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## Graphic technology — Determination of the operating power consumption of digital printing devices

*Technologie graphique — Lignes directrices pour déterminer la  
consommation électrique des dispositifs d'impression numérique*

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## Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

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## Introduction

Estimates of operating costs for digital printing devices often include a calculation of energy consumption. However, energy efficiency comparisons are currently impossible to make, as there is no standard reference for their calculation.

It is common industry practice to estimate energy usage based solely on the connected load of a machine. This is not a very reliable method, however, as this means that, in many cases, the calculated values (e.g. 70 % of the power consumption) do not reflect the actual usage of the machine and its energy consumption<sup>[2]</sup>. Actual energy consumption often differs significantly from the estimated values<sup>[8]</sup>. Using these methods, power consumption data across devices can, therefore, not be compared, since the calculations have not followed a common framework that takes into account the influence of peripheral equipment such as IR or UV dryers and measurement cycles. This document provides requirements for the measurement of the parameters needed to estimate the energy efficiency (e.g. 1 000 A4 sheets/kWh) that correspond to the actual energy consumption for a defined machine combination.

This document specifies a method for the estimation of energy efficiency for digital production printing presses, also known as professional digital printing presses. It is up to the manufacturer of a digital printing system to declare whether it is suitable for use as a digital production printing press and, in such cases, this document is applicable.

Specifications to calculate the energy consumption of conventional sheet-fed and web-fed offset machines<sup>[5]</sup> and office equipment<sup>[6]</sup> exist and are widely used. This document is therefore, not applicable for the calculation of energy efficiency of conventional sheet-fed and web-fed offset printing machines, or for office equipment.

The universal availability of accurate and verifiable energy consumption data will enable printing machinery buyers, printers and their customers to assess the energy efficiency of digital production printing presses. However, the user of this document should understand that the effectiveness of power does not dictate quality acceptance levels of the expected output that a customer may require. Power consumption is an important part of all the output requirements and quality standards necessary for maintaining the quality and repeatability required by the print buyer. Energy efficiency can be reported in various ways, such as the number of prints printed per kWh, or as the amount of energy required in kWh to produce a specific number of prints. This information can be used to

- assess the power consumption and energy efficiency of machines including peripheral devices,
- estimate operating costs for investment planning,
- benchmark energy efficiency of digital production presses,
- measure energy efficiency improvements of digital printing devices over time or for dedicated process variations, and
- provide data to enable companies to claim environmental subsidies, when replacing equipment with more energy efficient equipment.

This document defines how to calculate the electrical energy requirements and thus the energy efficiency of digital printing devices.

When comparing the results obtained from this document, care should be taken that the devices being compared were set up to produce the same print quality using comparable types of printing technology, process and device configurations. This document may not be suitable for all devices, such as those resulting from continuous developments. It is intended to be revised as the technology evolves.