Committee on Commodity Problems

JOINT MEETING OF THE 38TH SESSION OF THE INTERGOVERNMENTAL GROUP ON HARD FIBRES AND THE 40TH SESSION OF THE INTERGOVERNMENTAL GROUP ON JUTE, KENAF AND ALLIED FIBRES

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THE IMPORTANCE OF ROUTINE POLICY REVIEWS IN THE CONTEXT OF DEVELOPMENT OBJECTIVES OF THE NATURAL FIBRES SUB-SECTORS

# INTRODUCTION

1. At the last Joint Meeting (JM) of the Intergovernmental Groups on Hard Fibres and on Jute, Kenaf and Allied Fibres (IGG/HFJU), delegates noted that accurate data and analyses were prerequisites to formulate effective policy options which influence economies in addressing poverty alleviation and improving food security and malnutrition. The benchmark and conclusions presented by the Secretariat on production and trade policies were adopted by the JM.
2. In particular, efforts needed to be made to engage with trade partners in bilateral, regional and multilateral negotiations to review the remaining tariffs, and especially the issue of tariff escalation. In the case of non-tariff barriers (NTBs) to trade for products such as composites derived from jute, abaca, coir, kenaf and/or sisal (JACKS), although minor progress had been made on some fronts, in terms of reporting and monitoring, no concrete actions or road map to their reduction and harmonization had been agreed at the multilateral level.
3. However, there was little point in improving market access if products were not available in acceptable quality and quantity. In this regard, producers of JACKS[[1]](#footnote-1) would need to ensure that supply-side constraints were overcome. The focus should not be limited to improving the agronomic conditions but should also include research and development on new and prospective end-uses, building on the current heightened environmental concerns over the use of synthetic substitutes. Enabling policies could be considered in JACKS producing countries to support the emerging composite fibres industry, for example, with incentives to use composite materials for the construction of public buildings, such as hospitals and schools.
4. The Secretariat was requested to actively engage in monitoring policy developments in trade and markets, including their possible impact on countries and regions. However, recognizing the limited resources of the Secretariat, the JM agreed that the work had to be done in phases and that the IGG members had to be part of the process and collaborate fully with the Secretariat. It may be noted that no coherent work on policy has been done by the IGG/HFJU, since the Uruguay Round of Trade Negotiations.

# BACKGROUND

1. In response to the JM request to actively engage in monitoring policy developments related to trade and markets, including their impact on countries and regions, at the previous Session of the JM IGG/HFJU in November 2013, the Secretariat produced a document on production and trade policies (CCP:HF/JU 13/2) and modified its annual questionnaire to include a comprehensive listing of tariffs and NTBs so as to have a better understanding of the policy environment influencing international trade. However, the response rate to the questionnaire was extremely low, even after direct follow-up by the Secretariat to members of the Groups since June 2015.
2. On further enquiry, the designated Focal Point of the Working Groups informed the Secretariat that several delegates who were drivers of the policy review initiative had retired or moved to other institutions. Hence, delegates who had replaced them did not include the monitoring work in their work plans. The Focal Point suggested that the Secretariat provide some background and explanation on the importance of policy review and analysis, in particularly to the new members.

# THE NEED FOR AN AGRICULTURE POLICY FRAMEWORK: THE CASE FOR JACKS

1. Agricultural and rural development and poverty alleviation require clearly defined policies. Well-defined macroeconomic and social policies promote growth and could alleviate poverty. History has broadly demonstrated that sound agricultural policies generally resulted in sustained and efficient agricultural systems, as well as in economic development and poverty reduction.
2. The agricultural sector provides employment for over one billion people[[2]](#footnote-2) in the world. In low and middle income economies, the agricultural sector is traditionally the main source of employment. In 2010, almost 40 percent of the world population was employed in agriculture, ranging from 4.2 percent in developed countries to 48.2 percent in developing countries[[3]](#footnote-3). Of this proportion, approximately 500 million were smallholders providing sufficient food and agricultural products to the world, even though most of them worked outside the formal market economy. Although they play an important role in the economy, most are excluded from the lucrative segments of the value chain and therefore are poverty-stricken. Agriculture is an important sector in the economies throughout the world and is vital for poverty reduction and food security.
3. Agricultural policies define the performance of the national agricultural sector of any given country and reflect the strategies established by governments with the general objective of improving agricultural efficiency, income distribution and food security (Norton[[4]](#footnote-4)) . Specific targets of agricultural policy in the domestic market include, *inter alia*, improving of agricultural produce quality of agricultural produce, income stabilization, marketing systems, credit services, land use and mechanization.
4. Policies identify and prioritize the areas needing external funding and the framework to receive the required external finances. Financing institutions and donors increasingly require that economic growth policies safeguard social and environmental sustainability and be inclusive in nature[[5]](#footnote-5).
5. Throughout the world, the natural fibres industry employs millions of people, the majority of whom are smallholders and small scale processors. As cheaper synthetics entered the international textile market, exports of the JACKS declined and impacted negatively on the livelihood and food security of smallholders.
6. Although there has been a surge in interest to make better use of natural, renewable resources, man-made fibres (MMF) continue to account for 70 percent of all fibres produced worldwide (European Man-Made Fibres Association[[6]](#footnote-6)). Countries are beginning to propose policy measures to tax the use of MMFs in favour of natural fibres because of the adverse impact of production and disposal of these fibres on the environment. This development could increase the demand for natural fibres, including JACKS, in the long run. Legislative provisions could include restricting non-biodegradable MMFs as well as compelling end-of-life recycling obligations on the construction, automobile and supermarket industries.
7. Given the competitive nature of the fibres market, it would be advisable that policymakers in JACKS producing countries aim at improving product quality and invest in increasing fibre production to enhance the competitiveness of the geotextile sub-sector. In order to increase quality production, policies on *inter alia* capacity building, research and development and new and improved infrastructure (such as roads, irrigation technology and storage) need to be developed. Ways to increase remuneration of all the stakeholders along the JACKS value chain should also be explored, and as natural fibres are totally bio-degradable, policymakers could take advantage of the current environmental consciousness by entering new markets and supporting new products.

# TRENDS AND STRUCTURE OF JACKS TRADE

1. Industries are increasingly looking at natural products and inputs in a more positive and   
   pro-active manner. They are considered not only as technically sound components, but final products also attract premium prices because of their superior environmental attributes and compatibility with socially responsible production and disposal requisites. Figures 1 and 2 illustrate trends in the trade of jute and hard fibres.
2. The JACKS sub-sector needs to be urgently transformed to meet the sustainability opportunities and challenges of the new century. Jute and hard fibres are exclusively produced in developing countries and are vitally important for the livelihood and food security of farmers in some of the poorest regions of the world. In a time when climate change is increasingly affecting low-income populations in rural areas, some of these crops have the adaptability to cope with the stresses brought about by climate change. For example, sisal grows very well in drought-prone regions and postharvest residues from jute act as fertilizers for poor soils.
3. It is well-known that the markets for JACKS fibres have significantly eroded since the introduction of synthetic fibres. However, niche markets have been maintained and a number of new markets are emerging, such as fibre reinforced composites in automotive industries, building and construction materials and biodegradable geo-textiles, with ecologically friendly cellulosic fibres becoming a driving force for innovation and development. In addition, the potential for using waste to generate biogas, fertilizer and animal feed and to substitute wood, both in the paper and building industries, continues to grow. However, there is limited knowledge and understanding about such future developments and the uncertainties associated with them in developing countries. Appropriate policy frameworks need to be in place to encourage their development.
4. Synthetic fibre production is concentrated in a small number of countries, with three quarters of world production occurring in just seven countries. The production of MMFs has become particularly concentrated in China, which is the major producer of polyester fibre, accounting for 65 percent of total global output. With the exception of India, most of the other MMF producing countries have witnessed a decline in production over recent years.

# COMPETITIVENESS AND KEY DRIVERS

1. Although the lack of competitiveness *vis-à-vis* synthetic fibres and products is a major constraint to jute and hard fibres in both developed and developing country markets, various non-price factors, such as technical characteristics, quality issues and supply reliability, as well as market access barriers may also influence the extent of the natural fibre market erosion. In an environment of increased volatility and intensified competition, where buyers increasingly demand variety, quality and timely delivery in addition to price, competing on the basis of low wages and large volumes can lock producers at the lowest end of the value chain where price competition is the harshest and where opportunities to cultivate the skills needed to sustain competitiveness are limited.
2. Key factors having an impact on competitiveness and export availabilities of JACKS on the production side are price volatility and reliability of supplies. These are affected by climatic conditions, relative price of competing crops and returns to farmers in the previous season. Production policies, such as those favouring crops, also influence farmer planting decisions.
3. Smallholders need: access to markets and finance; extension advice to improve productivity, production and quality; access to information (market, technical and research and development); and, generally, strategies to promote fibres production as a viable business.
4. On the demand side, competitiveness is influenced by prices of JACKS relative to those of competing fibres, particularly synthetics, in various end-use markets where substitution is a technically acceptable option. The structure of the petrochemical industry, which is often vertically integrated, allows for a flexible allocation of cost components between the various outputs at any given stage of the processing chain. In general, the price difference is more important at the first stage of the processing chain, where polypropylene resin is often more expensive than jute or sisal fibre, due to the relatively high and fluctuating price of crude oil. Although the prices of synthetics may be higher at the time of their introduction, subsequent developments in economies of scale can reduce them.
5. The major non-price factors affecting JACKS versus polypropylene are: technical characteristics, quality, reliability of supplies and effective marketing strategies. Jute and hard fibres supplies are unstable due to the dependence on weather conditions and long distance transport and are occasionally subject to problems in quality. Synthetic fibres have regular supplies, they can be produced at short notice and production firms usually adopt aggressive marketing strategies. However, the environmental advantages of JACKS fibres over synthetic fibres, characterized by lower energy demand and waste production, could enhance the competitiveness of natural fibres.
6. The competitiveness of JACKS relative to synthetic materials is also affected by market access conditions at both regional and international levels. JACKS demand has recovered largely through competitive prices and deliberate policy choices by commodity traders. For example, the Government of India imposed the compulsory use of jute packaging material. For 2014-2015, a proposal by the Ministry of Textiles stipulated that a minimum of 90 percent of food grains and a minimum of 20 percent of sugar were to be packed using jute packaging materials. The jute packaging order is likely to be adopted in Bangladesh and Nepal as well.
7. Demand for natural products is growing and is reflected in the changes in regulations encouraging industries to follow more environmentally-sound practices. Of direct relevance to the natural fibres economy are a number of legislative provisions ranging from the banning of non-biodegradable plastic bags to the establishment of end-of-life recycling requirements for the automobile industry. These regulatory provisions are indicative of the trend in many high-income countries towards enacting legislation aimed at reducing environmental damage and the associated costs to society.
8. There is considerable scope for developing commercial opportunities for JACKS composites. However, the financial and economic viability of the production and trade of these products on a commercial scale are still being evaluated, particularly in terms of their competitiveness against existing products. So the use of JACKS in innovative industrial applications should take place alongside the traditional uses of these fibres.

# TRADE POLICIES AFFECTING FIBRES AND THEIR PRODUCTION

1. The implementation of the Uruguay Round commitments and the phasing out of the Multi-Fibre Agreement (MFA) in 2004 were important for the international trade of jute and hard fibres. As stated in the Agreement on Textiles and Clothing (ATC), the textiles and clothing world has become a more open market, subject to stronger price and quality competition.
2. Although tariffs on JACKS have generally been brought down under both multilateral and bilateral trade liberalization, their market access is still plagued with some remaining problems. Developing countries have placed on the Doha Agenda a number of issues they face in implementing the present agreements. They still face exceptionally high tariffs on selected products in important markets, which continue to obstruct their exports. In the Uruguay Round, on average, industrial countries made slightly smaller reductions in their tariffs on products that are mainly exported by developing countries than on imports from all countries. At the same time, the potential for developing countries to trade with each other is also hampered by the fact that the highest tariffs are sometimes in developing countries themselves. The effectively applied tariffs in trade among them are mostly governed under either some form of preferential, bilateral or regional trade agreements. A related issue is tariff escalation, this implies that for exporters access to exports for processed industrial products becomes more difficult, and that vertical diversification of production for exports of higher value-added products is slowed down. Another issue that worries developing countries of the liberalization through the Doha Agenda negotiation is the erosion of tariffs in that special tariffs concession become less meaningful if the normal tariff rates are cut.
3. However, the Everything But Arms (EBA) arrangement gives all least developed countries (LDCs) duty free and quota free access to the EU for all their JACKS exports. Entry into the EBA is automatic and, unlike the generalized schemes of preference (GSP), the EBA has no time-limit. Rules of origin (ROOs) are a necessary part of preferential trade arrangements in order to ensure that trade preference is granted to products that effectively originate from the beneficiary countries. However, specific and more stringent ROOs make it more difficult for suppliers to ensure the regional content. This creates an incentive for manufacturers to source inputs from regional suppliers and may act as a trade barrier. By limiting the sourcing of inputs from regional partners, ROOs may encourage a vertical integration of the production chain that may not be competitive outside the regional market. A further problem with specific ROOs is that the determination of regional content for yarns, fabrics and final products that involve multiple components can be so burdensome and costly that suppliers prefer not to use the preferential arrangements.
4. India is the largest producer of jute fibre and the second largest exporter of raw jute and jute products. Although Bangladesh is the second largest producer, it is the largest exporter of raw jute and jute products, accounting for 79 percent of world exports in 2014. India is also a major importer of both fibre and jute products along with China, but imports of raw jute by China have halved in recent years as imports of manufactures have increased. Pakistan and Turkey are minor producers, but the largest importers of jute fibre globally. The former accounted for 28 percent of world jute fibre imports in 2014, while the latter accounted for 25 percent of total jute manufactures.
5. The effectively applied tariffs in trade among developing countries are mostly governed under some form of preferential, bilateral or regional trade agreements. Tariff escalation is evident in the Islamic Republic of Iran, a major processed fibre importer, that imposes a tariff of 30-65 percent on jute manufactured products reportedly to protect its domestically produced wool (carpets) and polypropylene (bags) fibres (Table 1). Pakistan imposes 1 percent tariffs on jute fibre imports, while China and India apply most-favoured nations (MFN) tariffs of five and 10 percent, respectively. Bangladesh, a key producer, imposes 25 percent MFN duties on all jute and jute products except jute twine and cordage for which the duty is zero for all countries. China imposes a tariff of 10-14 percent, India applies a uniform tariff of 10 percent and Pakistan's tariff rate ranges between 10 and 25 percent.
6. Developing countries export to major importing developed countries; the EU and the United States are mostly under GSP, while Australia, the third largest importer of jute products, is not part of the Agreement. GSP tariff rates are zero for slightly woven products, while MFN tariff is 4 percent in the EU and zero in USA and Australia.

**Table 1. MFN Applied Tariffs on Jute and Jute Products for Selected Major Importers**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Product | Raw or retted jute fibre | Raw jute fibre | Single yarn jute | Multiple yarn jute | Unbleached jute fabric | Other jute fabric | Felt and stitch-bonded jute | Other jute felt | Jute carpets | Jute sacks and bags |
| HS Code | 5303.10 | 5303.90 | 5307.10 | 5307.20 | 5310.10 | 5310.90 | 5602.10 | 5602.29 | 5702.39 | 6305.10 |
| Australia | 0 | 0 | 5 | 5 | 0 | 0 | 5 | 5 | 3.33 | 0 |
| China | 5 | 5 | 6 | 6 | 10 | 10 | 10 | 10 | 14 | 10 |
| EU | 0 | 0 | 0 | 0 | 4 | 4 | 6.7 | 6.7 | 8 | 3 |
| Ghana | 10 | 10 | 10 | 10 | 20 | 20 | 20 | 20 | 20 | 20 |
| Indonesia | 0 | 5 | 5 | 5 | 7.5 | 10 | 10 | 5 | 15 | 5 |
| Iran | 22 | 4 | 10 | 10 | 50 | 50 | 30 | 30 | 50 | 65 |
| Japan | 0 | 0 | 0 | 0 | 10 | 10 | 5.6 | 5.6 | 8.2 | 0 |
| Nepal | 5 | 5 | 10 | 10 | 15 | 15 | 15 | 15 | 30 | 15 |
| Pakistan | 1.0 | 1.0 | 10 | 10 | 25 | 25 | 15 | 15 | 25 | 25 |
| Russian Fed. | 5 | 5 | 5 | 5 | 10 | 10 | 15 | 15 |  | 15 |
| Saudi Arabia | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Syria | 1 | 1 | 1 | 1 | 5 | 5 | 5 | 5 | 50 | 3 |
| Thailand | 5 | 5 | 5 | 5 | 5 | 5 |  |  |  | 10 |
| Turkey | 0 | 0 | 0 | 0 | 4 | 4 | 6.7 | 6.7 | 8 | 3 |
| USA | 0 | 0 | 0 | 0 | 0 | 0 | 11.3 | 6.3 | 1.8 | 0 |

**Source:** WTO.

1. Brazil and China are the major producers of sisal fibre, together accounting for 63 percent of world production in 2014. The US accounts for 42 percent of imports of manufactured sisal and imposes zero import tariff (GSP and MFN) on raw sisal fibre. The EU, which accounts for 22 percent of world imports of sisal products, imposes a 12 percent MFN tariff (Table 2). Tanzania, the third sisal producer, imposes zero MFN duty for raw fibre and 25 percent for processed sisal products.

**Table 2 - MFN Applied Tariffs on Sisal and Sisal Products for Selected Major Importers**

|  |  |  |  |
| --- | --- | --- | --- |
| **Product** | **Raw sisal fibre** | **Twine, cordage, ropes of sisal (binder or baler twine)** | **Other twine, cordage,  ropes of sisal** |
| **HS Code** | **5305.00 1/** | **5607.21** | **5607.29** |
| Australia | 0 | 5 | 5 |
| Canada | 0 | 0 | 6.7 |
| Chile | 6 | 6 | 6 |
| China | 4.8 | 5 | 5 |
| Egypt | 0 | 5 | 5 |
| EU | 0 | 12 | 12 |
| India | 10 | 10 | 10 |
| Indonesia | 5 | 5 | 5 |
| Japan | 0 | 0 | 4 |
| Saudi Arabia | 5 | 5 | 5 |
| USA | 0 | 0 | 3.6 |
| Viet Nam | 5 | 12 | 12 |
| **Source:** WTO. 1/ The HS codes for sisal fibre 5304.10 and 5304.90 were eliminated from the Harmonized System effective 1 January 2007. Therefore, sisal tariffs are classified under HS code 5305.00. | | | |

1. India, Sri Lanka and Viet Nam are the major producers of coir fibre. China is the world’s largest importer of coir fibre, accounting for 68 percent of total imports, and imposes a 4.8 percent duty, 6 percent for the coir yarn and 14 percent for coir floor covering (Table 3). The EU is the largest importer of coir yarn and mats; it imposes an MFN duty of 4 percent on coir floor coverings and zero on the other products. However, most of the trade takes place under GSP or some other preferential arrangement in the other developed countries.

**Table 3 - MFN Applied Tariffs on Coir and Coir Products for Selected Major Importers**

|  |  |  |  |
| --- | --- | --- | --- |
| **Product Name** | **Raw Coir fibre** | **Coir yarn** | **Floor coverings  of coir fibres** |
| **HS Code** | **5305.00** | **5308.10** | **5702.20** |
| Australia | 0 | 0 | 0 |
| Canada | 0 | 0 | 0 |
| Chile | 6 | 6 | 6 |
| China | 4.8 | 6 | 14 |
| EU | 0 | 0 | 4 |
| Japan | 0 | 0 | 0 |
| Pakistan | 1.0 | 10 | 25 |
| Saudi Arabia | 5 | 5 | 5 |
| South Africa | 0 | 0 | 30 |
| USA | 0 | 0 | 0 |

**Source:** WTO.

1. The Philippines and Ecuador are the main producers and exporters of abaca and abaca products principally to the EU, the US and Japan. All countries, except China and Thailand, have set a zero MFN duty for raw abaca fibre. Duty ranges from a low of 1.9 percent in the US to a high of 7 percent in the EU for cordage and ropes of abaca.

**Table 4 - MFN Applied Tariffs on Abaca and Abaca Products for Selected Major Importers**

|  |  |  |
| --- | --- | --- |
| Product Name | Raw Abaca Fibre | Abaca Cordage |
| HS Code | 5305.00 | 5607.90 |
| China | 4.8 | 5 |
| EU | 0 | 7 |
| Japan | 0 | 1.7 |
| Malaysia | 0 | 1.8 |
| Singapore | 0 | 0 |
| Thailand | 5 | 5 |
| USA | 0 | 1.9 |

**Source:** WTO.

# NON-TARIFF BARRIERS (NTBs)

1. Over the years, environmental trade barriers (ETBs) have emerged as one of the non-tariff measures (NTMs). JACKS products in developing countries have to comply with effluents, pollutants, bio-hazards, chemicals and pesticides that potentially affect health and the environment, from growing to processing. On the policy side, environmental standards may potentially act as NTBs in developing countries because they are designed according to domestic environmental priorities. These include strict packaging and labelling requirements (CERCA, FRS), sanitary and phytosanitary (SPS) measures, complex customs and administrative procedures, and import licensing requirements on the export of processed fibre product.
2. According to the WTO Environmental Database (EDB), the share of environmental related notification under the WTO Agreement on Technical Barriers to Trade has increased from 10 percent in the early 1990s to 17 percent in 2012. Regulatory standards related barriers could effectively restrict market access for exporters if they are stringent and complex, making compliance (de facto) very costly if not impossible.
3. JACKS products processed with biocides have to meet different importers’ regulations. The new EU regulatory system differs from other global regulatory systems for biocides and redefines what are considered biocidal products and treated articles. Products used to reduce microorganism growth or the odour of wood, fibres, paper, composite materials and textiles are listed in the new regulation, which cause great confusion for non-EU manufacturers that intend to export to the EU.

# CONCLUDING REMARKS

1. Tariffs on JACKS have generally been reduced under both multilateral and bilateral trade liberalization. The main constraints to market access remain the tarification for imports of processed products in several developing countries producing similar products, which are in direct competition with imported products, and NTBs, which, for JACKS, are mainly ETBs. Tariff reductions are subject to ongoing bilateral negotiations. However, for ETBs, there are several issues at play.
2. Based upon destination countries, different environmental certifications are required. Over the years, a variety of eco-labels has emerged, both public and private. JACKS products need to comply with multiple production standards for dyes, fibres and bleaching chemicals and packaging requirements. These codes mainly correspond to environmental and labour standards, which can significantly raise suppliers' costs, especially where multiple codes with different monitoring and reporting requirements are involved. In addition, in producing countries, where small and medium enterprises (SMEs) play an important role as exporters, industries may find it relatively more difficult to respond to stringent environmental requirements. SME suppliers are not fully conversant with environmental standards nor do they have the capacity to meet the significant costs involved in adopting them. Imposing countries consider it legitimate or precautionary to set health, safety, fair wage, child labour and environmental standards, but exporters require technical knowledge and help in complying with these standards. Effective gathering and dissemination of information on new environmental and health requirements in key export markets is very important. Developing countries need to participate actively in pre-standard and pre-regulation-setting consultations. Such consultations should lead to *ex-ante* reviews of the impacts of planned regulation on developing country exporters. Finally, consideration should be given to harmonizing some of these standards.
3. Conversely, more stringent regulations demanded in export markets might generate economic and environmental benefits and more efficient use of resources at the national level in developing countries. Dynamic analyses might show lower costs, since incentives for innovation and use of clear technologies may result in cost savings over the long-term. Win-win situations arise in cases where increased resource efficiency could be achieved or where price premium could be obtained through improving quality. However, the lack of knowledge, experience and financial resources of exporters from developing countries are barriers that need to be overcome.

1. JACKS: jute, abaca, coir, kenaf and sisal. [↑](#footnote-ref-1)
2. International Labour Organization. This figure should be used with extreme caution, as there are various statistical and conceptual challenges involved in providing a reliable figure of the total number of persons for which agriculture provides employment. [↑](#footnote-ref-2)
3. International Labour Organization. [↑](#footnote-ref-3)
4. Norton, Roger D. (2004), Norton, Roger D. (2004), Agricultural Development Policy: Concepts and Experiences, Food and Agriculture Organization of the United Nations, Food and Agriculture Organization of the United Nations. [↑](#footnote-ref-4)
5. International Monetary Fund. [↑](#footnote-ref-5)
6. The European Man-Made Fibres Association is the representative body for the European man-made fibres industry which includes the following fibres: viscose, modal, acetate, ultra-high molecular weight polyethylene (UHMwPE), lyocell, acrylic, polyamide, polyester, polyolefins, aramid, elastane, glass and carbon. The Association is based in Brussels, Belgium. For more information, please go to <http://www.cirfs.org/>. [↑](#footnote-ref-6)