QUALITY INNOVATION 2015
Application form

The maximum length of the completed application is 2 pages and max 5 pages attachments. Please send the completed application form to EUSKALIT (Terese García: tgarcia@euskalit.net).

(Note. More information about the competition and how to fill this application form can be found www.qualityinnovation.org)

The official name of the organisation SORALUCE S.COOP.		
Postal address Osintxu auzoa	Postal code E-20570	City BERGARA
Competition category (*Please delete unnecessary categories. An innovation may only participate in 1 category.)* **Large companies** - For large companies with turnover more than 50 million EUR and/or more than 250 employees		
The name of the quality innovation (max. 100 characters) *DAS system (Dynamics Active Stabilizer).*		
A short description of the quality innovation (max. 200 characters) *A device integrated into a machine tool ram that makes possible to increase the power for cutting conditions in the machining processes, through the improvement of the machine's dynamic rigidity.*		
Description of the innovation (Explain what is the essence of this innovation, starting point, steps taken, resources used (human and financial) and a description of how the innovation has made a difference, financially or environmentally). *Essence of the innovation: Through an innovative active damping system, the DAS system reduces the risk of instability (chatter) and enables the machining process to attain maximum cutting conditions with an increase of up to 300% in cutting capacity at many stages of the process, with a resulting improvement of up to 45% in average cycle times .The system also makes possible to improve the quality of surface finishing quality and reduces the risk of tool breakage, thereby increasing their useful life.* *Starting point: This innovative opportunity was based on the idea that the limiting dynamics of chatter in the machining processes (considered as a problem inherent to the sector) can actually be eliminated or reduced. This initial concern was combined with SORALUCE's awareness of prior developments in the "Dynamics and Control research line" at IK4-IDEKO technological centre. This research centre had already shown the potential of using active damping systems to improve the dynamics in these types of machining processes in a laboratory environment.* *Steps taken: Therefore, SORALUCE started a large innovation project requesting the collaboration of IK4-IDEKO as a technological partner regarding R&D activities. This project finished with the launch of the new DAS system onto the market. The product is Intellectually protected by a European patent request (EP14380034.0) after exhaustive analysis.* *Used Resources: The aforementioned innovation project started in 2013 and was considered as finished in 2014 with the official presentation at Innovation Days organised by SORALUCE-BIMATEC in Germany. It is a clear example of Open Innovation, which has been constructed mainly through the creation of a joint team between SORALUCE and IK4-IDEKO. SORALUCE personnel from practically all departments have played a part (commercial, sales, technical office, purchasing and production) with leadership and involvement from general management as this was considered a strategic project. From IK4-IDEKO, researchers from the Dynamics and Control line collaborated on the R&D aspects themselves along with research personnel from the Strategic Innovation line, especially collaborating on all aspects related to competitive intelligence, industrial protection and supporting of market launch.* *On a financial level, the DAS innovation project had an approximate budget of €850,000 in the almost two years of the project's duration. In this sense, it is necessary to thank the public institutions for their cooperation, especially regarding aspects related to the challenges in R&D, through their specific aid programmes.* *Financial and environmental results: The launch of the DAS has had the effect of increasing the sales of SORALUCE machines during 2015. Practically all of them have included the DAS system, with the resulting increase in added value and price. This extra margin has made possible for SORALUCE to achieve pay-back of the investment into the project in less than a year.* *Therefore, the DAS has made possible not only to improve SORALUCE's competitive positioning, but also to increase sales with higher margins.* *In the environmental field, improvements are determined by reductions in production times and higher energy efficiency rates consuming less energy. These improvements are reflected in lower environmental costs to be attributed to each machined part.*		

INNOVATIVENESS

Self-assessment of the innovation's novel features. How the innovation does fulfil and/or exceed the customers, society's or environments needs in a new or significantly revised way?

Chatter is a typical dynamic instability effect and is inherent to all machining or cutting processes. It has been a constant problem for the sector and for which the usual solution has mainly consisted of two measures: By the machine tool manufacturer: over-sizing the machine in the design with the consequent increase in costs. By the machinist: slowing down cutting conditions with an increase in cycle times and unforeseen costs.

The DAS breaks this paradigm and makes possible to achieve cutting conditions that previously were susceptible to the appearance of chatter. Therefore, the machine's maximum power can be used throughout the entire work space.

Self-assessment of usability. How is the innovation applied in practice? Is it done systematically and according to a plan within the organisation? Is the innovation usable?

This is the result of a collaboration plan between SORALUCE and IK4-IDEKO. This refers to a collaboration plan that made it possible to jointly carry out systemised Open Innovation processes. From identifying the opportunities through Competitive Intelligence and creative processes, to the creation of new duly protected products and services. The DAS system is one of the successes with clear usefulness in the sector that acquires the characteristics of a disruptive innovation for SORALUCE's clients. This refers to machining companies under strong competitive pressure and the need to reduce times and costs, as well as to improve the finishing quality.

The DAS, as an integrated accessory, works automatically and does not require any special training for clients. In the different tests corroborated by the clients, the cycle times were reduced by up to 45%. These improvements also have a significant effect on the cost attributed to using the machine. An increase of the tool lifespan and improvements to the part surface quality also occur. All these improvements have their consequence on the environment by giving the processes greater energy efficiency. In addition to the savings in time and energy used, it is all reflected in the lower cost added to each part.

Learning. Is the innovation based on a new idea or discovery? Is the innovation based on a systematic development process? Does the innovation extend an existing knowledge or practice?

Within the Open Innovation framework system itself between SORALUCE and IK4-IDEKO, there are various sources that enabled the identification of DAS as a great opportunity in the market.

Firstly, direct feedbacks and opinions from customers were obtained by SORALUCE worldwide. Secondly, the supplier network also suggested ideas related to overcome technical challenges. Moreover, IK4-IDEKO, as an expert in production processes, carried out a scientific-technical assessment on the opportunities and provided proposals within the framework of Competitive Intelligence and systemised creativity processes. This entire collaboration network facilitated the evaluation of all the ideas and the execution of a selection process based on prearranged methods.

Such selection and prioritisation triggered an innovation process that was aligned with the SORALUCE Market Plans and Products and in which the intellectual property aspects were also key issues. In fact, they are cyclical and recurring processes based on modern methodologies such as the Lean Start-Up model.

QUALITY

Self-assessment of customer orientation. How does the innovation correspond to stakeholders and customers current and/or future needs? How does the innovation fulfil and exceed their requirements and expectations?

As we have mentioned, the product innovation that the DAS system entails directly influences the competitiveness of clients that demand solutions for improvements in their production processes. In any case, one of the main points for satisfaction and improvement of expectations is based on dislodging the myth of the inevitable appearance of chatter and impossibility of reducing it without having to reduce the cutting conditions and therefore, increasing times and financial and environmental costs. The DAS enables to achieve previously unimaginable levels by attaining all of the machine's power and capacity, which until now had been hidden in the shadow of chatter.

Self-assessment of effectiveness. How has the innovation improved technological and commercial performance with regard to the customer and ecological / social responsibility?

1. *The DAS system means using the machine's maximum power throughout the work space. Under certain conditions it is capable of reducing chatter to the maximum and achieving improvements in productivity up to 300%.*
2. *The average cycle times have been reduced by up to 45%. These improvements also have a significant impact on the cost attributed to using the machine.*
3. *Savings due to the increase in useful tool life and improvements to the part surface quality.*
4. *Less environmental impact by increasing the machining process' energy efficiency, which also results in lower financial costs in manufacturing.*

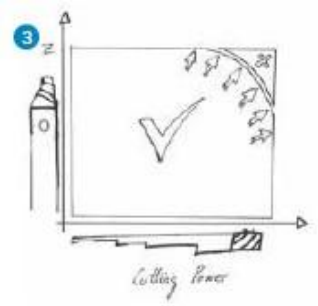
APPENDIXES

DAS (Dynamic Active Stabilizer) system presentation.

A figure shows the positioning of the DAS system on both sides of the ram for acting on the two main axes. As has been mentioned, the system works automatically without the need for any contribution from personnel.

Widening machine limits.

The use of quills, machining materials with poor machinability and a demand for enormous cutting power to accelerate cutting times facilitate the appearance of chatter.
The DAS system increases dynamic rigidity, minimises this adverse effect and enables both, machining in extreme conditions and increasing machining power to maximums.



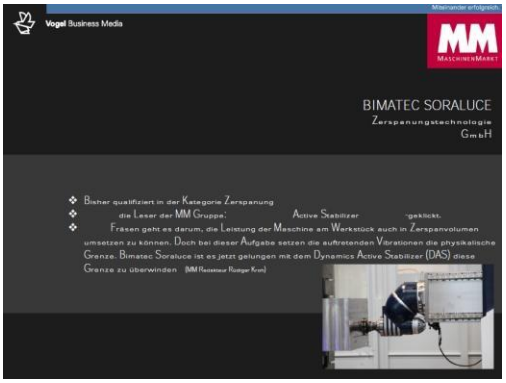
Main promotion activities.

An initial product presentation took place at the end of 2014 at the Innovation Days organised by BIMATEC-SORALUCE in Germany with great expectations focused on the DAS system. The show was indeed a great success and as a result, SORALUCE has experienced a significant growth in sales.

Besides, EMO 2015 - the largest trade fair in the sector held in October in Milano - was used to promote internationally the system showing an innovative image of a leading Basque company.

We should also mention that the magazine "Maschinenmarkt", the most prestigious in Germany related to the manufacturing field, nominated BIMATEC-SORALUCE for its DAS technology in the "Best of Industry 2015 award".

This award recognises the best contributions in the industry regarding processes, products and solutions, based on the articles of greatest impact in the magazines of the publishing group. This nomination is a sample of the expectation that the DAS system has generated internationally.



Finally, two very prestigious company / institutions worldwide, the Oil and Gas Division of General Electric and the British AMRC (Advanced Manufacturing Research Centre) Centre of Excellence, impressed by the efficiency of the DAS system after demonstrations carried out by SORALUCE, have invited SORALUCE to take part jointly in the European CPS-ME project (H2020 call). The main "leitmotiv" for the project is the development of intelligent machines with embedded sensors based on the inclusion of cyber-physical systems. Specifically, DAS technology is considered one of the key points in the project to provide greater intelligence and efficiency to the production systems.