

# Use of natural fibres in composites in the German and Austrian automotive industry

## Market Survey 2002: Status, Analysis and Trends

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From June to October 2002, 139 companies and institutes from the natural fibre composite sector in Germany and Austria were addressed with a standardized questionnaire.

24 companies and institutes, 50% of them tier-one suppliers, sent the filled-in questionnaire back. The survey's major goal was to collect reliable data about the equaled status and the future market development of the use of natural fibres in composites in Germany and Austria (1, 2, 3), analogously to the surveys by the nova-Institut in 1996, 1999 and 2000.

The analysis of the survey results shows that the major automotive supplier (here tier-one suppliers) make the most substantial contribution to the use of natural fibres for composites. The currently most important German and Austrian producers of natural fibre composites for the automotive industry are listed in the following:

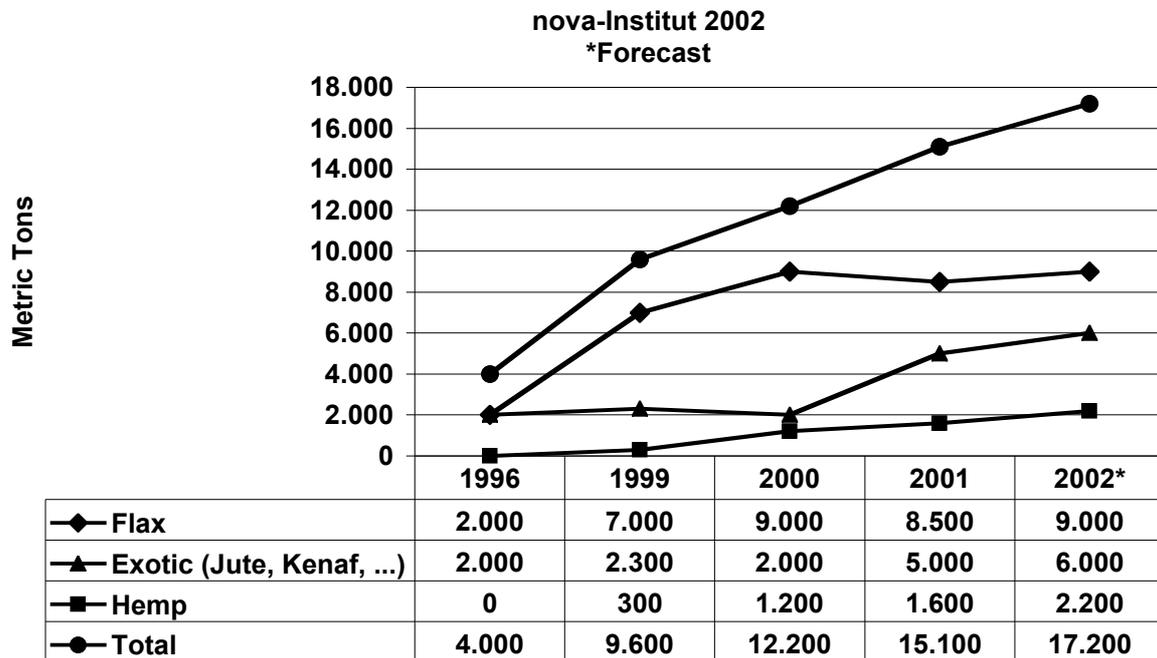
- Borgers
- Dräxlmaier
- Faurecia Interior Systems
- Findlay Industries
- Funder Industrie
- Johnson Controls Interiors
- Karmann
- Lear Corporation
- Quadrant
- Seeber

Basically, the survey results amongst the tier-one suppliers show that inspite of the relatively poor economic situation in the automotive sector in 2001 and 2002, the use of natural fibres (excl. of wood and cotton) for composites has further increased.

Figure 1 shows the current development till 2002. According to this delineation, 15,100 tons were used in 2001, and a use of 17,200 tons of natural fibres for composites is forecasted for 2002.

*Remark:* As a consequence of the current surveys, corrections with regard to former surveys and analyses by the nova-Institut were necessary (1, 2). In the framework of the currently conducted surveys, the data of all surveys since 1996 have newly been analysed, detecting and correcting not only forecastings by the interviewees that were too optimistic, but also inconsistencies and outliers in the older data. While the new analysis could confirm the trend of the former surveys, it could not hold up the absolute use amounts of natural fibres. Compared to former surveys, these amounts were respectively achieved not before two years later.

## Use of Natural Fibres for Automotive Composites in Germany & Austria 1996-2002\*



**Figure 1:** *Use of natural fibres for automotive composites*

Basically, an almost linear increase in the use amounts from 1999 till 2002, with an average yearly growth rate of 22%, can be stated. However, in the single years different natural fibres were responsible for this growth. Until the year of 2000, the growth rate was predominantly conditional upon the increased use of flax fibres. With the beginning of the flax fashion trend and the increase of flax tow prices in 2001 however, this picture changed, and the thitherto more stagnating resp. even declining “exotic fibres” (jute, kenaf, sisal) could substantially put on in 2001 and 2002.

Since its rediscovery in 1996, the use of hemp fibres shows a continuous increase to about 2,200 tons in 2002. Due to the fact that the European hemp industry has comparatively small production capacities, the demand gap, which resulted from the further increasing demand and very high flax tow prices, could not be covered. In the years of 2001 and 2002, this was the chance for exotic fibres, which were predominantly imported from Bangladesh and India. Regarding the value of the used natural fibres, for the year of 2002 there is a market value of about 10 Mio. EUR in Germany and Austria, given a total of 17,200 tons and an average price level of 0.55-0.60 EUR/kg (Total EU: about 15 Million EUR, at a use of 25,000 tons of natural fibres)

Also the forecastings by tier-one suppliers for the future amount development from 2001 till 2005 turn out positively, with an average yearly increase of about 14 to 15 percent.

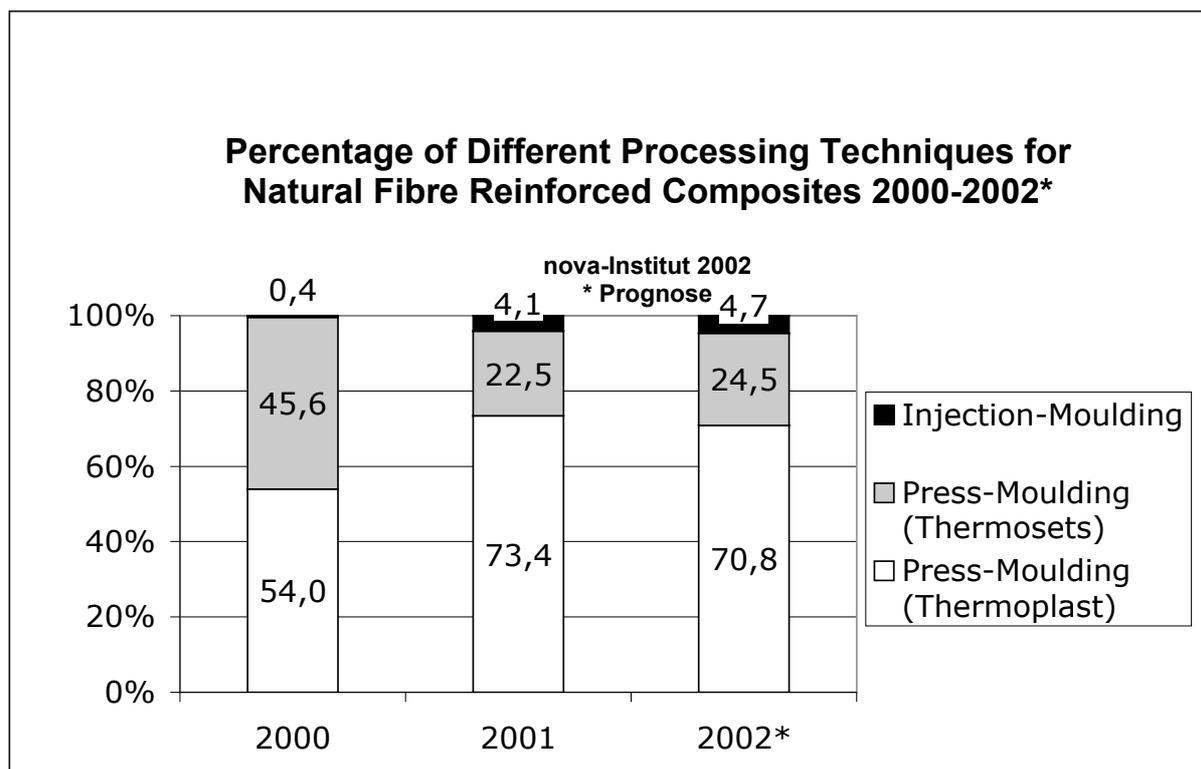
Depending on the realised growth rate, one can assume a natural fibre use of about 26,000 to 34,000 tons for natural fibre composites in the automotive sector. In automobiles that make use of natural fibres for press-moulded parts, the average use amount of natural fibres is between 5 and 10 kg per vehicle, depending on the model.

For the future, one can expect other models in other vehicle segments and means of transport (e.g. small cars, trucks, trains), as well as in other European countries (e.g. France), to be fitted with natural fibre press-moulded parts.

The 5 to 10 kg of natural fibres that are possible at present alone yield a market potential of 80,000 to 160,000 tons of natural fibres for press-moulded parts per year, given 16 million produced vehicles in West Europe.

The analysis of the survey results amongst tier-one suppliers regarding current processing technologies shows that in comparison to the survey of 2000, a clear trend towards thermoplastic matrix systems like polypropylene can be observed. The reasons for this can be found in the easier processability of thermoplasts and also in the fogging problems of certain thermoset matrix systems.

From figure 2 we learn that in 2000, 45% of the produced natural fibre press-moulded parts still had a thermoset matrix (e.g. PU). In 2001 and 2002 however, merely 22 to 24% of natural fibre composites still featured a thermoset matrix. It also becomes clear that with regard to the processing technique, press-moulded parts keep on leading the way. When it comes to injection-moulding, however, a slight increase to 4,7% in 2002 can be observed, currently tracing back to the already serial use of cellulose fibre injection-moulding (these data include both natural fibres and wood resp. cellulose fibres).

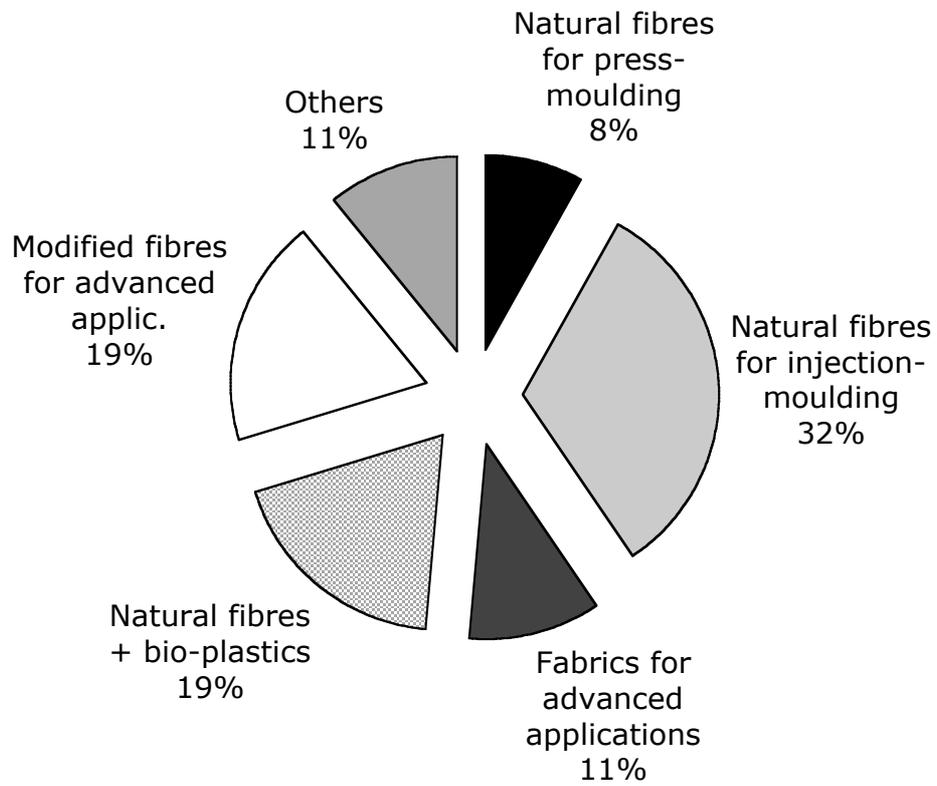


**Figure 2:** Percentage share of different processing techniques of natural fibre composites

With regard to the future trends till 2005, the analysis in figure 3 shows that 32 % of the interviewed companies and institutes anticipate an increase in the importance of natural fibre injection-moulding techniques. The natural fibre injection-moulding segment can accordingly advance to an important growth factor of the future use of natural fibres in composites. Also other innovative techniques and materials like “modified/treated natural fibres for expanded application fields” or “natural fibre reinforced bioplastics” will gain importance in the opinion of respectively 19% of the interviewees.

## Future Trends 2005: Which Natural Fibre Technologies for Composites Will Gain in Significance?

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**Figure 3:** *Future Trends 2005*

## Literatur

- 1 Karus, M., Kaup, M. 2001: *Naturfasereinsatz in der europäischen Automobilindustrie*. Technische Textilien, Jhrg. 44, 11/2001, S. 258-262
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The market study presented here in short is part of the cooperation project “development of a characteristic value database for natural fibre reinforced materials from native renewable resources”. The entire project is conducted by the partners Institut für Kunststoffverarbeitung (IKV), Aachen, M-Base Engineering + Software GmbH, Aachen, Fibre Institute Bremen e.V. and the nova-Institut GmbH, Hürth. Through the Specialized Agency of Renewable Resources (DE: Fachagentur Nachwachsende Rohstoffe / FNR), under the project number 22004500 the project thankfully gets financial support from the Federal Ministry of Consumer Protection, Food and Agriculture (BMVEL).

For further information visit [www.N-FibreBase.net](http://www.N-FibreBase.net). There you can find also information about suppliers of natural fibres, nonwovens and composites, as well as a price development index for flax and hemp fibres starting on may, 8<sup>th</sup>.