

BREVET DE TECHNICIEN SUPÉRIEUR

PRODUCTIQUE TEXTILE

Option FILATURE
Option BONNETERIE
Option TISSAGE
Option ENNOBLISSEMENT

ANGLAIS

Durée : 3 heures

Coefficient : 2

Matériel autorisé :
dictionnaire bilingue

Tout autre matériel est interdit

*Dès que le sujet vous est remis, assurez-vous qu'il est complet.
Ce sujet comporte 3 pages numérotées de 1/3 à 3/3.*

DOCUMENT 1

Natural Fiber Substitutes For Automotive Components

NATURAL FIBERS USED IN THE AUTOMOTIVE INDUSTRY

Excerpts from *Biochemicals in the Automotive Industry*, a report by Michelle Carstensen.

The 2,000 natural materials from which humans have extracted, spun, and woven fibers also have qualities which make them attractive for the automotive engineer. This is true, despite high-technology competition from steel and plastics. Natural materials are good humidity regulators, insulate against heat and noise, and are renewable. Both bio-degradable and usually comparatively inexpensive, they rarely present a health risk. And, although normally low in weight, they are extremely strong.

Natural fibers can be used to reinforce synthetic materials. The glass fibers embedded in plastic hinder the environmentally compatible disposal of the used components. For this reason, ecologically more suitable fibers such as flax are already being used in place of fiberglass.

For example, flax or coir can be used to reinforce a thermoplastic material, such as polypropylene. This combination would be stronger and more easily recyclable than plastics reinforced with fiberglass.

Hemp has also been a key natural fiber that is suitable to replace glass fiber. However, until recently, its cultivation was illegal in Germany. As of 1996, the cultivation of hemp is again permitted and researchers have determined that its advantages even outweigh those of flax. Hemp fibers are more rigid and can be cultivated without the use of insecticides. In addition, initial investigations have shown that in most criteria, hemp matches and even surpasses flax in terms of performance potential and may even prove to be more economical. [...]

Furthermore, fibers from the leaves, wood, and even the fruit of the banana tree are bright prospects for car components including: interior trim and supports, backing for carpets, and reinforcement for polyester resins.

Mercedes Benz: Leading The Way

A modern vehicle like a Mercedes-Benz consists of a variety of materials, of which the best known are steel, plastics, glass and rubber. But a closer look underneath the bodywork of the car would reveal an increasing number of new materials which one would not normally associate with car manufacture: cotton, flax, coir (coconut fiber), sisal and latex.

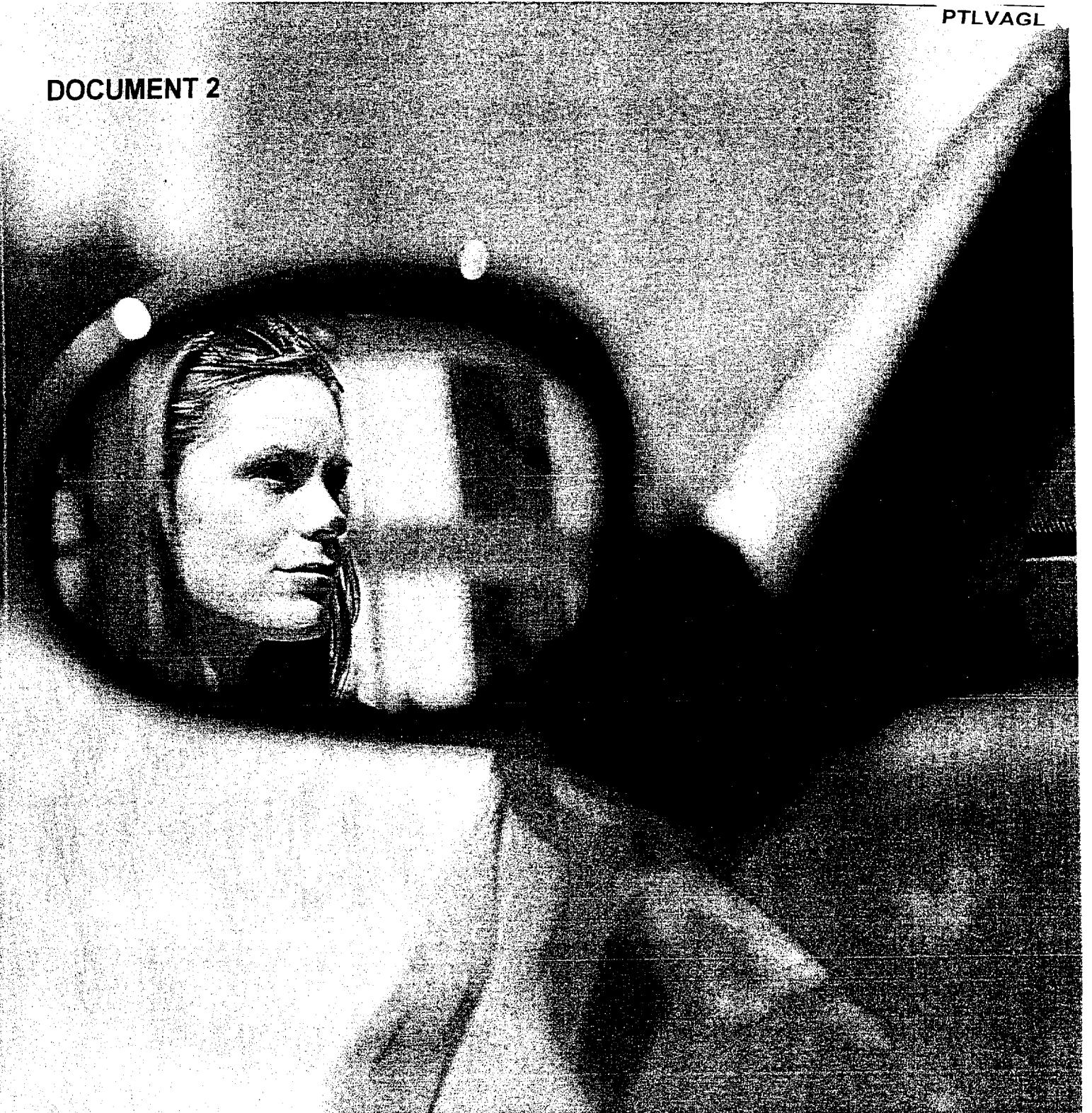
A combination of flax and sisal, called Flexiform, is used for interior trim and acoustic insulation. It is 20% lighter than traditional materials, and meets rigorous crash-test and quality control standards. In Stuttgart, engineers found that it makes a better door paneling than plastic. Besides being lighter, it does not splinter upon impact in a crash.

It also provides sound insulation. It reduces the weight of a car by one kilogram, reducing fuel consumption. It is also easy to recycle. Flexiform is already in Mercedes family size C-class cars. It is exceptionally strong, corrosion proof, and is never expected to wear out. [...]

Cotton fibers have been used to make rear parcel shelves in the class C cars. The transmission tunnel, dashboard and lower instrument panel have all been sound-deadened by cotton fleece. A mixture of cotton, coir and latex can also be used in seat cushions.

http://www.carbohydrateeconomy.org/library/admin/uploadedfiles/Biochemicals_for_the_Automotive_Industry.pdf

DOCUMENT 2



***We keep an eye on the car
So you can keep your eye on the road.***

Innovative solutions from Ciba Specialty Chemicals boost performance and protection for automotive paints, plastics and textiles. Our pigments, our flame-retardants, our UV absorbers as well as our dyestuffs keep cars looking better, longer. No matter where you're headed, we help make the journey more comfortable.

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Value beyond chemistry 2/3

TRAVAIL À EFFECTUER

I. COMPTE RENDU EN FRANÇAIS (10 points)

Rendre compte **en français**, de manière ordonnée et cohérente, des éléments essentiels exposés dans le **DOCUMENT 1**.
(200 mots +/- 10%)

II. EXPRESSION EN ANGLAIS (10 points)

1. Why does Mercedes Benz use natural fibers in its cars? **(80 mots)**

(3 points)

2. In your opinion, what can be done in the field of textiles to improve our environment? **(80 mots)**

(3 points)

3. Describe and analyse **DOCUMENT 2**. **(130 mots)**

(4 points)