



PROJECT MIDWOR-LIFE Deliverable A1.2

Report on the results of the survey (Action A1. Task A1.3)

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Author(s):	Ariadna Detrell, Milos Beran, Paola Fontana
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¹ **Nature of Deliverable:** P= Prototype, R= Report, S= Specification, T= Tool, O= Other.

² **Dissemination level:** PU = Public, RE = Restricted to a group of the specified Consortium, PP = Restricted to other program participants (including Commission Services), CO= Confidential, only for members of the Consortium (including the Commission Services)



Contents

1. Introduction	1
2. Survey Purpose	1
3. Methods	1
3.1. Organisation	1
3.2. Target groups for the survey	1
3.3. Data collection	1
4. Questionnaire	2
5. Results	6
6. Conclusions	11

1. Introduction

This document contains the results of **Task A1.3 Survey on textile companies** within **Action A.1 Selection of most representative textile materials and finishing technologies** which objective was to identify the use of DWOR in the textile industry and the experience of textile finishing companies as well as DWOR producers.

The results of this task have contributed to the selection of current DWOR, alternatives and fabrics.

Action A.1 has been developed from September'15 to March'16, coordinated by AEI TEXTIL and with the collaboration of LEITAT, CLUTEX and CS-POINTEX.

Task A1.3 has been led by AEI TÈXTILS with the collaboration of CLUTEX and CS-POINTEX.

2. Survey Purpose

The overall purpose of the survey was to assess the current use of Durable Water and Oil Repellents (DWOR) at industry level. The objective was to gather information about the most used DWOR, the fabrics where these are applied, sectors of appliance and other relevant information concerning the environmental issues that the use of current DWOR implies.

3. Methods

3.1. Organisation

This task was shared between the three cluster associations, AEI TEXTIL, CLUTEX and CS-POINTEX. Each cluster should reach out to their local industry to collect the replies.

The survey questionnaire was drafted by AEI TEXTIL with the support of LEITAT and by the other two clusters. Then it was translated to the three local languages: Catalan, Czech and Italian, to facilitate the responses.

3.2. Target groups for the survey

Two target groups were defined for this survey:

- A. Finishers for third-parties or manufacturers of finished fabric
- B. Producers or Formulators of finishing products for the textile industry

3.3. Data collection

Data collection was made online through a public form. The link to this form was sent by each cluster to their industry contacts.

The survey was online for a period of 4 months (December/15 – March/16). During this time the cluster managers had to make several reminders to these companies asking to fill-out the survey.

4. Questionnaire

The English version of the questionnaire follows below:

MIDWOR-LIFE project survey

MIDWOR-LIFE is co-funded by the European Community under the LIFE+ Financial Instrument within the axe Environment Policy and Governance and under the Grant Agreement nº. LIFE14 ENV/ES/000670.

MIDWOR-LIFE project aims to reduce the impact on the environment, health and safety of current liquid repellent chemicals used in the textile industry and its future alternatives, analysing their environmental impact and functionality. Further information: www.midwor-life.eu

1. Please indicate the name of your company
2. Which is the activity of your company?
 - A. Finisher for third-parties or manufacturer of finished fabric
 - B. Producer / Formulator of finishing products for the textile industry

(Depending on the answer (A or B) it goes to Q3 o to Q

A. Finisher for third-parties or manufacturer of finished fabric

3. Does your company produce finished fabrics with durable water and oil repellents (DWOR)?
 - i. Yes
 - ii. No
4. For which sector(s)?
 - Home
 - Fashion
 - Sport
 - PPE (Personal Protective Equipment)
 - Other...
5. Could you specify the weight of the fabric?

6. Could you specify the composition of the fabric?
7. Could you specify the density of warp yarns of the fabric?
8. Could you specify the weft thread count of the fabric?
9. What finishing products does your company use for fabrics with water and oil repellent properties? (Indicate, if possible, company and trade name)
10. Does your company use products containing fluorocarbons to provide water and oil repellency properties?
 - i. Yes
 - ii. No

If the answer to Q10 is “Yes”:

About products with fluorocarbons

11. Does the market accept them?
 - i. Yes, no questions asked
 - ii. Yes, but with some drawbacks
 - iii. No

Alternatives to fluorocarbons

12. Does your company offer fluorocarbon-free fabrics with good water and oil repellency performance?
 - i. Yes
 - ii. No

Alternatives to fluorocarbons (if answer to Q12 is “Yes”)

13. Which are the alternative products used in your company?

Problems of fluorocarbon-based finishes (if answer to 11 is ii or iii)

14. What are the main issues that your company faces while using finishing products containing fluorocarbons?
15. What solutions or alternatives to fluorocarbons does your company offer?

B. Producer / Formulator of finishing products for the textile industry

16. Does your company offer products durable water and oil repellent (DWOR) finishes for the textile industry?
 - i. Yes

ii. No

17. For which fiber compositions?

18. Which application method is recommended?

- Impregnation
- Exhaustion
- Covering
- Other...

19. What is the chemical base of the product that offers better repellency performance?

- i. Long chain fluorocarbon (8 or more carbons)
- ii. Short chain fluorocarbon (6 or less)
- iii. Silicones
- iv. PUR
- v. Other...

20. What PFOA / PFOS -free alternatives do you believe will take over in the future of the textile industry?

- i. Fluorocarbons with very short chains
- ii. Branched / structured polymers
- iii. PUR
- iv. Fluorosilicone
- v. Modified silicones
- vi. Sol-Gel Techniques
- vii. Other...

21. Does your company offer fluorocarbon-free alternatives with good water and oil repellency performance?

- i. Yes
- ii. No

For companies of group B:

C. Collaboration with the project MIDWOR-LIFE

22. Would you like to collaborate in carrying out a comparison of these alternatives, more respectful of the environment and health, against conventional fluorocarbon products?

- i. Yes
- ii. No



23. Contact details

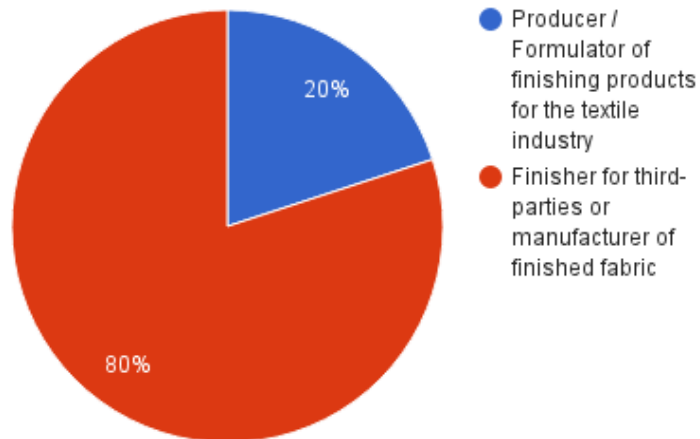
Please enter your name and email so that we can contact you.

5. Results

Q1. A total of **62 replies** were received.

Q2. Which is the activity of your company?

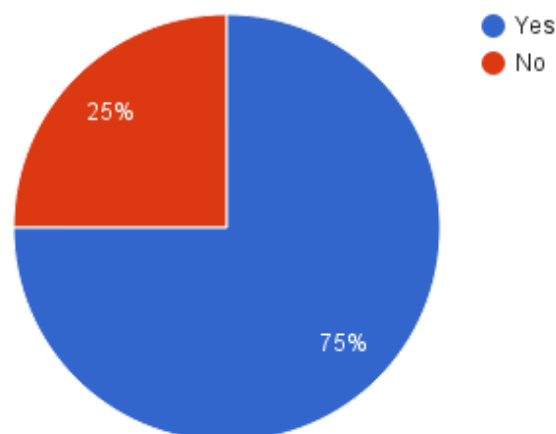
Which is the activity of your company?



Related to the first group "Finisher for third parties or manufacturer":

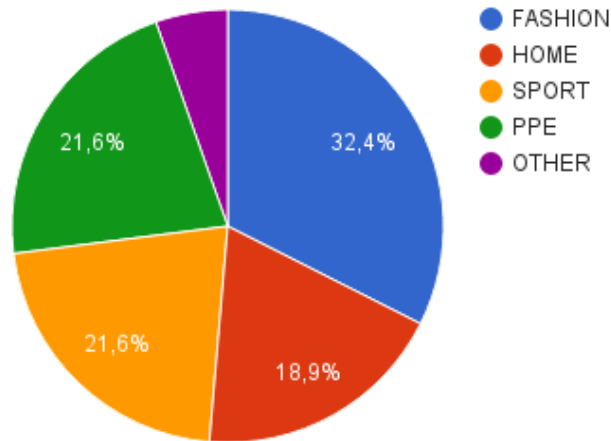
Q3. Does your company produce finished fabrics with durable water and oil repellents (DWOR)?

Does your company produce finished fabrics with durable water and oil repellents (DWOR)?

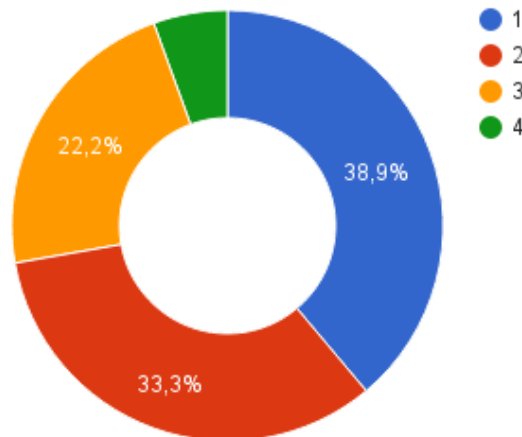


Q4. For which sector(s)?

FOR WHICH SECTOR?



N° of sector handled by company



Q5 to Q8 are related to technical details of the fabrics but are not a good material for a statistical analysis. The reason is that responses are very heterogeneous due to the different application markets of the respondents.

Q9. What finishing products does your company use for fabrics with water and oil repellent properties? (Indicate, if possible, company and trade name)

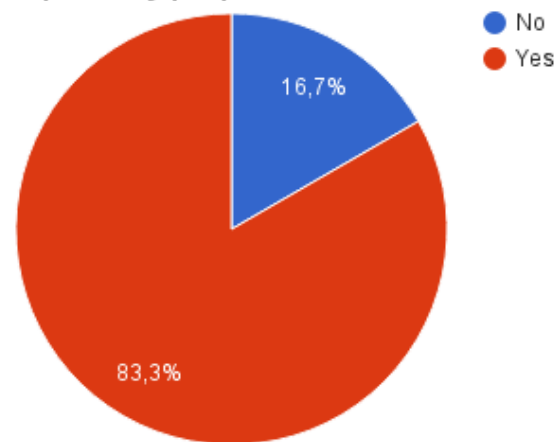
The following is a list of the most concrete answers received:

- C6-fluorcarbon based products
- Huntsman products

- Rudolf Chemie products
- Archroma products
- Silicone based products

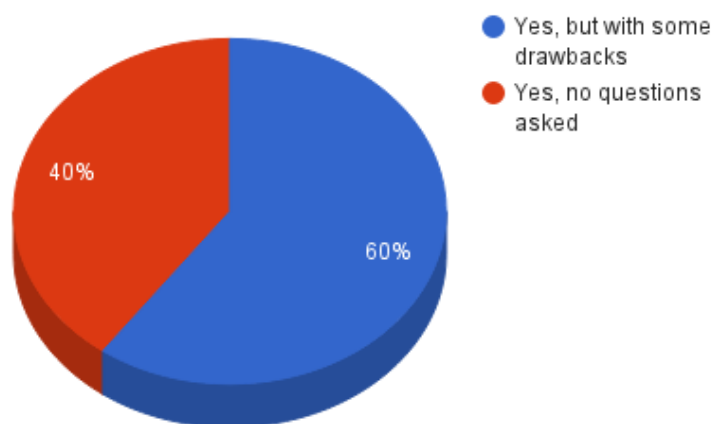
Q10. Does your company use products containing fluorocarbons to provide water and oil repellency properties?

Does your company use products containing fluorocarbons to provide water and oil repellency properties?



Q11. Does the market accept them?

Does the market accept them?



The following two questions were answered only by companies which replied “Yes, no questions asked”:

Q12 & Q13: Most companies don't offer alternatives to current DWORs. The ones which do are offering Silicone based alternatives.

The following two questions were answered only by companies which replied “Yes, but with some drawbacks”:

Q14. What are the main issues that your company faces while using finishing products containing fluorocarbons?

- Environmental restrictions / Conflict with EU regulations (50%)
- Demand for alternative products
- Regulations about treatment of emissions to the atmosphere
- Performance drawbacks (allowed percentages / feel of fabric (fashion sector))

Q15. What solutions or alternatives to fluorocarbons does your company offer?

- Flourine-free products
- HF ecological adaptation
- Silicones
- Microcapsuled waxes
- None (30%)

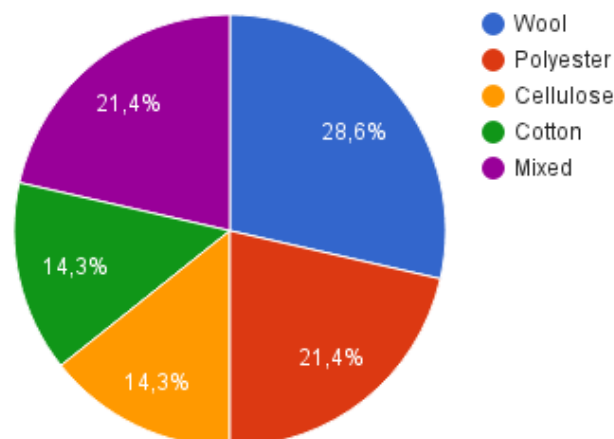
Related to the second group “Producer / Formulator of finishing products for the textile industry”:

Q16. Does your company offer products durable water and oil repellent (DWOR) finishes for the textile industry?

All companies which replied answered “Yes”.

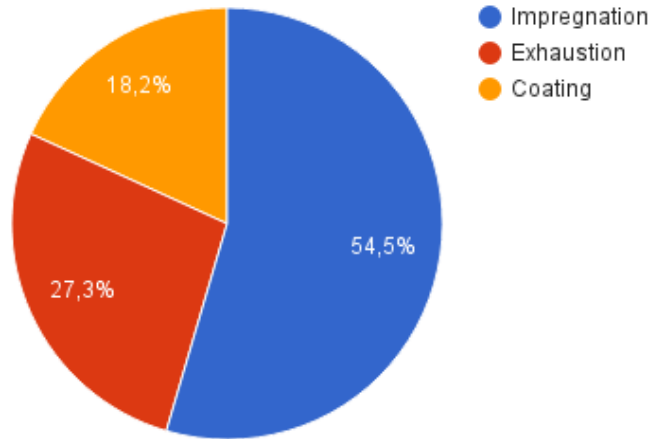
Q17. For which fibre compositions?

For which fiber compositions?



Q18. Which application method is recommended?

Which application method is recommended?

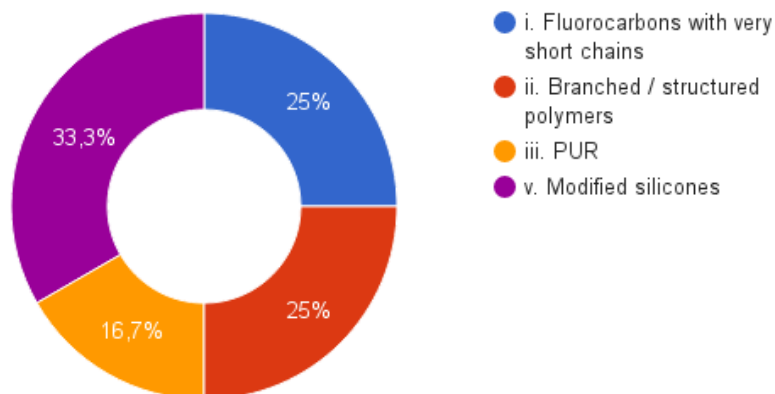


Q19. What is the chemical base of the product that offers better repellency performance?

All companies in this group replied that the best chemical base is “Long chain fluorocarbon (8 or more carbons)”

Q20. What PFOA / PFOS -free alternatives do you believe will take over in the future of the textile industry?

What PFOA / PFOS -free alternatives do you believe will take over in the future of the textile industry?



Q21. 21. Does your company offer fluorocarbon-free alternatives with good water and oil repellency performance?

75% of companies say that they offer good performance alternatives. All of them sent their contact details to collaborate with MIDWOR-LIFE project.



6. Conclusions

The majority of respondents are finishers (80%) and 75% of them use DWOR products. The sectors which they work for are fashion, sport, personal protective equipment and home textiles. Most of the companies work only for one, two or maximum three sectors, being for one sector the most representative of the respondents. It is observed that most companies solve the problematic of water and oil repellency, by using fluorocarbon-based finishing, but most of them notify that the market begins to ask about environmental issues.

Regarding future trends, companies believe that the solution will be to study modified silicones and short-chain based fluorocarbon and structured and hyper branched polymers (most of them based in short-chain fluorocarbon).

As has been observed, most of the companies work with products of big companies as ARCHROMA, HUNTSMAN or RUDOLF and most of them work with various alternatives from different companies and alternatives from the same company depending on the sector of application, and fabric composition, that they are working for.