presented in the figures 1 and 2 respectively.

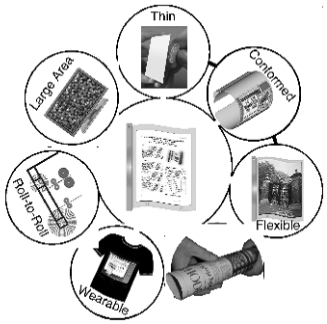

Fig. 1 – The technology attributes of flexible displays

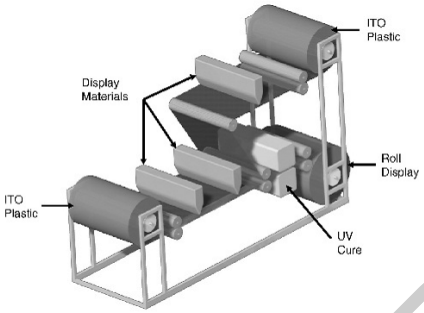

Fig. 2 – A simple schematic diagram of a roll-to-roll manufacturing process

The technology of flexible displays includes many components and supporting technologies. Anticipating a new market opportunity, the display industry has been developing display materials targeted specifically at flexible flat panel display requirements. These technologies must be compatible and converge to enable a truly flexible display. The necessary technologies include robust flexible substrates, conducting transparent conducting oxides and/or conducting polymers, electro-optic and reflecting materials, inorganic and organic electronics, and packaging technologies. In addition, many processes must also be developed and optimized in concert with the materials development, such as roll-to-roll manufacturing, coating technology, and printing. In reality, these components and processes can not be optimized independently since a flexible display is a complex system of linked components that must be co-developed in order to function efficiently.

Literature sources:

1. Flexible flat panel displays : SID. – Santa Clara, CA, 2005.
2. Liquid Crystal Displays : SID – New York, 2011.

THE STUDY OF TEMPERATURE PROFILES WITH MINICOMPUTER

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Modern electronic manufacturing is characterized by a high level of automatization and accuracy. The creating of new measuring and controlling devices is one of the main part of modern production in electronic industry.

Nowadays technology advance is achieved by the improvement of instruments, equipment, materials as well as through the development of new and more efficient processes. The application of the methods of heating components and materials based on contactless technology using a ring or magnetic inductor, light emission, hot air is perspective. But not only the choice of technology determines the efficiency of the soldering process. Another important component is the monitoring of process parameters with the help of controllers and computers. We can use some CAD programs to predict how system will behave and control its parameters using a minicomputer. For example, we can modulate temperature with Comsol Multiphysics and then control this temperature with minicomputer Raspberry Pi connected with thermocouple (pic. 1). Raspberry PI is a credit-card-sized single-board computer based on ARM processor.

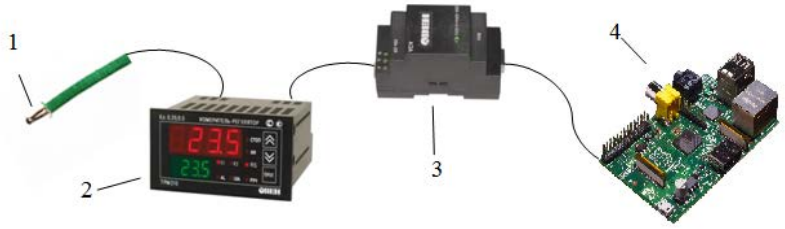

Fig. 1 - Structural diagram temperature measurement: 1 - temperature sensor (thermocouple), 2 - meter-controller TRM210, 3 - Automatic interface converter AC4, 4 – Raspberry PI

The structural diagram of temperature measurement is the following: thermocouple contacts with heated components and creates a signal. This signal is detected on controller and together with automatic interface

converter creates the signal which is processed on minicomputer Raspberry PI. Raspberry PI processes incoming data and creates termoprofiles, Raspberry PI has fine element analyses software - Comsol Multiphysics. In Comsol Multiphysics we create some models of heating with current parameters, so we can quickly change heating parameters to create more suitable termoprofiles. Comsol Multiphysics modeling allows us to choose the most optimal parameters, for example we can create induction heating models. Thermoprofiles for induction heating model are shown on fig. 2.

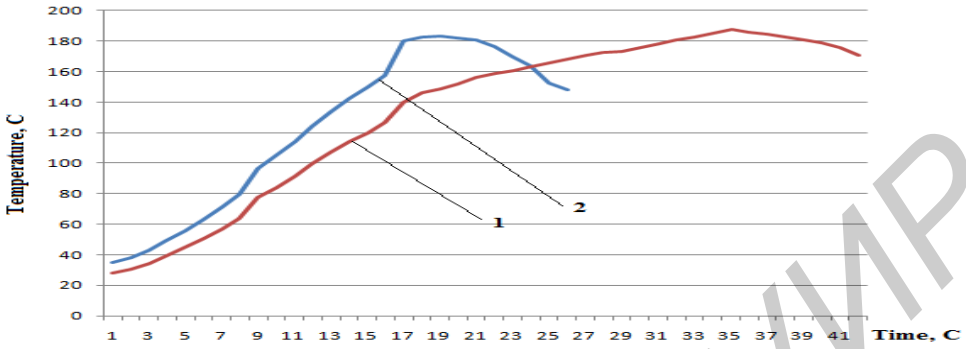

Fig. 2 - Induction heating termoprofiles: 1 – with magnet, 2 – without magnet

Thus, it is possible to control effectively the process of soldering and replace the device using large controllers. For example, Raspberry PI has credit card size and less power consumption than big computers but provides the same capabilities. Using FEA software provides more possibilities to control technological systems and can increase the quality of products.

References:

1. Lanin, V. L. High-Frequency Heating for Soldering in Electronics // Circuits and Systems, 2012. – № 3. – P. 238–241.

2. Lanin, V. L. Induction Devices for Assembly Soldering in Electronics / V. L. Lanin, I. I. Sergachev // Surface Engineering and Applied Electrochemistry, 2012, № 4.— P. 384–388.

THE HARDWARE-SOFTWARE COMPLEX OF ELECTRONIC-OPTICAL SYSTEM CONTROL

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The last two decades are characterized by intensive development of research in control of robotic systems. Modern methods of electronic systems use microcontrollers. They represent a chip combining functions on a single chip microprocessor peripherals and permanent random access memory and can perform simple tasks. The advantages of the microcontroller compared with other methods of control may include a small size, high performance, low power (10mW at idle).

The objective is to create a hardware-software complex of control robotic pneumatic system and a laboratory methods complex.

The implementation of the hardware is performed on microprocessor unit Arduino (Fig. 1) with microcontroller ATMega2560.