

LEM – the First Russian Standardized Test Method to Evaluate the Quality of Office Printing

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During the last 70 years since the creation of the first electrographic machine printing technologies have changed in such a radical (or even a revolutionary) way that today we see an absolutely different picture of our industry compared to what we could have seen relatively not long ago when direct transfer ruled supreme. Today the share of this technology within the overall volume of industry's production has decreased down to one third and continues steadily to shrink. Practically all operative or office/home printing today is a laser type. Its optimal quality, efficiency, and cost made it the market leader. The solutions provided by the leading manufacturers are the top of the cream of the engineering thought, ideal technological masterpieces coupled with a large number of production sites all across the world. However there is one "however". And that is a price. The solutions from any of the OEMs are quality ones, but they are not cheap. The attack on this niche of the market has always been quite foreseeable, the question has been only who will make it and when. China came with price-dumping and ineradicable defectiveness, but remained on the market, and today everyone has to reckon with its presence. Manufacturers from the Celestial Empire are changing for the better right before our eyes by raising the quality and widening the range of products being offered. And if not so long ago OEMs could, when backing their point of view, speak of Chinese consumables as being of terrific quality and evil for equipment, today the line between OEM and compatible products became so thin that only experts competent in the field can identify their quality differences. It would be wise not to forget that there are service and manufacturing companies that are still active participants of the market, them being engaged in refilling and remanufacturing of cartridges. Their vision of quality also makes its impact on the general picture of the market and makes the choice for the consumer extremely difficult.

During its years in the industry, Laboratory of Electrography has faced and still faces the problem of mutual understanding between the participants of the operative printing market. The consumer being attacked from all sides by the streams of marketing and technical information is quite often incapable of making the choice, and even having done so is not protected from receiving products and solutions with quality lower than declared by the supplier. In such case the consumer usually lacks competence to defend his/her interests and is

forced to suffer economical, reputational and other losses.

We work in Russia and we understand that Russian market has its own unique specifics connected with its structure, national law requirements and various other factors. At the same time the manufacturers of consumables – Chinese as well – do not always take it into consideration, since they supply not only Russia with their products but customers all over the world. They have customers in America, Australia, Europe, and Africa. Everywhere there are own specific technical standards, buyers' requirements which vary strongly from place to place. This includes various buying capacity, mentality and understanding of printing quality concept. Also what should be considered includes standards of voltage, differences in public technical standards, certificates.

Everyone knows that one of the criteria for evaluating market's prospects is the presence of niches for replacement products within "price-quality" category, which (products) are able to provide the same quality with lower prices. Unfortunately in our case we have a tacit degradation of market happening. The customer is offered a lower price for uncontrolled and low quality. What counts as a "bad quality" in Europe and USA is being sold and purchased on the market of Russia. All this happens independently from the demands of Russian consumer, who, in such abundance of factors, has a serious trouble of making a right choice, a choice in favor of product which fits best with his/her understanding regarding the etalon quality.

That is why we create unified and important requirements in regard to products, quality standards and characteristics whose must be strictly adhered to and conformed to. On Business-Inform 2019 Expo Laboratory of Electrography presented its new project – the standardized test method for evaluating of operative-office printing (LEM).

The idea of the project is to create an instrument equally comprehensible for all market participants, an instrument that will allow to judge impartially the product's quality and the possibilities of its usage. Laboratory of Electrography has created the educational center and developed learning programs for preparing profile specialists. The specialists completing the course become experts in the field of printing quality evaluation.

On the whole the LEM standardized test method consists of two main parts.



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During the first stage the quality of separate print is being evaluated. The object for evaluation can be provided by anybody interested in the information (manufacturer, supplier, end-user). The evaluation of test print happens according to the method-related test-objects containing printing elements allowing to control parameters measured and to perform visual study of defects and printing problems.

Parameters for measuring include optical density of the image, background, and adhesion.

As criteria for quality evaluation of the parameters above there have been chosen average values for optical density of image, background, and adhesion, inherent in OEM products.

The print defects (within the test method) include such parameters as 'offset' and 'wave' being consequences of electrographic process disruptions denoting unsatisfactory print quality and possible future printing problems.

The problems identified on prints such as satellites, spaces, white spots, heterogeneity, ghosting, bad resolution (according to Burmistrov's test-object) are considered to be minor defects and demonstrate limitation of printing in terms of graphical objects, micro-printing, bar-code printing, etc.

The method of evaluating the quality of print models the situation faced by end-users in their work when they send a test-page for printing and try to evaluate the resulting print. The results of such evaluation do not allow to make a right forecast regarding the yield and performance stability in the printing process.

Not always good quality performance received at the beginning of printing will be the same when the resource comes to an end.

That is why our LEM test method includes the second stage which is directed on studying the quality of printing throughout the whole yield of consumable or consumables combination being tested.

The evaluation of parameters is being made according to the same criteria as on analogous test objects for identifying quality of print. Test objects are being printed with 500-1000 pages interval with 5% text coverage according to ISO/IEC 19752.

The study identifies such parameters as printing yield, toner spending for 1000 pages, the effectiveness of toner's transfer to paper and performance stability.

According to the results received the experts produce their opinion and the LEM certificate regarding the quality of the product and possibilities of its usage.

Both stages (parts) of the LEM method, viewed as two separate methods, have undergone long years of trial in various applied manufacturing and scientific projects and showed their justifiability and universality.

We are confident that this type of research and resulting opinions might attract:

- corporative customers, who whom the standards of printing quality represent a tool of defining the professionalism and reliability of their suppliers;
- procurement and sales specialists who everyday face with the necessity of simple and easy-to-understand criteria for evaluating printing-organizing-products which are their field;
- service companies engineers for whom it is important to know and understand how their customers will evaluate their work;
- heads of service companies interested in stability of relationships with their customers and suppliers for their technological solutions;
- IT-technologies specialists wishing to enlarge their competence in the adjusted fields;
- the manufacturers of consumables interested in understandable standard parameters, defining the quality of product within the boundaries of understanding how the product should look in the eyes of consumers.

We are in the very beginning of the way, but it is already evident, that this way is the only right way for achieving compromise between market participants. Knowledge and tools we offer to consumer can help him/her to make a right choice and prevent unscrupulous players, who thinks quality is an abstract marketing concept and not a law of manufacturing, from entering the market. We are hoping for understanding and count on support from everyone interested in quality printing, our industry development, and profitability of the Russian business.

