

Authors: CIOFS-FP Lombardia, IES El Palo, Richtpunt campus Oudenaarde, ROC Amsterdam

Future skills for a better life in Sustainable Salons is a European project that aims to combine the sustainable ideas through education and training with innovative ideas within the sector.

This project has been funded with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

The project partners and associated partners within this program are:

****



**Afbeelding met tekst, illustratie

Automatisch gegenereerde beschrijvingAfbeelding met tekst

Automatisch gegenereerde beschrijving Afbeelding met tekst, illustratie

Automatisch gegenereerde beschrijving**

© 2023 Sustainable Salon project, Erasmus+ 2020-1-NL01-KA202-064515. No part of this document may be reproduced in any form without the authorisation of Stivako (project coordinator) and the authors.

Contact address:

Stivako [info@stivako.nl](mailto:info@stivako.nl)

Project website: [www.sustainable-salon.info](http://www.sustainable-salon.info)

Index

[1.Becoming a sustainable hairdresser, carbon footprint 4](#_Toc132806712)

[2.Energy in the hairdressing salon I 19](#_Toc132806713)

[3.Water 23](#_Toc132806714)

[4.Waste 23](#_Toc132806715)

[5.RAW MATERIALS 24](#_Toc132806716)

[6.MANAGEMENT 26](#_Toc132806717)

# 1.Becoming a sustainable hairdresser, carbon footprint

**Lesson 1**

Media used for this lesson is:

* Student’s manual
* Computer/laptop

**Assignments**

The assignments are made separately on assignment papers that can be printed. There are assignments everyone should make and additional assignments as well for students who could extend their knowledges and skills.

**Evaluation forms**

Every assignment has an evaluation form.

**Assignments + solutions + evaluation forms – How to act sustainable as a hairdresser?**

       student’s manual: page 5

**Think of some changes you can make fairly quickly in the salon to become more sustainable.**

|  |
| --- |
| **Actions to become more sustainable as a hairdresser** |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |

                                                                                            student’s manual: page 5

**Think of some changes you can make fairly quickly in the salon to become more sustainable.**

|  |
| --- |
| **Actions to become more sustainable as a hairdresser** |
| Use LED-lights |
| Incorporate 'clean' hair products into your offering. |
| Use sustainable and eco-friendly hair tools. |
| Use carbon neutral furniture |
| Lower your water and energy use. |
| Turn your salon’s waste into recycling. |
| Choose recyclable or reusable products. |
| Be smart with plastics. |
| Only use the washing machine and dryer when it’s full. |
| Use appliances with a good energy rating. |

                                                               Assignment student’s manual p. 5

**Give a score to yourself.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Evaluation criteria – self evaluation** | **Outstanding** | **Very good** | **Average** | **Below average** |
| I was able to give 10 examples of quick changes to become more sustainable in a salon. |  |  |  |  |

|  |
| --- |
| Could you give the examples quickly or did you need to think about it? |
|  |

|  |
| --- |
| What could you in order to be able to remember the knowledge from previous lessons? Is there any strategy you could apply? |
|  |

     student’s manual: page 6

**Read the article on the Internet. Are there any more changes you didn’t think of?**

<https://www.appointfix.com/blog/how-to-have-an-eco-friendly-hair-salon.html>

|  |
| --- |
| **Are there any more changes you didn’t think of?** |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |

|  |
| --- |
| **Give 4 advantages why you would act more sustainably as a hairdresser or barber. They are also mentioned in the article.** |
|  |
|  |
|  |
|  |

                                                                                          student’s manual: page 6

**Read the article on the Internet. Are there any more changes you didn’t think of?**

<https://www.appointfix.com/blog/how-to-have-an-eco-friendly-hair-salon.html>

|  |
| --- |
| **Are there any more changes you didn’t think of?** |
| Use energy-efficient light bulbs |
| Don’t forget the lights on |
| Go paper-free |
| Pay attention to water usage |
| Find a sustainable transportation |
| Storage plants in your salon |
| Recycle everything |
| Avoid using aluminum foils |
| Educate your clients |
| Don’t use animal-tested products |
| Give a try to the organic hair dye |
| Use reusable packaging products |
| Support an ecological cause |
| Install motion sensors |
| Turn off your devices |

|  |
| --- |
| **Give 4 advantages why you would act more sustainably as a hairdresser or barber. They are also mentioned in the article.** |
| It helps you reduce carbon footprint |
| It reduces your monthly expenses |
| It is healthier for your clients (vegan hair products) |
| You contribute to saving the planet |

                                                             Assignment student’s manual p. 6

**Give a score to yourself.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Evaluation criteria – self evaluation** | **Outstanding** | **Very good** | **Average** | **Below average** |
| I was able to complete the list of actions with new ideas. |  |  |  |  |
| I read the article. |  |  |  |  |
| I was able to give 4 advantages of acting sustainably as a hairdresser. |  |  |  |  |

|  |
| --- |
| What strategy did you use to read the text? |
|  |

|  |
| --- |
| What is the most renewing idea for you and why? |
|  |

     student’s manual: page 8

**What conditions do you think a good supplier should meet?**

**When you want to become more sustainable, you will probably need to adjust your criteria. Try to adjust the above criteria in a more sustainable way.**

**Now you know what you are looking for, do you have any idea of possible suppliers in your surroundings?**

**Write down the contact details of at least 5 suppliers that meet your criteria in the grid on the next page.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Company name** | **Address details** | **Contact person** | **E-mail** | **Website** | **What do they offer?** |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

                                                                                          student’s manual: page 8

**What conditions do you think a good supplier should meet?**

* certainty of the use of eco-friendly products and materials
* eco-friendly production
* implementation of the SDG’s
* applying the law and legislation
* good work conditions for the staff
* …

**When you want to become more sustainable, you will probably need to adjust your criteria. Try to adjust the above criteria in a more sustainable way.**

Apply sustainable practices at every decision point throughout their operations.

Understand your company's sustainability targets, and convey them to the procurement team.

Know how your current suppliers meet their own sustainability goals.

Centralize and consolidate eco-conscious spend data.

Expand partnerships with green/sustainable suppliers by tracking certifications and relevant. experience in the supplier master or supplier network.

**Now you know what you are looking for, do you have any idea of possible suppliers in your surroundings?**

**Write down the contact details of at least 5 suppliers that meet your criteria in the grid on the next page.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Company name** | **Address details** | **Contact person** | **E-mail** | **Website** | **What do they offer?** |
| Personal answers |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

                                                             Assignment student’s manual p. 8

**The teacher will score you.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Evaluation criteria** | **Outstanding** | **Very good** | **Average** | **Below average** |
| I could formulate conditions in a clear way. |  |  |  |  |
| I could adjust my standards in a sustainable way. |  |  |  |  |
| I can define what a good supplier is. |  |  |  |  |
| I could find 5 sustainable suppliers. |  |  |  |  |
| I was able to give the address details. |  |  |  |  |
| I was able to give the contact person. |  |  |  |  |
| I was able to give the e-mail. |  |  |  |  |
| I was able to give the website. |  |  |  |  |
| I was able to define what they offer. |  |  |  |  |

   student’s manual: page 10

**Which raw materials could be used for which purposes in a salon?**

|  |  |
| --- | --- |
| **Raw material** | **Purpose** |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

                                                                                          student’s manual: page 10

**Which raw materials could be used for which purposes in a salon?**

|  |  |
| --- | --- |
| **Raw material** | **Purpose** |
| leather | capes |
| wood | furniture and combs |
| oil | appliances |
| steal | furniture and tools |
| plastic | products |
| cotton | towels |
| trees | paper |

                                                             Assignment student’s manual p. 10

**The teacher will score you.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Evaluation criteria** | **Outstanding** | **Very good** | **Average** | **Below average** |
| I know what raw materials are. |  |  |  |  |
| I can give examples of raw materials. |  |  |  |  |
| I can name raw materials used in a salon. |  |  |  |  |
| I can define the purpose of the raw materials in a salon. |  |  |  |  |

                                               student’s manual: page 12

**What waste do salons produce? Make an overview.**

|  |
| --- |
| **Waste produced in a salon** |
| human hair |
|  |
|  |
|  |
|  |
|  |
|  |

**Can you name a reputable waste disposal company where you live?**

                                                                                          student’s manual: page 12

**What waste do salons produce? Make an overview.**

|  |
| --- |
| **Waste produced in a salon** |
| human hair |
| chemicals used in processing or hair color treatments |
| waxing strips |
| plastic containers |
| paper trash |
| garbage from the reception area |
| used masks and PPE |
| gloves |

**Can you name a reputable waste disposal company where you live?**

Personal answer.

                                                             Assignment student’s manual p. 12

**Evaluate yourself.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Evaluation criteria  - self evaluation** | **Outstanding** | **Very good** | **Average** | **Below average** |
| I can make an overview of salon waste. |  |  |  |  |
| I can name a reputable waste disposal company. |  |  |  |  |

|  |
| --- |
| What did you do good? What skills or knowledge are you proud of? |
|  |

|  |
| --- |
| What could you’ve done better and how? |
|  |

**Assignments + solutions + evaluation forms – carbon footprint**

 Assignment student’s manual: p. 13

**Can you remind a few actions a hairdresser could take to lower their carbon footprint?**

**If you need inspiration, watch the video:** [**https://www.youtube.com/watch?v=cr-tJ5TqoM4&t=179s**](https://www.youtube.com/watch?v=cr-tJ5TqoM4&t=179s)

|  |  |
| --- | --- |
| **How to lower your carbon footprint as a hairdresser?** | |
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |
| 6 |  |
| 7 |  |
| 8 |  |
| 9 |  |
| 10 |  |

                                                                                          student’s manual: page 13

**Can you remind a few actions a hairdresser could take to lower their carbon footprint?**

**If you need inspiration, watch the video:** [**https://www.youtube.com/watch?v=cr-tJ5TqoM4&t=179s**](https://www.youtube.com/watch?v=cr-tJ5TqoM4&t=179s)

|  |  |
| --- | --- |
| **How to lower your carbon footprint as a hairdresser?** | |
| 1 | Personal answers. |
| 2 | Using less water. |
| 3 | The water doesn’t have to be hot. |
| 4 | Using dry shampoo. |
| 5 | Using leave-in conditioner. |
| 6 | Using a water extraction system. |
| 7 | Shampooing just once, instead of twice. |
| 8 |  |
| 9 |  |
| 10 |  |

                                                                            student’s manual: page 13

**Evaluate yourself.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Evaluation criteria  - self evaluation** | **Outstanding** | **Very good** | **Average** | **Below average** |
| I was able to give actions a hairdresser could take to lower their carbon footprint. |  |  |  |  |
| I watched the video entirely. |  |  |  |  |
| I was able to complete my given actions with the actions referred to in the video. |  |  |  |  |

|  |
| --- |
| Did you get some new information by watching the video? |
|  |

|  |
| --- |
| Was this assignment useful or not? Explain yourself |
|  |

                                                                   student’s manual: page 14

**Work in pairs of four.**

**Which standards should be included in the test? How will you rate the standards?**

**Create a simple test in Excel. Make sure it’s practical and easy to use. Let the test in Excel inspire you.**

**Present your test to the rest of the groups. Discuss the results.**



**Work in your same group. Make the adjustments to the test you think are needed.**

**Take the test from 10 different hairdressers.**

**Visualize your results.**

**Evaluate your test with the hairdresser on the following components: efficiency, visuality, usability, time lag and effectiveness.**



                                                             Assignment student’s manual p. 14

**The teacher will score you.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Evaluation criteria** | **Outstanding** | **Very good** | **Average** | **Below average** |
| You used correct standards in the test. |  |  |  |  |
| You rated the standards in a logical way. |  |  |  |  |
| You used Excel in an effective way. |  |  |  |  |
| Your test is practical. |  |  |  |  |
| Your test is easy to use. |  |  |  |  |
| Your test is visually attractive. |  |  |  |  |
| You made adjustments after the class discussion. |  |  |  |  |
| You took the test with 10 different hairdressers. |  |  |  |  |
| You visualized your results. |  |  |  |  |
| You evaluated the test with the 10 hairdressers. |  |  |  |  |

**Evaluation of the hairdressers.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Evaluation criteria** | **Outstanding** | **Very good** | **Average** | **Below average** |
| The test is efficient. |  |  |  |  |
| The test is visually attractive. |  |  |  |  |
| The test is easy to use. |  |  |  |  |
| The test can be done in a reasonable time lag. |  |  |  |  |
| The test is effective. |  |  |  |  |

                 Assignment student’s manual: p. 15

**Design a poster to be displayed stating the possible impact of a hairdresser’s carbon footprint.**

**The poster needs to be colourful and eye-catching whilst clearly stating what is required and why.   The winning design will be made into a poster and displayed in the appropriate area within the college.**

|  |  |
| --- | --- |
| **Criteria** | **Did it or not** |
| I have to be innovative and creative. |  |
| I state what is required to have an impact as low as possible of a hairdresser’s carbon footprint. |  |
| I use colours. |  |
| I chose my pictures well. |  |
| I show craftmanship and skills development. |  |
| I think carefully about the content. |  |
| I know my target group. |  |
| I succeed in my goals. |  |
| I am convincing. |  |

                                                             Assignment student’s manual p. 15

**The teacher will evaluate you.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Evaluation criteria** | **Outstanding** | **Very good** | **Average** | **Below average** |
| You are innovative and creative. |  |  |  |  |
| You state what is required to have an impact as low as possible of a hairdresser’s carbon footprint. |  |  |  |  |
| You use colours. |  |  |  |  |
| You use a slogan. |  |  |  |  |
| You chose your pictures well. |  |  |  |  |
| You show craftmanship and skills development. |  |  |  |  |
| You think carefully about the content. |  |  |  |  |
| You know your target group. |  |  |  |  |
| You succeed in your goals. |  |  |  |  |
| You are convincing. |  |  |  |  |

|  |
| --- |
| Are you proud of your creative assignment? |
|  |

|  |
| --- |
| What would you do differently next time? |
|  |

**Take the Pretty Survey (see Excel document Pretty Survey EN)**

# 2.Energy in the hairdressing salon I

The tools needed for teaching are:

* Power Point presentation.
* Activity sheets.
* Computers with Internet connection.
* Projector or digital whiteboard.

**CONTENTS**

1. Energy suppliers
2. Reduction of consumption in the salon.
   1. Lighting.
   2. Tools and tools (battery or plug?)
   3. Household appliances.
   4. Air conditioning.
   5. Water heating.

**Power Point presentation: see document Presentation ENERGY module 2**

**1. ENERGY SUPPLIERS**

Sessions 1-9.



**Activity Sheet:**

**Activity 1:**

Look for information about the different energy suppliers of all kinds available for your hairdressing salon, analyse the offer and decide... Which supplier are you going to hire for your salon?

Share it and discuss it with the rest of your colleagues.

**Other resources:**

|  |  |
| --- | --- |
| Video 1 | <https://www.youtube.com/watch?v=bC-BYhuFUtY>  Informational video on energy marketers and potential green energy scams. |
| Video 2 | <https://www.youtube.com/watch?v=N-yALPEpV4w>  Video in English subtitled in Spanish about how renewable energies alone cannot save the planet and the need to consider other options that are currently controversial. |
| Video 3 | [https:/https://www.youtube.com/watch?v=yA5w9E1URFIw.youtube.com/watch?v=yA5w9E1URFI](https://www.youtube.com/watch?v=yA5w9E1URFI)  Video on how to choose a better and greener energy supplier and save money. |

**2. REDUCTION OF CONSUMPTION IN THE SALON**

Sessions 10-17.



**Activity sheet:**

**Activity 2:**

Changing working procedures to reduce salon consumption.

There are activities in the salon that involve very high energy consumption, so we want to consider other options.

In this activity you will have to do the following: think of arguments to convince customers to come to your revolutionary salon. In such a salon, only dry shampoos are used for hygiene and only one water wash is offered in case of applying color or other cosmetic treatments that require rinsing. Drying and styling are reduced to 10 minutes of blow-drying.

In groups of 4 people, after doing some research, you will have to answer the following questions:

* Percentage of energy and economic savings that these measures would entail.
* Inconveniences of adopting these measures.
* Arguments to attract and convince your customers to visit your revolutionary salon.
* Assessment of the effectiveness of these measures on the results of technical work and hair care.

Finally, a discussion will be held with the rest of the class.

After that, watch video 4.

**Activity 3:**

What tools and equipment in your salon could be powered by batteries or rechargeable batteries but have a corded option?

Share it with the rest of your colleagues.

.

**Activity 4:**

Select 5 pieces of equipment that can be found in a hairdressing salon and search the Internet for cost-effective and energy-efficient options, looking at their labels.

**Activity 5:**

Watch video 5 and discuss the following:

* Are all these measures applicable in the hairdressing salon?
* What other measures do you think should be taken in a salon?
* What do you think customers value most in relation to air conditioning and its efficiency?

**Activity 6:**

Use this calculator to predict the consumption of the electric boiler associated with the temperature.

<https://www.gfps.com/en-vn/downloads-tools/online-tools/hot-water-energy-calculator.html>

**Activity solution book:**

**Solution activity 3:**

Straighteners, curling irons, electric razors, electric shavers, electric cutting razors, blenders for mixing products, landline telephones, etc.

**Other resources:**

|  |  |
| --- | --- |
| Video 4 | <https://www.youtube.com/watch?v=qpVkntT4XyY>  Fantastic video on sustainability in hairdressing. |
| Video 5 | <https://www.youtube.com/watch?v=KhpPHD1Lmz0>  Video with guidelines on how to improve the efficiency of air conditioners. |

# 3.Water

**Lesson 5: ‘Water pollution by hairdressers’**

* Water pollution by hairdressers / water pollution per work station
* What can a hairdresser do to have less impact on the water resources?

**Lesson 6: (practical class) ‘Measuring to save water at a salon’**

* Measuring the quantity of water used at a salon
* Calculate how much water you can save by using a water-saving tap – experiments

**For PowerPoint see document Module 2 PowerPoint - Water**

# 4.Waste

**Lesson 7: ‘All that hairdresser’s waste…’**

* What waste does a hairdresser produce?
* What are the effective ways of reducing the waste a hairdresser (salon) produces?

**Lesson 8: ‘Hairdresser’s waste as a resource’**

* Smart products on the market to help a hairdresser create less waste
* Hairdresser’s waste as a resource

**For PowerPoint see document Module 2 PowerPoint - Waste**

# 5.RAW MATERIALS

In order to allow the specific study foreseen by this module, it is necessary to work, first of all, on the basic concepts of INCI, reading labels and certifications of cosmetic products. In addition to the Texbook, the teacher can use the following resources:

**Personal Care**

Founded in 1894, the Personal Care Products Council (PCPC) is the US leading national trade association representing cosmetics and personal care products companies.

<https://www.personalcarecouncil.org/resources/inci/background-information/>

The second step is the reading of a cosmetic label and the recognition of the function, type and quality of the ingredients present. Some additional resources that can help deepen can be found at the following links:

**The Derm review**

A comprehensive resource on skincare products, cosmetic ingredients and beauty how to’s.

<https://thedermreview.com/how-to-read-cosmetic-labels/>

Here’s a useful and engaging video about the topic

<https://youtu.be/afHZxkFeXWQ>

In addition to the content of the Textbook available to students, it could also be useful documentation and tools contained in the following websites:

**RAW MATERIALS for COSMETICS**

**Cosmetic Info**

CosmeticsInfo.org is a comprehensive, informational database containing science and safety information on cosmetics and personal care products

<https://www.cosmeticsinfo.org/>

**EWG’s Skin Deep**

Containing a lot of information about cosmetic ingredients and what they do.

<https://www.ewg.org/skindeep/>

**CosIng**

The European Commission database for information on cosmetic substances and ingredients

<https://single-market-economy.ec.europa.eu/sectors/cosmetics/cosmetic-ingredient-database_en>

**RAW MATERIALS for FURNITURE and EQUIPMENT**

EU politics on Raw Materials for Industries

<https://single-market-economy.ec.europa.eu/sectors/raw-materials/related-industries_en>

**WOOD**

Although this resource belongs to a manufacturer’s site, it is still general and comprehensive

<https://octaneseating.com/blog/types-of-wood-for-furniture/>

About wood sustainability

<https://thermory.com/blog-and-news/how-sustainable-is-wood/>

**GLASS**

Satra

SATRA is an independent research and testing organisation established in the UK in 1919.

<https://www.satra.com/spotlight/article.php?id=366>

About glass sustainability

<https://www.glassallianceeurope.eu/en/environment>

STEEL

World Steel Association

<https://worldsteel.org/about-steel/about-steel/#:~:text=Steel%20is%20an%20alloy%20of,important%20engineering%20and%20construction%20material>.

About steel sustainability

<https://www.nipponsteel.com/en/csr/steel/>

LEATHER

International Council of Tanners

<https://leather-council.org/introduction-to-leather/what-is-leather/>

FABRIC

From Physical Sciences Resources

<https://www.degruyter.com/document/doi/10.1515/psr-2016-0022/html>

PLASTIC

<https://plasticseurope.org/>

WATER

Raw Material Information System of the European Commision

<https://rmis.jrc.ec.europa.eu/?page=water-914f2b>

For the proposed activities students are suggested to use any Apps. Here’s some useful tutorials and link:

**MURAL** (To create mind maps and shared discussion boards)

<https://support.mural.co/en/articles/6672185-how-to-use-mural-your-quickstart-guide>

**VOCAROO** (To create and share Podcast files)

<https://www.youtube.com/watch?v=IqXDqmfv46M>

**BOOK CREATOR** (To easily create and eBook)

<https://www.youtube.com/watch?v=lW-JXVKaquQ>

**ANIMOTO** (To easily create and edit videos)

<https://animoto.com/resources/tutorials/how-to-create-a-video-in-animoto>

# 6.MANAGEMENT

THEORETICAL DEEPENING

**ABC ANALYSIS FOR WAREHOUSE MANAGEMENT**

It is well known that warehouse management is one of the most difficult hidden costs to analyze and, above all, to contain. The new techniques have, however, made it possible to find an adequate  solution for every situation. It is frequent to use JIT (Just In Time) techniques especially for the most expensive items with a lower turnover index, in order to avoid that these items remain in the company warehouse unused and incur risks of obsolescence or damage due to non-use. But not all articles can be treated with JIT. For example, high-turnover but low-cost items could prove extremely critical to business management.  Imagine a mechanical  assembly  company  that  is without screws because unexpected  and sudden consumption has occurred.  All production activity stops  only because of the absence of this article. In this case, the stock out costs are higher than the  savings that can be obtained with the application of JIT techniques. Therefore it is more convenient to manage these types of items according to traditional stock techniques with reorder point (the economic lot model is an adequate solution). But how to distinguish which articles to treat according to one technique rather than  another?

To the rescue comes the ABC technique which is based on Pareto's theorem, also called Law 80/20 (although in reality it was enunciated by Juran). According to this theorem, most effects depend on  a limited number of causes (approximating, it turns out that 80% of effects depend on 20% of causes). This analysis allows you to define which articles to focus your attention on. ABC analysis is extremely useful not only for defining  classes of items according to their crypticness, but for high turnover items it is also extremely useful for defining allocation zones within the warehouse. This results in a reduction in the time required to carry out all picking missions  .

To make the calculation in question, it is sufficient to use individual productivity software , such as Excel.Si lists all the items in descending order according to sales turnover. The cumulative sales per item are calculated . Already from this first summary analysis it can be seen that there are some articles whose influence on turnover is higher than others.

The articles are divided into 3 classes (A, B, C), falling into class A the articles that give rise to an approximate value of 80% (according to Pareto's law  ).  Class  B includes the   items  that are present in  the  next range, from 80% to 90%.  In class C there are,  instead  , the  articles that occupy the complementary  band to reach 100%.

The behavior towards articles is different depending on the class in which each of them falls. Class A requires special attention as it is the class that generates the highest turnover and is particularly in demand. Consequently, it  is a good idea to provide an adequate stock in order to avoid stock-out situations that would be particularly serious, given that these items are in high demand and generate a large share of turnover. Particular care must be taken to avoid excessively high running costs. Class B shows less criticality, given the lower influence on the Company's turnover. Class C, on the other hand  , is a low-criticality sector that has a reduced impact on company turnover and less  attention can be paid to it in the operational  phase.

The limitation of  the model is the consideration of turnover alone  as an index. Stocks  are neglected, with the result that the company often finds itself with high stock values of non-critical items. Surely the ABC analysis on turnover is of considerable help, but to overcome its limits it must frequently be integrated with across-analysis to an ABC approval of stocks in order to highlight the critical management issues. To this end, a table similar to the  previous one is created  with the valuation of stocks at  purchase cost.  As in the previous  case, the articles  are classified according  to the scheme suggested by the Pareto Law, dividing them into classes A (the articles that weigh on the  value of stocks up to 80%),  B (from 80%   90%) and C (90% to 100%). The next step is to cross the data in a table that allows you to highlight critical situation.

From the combined analysis between the value of stocks and turnover, 9 areas are obtained, as can be seen in the  image, which derive from the ABC classifications of the 2 previous tables. We now proceed to the analysis of the results obtained. There are 9 different situations, highlighted by the number relating to the box.  Each article is in one of the 9 proposed  situations.

On the diagonal (boxes 1, 5 and 9) the situation is absolutely appropriate. Stocks are adjusted to the turnover of the product.  However, cell 1 (turnover A – stocks A) is considered an area to be paid particular attention as there may be 2 extreme situations:

* Any stock out would produce drastic drops  in  turnover
* At   the  same time,  it is the area  where most action can be  taken to reduce inventories.

Box 9 (turnover C – stocks C), on the other hand, is in the diametrically opposite situation.  It is  an area of  inattention in which there are   items that are  most likely out  of the market or even then stock out (but whose value is so small as to be negligible).

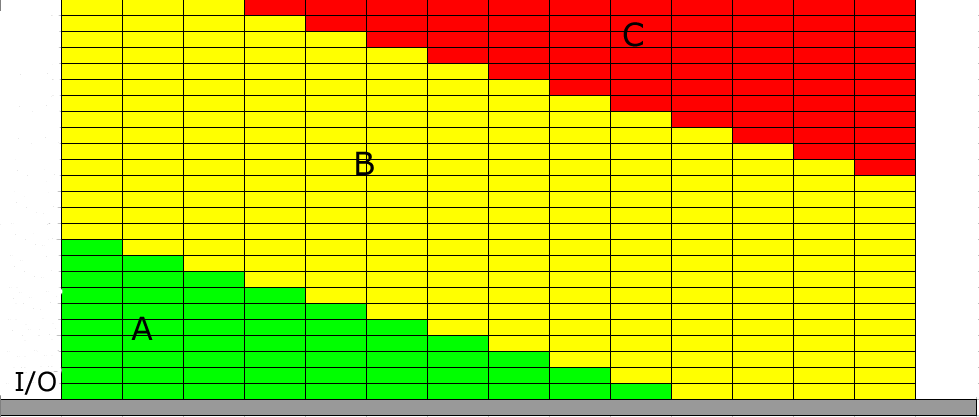
Boxes 3 and 7 are, on the contrary, very critical areas. In 3 (turnover C – stocks A)    the high level of  stocks is not   justified by  turnover  and,  therefore, stocks  are disposed of  (blocking supplies or making promotional  sales). The 7 (turnover A – stocks C) presents a seemingly ideal situation. A low level of stocks corresponds to a high turnover. It is good to be aware of this situation because it could hide pitfalls, such as high risks of stock out. In the event of a sudden request for this  item, the Company risks not being able to meet this request  with consequent erosion of  a high share of turnover.

Boxes 2,4,6 and 8 outline fewer critical issues, although the best solution is to bring the values back to an adequate congruence between the various categories, acting on turnover or stocks, as appropriate .

The result is an optimization of the warehouse. The ABC cross-matrix Turnover-Stocks is an interesting and useful solution to obtain a dynamic analysis.  It allows you to check the trend of the categories over time, prevent the risks of stock out and at the  same time to carry out a simple study of the life of the product. For example, a product that is  in box 9 (turnover C – stocks C) is most likely a product at the  end of its life and the Company may consider removing it from the  range of available.

The ABC method, applied instead to the stock turnover indices, is very useful for studying the positioning of products.   A table   is created in which the goods are reordered according to a decreasing order of rotation index (also here it is possible to use an Excel table).   The  turnover index  is given by the ratio (for example  monthly) between Revenues and Average Stock of the  warehouse referred to the product under analysis.

 The products are grouped into classes A,  B and C, always according to the previous division. Depending on the class to  which they belong, the products are allocated in the warehouse storage areas,  positioning the class A products in the most quickly accessible areas, in order to minimize the time of loading / unloading operations. The definition of the areas in which products are to be allocated  depends on the points and  systems of access to the storage  areas  .



The different positioning of the I/O (Input-Output) point of the products also generates a different division of the product allocation areas. The dimensions of the various zones can  also  change depending on the  size of the goods or handling systems  . In general, the arrangement of goods in storage cells depends on the  shape of  the company and its peculiar characteristics.

In summary, the ABC method, based on Pareto's Law, represents a valid solution to optimize the management of warehouse stocks. In its various forms it allows to :

* Prevent the risk of stock out
* Reduce stocks of undersold products,
* Analyze the life of products,
* Get the best allocation,
* Reduce warehouse  loading/unloading times

Source: lucabazzani.com

ADDITIONAL ASSIGNMENT:  EXERCISE ON ACCOUNTING



**Management and valuation of inventories**

Comec s.r.l. of Florence has the exclusive sale for Italy  of the Sanovit cosmetic cream (article number SV001), produced by the pharmaceutical company  Deltapharm of Zurich (Switzerland).

On 1/10 the  stock of the article in question, equal to no.   2 000 units are valued at a unit price of EUR 30.

In the last quarter of the year,  the following movements are carried out:

5/10 sale of n.  850 units;  19/10 sale of n.  350 units;

28/10 Purchase of n.  800 units at a unit cost of 32 euros;  2/11 sale of n.  700 units;

10/11 Purchase of n.  600 units at a unit cost of 32.20 euros;  24/11 sale of n.  150 units;

4/12 sale of n.  300 units;  18/12 sale of n.  500 units;

29/12 Purchase of n.  650 units at a unit cost of 32.50 euros.

In  the previous quarters,  Comec s.r.l.  sold  a  total of n.  7 950 units of   the Sanavit article, with an average replenishment time of 10 days; the safety stock must ensure that customer  demands can  be met for two weeks.

With reference to the article indicated:

1. calculate the  safety stock  and the level of reordering, bearing in mind that  Comec s.r.l.   expects a 20% increase in sales for the following year;
2. present the  warehouse sheets,  in quantities and values, enhancing the discharges with:
   * the  weighted average  cost method, per  movement and per period;
   * the  FIFO method;

(  with   appropriate comments on how  each method is to be applied and the calculations made)

1. subsequently, clarify which companies are fiscally obliged to keep auxiliary warehouse records, and with reference to which categories of well;
2. Finally, illustrate the criteria for the valuation of inventories of fungible assets dictated by the Italian Civil Code (also focusing quickly on the provisions of international accounting standards), as well as the  methods of  representation of inventoriesand in the financial statements.

**Exercise solutions**

1. **Calculation of safety stock and  reorder level**

(850 + 350 + 700 +  150 + 300     + 500)     = n.  2 850 units*sales for the last quarter of the year considered*

Sales for the year in question (7 950  + 2 850)

 sales increase  20%

Unit 10 800

Unit 2 160 

*Total sales forecast for the following* year  Unit 12 960

(12 960 : 360) =  n. 36 units *average daily sales* (*daily spare consumption)*

For simplicity, the 360-day business year was used.  S = (C × gs) =  (36 × 14) = **n. 504** *safety* *escort* **units**

LR = S + (C × ga) = 504 + (36 × 10) = **n. 864 reorder level units**

The symbols given in the formulae presented shall express:

* **C** = daily stock consumption  (sales)
* **GS** = DAYS SAFETY
* **ga** = days of supply
* **S** =  safety stock
* **LR** =  reorder level

1. **Stock sheets with quantities and values**

When stock records are kept at quantities and values, it is necessary *to enhance* loads, *unloads* and *existing stock*. The valuation  of **loads** is carried out at **purchase**  cost or  **production cost**, depending on the *external* or *internal* origin of the goods.   The valorisation of **discharges** can be carried out:

* the **specific cost** of each  individual good;  The determination of the specific cost is  rather complex, since it is not always possible (or in any case economically convenient for the company) to identify with certainty the correspondence  between the  units entered the warehouse and those exited;
* by one of the  following alternative methods  indicated by the legislator: **weighted average  cost**, **FIFO.**

With the weighted **average cost**  method, warehouse discharges are valued on the basis of the  weighted arithmetic mean  of the load values.  The weighted average cost can  be calculated:

* **by movement,** after each load of goods, by dividing the value of the existing stock in the warehouse by the same stock;
* **by** predetermined period (after each month, quarter or year), by determining the weighted arithmetic mean of the lots loaded in the same period.

**Valorisation of discharges at weighted average cost per movement**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Description **Item code**  **Unit of measurement Safety stock**    Sanovit SV001 cosmetic  cream Unit No. 504 units **Suppliers Reorder time**  **Reorder level**  Deltapharm – Zurich (CH) 10 days n. 864 units | | | | | |
| **Data** | **Reason for movements** | **Quantity** | **Unit** prices | | **Amounts** |
| **of**  **cargo** | **discharge** |
| 01/10  05/10 | initial unloaded stock | 2 000  – 850 | 30,00 | 30,00 | 60 000,00  – 25 500,00 |
|  |  | 1 150 |  |  | 34 500,00 |
| 19/10 | unloading | – 350 |  | 30,00 | – 10 500,00 |
|  |  | 800 |  |  | 24 000,00 |
| 28/10 | cargo | 800 | 32,00 |  | 25 600,00 |
|  |  | 1 600 |  |  | 49 600,00 |
| 02/11 | unloading | – 700 |  | 31,00 | – 21 700,00 |
|  |  | 900 |  |  | 27 900,00 |
| 10/11 | cargo | 600 | 32,20 |  | 19 320,00 |
|  |  | 1 500 |  |  | 47 220,00 |
| 24/11 | unloading | – 150 |  | 31,48 | – 4 722,00 |
|  |  | 1 350 |  |  | 42 498,00 |
| 04/12 | unloading | – 300 |  | 31,48 | – 9 444,00 |
|  |  | 1 050 |  |  | 33 054,00 |
| 18/12 | unloading | – 500 |  | 31,48 | – 15 740,00 |
|  |  | 550 |  |  | 17 314,00 |
| 29/12 | cargo | 650 | 32,50 |  | 21 125,00 |
|  | *final* stock | **1 200** |  |  | **38 439,00** |

The first two discharges (5/10  and 19/10) are valued at an average cost of 30 euros per unit.  For the  valorisation of subsequent discharges, the calculations  are as follows:

Stock value

49600

47 220

2/11: existing = = 31 euros; 24/11: = EUR 31.48 existing stock  1 600 1 500

4/12: EUR  42 498 = EUR 31.48; 18/12:  33 054 = 31,48 Euro

1 350 1 050

**Valorisation of discharges at weighted average cost per period**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Description **Item code**  **Unit of measurement Safety stock**   Sanovit SV001 cosmetic  cream tubes n. 504 tubes **Suppliers Reorder**  **time  Reorder level**  Deltapharm – Zurich (CH) 10 days n. 864 tubes | | | | | |
| **Data** | **Reason for movements**  initial cargo stock   load load | **Quantity** | **Unit** prices | **Amounts** | **Average** cost    126 045 = 31,12 |
| 01/10 | 2 000 | 30,00 | 60 000,00 |
| 28/10 | 800 | 32,00 | 25 600,00 |
| 10/11 | 600 | 32,20 | 19 320,00 |
| 29/12 | 650 | 32,50 | 21 125,00 |
|  | *Total loads in the* |  |  |  |
|  | *period* | 4 050 | 126 045,00 |
|  |  |  |  |  | 4 050 |
|  | *Total discharges into the* |  |  |  |  |
|  | *period* | – 2 850 | 31,12 | – 88 692,00 |  |
|  | *final* stock | **1 200** |  | **37 353,00** |  |

**Valorisation of discharges with FIFO method**

With the **FIFO**  method (First **I**n **F**irst **O**ut,  first entered first out) it is assumed that the materials or goods that entered the warehouse at the earliest time (first in) are the first to be picked up (*first out*). Therefore, warehouse discharges are valued on the basis of the prices of the goods loaded first until they are exhausted.  The FIFO method is applied *continuously*, updating stocks and discharges after each warehouse movement   .

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Description **Item code**  **Unit of measurement Safety stock**    Sanovit SV001 cosmetic  cream Unit No. 504 units **Suppliers Reorder time**  **Reorder level**  Deltapharm – Zurich (CH) 10 days n. 864 units | | | | | |
| **Data** | **Reason for movements** | **Quantity** | **Unit** prices | | **Amounts** |
| **loading** | **discharge** |
| 01/10 | initial stock | 2 000 | 30,00 |  | 60 000,00 |
| 05/10 | unloading | – 850 |  | 30,00 | – 25 500,00 |
|  |  | 1 150 |  |  | 34 500,00 |
| 19/10 | unloading | – 350 |  | 30,00 | – 10 500,00 |
|  |  | 800 |  |  | 24 000,00 |
| 28/10 | cargo | 800 | 32,00 |  | 25 600,00 |
|  |  | 1 600 |  |  | 49 600,00 |
| 02/11 | unloading | – 700 |  | 30,00 | – 21 000,00 |
|  |  | 900 |  |  | 28 600,00 |
| 10/11 | cargo | 600 | 32,20 |  | 19 320,00 |
|  |  | 1 500 |  |  | 47 920,00 |
| 24/11 | unloading | –{100 |  | 30,00 | – 3 000,00 |
|  |  | – 50 | 32,00 | – 1 600,00 |
|  |  | 1 350 |  |  | 43 320,00 |
| 04/12 | unloading | – 300 |  | 32,00 | – 9 600,00 |
|  |  | 1 050 |  |  | 33 720,00 |
| 18/12 | unloading | –{450 |  | 32,00 | – 14 400,00 |
|  |  | – 50 | 32,20 | – 1 610,00 |
|  |  | 550 |  |  | 17 710,00 |
| 29/12 | cargo | 650 | 32,50 |  | 21 125,00 |
|  | *final* stock | **1 200** |  |  | **38 835,00** |

The discharges of 5/10, 19/10 and 2/11 are valued at the loading price of the initial stock, i.e. 30 euros.  The discharge  of 24/11 for  a part (100 units)  exhausts the initial  stock,  and therefore is valued at 30 euros, while for  the remaining    part (50  units) the   Price of the   "oldest" stocks loaded  on 28/10 at 32 euros.

The unloading of the 4/12  is still carried out at the price of  the batch of goods loaded on 28/10.

With the  discharge of 18/  12  for a part (450 units) the  lot loaded on 28/10  is exhausted,  while the  remaining  part (50 units)  is valued at the purchase price made on    10/11 to     32.20 euros.

**International Accounting Standards  (IAS/IFRS)**

According to international accounting standards, inventories are to be measured at specific cost  (*preferable criterion*) or  by the **FIFO** method  or weighted **average cost.**