

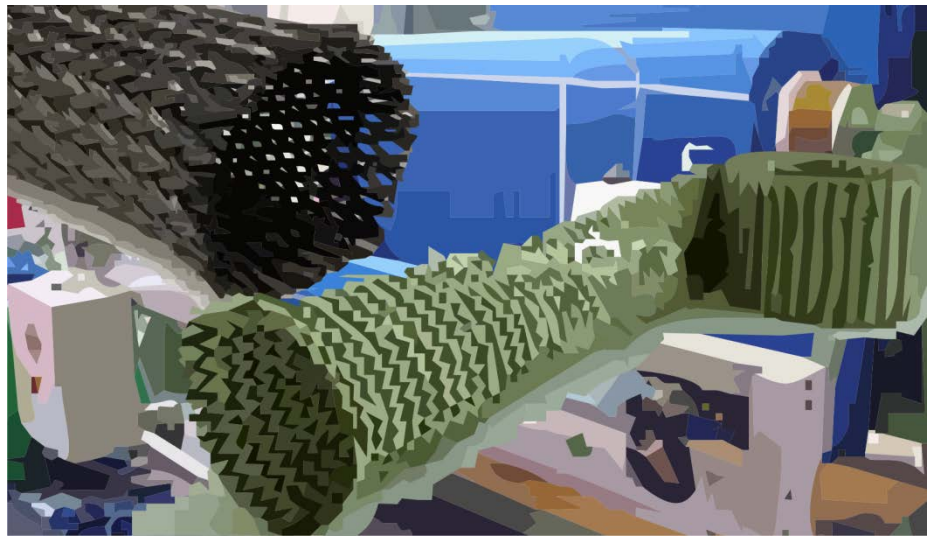
This fiche is part of the wider roadmap for cross-cutting KETs activities

**'Cross-cutting KETs' activities bring together and integrate different KETs and reflect the interdisciplinary nature of technological development. They have the potential to lead to unforeseen advances and new markets, and are important contributors to new technological components or products.**

The complete roadmap for cross-cutting KETs activities can be downloaded from:

<http://ec.europa.eu/growth/industry/key-enabling-technologies/eu-actions/ro-ckets>

## Potential areas of industrial interest relevant for cross-cutting KETs in the Textiles domain



This innovation field is part of the wider roadmap for cross-cutting KETs activities developed within the framework of the RO-cKETs study. The roadmap for cross-cutting KETs activities identifies the potential innovation fields of industrial interest relevant for cross-cutting KETs in a broad range of industrial sectors relevant for the European economy.

The roadmap has been developed starting from actual market needs and industrial challenges in a broad range of industrial sectors relevant for the European economy. The roadmapping activity has focused on exploring potential innovation areas in terms of products, processes or services with respect to which the cross-fertilization between KETs can provide an added value, taking into account the main market drivers for each of those innovation areas as well as the societal and economic context in which they locate.

Taking the demand side as a starting point, cross-cutting KETs activities will in general include activities closer to market and applications. The study focused on identifying potential innovation areas of industrial interest implying Technology Readiness Levels of between 4 and 8.

## TX.2.5: Technical textiles and textile products for specialized industrial applications

### Scope:

To develop technical textiles for specialized industrial applications with improved functionalities and performance (e.g. textile-based filters with high filtration efficiencies; lightweight, non-flammable and scratch-resistant technical textiles for mobile applications, including for seats and in-vehicle garments, etc.).

### Demand-side requirements (stemming from Societal Challenges) addressed:

Depending on the application, textiles can contribute to tackle the following societal challenges:

- Health, demographic change and wellbeing
- Inclusive, innovative and secure societies
- Climate action, resource efficiency and raw materials
- Secure, clean and efficient energy

### Demand-side requirements (stemming from market needs) addressed:

- Demand for high performing materials with improved functionalities

### Specific technical/industrial challenges (mainly resulting from gaps in technological capacities):

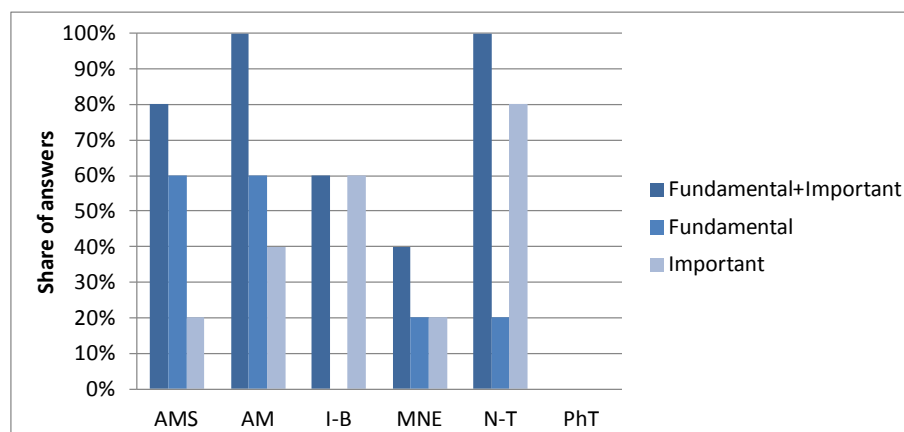
- Development of fibres and textiles with enhanced functionalities and performances (e.g. high strength, scrap resistance, high modulus, hydrophilic or hydrophobic, etc.)
- Development of surface functionalization methods and processes for the production of fibres and textiles with enhanced performance

### Contribution by cross-cutting Key Enabling Technologies:

In respect to this Innovation Field, the integration of KETs could contribute to the development of advanced technical textiles for specialized industrial applications, thanks to solutions such as fibres and textiles with enhanced functionalities and performance (e.g. high strength, cut and puncture resistance, high modulus, hydrophilic or hydrophobic, non-flammable, lightweight properties, etc.), along with functionalization methods and processes.

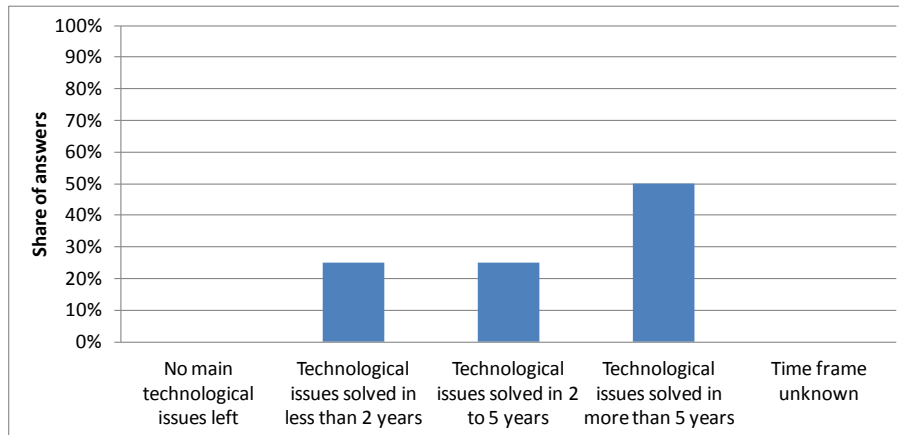
To this aim, the combination of KETs experts' opinions collected through the dedicated survey (whose result is depicted in the below bar chart), the examination of KETs-related patenting activity in respect to this Innovation Field, and desk research activities, have allowed identifying a rather strong interaction of KETs with respect to this Innovation Field, with either fundamental or important contribution mainly by the following KETs:

- Advanced Manufacturing Systems (AMS)
- Advanced Materials (AM)
- Nanotechnologies (N-T)



### Timing for implementation:

According to the majority of KETs experts' opinions (whose result is depicted in the below bar chart), desk research, and in line with the KETs-related patenting activity in this field, it is considered that the main technological issues holding back the achievement of cross-cutting KETs based products related to this Innovation Field could be solved in a time frame of more than 5 years, yet significant consensus by experts indicates also shorter periods being necessary:



Hence, depending on the specific technical and/or industrial challenges holding back the achievement of cross-cutting KETs based products related to this Innovation Field, the provision of support in the short to medium term should be taken into consideration within this framework.

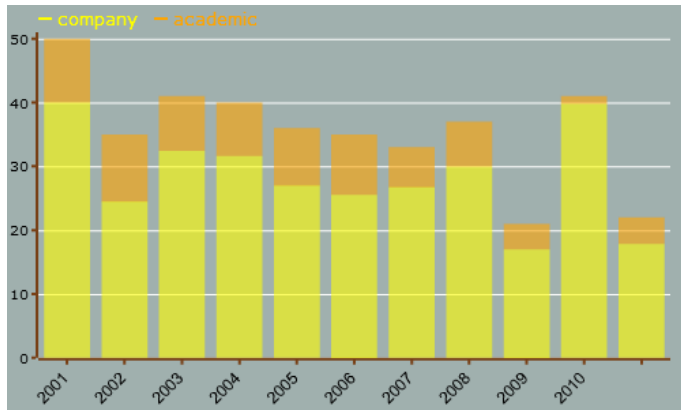
### Additional information according to results of assessment:

#### ➤ **Impact assessment:**

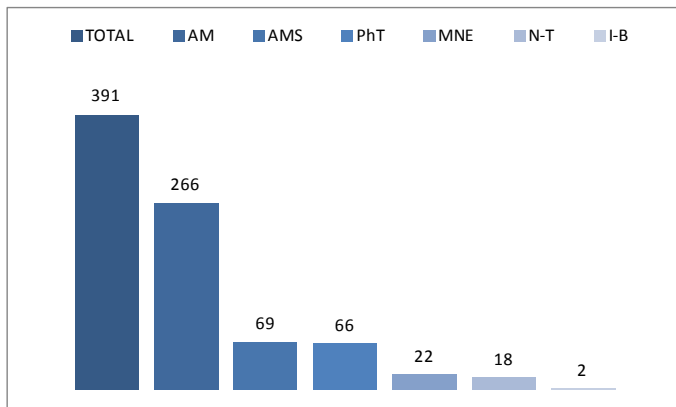
- While fashion and home apparel remains to date the main part of the EU industry and will continue to be important, a closer look at the EU textiles and clothing industry structure shows that technical textiles have become an increasingly vital part of the European textiles and clothing industry. The sub-sector of technical textiles is one of the most dynamic sub-sectors, accounting for an increasing share in EU production. In 1998 technical textiles accounted for approximately 25% in total EU textile production. A percentage that has increased and where estimates suggest that technical textiles account today for 33 to 36% of EU textiles and clothing turnover.
- Technical textiles are as well the section of the industry with most interest for research, with most skills in planning research and protecting intellectual property. As a result, 85% of all patents in textiles are in technical textiles, and this contributes to the global leadership Europe has in this segment.
- The technical textiles segment is organized in rather large companies, with a high level of organization and the necessary skills to compete worldwide. For universities and research centres, this industry offers a stable source of funding for programmatic research or for commercial services. In addition, research into technical textiles enables the publishing of articles in journals with a high impact and thus a contribution to excellence.
- Commercial research from companies have also a considerable role and especially applies to technical fibres, such as aramides that were developed in the 1970s by Dupont (US) and Akzo (The Netherlands) as well as other strong fibres developed by Rhone-Poulenc (France) and DSM (The Netherlands). These companies have also been active in fostering the applications of these fibres in the value chain and have adopted dynamic technical marketing. The application of technical fibres has been promoted by higher security needs (e.g. in personal protective equipment) or regulation in fuel-efficient mobility.
- Public procurement is also an important element in market adoption of technical textiles. Hence public authorities have been rather present, but more in a regulatory than in a funding role. The same applies to composites, geotextiles, filtration materials for which innovation is largely driven by higher regulatory demands.
- Sources: Sectoral Study, Textile Industry in European Union-Bringing together the EEN to improve environmental management in the leather, paper, chemicals and textiles sectors; Source: In-depth assessment of the situation of the T&C sector in the EU and prospects, Task 7: Synthesis report for the European textile and clothing sector, December 2012

➤ **Results of patents scenario analysis:**

- 391 exclusively KETs-related patents identified in the period 2001-2011 for the specific Innovation Field
- Almost stable slightly decreasing trend curve (number of patents per year)
- Highest share of industrial applicants with intermittent relevant patenting activity by academic applicants especially in the early part of the period, most probably standing for new technologies having been patented in the corresponding periods:



• Patents by KET:

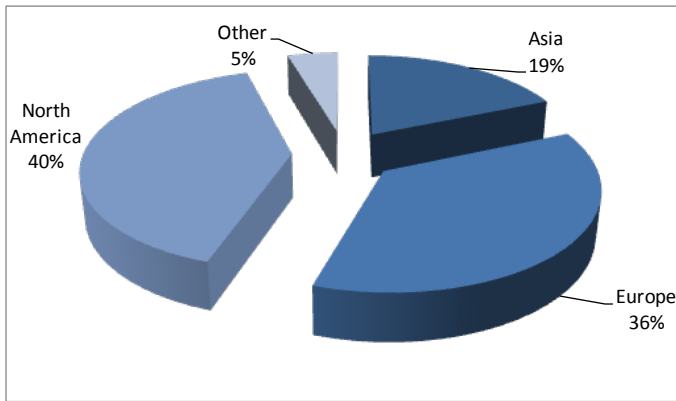


• Patents by KET(s) and relevant combinations of KETs:

KET(s)	Number of patents
AM	266
AM / MNE	5
AM / MNE / N-T	1
AM / MNE / N-T / PhT	1
AM / MNE / PhT	4
AM / N-T	10
AM / N-T / PhT	1
AM / PhT	10
AMS	69
AMS / AM	10
AMS / AM / N-T	1
AMS / MNE	1
AMS / N-T	1
AMS / PhT	4
IBT	2

<i>KET(s)</i>	<i>Number of patents</i>
MNE	22
MNE / N-T	1
MNE / N-T / PhT	1
MNE / PhT	15
N-T	18
N-T / PhT	2
PhT	66

- Patent distribution by (Applicant) organization geographical zone:



- Patent distribution by geographical zone of priority protection:

