RESSOBOIS – WOODEN BOXSPRING

Problem – Challenge
Sleep is one of the essential part of our existence. Nowadays our sleep is disturbed by many factors like noise, indoor air quality, light and Electromagnetic. Customers’s demand is increasingly oriented to the use of fully natural materials in order to replace metal and plastics in bed systems. Elite SA and the Institute for materials and wood technology of the BFH have been together studying the possibilities to replace flexible metallic parts in bed by wooden elements. This represents several technical challenges: the element should have an adaptable stiffness to give comfort to the different body parts; they should have small dimensions and should resist to approximately 30’000 loads and climate cycles. The complex analysis of the wood behaviour in terms of hygromecanics, relaxation, creep, fatigue and viscoelasticity in this specific case had to be first clarified. 3-dimensional woodworking solutions had to be developed in order to find a suitable cutting pattern giving wood more flexibility.

Solution
The project has demanded an extended work in prototyping and mechanical characterisation wooden springs. Several wood species were investigated as they offer different solutions in terms of viscoelasticity and resistance. Climate cycles have been measured in different point of a bed in normal use. Thanks to this data it was possible to simulate numerically the solicitation of several night cycles. A testing set-up was also developed in order to validate the numerical models with experimental values. Finally the team developed a wooden box spring system where laths are 3-D machined in order to produce an in-line series of wooden rectangular springs. This offers a progressive load carrying and increases the comfort. The system is manufactured out of spruce (Picea abies) without any specific treatment. First Wooden Boxspring systems are already successfully commercialized by Elite SA.

DNAFOIL – 30 MINUTES TEST TO DETECT UNDECLARED INGREDIENTS AND CONTAMINATIONS IN FOOD

Problem – Challenge
To be safe for consumption, food needs to be free from pathogen contaminants. In addition, many consumers want to be able to detect and avoid specific foods such as for example peanuts, pork or horse meat. DNA testing is possible but currently takes up to 7 days and can only be done in a laboratory setting. Food is however produced and consumed much faster, often in only about 2 days. The resulting gap constitutes a big risk for food companies who often have to resort to expensive and image-damaging food recalls.

Solution
Researchers at the University of Geneva have invented a DNA-reacting, color-changing ink that can be used to detect specific DNA bar codes with the naked eye, outside a laboratory setting. SwissDeCode, a spin-off company from the University of Geneva, has developed a point-of-need test kit that allows food factory staff to screen raw materials and finished products for undeclared ingredients and contaminations in 30 minutes. SwissDeCode has won a MassChallenge Accelerator Gold prize in November 2016 and has started commercializing its first kit for meat detection in early 2017.