTING**

JOB ORDER COSTING

**EXERCISE 1 - FRESH COMPANY**

The Fresh company produces paper tissues. Specifically, its core products are three types of tissues: Silk (S), Rare (R ) and balsamic (B). The quality of the finished good depends on the quality of the veil used: each type of paper towel is realized using different veils. The productive process is composed by three phases:

* Treatment (in-house only for S and B, while the treatment phase for R is in outsourcing for a cost of 0,5 €/m2)
* Processing
* Packaging

The production of S, R and B is based on batches. At the beginning of November the Fresh company has the following productive situation:

* Inventories of raw material are 45.000 € (20.000 € related to 50.000 m2 used in the treatment phase and the remaining 25.000 € of raw material used in the packaging phase).
* The batch B1 is already under production and it is composed by 120.000 units of B[[1]](#footnote-1). This batch passes the treatment and the processing phase for a total cost of 35.000 euro and it has to enter the packaging phase.
* Inventories of finished goods are the following:
* 96.000 units of S (0,33 €/u)
* 72.000 units of B (0,35 €/u)
* 72.000 units of R (0,36 €/u)

During November:

* The company ends the production of B1
* The production of other 3 batches starts:
* Batch B2 (132.000 units of B) and batch R1 (108.000 units of R), both completed in November
* Batch S1 (144.000 units of S) that, at the end of November, ends only the treatment phase
* The company buys 140.000 m2 of veil for a total cost of 49.000 €;
* The consumption of raw material of the treatment phase is related to m2 of veil
* The dimension of tissues is 20 cm x 20 cm, irrespective from the type of tissue
* In the treatment phase the consumption of resources is reported in the following table

|  |  |  |  |
| --- | --- | --- | --- |
|  | Batch | **Hour/plant (h)** | **Cost of direct labor (€)** |
| 20/11/16 | B2 | 140 | 3.500 |
| 14/11/16 | S1 | 100 | 2.750 |

* In the processing and packaging phase the consumption of resource is reported in the following tables

|  |  |  |
| --- | --- | --- |
| **Processing phase** | | |
| Batch | **Hour/plant (h)** | **Cost of direct labor (€)** |
| B2 | 125 | 1.300 |
| R1 | 95 | 1.940 |

|  |  |  |  |
| --- | --- | --- | --- |
| **Packaging phase** | | | |
| Batch | **Direct Material (€)** | **Hour/plant (h)** | **Cost of direct labor (€)** |
| B1 | 2.320 | 120 | 3.000 |
| B2 | 1.800 | 135 | 3.000 |
| R1 | 3.600 | 100 | 2.900 |

* Batch B1 is completed before the batch B2
* Indirect materials are used in the three phases:
* 1.350 € during the treatment phase
* 680 € during the processing phase
* 4.120 € during the packaging phase
* 20.000 kwh of energy had been used: 30% for treatment and 50% for packaging phase. The cost of energy is 0,4 €/kwh;
* Information related to plants used the productive phases are reported in the following table

|  |  |  |
| --- | --- | --- |
|  | **Treatment** | **Packaging** |
| Costo of purchase | 360 K€ | 480 K€ |
| Date of purchase | 2010 | 2010 |
| Useful life | 4 anni | 8 anni |

* The processing phase is carried out using a plant completely depreciated. Annual maintenance costs for this plant is 6.000 euro
* The supervision and maintenance activities of plants the company employes 6 supervisors (annual cost 30.000euro/supervisor):
* 3 supervisors only for the treatment phase
* 1 supervisor only for the packaging phase
* The remaning 2 supervisors are employed for the 50% of their time in the processing phase and the remaining 50% of their time is spent managing suppliers.
* Sales of November are the following:
* 96.000 of R;
* 216.000 of B;
* 72.000 of S
* The overall revenues for the sale of R, B and S is 190.000
* The Fresh uses the FIFO logic for the valorization of inventories
* The net result for the month of November is 34.000 €
* Allocation base fro OVH are following:
* Cost of direct labor (treatment phase)
* Hour/plant (processing and packaging phase)

You are required to identify:

* The **unitary full cost** of completed batches
* **Value of inventories** (direct material, WIP and finished goods)
* **Period costs**

**EXERCISE 2 – GAMATA COMPANY**

The GAMATA Company produces tennis balls. Its productive process is composed by three productive units: production units, finishing unit and packaging unit. Three types of balls are produced: WIL, PEN e DUN. The Company, to detect the unitary full cost uses the Job Order Costing technique.

At the end of March, inventories are the following:

* Raw Material: 16.000 €
* WIP: 111.000 € and pecifically:
* 31.000 € of WIL (name of the batch J1);
* 55.000 € of PEN (name of the batch J2);
* 25.000 € of DUN (name of the batch J3);
* Finished goods: 325.000 € and specifically:
* 75.000 € of WIL (unitary full cost 7.500 €)
* 165.000 € of PEN (unitary full cost 11.000 €);
* 85.000 € of DUN (unitary full cost 17.000 €)

In April, the company ends the production of the batch J1, J2 and J3 (whose production started in March).

The following information are available:

* Consumption of resources for J1, J2 and J3 is reported in the following table (in thousand euro)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **PRODUCTION** | | **FINISHING** | | **PACKAGING** | |
|  | **DM** | **DL** | **DM** | **DL** | **DM** | **DL** |
| J1 | 3.500 | 4.000 | 2.500 | 5.000 | 3.000 | 6.000 |
| **J3** | 3.000 | 2.000 | 2.000 | 4.000 | 3.000 | 4.000 |
| **J2** | 2.500 | 4.000 | 3.000 | 3.000 | 4.000 | 15.000 |
| **J1** | 4.000 | 6.000 | 1.500 | 3.000 | 2.000 | 8.000 |
| **J2** | 3.500 | 3.500 | 1.500 | 2.500 | 2.000 | 5.000 |
| **J3** | 8.000 | 5.500 | 2.000 | 3.500 | 3.500 | 7.000 |

* At the end of April the production of J2 ends and it is composed by 15 units of PEN;
* The Company uses the FIFO logic for the valorization of inventories;
* Sale on a trade credit for 5 units of WIL and 20 units of PEN (payment every 4 months). Total revenues are 350.000 €
* Value of final inventories of direct material: 9.000 €;
* Total overhead for the three units are:
* Production unit: 60.000 €
* Finishing unit: 50.000 €
* Packaging unit: 90.000 €
* Allocation bases for the three units are the following:
* Production unit: time/plant with the following data

|  |  |
| --- | --- |
| **J1** | 55h |
| **J2** | 35h |
| **J3** | 30h |

* Finishing unit: direct material
* Packaging unit: direct labor
* Commercial costs related to the sale of PEN are 15.000 €
* At the end of April the Company pays 12.500 € of borrowing costs, related to the previous year.

You are required to determine:

* **Manufacturing full cost** of PEN and of the other job
* **Value of purchase of direct material** and **value of final inventories of finished goods** at the end of April
* **Gross profit and Net result**

**EXERCISE 3 – SANIX**

The production process of the Sanix is articulated into two productive units: processing unit (highly automated system) and finishing unit (mainly based on direct labor).

In relation to the production of October, the following information are available:

***Work In Progress (in thousand euro)***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **N° batch** | **N. of unit for each batch** | **Direct Material** | **Direct Labor** | Overhead |
| 001 | 2.000 units | 60.000 | 20.000 | 120.000 |
| 002 | 2.500 units | 40.000 | 15.000 | 80.000 |

***Processing unit***

|  |  |  |  |
| --- | --- | --- | --- |
| **N° batch.** | **Direct material (€)** | **Time plant** | **Hour direct labor** |
| 001 | 5.000 | 3500 | 250 |
| 002 | 10.000 | 2500 | 400 |
| 003 | 45.000 | 2000 | 50 |

|  |  |  |
| --- | --- | --- |
| **Type of resource** | **Unitary cost** | **Use** |
| Direct labor | 20 €/hour | 700 hours |
| Supervisors | 50 €/hour | 300 hours |
| Maintenance technicians | 50 €/hour | 160 hours |
| Energy | 20.000 €/month |  |
| Depreciation | 50.000 €/month |  |

***Finishing unit***

|  |  |  |
| --- | --- | --- |
| **N° batch.** | **Direct material (€)** | **Hour direct labor** |
| 001 | 10.000 | 1500 |
| 002 | 15.000 | 3000 |
| 003 | 0 | 0 |

|  |  |  |
| --- | --- | --- |
| **Type of resource** | **Unitary cost** | **Use** |
| Direct labor | 20 €/h | 4500 h |
| Supervisors | 50 €/h | 700 h |
| Maintenance technicians | 50 €/h | 40 h |
| Energy | 8.000 €/month |  |
| Depreciation | 18.000 €/month |  |

At the end of October, the Company completes the production of batches 001 and 002, while the production of batch 003 is still ongoing.

You are required to determine:

* **Manufacturing full costs** (unitary cost) of the products
* The **value of final inventories of WIP**

**EXERCISE 4 – SERAX**

The Serax Company produces 3 type of libraries: Green (G), Pink (P) and Blue (B). To be produced, all the three models pass through the unit A, while only the model Blue (B) passes through the unit B, where some finishing activities are carried out. All the type of libraries are produced in batches. A batch of G is composed by 100 unit, a batch of P is composed by 200 units and a batch of B is composed by 50 units.

At the beginning of November, there are the following quantity of finished goods:

* 30 units of G (unitary full cost 500 Euro/u)
* 40 units of P (unitary full cost 300 Euro/u)
* 8 units of B (unitary full cost 800 Euro/u)

The value of inventories of raw material is 20.000 euro and that of WIP is 36.000 euro. Detailed value of WIP is reported in the following table (value is expressed in thousand euro)

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Direct Material** | **Direct Labor** | **OVH** |
| *G* | 10 | 8 | 2 |
| *B* | 11 | 4 | 1 |

In November the company completes the production of G and B and it also starts the production of P. The overall use of resources is reported in the following table (value is expressed in thousand euro).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Unit A** | | **Unit B** | |
| ***Direct Material*** | ***Direct Labor*** | ***Direct Material*** | ***Direct Labor*** |
| *G* | 5 | 3 |  |  |
| *P* | 13 | 6 |  |  |
| *B* | 4 | 1 |  |  |
| *P* | 7 | 2 |  |  |
| *B* |  |  | 14 | 4 |
| *G* | 11 | 9 |  |  |
| *P* | 6 | 3 |  |  |

We also know that:

* Total cost of energy in the unit A is 1.000 Euro and 300 euro in the unit B
* There are 2 supervisors (annual cost for each supervisor 24.000 euro) who work 90% of their time in the unit A and the remaining 10% of time in the unit B
* There are other indirect cost, equal to 2.600 euro in the unit A and 200 euro in the unit B
* The company sells 40 units of di B (related revenues 48.000 euro) and 70 units of G (related revenues 49.000 euro)
* Total selling costs are equal to 6.000 euro (3.500 for G and 2.500 for B)
* The company purchases direct material for a total amount of 45.000 euro
* Administrative costs are equal to 4.000 euro
* Use of FIFO criteria for the valorization of inventories

You are required to determine

* **Manufacturing full costs** (unitary cost) of the products (only for completed batches)
* The **value of final inventories of direct materials, WiP and finished goods** (
* **Gross profit and Net result**

**EXERCISE 5 – TAXER**

The TAXER Company produces three type of vases: vase A, vase B and vase C. The productive cycle is made up by two phases: preparing phase and firing phase.

The production of vases is realized in batches and the Company uses a Job Order Costing to detect the manufacturing full cost. At the beginning of **June 2002**, inventories are following:

* Inventories of raw material: value 2.400 €;
* Inventories of finished goods: 200 units of A (total value 17.000€) and 80 units of C (total value 6.000 €);
* Inventories of WIP: at the beginning of June, two batches are under production, consuming the resources reported in the following table

|  |  |  |  |
| --- | --- | --- | --- |
| Batch | Composition of the batch | Costs | Productive phases they have to pass throguh |
| *B001* | 260 vase B | 3.700 € | Both preparing and firing |
| *C001* | 300 vase C | 10.400 € | Only firing |

During the two-months period of **June and July 2002**, the Company completes the production of B001 and C001 and it starts the production of other two batches:

* A001 composed by 280 vases of A – completed in July;
* B002 composed by 200 vases of B – at the end of July it has to pass through the firing phase

We also know that during the period June-July:

* Purchase of raw material: 5.000 €;
* The consumption of resources in each phase is reported in the following table:

|  |  |  |  |
| --- | --- | --- | --- |
| Preparing phase | Direct material | Time/plant | Hour direct labor |
| B001 | 750 € | 80 h | 50 h |
| A001 | 2.600 € | 100 h | 140 h |
| B002 | 1.800 € | 140 h | 80 h |

|  |  |  |  |
| --- | --- | --- | --- |
| Firing phase | Direct material | Time | Hour direct labor |
| C001 | 210 € | 120 h | 10 h |
| B001 | 120 € | 150 h | 24 h |
| A001 | 140 € | 110 h | 16 h |

* Hourly cost for direct labor: 25 €/h;
* Cost of indirect material:
* 500 € (preparing phase)
* 380 € (firing phase)
* With respect to energy:
* Total consumption 22.000 kwh and the 30% refers to the firing phase;
* Cost of energy: 0,3 €/kwh;
* With respect to plants used:
* The plant used in the preparing phase was bought in 1995 at a price of 300 k€. Its depreciation started in 1995 for 6 years;
* The furnace used in the firing phase was bought in 1998 at a price of 480 k€. Its depreciation started in 1995 for 8 years;
* For supervisions and maintenance, the TAXER employs, for both phases, 5 supervisors: 2 are employed in the preparing phase, while 3 in the firing phase. Their annual cost is 30.000 €/supervisor;
* Sales: 350 vases type A, 180 vases type B and 250 vases type C, realizing a total revenues of 68.000 €;
* Other costs are also reported:
* administrative and marketing costs: 4.300 €;
* R&D costs: 2.000 €.
* For the valorization of inventories, the TAXER uses the FIFO criteria
* Allocation base for overhead:
* Preparing phase: cost direct labor
* Firing phase: time for firing

You are required to determine:

‒ **Manufacturing full costs** (unitary cost) of the products (only for completed batches)

‒ The **value of final inventories of direct materials, WiP and finished goods**

‒ **Gross profit** and **Net result**

**SOLUTION**

**EXERCISE 1 - FRESH COMPANY**

1. ***Unitary full cost***

Unitary full cost= Direct material + direct labor + OVH

* *Direct material*

For the treatment phase, we should calculate the m2 used and apply the FIFO logic for its valorization. To calculate the value m2 of veils used for the production of batches, we start by considered the quantity of veils used.

1 tissue= 400 cm2, therefore, for a box of tissues 400 cm2 x 10 tissues = 4.000 cm2

B2= 132.000 units, therefore 4.000 cm2 /unitsx 132.000 units = 52.800 m2

S1= 144.000 units, therefore 4.000 cm2 /units x 144.000 units = 57.600 m2

Tot. m2 of veils for the production of batches = 110.400 m2

At the beginning of November, the value if initial inventories is 20.000 euro for 50.000 m2, and therefore 0,4 €/m2. During November, 140.000 m2 of veils are bought at a total value of 49.000 €, therefore 0,35 €/m2. Following the production cycle, is it possible to valorize the use of m2:

* DMB2 = 52.800 m2 x 0,35 €/m2 = 18.480 €
* DMS1 = 50.000 m2 x 0,4 €/m2+ 7.600 m2 x 0,35 €/m2= 22.660 €

For the packaging phase, the use of direct material is reported in the table.

* *Direct Labor*

See table in the text.

* *OVH*

We should consider the indirect cost and the related allocation base.

**Treatment**

OVH = 0,3\*20.000\*0,4 (energy) + 7.500 (depreciation)+ (3\*30.000)/12 (supervisors) + 1.350 (indirect materials) = 18.750 €

Allocation base= cost DL

AB tot. = tot. cost DL treatment unit = 6250 €

K (TR) = 18.750 / 6.250 = 3

OVHS1= 3 \* 2.750 = 8.250 €

OVHB2 = 3 \* 3.500 = 10.500 €

**Processing**

OVH = 0,2\*20.000\*0,4 (energy) + 500 (maintenance)+ (0,5\*2\*30.000)/12 (supervisors)+ 680 (indirect materials) = 5.280 €

Allocation base = Hour/plant

A.B. tot. = 125h + 95h = 220h

K (LAB)= 5.280/ 220 = 24 €/h

OVHB2 = 24 \* 125 = 3.000 €

OVHR1= 24 \* 95 = 2.280 €

**Packaging**

OVH = 0,5\*20.000\*0,4 (energy) + 5.000 (amm)+ (30.000)/12 € (supervisor) + 4.120 € (indirect materials) = 15.620 €

Allocation base = Hour/plant

AB tot. = 120h + 135h + 100h = 355h €

K (pack) = 15.620 / 355 = 44 €/h

OVHB2 = 44 \* 135 = 5.940 €

OVHR1= 44 \* 100 = 4.400 €

OVHB1= 44 \* 120 = 5.280 €

To sum up:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *B1*  (120.000 u) | **DM** | **DL** | | **OVH** |  | *B2*  (132.000 u) | **DM** | **DL** | | **OVH** |
| *WIP* | 35.000 | | | | *WIP* | - | | | |
| **Treat.** | - | - | | - | **Treat.** | 18.480 | 3.500 | | 10.500 |
| **Proc.** | - | - | | - | **Proc.** | - | 1.300 | | 3.000 |
| **Pack.** | 2.320 | 3.000 | | 5.280 | **Pack.** | 1.800 | 3.000 | | 5.940 |
|  | **Tot.** | | **45.600** | |  | **Tot.** | | **47.520** | |
| *S1*  (144.000 u) | **DM** | **DL** | | **OVH** |  | *R1*  (108.000 u) | **DM** | **DL** | | **OVH** |
| *WIP* | - | | | | *WIP* | - | | | |
| **Treat.** | 22.660 | 2.750 | | 8.250 | **Treat.** | outsourcing | | | |
| **Proc.** | - | - | | - | **Proc.** | - | 1.940 | | 2.280 |
| **Pack.** | - | - | | - | **Pack.** | 3.600 | 2.900 | | 4.400 |
|  | **Tot.WIP** | | **33.660** | |  | **Tot.** | | **36.720** | |

## **Outsourcing = 0,5 €/m2 \* 0,4 m2/units \* 108.000 units = 21.600 €**

Unitary full cost:

* R = 36.720 /108.000 = **0,34 €/u**
* B1 = 45.600 /120.000 = **0,38 €/u**
* B2 = 47.520 /132.000 = **0,36 €/u**

1. ***Final inventories***

*Raw material*

Veils

Initial inventories = 20.000 €

Purchase = 49.000 €

Consumed = 20.000 € (in. Invent.) + 21.140 € (purchase)

Final inventories = **27.860 € (0,35 €/m2)**

Other raw material

Final inv. = initial inv. + purchase – consumed

Final inv. = 25.000 € + 0 € - 7.720 € **= 17.280 €**

*Wip*

WIP S1 = **33.660 €**

*Finished goods*

S

In. Inv. = 96.000 u (0,33 €/u)

Produced = -

Sold = 72.000u

Final Inv. = 24.000 u (0,33 €/u) 🡺 **7.920 €**

B

In. Inv. = 72.000 u (0,35 €/u)

Produced = 120.000 u (0,38 €/u)

132.000 u (0,36 €/u)

Sold = 216.000 u

Final Inv. = 108.000 u (0,36 €/u) 🡺 **38.880 €**

**R**

In. Inv. = 72.000 u (0,36 €/u)

Produced = 108.000 u (0,34 €/u)

Sold = 96.000 u

Final Inv. = 84.000 (0,34 €/u) 🡺 **28.560 €**

1. ***Period cost***

Period cost= gross profit – net results

Net sale= 190.000 (text)

Cost of sale = (72.000\*0,33) + (72.000\*0,35+ 120.000\*0,38 + 24.000\*0,36) + (72.000\*0,36 + 24.000\*0,34) = 137.280 €

Gross profit= 190.000 – 137.280 = 52.720 €

Period cost= 52.720 € - 34.000=**18.720 €**

**EXERCISE 2 – GAMATA COMPANY**

**DATA ON INVENTORIES**

**Direct material**

Initial Inventories of direct material= 16.000 €

Final inventories of direct material= 9.000 €

**WIP**

WIPin = 111.000 € and:

* WIPin (WIL) = 31.000 €
* WIPin (PEN) = 55.000 €
* WIPin (DUN) = 25.000 €

**Finished goods**

Inventories = 325.000 € and:

* (WIL) = 75.000 € → Unitary cost (WIL) = 7.500 € → Final inventories (WIL) = 10 u
* (PEN) = 165.000 € → Unitary cost (PEN) = 11.000 € → Final inventories (PEN) = 15 u
* (DUN) = 85.000 € → Unitary (DUN) = 17.000 € → Final inventories (DUN) = 5 u

**OVERHEAD**

**Production unit**

OVHtot (PROD) = 60.000 €

Allocation base= time/plant

|  |  |
| --- | --- |
| **WIL** | 55h |
| **PEN** | 35h |
| **DUN** | 30h |

Ʃba = 120h

KP = 60.000/120 = 500 €/h

OHWIL = 500 \* 55 = 27.500 €

OHPEN = 500 \* 35 = 17.500 €

OHDUN = 500 \* 30 = 15.000 €

**Finishing unit**

OVHtot (FIN) = 50.000 €

Allocation base = direct material

|  |  |
| --- | --- |
| **WIL** | 4.000 € |
| **PEN** | 4.500 € |
| **DUN** | 4.000 € |

Ʃba= 12.500 €

KF = 50.000/12.500 = 4

OHWIL = 4 \* 4.000 = 16.000 €

OHPEN = 4 \* 4.500 = 18.000 €

OHDUN = 4 \* 4.000 = 16.000 €

**Packaging unit**

OHtot (PACK) = 90.000 €

Allocation base= direct labor

|  |  |
| --- | --- |
| **WIL** | 14.000 € |
| **PEN** | 20.000 € |
| **DUN** | 11.000 € |

Ʃba=45.000 €

K = 90.000/45.000 = 2

OHWIL = 2 \* 14.000 = 28.000 €

OHPEN = 2 \* 20.000 = 40.000 €

OHDUN = 2 \* 11.000 = 22.000 €

**Value of punished good of PEN and wip**

V(PEN) = 55.000 + (6.000 + 7.500 + 17.500) + (4.500 + 5.500 + 18.000) + (6.000 + 20.000 + 40.000)

= 55.000 + 31.000 + 28.000 + 66.000 = 180.000 €

Manufacturing cost PEN= 180.000/15 = **12.000 €**

WIP (WIL) = 31.000 + (7.500 + 10.000 + 27.500) + (4.000 + 8.000 + 16.000) + (5.000 + 14.000 + 28.000)

= 31.000 + 45.000 + 28.000 + 47.000 = **151.000 €**

WIP (DUN) = 25.000 + (11.000 + 7.500 + 15.000) + (4.000 + 7.500 + 16.000) + (6.500 + 11.000 + 22.000)

= 25.000 + 33.500 + 27.500 + 39.500 = **125.500 €**

**Value of purchase of direct material and inventories of finished goods**

Fin inv.(DM) = In. inv. + purchase – consumption

Purcahse = Final Inv – Initial inv.+ consumption

Purchase = 9.000 – 16.000 + (24.500 + 12.500 + 17.500)

Purcahse = 9.000 – 16.000 + 54.500 = **47.500 €**

Finished goods (DUN) = **85.000 €**

Finished goods (WIL) = 5 \* 7.500 = **37.500 €**

Finished goods (PEN) = 10 \* 12.000 = **120.000 €**

**Gross Profit and Net results**

Net sale 350.000 €

Cost of sale 5 \* 7.500 + 165.000 + 5 \* 12.000 = 262.500 €

Gross profit **87.500 €**

Period costs 15.000 €

Net results **72.500 €** **Borrowing costs should not be considered according to the accrual accounting principle!**

**EXERCISE 3 – SANIX**

**OVH PROCESSING UNIT**

|  |  |  |  |
| --- | --- | --- | --- |
| **Type of resource** | **Unitary cost** | **Use** | **Cost in the period [€]** |
| Supervisors | 50 €/h | 300 h | 15.000 |
| Maintenance technicians | 50 €/h | 160 h | 8.000 |
| Energy | 20.000 €/month |  | 20.000 |
| Depreciation | 50.000 €/month |  | 50.000 |
| **total OVH** | | | **93.000** |

Allocation Base: direct labor

*700 [h] \* 20 [€/h] = 14.000 [€]*

Coefficient (K)

*K = 93.000 / 14.000 = 6,64*

Therefore:

* *OH (001) = KL \* 250 \* 20 = 33.200 [€]*
* *OH (002) = KL \* 400 \* 20 = 53.150 [€]*
* *OH (003) = KL \* 50 \* 20 = 6.650 [€]*

**OVH FINISHING UNIT**

|  |  |  |  |
| --- | --- | --- | --- |
| **Type of resource** | **Unitary cost** | **Use** | **Cost in the period [mln]** |
| Supervisors | 50 €/h | 700 h | 35.000 |
| Maintenance technicians | 50 €/h | 40 h | 2.000 |
| Energy | 8.000 €/month |  | 8.000 |
| Depreciation | 18.000 €/month |  | 18.000 |
|  |  | **total OVH** | **63.000** |

Allocation Base: direct labor

*4500 [h] \* 20 [€/h] = 90.000 [€]*

Coefficient (K)

K = 63.000 / 90.000 = 0,7

Therefore

OH (001) = KF \* 1500 \* 20 = 21.000 [€]

OH (002) = KF \* 3000 \* 20= 42.000 [€]

In summary (data in thousand euro)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Job 001 | DM | DL | OH |  | **Job 002** | DM | DL | OH |  | **Job 003** | DM | DL | OH |
|  | WIP | 60 | 20 | 120 |  | WIP | 40 | 15 | 80 |  | WIP | - | - | - |
|  | **Process.** | 5 | 5 | 33,2 |  | **Process.** | 10 | 8 | 53,15 |  | **Process.** | 45 | 1 | 6,65 |
|  | **Finish.** | 10 | 30 | 21 |  | **Finish.** | 15 | 60 | 42 |  | **Finish.** | - | - | - |
|  | | 75 | 55 | 174,2 |  |  | 65 | 83 | 175,15 |  |  | 45 | 1 | 6,65 |

**Unitary Full cost**

UFC 001 = 304.200 [€] / 2000 [unità] = **152,1 [€/u]**

UFC 002 = 323.150 [€] / 2500 [unità] = **129,26 [€/u]**

**Value of inventories of finished goods= 52.650 €**

**EXERCISE 4 – SERAX**

1. ***Full unitary cost***

Identification of indirect costs of production

Unit A= 1 (energy) + (24\*2/12)\*0,9 (supervisors) + 2,6 (other indirect cost) = 7,2 thousand Euro

Unit B= 0,3 (energy) + (24\*2/12)\*0,1 (supervisors) + 0,2 (other indirect costs) = 0,9 thousand Euro

Allocation base: direct labor

Total direct labor= 3 + 6 + 1 + 2 + 9 + 3 = 24 thousand Euro

* Direct Labor G= 3 + 9 = 12 mila Euro 🡪 KG = 1/2 🡪 OVH = 3,6 thousand Euro
* Direct Labor P= 6 + 2 + 3 = 11 🡪 KP = 11/24 🡪 OVH = 3,3 thousand Euro
* Direct Labor B= 1 🡪 KB = 1/24 🡪 OVH = 0,3 thousand Euro

In summary we have:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **G** | | | |  | **P** | | | |  | **B** | | | |
|  | DM | DL | OVH |  |  | DM | DL | OVH |  |  | DM | DL | OVH |
| WIP | 10 | 8 | 2 |  | **WIP** | - | - | - |  | **WIP** | 11 | 4 | 1 |
| **Unit A** | 5  11 | 12 | 3,6 |  | **Unit A** | 13  7  6 | 11 | 3,3 |  | **Unit A** | 4 | 1 | 0,3 |
| **Unit B** | - | - | - |  | **Unit B** | - | - | - |  | **Unit B** | 14 | 4 | 0,9 |
|  | 26 | 20 | 5,6 |  |  | 26 | 11 | 3,3 |  |  | 29 | 9 | 2,2 |
| **Tot.** | | | 51,6 |  | **Tot.** | | | 40,3 |  | **Tot.** | | | 40,2 |

Unitary Full cost:

* G= 51,6 thousand Euro / 100 u = **516 Euro/u**
* B=40,2 thousand Euro / 50 u = **804 Euro/u**

1. ***Value of inventories***

Direct Material = 20 + 45 – (5 + 13 + 4 + 7 + 11 + 6 + 14) = **5 thousand Euro**

WIP= The production of G and B ends. WIP are represented by 40,3 thousand Euro of P

Finished goods

* G: 70 units are sold: 30 from initial inventories and 40 produced in November  
  🡪 final inventories G = (100u – 40u) \* 516 Euro/u = 30.960 Euro
* P: P has not been sold. In addition, the production of P is not completed
  + final inventories P = initial inventories = 40 u \* 300 Euro/u = 12.000 Euro

B: 40 units are sold: 8 from initial inventories and 32 produced in November   
🡪 Final inventories B= (50u – 32u) \* 804 Euro/u = 14.472 Euro

Total inventories of finished goods: 30.960 + 12.000 + 14.472 = **57.432 Euro**

1. ***Gross profit and Net result***

Net sale= 48.000 Euro + 49.000 Euro = 97.000 Euro

Cost of sales= 30 uG \* 500 Euro/u + 40 uG \* 516 Euro/u + 8 uB \* 800 Euro/u + 32 uB \* 804 Euro/u =

= 67.768 Euro

Gross profit= 97.000 Euro - 67.768 Euro= **29.232** **Euro**

Period costs= 6.000 + 4.000= 10.000 euro

Net result= 29.232 – 10.000 = **19.232 Euro**

**EXERCISE 5 – TAXER**

1. **MANUFACTURING FULL COST**

**Direct material** and **direct labor**: see the text

**OVH**

Indirect material: see the text

Energy:

*Preparing phase*: 22.000 \* 0,7 \* 0,3 = 4.620 €/two-months

*Firing phase*: 22.000 \* 0,3 \* 0,3 = 1.980 €/two-months

Plants:

*Preparing phase*: the plant is completely depreciated.

*Firing phase Depreciation*= 480.000 € / 8 years = 60.000 €/year 60.000 / 6 = 10.000 €/two-months

Supervisors:

*Preparing phase*: 2 \* 30.000 / 6 = 10.000 €/two-months

*Firing phase*: 3 \* 30.000 / 6 = 15.000 €/two-months

**OVH preparing phase**

Overhead tot.: OVH = 500 + 4.620 + 0 + 10.000 = 15.120 €

Allocation base: cost direct labor

AB tot. = 50\*25 + 140\*25 + 80\*25 = 1.250 + 3.500 + 2.000 = 6.750 €

K = 15.120 / 6.750 = 2,24

OVHB001 = 2,24 \* 1.250 = 2.800 €

OVHA001 = 2,24 \* 3.500 = 7.840 €

OVHB002 = 2,24 \* 2.000 = 4.480 €

**OVH firing phase**

Overhead tot: OVH = 380 + 1.980 + 10.000 + 15.000 = 27.360 €

Allocation base: time

AB tot.= 120 + 150 + 110 = 380 h

K = 27.360 / 380 = 72 €/h

OVHC001 = 72 \* 120 = 8.640 €

OVHB001 = 72 \* 150 = 10.800 €

OVHA001 = 72 \* 110 = 7.920 €

Manufacturing full cost

A (batch A001): 22.400 €/ 280 u = **80 €/u**

B (batch B001): 20.020 €/ 260 u = **77 €/u**

C (batch C001): 19.500 €/ 300 u = **65 €/u**

In summary:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **B001** (260 u B) | **Direct Material** | **Direct Labor** | OVH | TOTAL |
| **WIP** |  |  |  | **3.700 €** |
| **Preparing** | 750 € | 1.250 € | 2.800 € | **4.800 €** |
| **Firing** | 120 € | 600 € | 10.800 € | **11.520 €** |
|  |  |  |  | **20.020 €** |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **C001** (300 u C) | **Direct Material** | **Direct Labor** | OVH | TOTAL |
| **WIP** |  |  |  | **10.400 €** |
| **Preparing** | 0 € | 0 € | 0 € | **0 €** |
| **Firing** | 210 € | 250 € | 8.640 € | **9.100 €** |
|  |  |  |  | **19.500 €** |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **A001** (280 u A) | **Direct Material** | **Direct Labor** | OVH | TOTAL |
| **WIP** |  |  |  | **0 €** |
| **Preparing** | 2.600 € | 3.500 € | 7.840 € | **13.940** |
| **Firing** | 140 € | 400 € | 7.920 € | **8460** |
|  |  |  |  | **22.400** |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **B002** (200 u B) | **Direct Material** | **Direct Labor** | OVH | TOTAL |
| **WIP** |  |  |  | **0 €** |
| **Preparing** | 1.800 € | 2.000 € | 4.480 € | **8.280 €** |
| **Firing** | 0 € | 0 € | 0 € | **0 €** |
|  |  |  |  | **8.280 €** |

**INVENTORIES**

Raw Material

Final inventories = initial inventories + purchase – consumtion

Final inventories = 2.400 + 5.000 – (750 + 2.600 + 1.800 + 210 + 120 + 140) = **1.780 €**

WIP

200 units of vases B (batch B002)

Final inventories = **8.280 €**

Finished goods

A: 130 \* 80 = 10.400 €

B: 80 \* 77 = 6.160 €

C: 130 \*65 = 8.450 €

Total value of final inventories (finished goods)= 10.400 + 6.160 + 8.450 = **25.010 €**

**GROSS PROFIT and NET RESULT**

Net sale: 68.000 €

Cost of sale 17.000 + 150\*80 + 180\*77 + 6.000 + 170\*65 = 59.910 €

**GROSS PROFIT 8.090 €**

Administrative and marketing cost 4.300 €

R&D costs: 2.000 €

**NET RESULTS**

1. Each unit is equal to a box of tissues. Each box contains 10 tissues. [↑](#footnote-ref-1)