EUROPEAN COMMISSION
RESEARCH DIRECTORATE-GENERAL

Directorate G - Competitive and Sustainable Growth : industrial manufacturing research
Products, Processes, Organisations

RTD.G2/AdB

EC research project on Violins, Bows and Strings.

This research project changed violin building into a profession, where the violin players specify upfront what kind of violin they would like to have. The violin, bow and string builder are now capable of making an instrument that meets the specifications of the client.

This means that the usual way of working, where a violin or bow maker produces an instrument and then looks for a client who likes the instrument, is inverted. This project allows the producer to systematically influence and control the behaviour of the violin, bow, and string to satisfy individual preferences of the artists.

The project continued the long rewarded tradition of violin-making, that originated in central Europe, including masters like Stradivarius, Guarneri, Amati, Bergonsi, and Montaniana. The project continued and protected this unique European heritage.

Research done in the Research programmes of the EC, target to innovate production in a sustainable way. The current string instrument market is about 100.000 string instruments a year in European representing 530 m€ a year in turnover of which 50% is satisfied by non-European production. There are some 2000 violin builders in Europe who could use the results. The inclusion of the schools of Cremona and Markneukirchen help to disseminate the results. Increasing demand is indicated by an ever increasing waiting list for producers.

The project was a collaboration between professional violin-makers, bow-makers, and string producers across Europe, accompanied by researchers in psychoacoustics, materials and production technologies.

Artists were asked to describe their wishes according to a set of 10 parameters like brightness, reaction, balance and colourfulness. Some of these parameters are clearly related to physical properties of the violin, bow and string, whereas others to their surprise can not be related to physical properties of the instrument.

With this knowledge a reliable description of what the artist would like to have as a violin could be established and the project continued to investigate the material, form and dynamic characteristics that would meet these specifications. New presses for the ribbon covering strings were developed as well as quality inspection tools. New material was found for the bows. To determine the wood characteristics new ways were

Commission européenne, B-1049 Bruxelles / Europese Commissie, B-1049 Brussel - Belgium. Telephone: (32-2)299 11 11.
Office: 2/20. Telephone: direct line (32-2)2963.586. Fax: (32-2)2958.046.

E-mail: Anne.Debaas@cec.eu.int

developped into tools together with a new laser–based non destructive testing method to measure the thickness of the violin plate.

Next to the specification methodology, the project achieved a classification of wood suitable for violin making and a surface characterization of wooden instruments as a basis for the final production. Martin Schleske (violins@schleske.de), the violin builder of the project, is now producing violins, that meet the highest standards. New tonal copies of old master-violins are produced at affordable prices. But most strikingly Schleske is capable of mixing the characteristics of a Stradivarius and a Guarneri according to the wishes of the artists.

Arcus (www.arcus-bow.de) designed new standards for the bows of carbon reinforced material and their bows posses very high quality and are already in use by renowned musicians worldwide.

Karl Hoefner (hofner-gmbh@t-online.de) will use the results in their factory that turns out thousands of violins a year and the results will be used by their daughter company Paesold, a large bow manufacturer.

The new methods of processing cover material for strings enables Thomastik Infeld (vogl@thomastik-infeld.com) to produce strings that are very even over their total length and with the characteristics in swinging aimed for.

In short, this collaborative project integrated the know-how of the partners, each so different from the others. This cross- European network came to astounding new results and will in future guarantee the continuation and protection of the European heritage in stringed instruments.

Other projects funded by the EC Research programmes target innovating the production of church organs and piano's. They respectively work on the windsystem design, expert systems for tuning and sound amplification. Information can be obtained from Konrad Mühleisen (Orgelbaumu@aol.com) and Rolf Ibach (rolf.ibach@ibach.de).

Dr Anne de Baas
Principle Scientific Officer
European Commission,
Research Directorate General,
Directorate G - Competitive and Sustainable Growth
Unit G2 - Industrial Manufacturing Research