

тем не менее они обладают достаточно высокой приспособляемостью – 1,35 и выше.

Следовательно, выводы об эффективности использования ДПМ на лесосечных машинах [2] распространяются и на машины с двигателями Common Rail. С большой долей вероятности можно предположить, что формулы (1), (2) и (3) для определения скорости грузового хода и транспортной производительности лесосечных машин оснащенных ДПМ могут использоваться в расчетах и для техники на которых установлены двигатели с аккумуляторной топливной системой Common Rail.

#### ЛИТЕРАТУРА

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## **PROJECT PROWO: PROMOTING CROSS-BORDER WOOD CONSTRUCTION BUSINESS**

Timo Pakarinen

*Karelia University of Applied Sciences, Joensuu, Finland*

Svetlana Tereshchenko

*Saint-Petersburg State Forest Technical University, Saint- Petersburg, Russia*

Micro-project PROWO is connected with the opportunities of the development of wood construction in the cross-border territories in Finland and Russia. Karelia University of Applied Sciences is participating in the project from Finnish side. From Russian side there are two participants: Petrozavodsk State University and Saint Petersburg State Forest Technical University. The project will be realized in the frame of funding of Karelia CBC program.

Wood construction is one of the potential growers' in the construction business sector. It is one of the big promises of bioeconomy. In case of effective development of wood construction, it might influence on local economies providing more profits and expanding labor markets for experienced persons and young graduates. It may support the employability and wellbeing in the cross-border regions. Furthermore, Finland promoting bioeconomy and wood construction is one of the key goals set by the national government. However, the potential of the wood construction business is still partly hidden and the resources are not utilized. Furthermore, there are bottlenecks slowing down or even hindering the development of the business. The bottlenecks seem to relate to the politics, attitudes and questions of land use and zoning, difference in methods of structural design according to Russian codes and Eurocodes, absence of mutual understanding (there is still no harmonization between design documents) . That's why there is a severe need for the key players in the partnering cross-border regions to find new ways to win the obstacles, expand the wood construction businesses

and build an innovation hub bridging and growing the varied expertise bringing added value for all parties.

The universities that are participating in the project play a key role in developing the expertise and networks supporting the businesses in the cross-border regions. In its best, innovation, research and education form an iterative development process where higher education organization, businesses and business developers together find new ways to benefit all the actors. Yet, there is still work to do to identify the bottlenecks of the development in details and to find ways to fill in the gap between the higher education and businesses.

The overall goal of the micro project PROWO and later the regular PROWO project is to strengthen the business opportunities, markets and expertise in wood construction businesses across the border applying both B2B and U2B approaches bridging the key players together to work for the shared goal. This work will be done by the partner universities, businesses and business developers. Micro project PROWO aims at three goals: 1. Identifying and analyzing in details the bottle-necks hindering the growth and full use of the potential of the wood construction business, 2. Building the network of key players to develop the business, 3. Building common understanding on how to solve the exiting problems. Micro project PROWO results will form the base for the development of big project PROWO. It also preliminarily gives opportunities to investigate the possibilities for new business models, incubators and innovations. Expected results of micro project PROWO will be: 1. Increased knowledge and understanding about the obstacles and opportunities for the business development. The increased knowledge and understanding will be based on profound data collection and analyses – such knowledge will not be received without interaction. This may support the potential developers in their future actions and make the key players and networks visible. 2. Increase of the awareness of not only the businesses and universities but also the wide audience which will strengthen the positive attitudes to wood based building.

The target groups and beneficiaries of the project are the regional wood construction businesses, universities, business developers, administrative organizations, communities and the authorities dealing with wood construction issues. As the project is a small scale one and preparatory in its character, the direct target groups and beneficiaries are the partner universities, the pilot businesses and business incubators who join the project implementation. The indirect target groups would benefit from the project later on as it would improve the business possibilities in the regions.

Micro project PROWO will have three concrete outputs: 1. Analyses on the bottlenecks and obstacles hindering the growth of the cross-border wood construction business; this will be published as a Cross-border case study. 2. A list of potential businesses, who will commit themselves to participate in the project as equal partners and pilot the actions. It was decided that 5-10 companies will participate in the project from each side. 3. A concrete plan for the future development based on the future wheel and its reflective analyses with the previous workshop result. The plan will lead into the CBC-development project which will in its turn widely discuss and explore the possibilities to boost cross-border wood construction business.

In the frame of micro project PROWO there will be made a thorough survey in the three cross-border regions (North Karelia in Finland, Leningrad Region and Republic

of Karelia in Russia). Each of the surveys is led by the university from the region involving local businesses. Based on the results of the surveys, micro project PROWO may build a coherent partner network to enable the consortium to design and create a feasible regular project involving all the key actors and potential businesses from the partner regions to reach the PROWO goals.

The activities in this project are quite simply and easily can be organized. It was planned that there will be three workshops during the micro project PROWO in each of the regions, participating in it (North-Karelia, Petrozavodsk and St. Petersburg). Besides of the workshops, the project team will work online applying some e-tools like Moodle, Yammer or alike and also Office365 will be utilized. The micro project PROWO will last twelve months.

The cooperation is based on the combination of relevant expertise the partners that can be used in the consortium. All the partners bring in their own expertise and networks with a bit different emphasis on the knowledge and skills needed in wood construction – together this formulates a community of experts who together may achieve much more than any of the players alone. Furthermore, the partner regions share a great potential in promoting wood construction business.

## **ВЫЯВЛЕНИЕ НАИБОЛЕЕ РАСПРОСТРАНЕННОГО ДЕФЕКТА, ВОЗНИКАЮЩЕГО В ПРОЦЕССЕ ЭКСПЛУАТАЦИИ КОЛЕНЧАТЫХ ВАЛОВ**

Парфенопуло Г.К., [parfenon73@mail.ru](mailto:parfenon73@mail.ru), Кретинин В.И., [kvi\\_1960@mail.ru](mailto:kvi_1960@mail.ru), Алексеева Е.А., [2904180@mail.ru](mailto:2904180@mail.ru), Кривоногова А.С., [kas.spb.lta@mail.ru](mailto:kas.spb.lta@mail.ru), Черных Л.Г., [2904180@mail.ru](mailto:2904180@mail.ru)

*Санкт-Петербургский государственный лесотехнический университет имени С.М.Кирова*

*Введение:* Как показывает статистика, дефекты коленчатых валов носят обычно усталостный характер и вызываются переменными напряжениями изгиба и кручения.

Разрушения отдельных элементов кривошипа начинаются в местах концентрации напряжений, у краев масляных отверстий коренных и шатунных шеек со щеками. При усталостном разрушении шейки вала от переменных напряжения кручения на поверхности шейки образуется спиральная трещина, идущая от краев масляного отверстия в направлении щек. Усталостное разрушение щеки от переменных напряжений изгиба, сжатия-расширения и кручения начинается в середине щеки по сечению галтели вместе максимальной концентрации напряжений.

*Методика исследования:* Согласно проведенных исследований, наибольшее распространение (около 90%) получили износы шатунных и коренных шеек.

Коленчатые валы автомобильных двигателей, поступающих в ремонт, могут иметь следующие дефекты:

➤ обломы и трещины, в том числе трещины на шейках проходящие через отверстия масляного канала и не доходящая до галтели на 3мм и больше;