3) RFC parameters: RFC classes and groups; types of RFC and specifications; full conditional entries of RFC; the parameters in the full conditional entry and their possible values; the installation options RFC on the printed circuit board; RFC model installation options; RFC geometric, mechanical, thermal, electrical, reliable, available options, RFC images on a plane and in space;

4) the mathematical model for calculating the values of the RFC operational failure and the coefficients values of the reliability model;

5) the vibration isolators parameters: the coefficients of stiffness, damping, and etc. Additional tables are created.

Additional tables can contain numeric, string, logical, text, graphics and functionality dependency parameters of the RFC.

ASONIKA-UM (subsystem management modeling during the REM engineering) allows for integration of CAD, embedded in the companies – Pro/ENGINEER, SolidWorks, Inventor, Mentor Graphics, Altium Designere, OrCAD, ASONIKA and etc., and manages data transfer between the subsystems during modeling in the process of REM structural engineering. The subsystem integrates with any PDM-system used in the company. During engineering, the subsystem allows to generate a comprehensive model of REM within mathematical models of thermal, electrical, aerodynamic, mechanical processes and mathematical models of REM reliability and quality.

Realization of the described integration marked the beginning of the development and implementation of CALS-technologies in the companies of electronic and instrument industries. Practical and innovative results are as follows. Integration software allows REM composite computer-aided design, based on simulation of complex physical processes. Language of user interface with software is as close as possible to the language of REM developer. The familiarization with the proposed programs requires a relatively short time. When implemented, a sufficiently high rate of modeling problem solving and significant savings of material means is attained by reducing the number of tests. Increased REM reliability and quality, engineered on the basis of the proposed integrated CAD.

Information consistency of the whole system provided at a level REM electronic model, in which information is represented as a set of information objects and relationships between them, regulated by ISO 10303 STEP, with no duplication of information. In this case, there is a need only in the interfaces between each individual subsystem and ASONIKA-UM subsystem.

These interfaces provide conversion of REM information objects electronic model, describing the original data for the target subsystem, in the project files of the subsystem and vice versa – converting project files of the original subsystem in REM information objects electronic model and their interactions, regulated by ISO 10303 STEP, providing unambiguous presentation of information in an electronic model of REM.

This solution of the information consistency provides the flexibility of REM ASONIKA's system structure. Thus, during the update, replacement of existing subsystems, and the addition of new subsystems in this structure, it is necessary to change the interfaces of integration with the ASONIKA-UM subsystem that needed to be replaced or introduced into the structure. Complexity of the interfaces is defined by used as components through CAD REM software systems.

The purpose of application of the ASONIKA system is to increase the efficiency of the structural units of the company, to shorten engineering and development time of highly technological REM, and to increase reliability developed REM.

Thus, the application of the ASONIKA system will be your transition to a new level of information technology that will expand the range of products, reduce time it takes a new product to the market, reduce the number of defects and the production costs.

Suggestion:

1. The application of ASONIKA in the electronics industry companies and in universities.

2. To provide consulting services to electronic industry companies with modeling of electronic equipment on the exterior mechanical, thermal, electromagnetic and other effects with the help of ASONIKA.

3. To organize the training of specialists for working with ASONIKA system.

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COMPARATIVE EVALUATION OF TENSION THAT ARISE IN NATURAL STONE DURING ITS DESTRUCTION WITH LIQUIDS, PLASTIC SUBSTANCES, AND GADS

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To evaluate the degree of oscillation of crack that is formed in fragile environment from a straight direction, comparative research to define tension that arise in its peak and in different distances from it. Marble has been selected as the destructed material. The problem was solved considering three possible ways to impact it: with fluids, plastic substances, and also with gads trough spurs and cracks that are described by similar geometric parameters. The following data was used in the calculation:

– pressure that is necessary to create in a spur to initiate and continue the destruction process (no less) – 45 MPa;

– spur radius – 25 mm;
– length of the formed crack – 0,2 m;
– utmost stretching tension for marble – σp = 20 MPa;
– utmost cramping tension for marble – σc = 160 MPa;
– coefficients of friction against a crack walls: liquids – 0; plastic substances – 1; gads – 0;
– coefficients of a crack filling: liquids – 1; plastic substances – 0,6; gads – 0.

The objective of our calculations was to define horizontal σx and vertical σy stretching tensions. The goal was being solved using the necessary systems of differencial equations of the second order that were realized in means of computer modelling Comsol Multiphysics 3.5a.

The main differential characteristics of destruction of a fragile environment by liquids are an absolute filling of cracks by the destructing matter and equal pressure degrees at all points according the law of Pascal. Hermetization of a spur collar was not considered. The calculations show that the destruction of marble with liquids goes under maximum horizontal pressured up to 102,5 MPa, and vertical – up to 110 MPa. Maximum horizontal oscillation equals ± 20 mm, and vertical – ±75 mm per each 200 mm of the formed crack length.

The schematics of destruction of a fragile environment with plastic substances is characterized by partial filling of the formed crack with them and different pressure along its length that decreases from the peak point in accordance with the logarithmic law. Hermetization as a spur collar was not considered. The calculations show that destruction of marble with plastic substances goes under maximum horizontal pressure up to 88 MPa, and vertical – up to 110 MPa. Maximum horizontal oscillation equals ±14 mm, and vertical – ±75 mm per each 200 mm of the formed crack length.

The schematics of destruction of a fragile environment with gads is characterized by an absence of crack filling and impact upon the destructed object only in points of contact with the gad. In this case no destructing matter fills a spur and a crack, formed with a gad. The calculations show that destruction of marble with gads goes under maximum horizontal pressure up to 102,5 MPa, and vertical – up to 110 MPa. Maximum horizontal oscillation equals ±20 mm, and vertical – ±75 mm per each 200 mm of the formed crack length.

On the foundations of the circle of works we can conclude that:

1. During the destruction of marble through spurs by short cracks (up to 200 mm) with liquids or gads vertical (up to 110 MPa) and horizontal (up to 102,5 MPa) pressures that arise in a fragile environment and also oscillations of the formed cracks from their straight direction in vertical (±75 mm) and horizontal (±75 mm) axis are same.

2. In case of destruction of marble through spurs by short cracks (up to 200 mm) with plastic substances horizontal pressures that arise in a fragile environment decrease by 14,1 % (down to 88 MPa), and oscillations of the formed cracks from the straight horizontal direction decrease by 30 % (down to ±14 mm).

3. The lowest degree of horizontal pressure that arise in a fragile environment (down to 88 MPa in marble) that is destructed with plastic substances through spurs explains the minimal interval of oscillations of the formed cracks from a straight direction in vertical axis (down to ±14 mm), compared to usage of liquids and gads for the same purpose.

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