

leading in emotions

NATURE 50 

Trim parts HIB / NBHX



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DECEMBER 2012 – The Goal

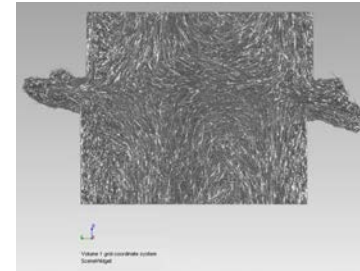
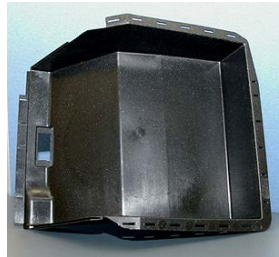
Development of a **lightweight decorated trim part** with **cost reduction**, made from **renewable raw materials**

IDEAS:

Formed NF-PP

NF-PP/ WPC injection mold

Filled PP injection mold



THE JOURNEY

- Decorated formed natural fiber – PP mat

The benefit:

- Easy to handle
- Machine manufacturer and toolmaker are on hand in Germany
- Could be used for mass produktion

Handycap:

- Small radius are not fabricable
- Fasteners must be clued or expensive backmolded



THE JOURNEY

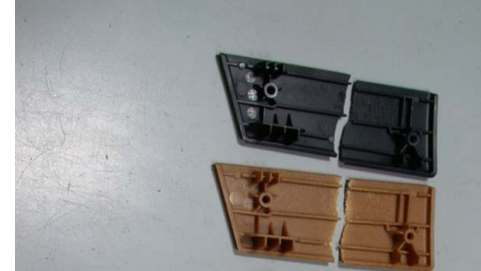
- **WPC material**

The benefit:

- Easy to handle
- Run at standard Injection machines
- Lightweight material

Handycap:

- Mechanical values for automotive not in range



THE JOURNEY

April to June 2013 Inquiry for molding NF-PP materials

- Inquiry:
 - dissertations
 - engeneering studies
 - results out of Reseach and Development
- Search report
 - only short fiber PP materials on market → Test WPC materials
- **Idea : injection molding mat** → Search supplier of hemp or flax fibers

THE JOURNEY

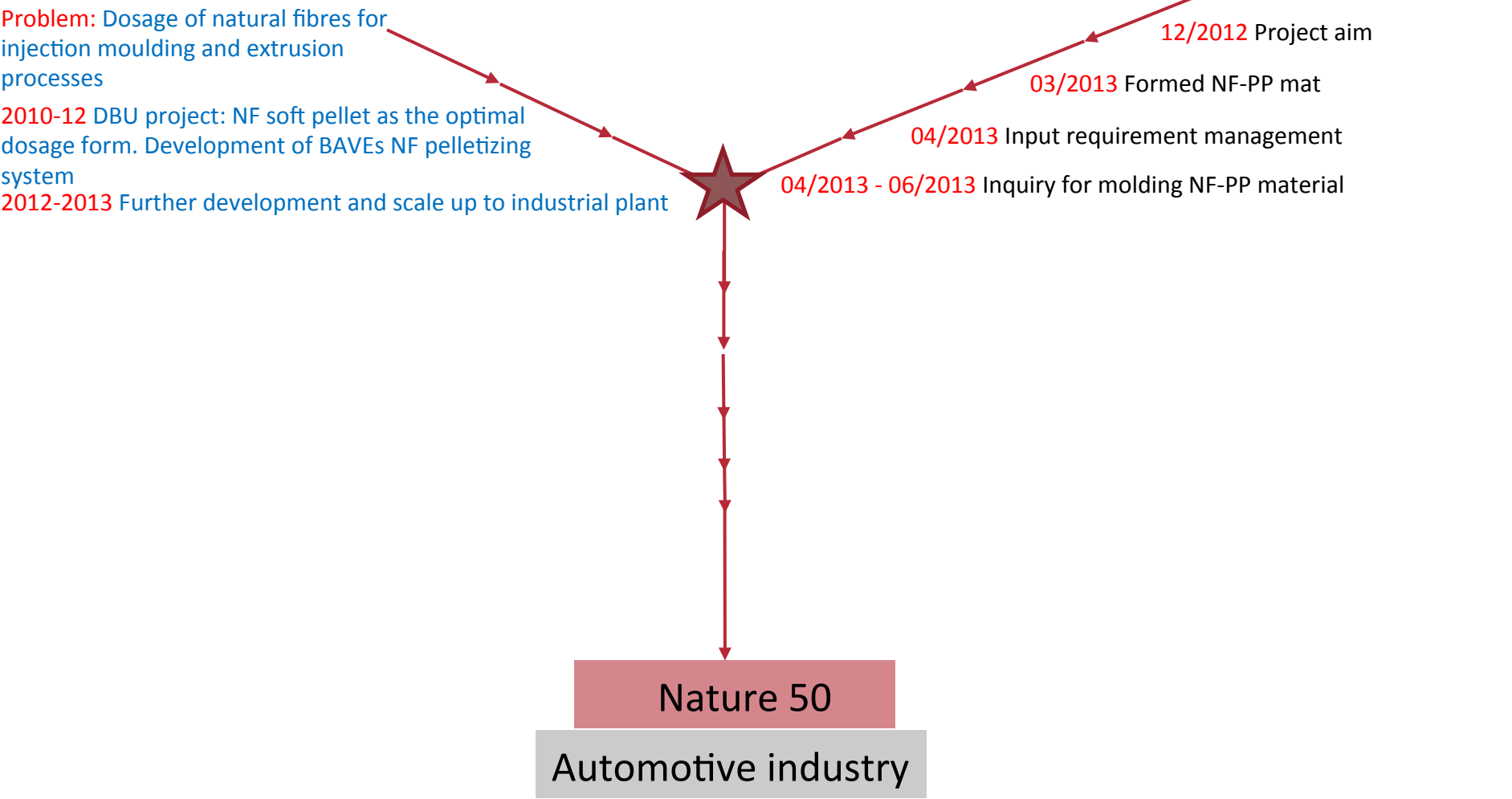
June 2013 Supplier of hemp and flax fibers

Durchbruch beim Naturfaser-Spritzgießen: Zufuhr als Faserpellets löst Dosierprobleme

Gefördertes Projekt konnte erfolgreich abgeschlossen werden, Hanffaser-Pellets stehen ab sofort zur Verfügung

Die Ergebnisse des von der Deutschen Bundesstiftung Umwelt (DBU), Osnabrück, geförderten Projekts „Entwicklung einer industriellen Naturfaser-Pellet-Produktion zur Nutzung von Naturfasern als Verstärkung von (Bio-)Kunststoffen in Spritzguss und Extrusion“

- My idea of a injected molded mat is gone realistic
 - BaFa GmbH in Malsch are one of the project partners.
 - They are very closed to HIB Bruchsal.



THE RAW MATERIAL – Natural fibre pellets from different fibres and additives



THE PELLET MATERIAL – Produced by company bave, grown in France



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FIRST STEPS - First tests with hemp and flax fibers

MY IDEA : No chemical connector only long fiber hemp and PP

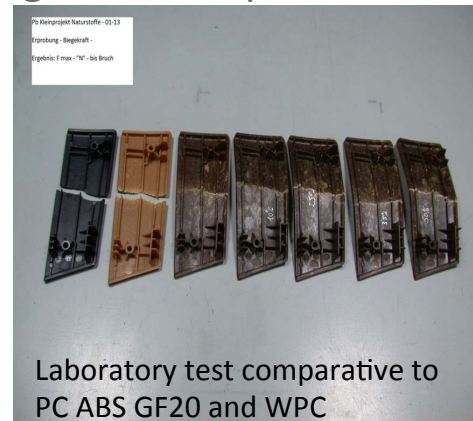
mixtures : 4% pellet material, 96% PP

19% pellet material, 81% PP

29% pellet material, 71% PP

44% pellet material, 56% PP

54% pellet material, 46% PP → Current pellet material



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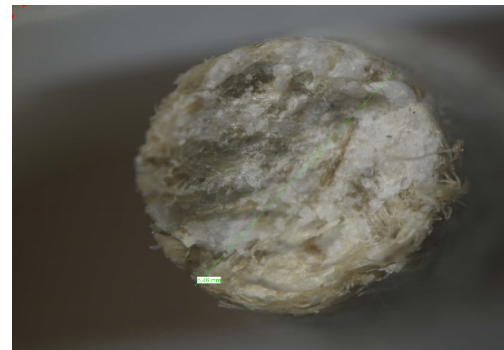
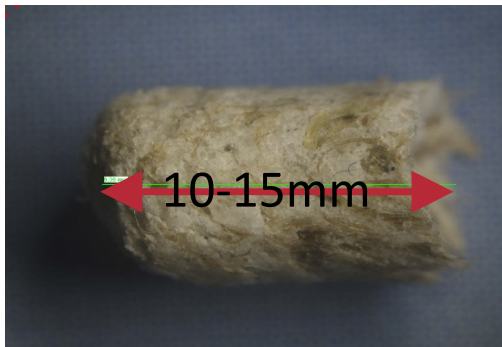
- ✓ Molding Wood plastic composites (WPC)



- ✓ Inquiry for natural long fiber molding material

THE IDEA WAS BORN → LONG NATURAL FIBERS combined with POLYPROPYLEN
in form of a COLD PRESSED PELLET

- Improvement Pellets together with company Bave



THE JOURNEY

- ✓ Decorated formed natural fiber – PP mat



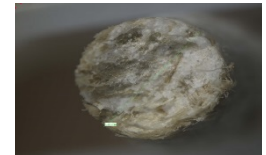
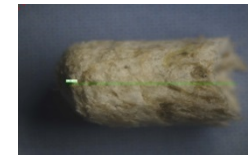
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- Improvements injection parameters for 3 different injection machines
(80to. ; 420to. and 650to.)



THE JOURNEY

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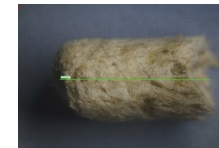
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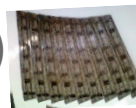
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- Long-term production test with 10 tons hemp
(3 different ratings of hemp)

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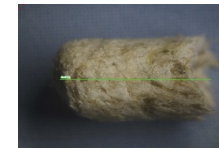
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- Trails with recycling PP → Upcycling product. First tests results are optimistic

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NATURE 50 – unique specific character

- **Mechanical properties close to PC ABS GF 20 material**



→ Dart impact strength

→ Shrinkage (PC ABS GF20 = 0,24%; Nature 50 = 0,26%)

- **More than 50% natural long fibers in hemp or flax**



→ No chemical bonding materials, molded mat

→ No sharp edge after break

→ Cold pressed pellets, no extrusion pellets

- **Weight reduction to PC ABS GF20**

→ up to 20%

NATURE 50 – unique specific character

- Amazing surface optics for colored molded parts
- Combining material for backmolding NF-PP mats
- **Upcycling** product if **recycling PP** is in use.
- **Positive CO2 footprint**

NATURE 50 – Project Summary

- Nature 50 is a alternative to PC ABS GF20 plastic
- Can be used for :
 - Backmolding wood trim parts
 - Backmolding Aluminium trim parts
 - Backmolding Carbon trim parts
- Nature 50 is a **lightweight material**
- **Cost reduction**
- Colored molded material can be used for **new design surfaces**

NATURE 50 – The material



Hanf – PP 8% weiß Matt lackiert

Hanf – PP 8% weiß Hochglanz lackiert

Natur Hanf – PP Hochglanz lackiert

Natur Hanf – PP Matt lackiert



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NATURE 50 – The material white coloured



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Charpy Dart impact strength

Wert in KJ/m²

konditioniert

**M/MB5 PC ABS
GF 20**

**40 /13 Hanf
PP L**

**48 / 6 Hanf
R_PP**

32,00	32,00	29,60	
28,80	27,20	24,80	
30,40	28,00	30,40	
30,40	28,00	21,60	
29,60	28,00	21,60	
30,40	28,00	28,00	
28,00	27,20	21,60	
31,00	26,40	36,00	
28,00	28,00	28,00	
28,00	28,00	28,00	
29,76	27,84	28,08	Meanvalue
28,00	24,80	21,60	Minimum
32,00	32,00	36,00	Maximum
1,28	1,75	3,64	Standard deviation

Interne
Laborwerte



NATURE 50 – Award



- 8 th International Conference on Bio-based Materials
13-15 April 2015, Maternus, Cologne, Germany
- We are happy and proud to announce
that we received the **second Price**
Bio-based Material of the year

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***How it function ?
See some clips out of production***