

***The Classification of Indonesian Textiles***  
*Based On Structural, Materials, and Technical Analyses*

presented by  
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**ABSTRACT**

This author focuses on Indonesian textiles with ethnic-group characteristics and various material attributes. Examinations were conducted, which then resulted in 'the classification system'. His classification system provides the implications for structural (*anatomical*), materials and technical studies.

More than 2000 textile objects in the custody of Museum Nasional of Indonesia were examined by various analytical methods. This paper discusses identification, naming and systematical classification for 'weaving/ non-weaving and coloration techniques.'

**A. INTRODUCTION**

Leene (1972) defines 'textile' as a woven object or that made by interlacing or bonding of yarns. The yarns are made of fibers having the textile fiber properties, spinnability and weavability; the object itself has the textile properties of handling, drape and suppleness. In addition, Indictor (1987) mentions 'historic textile' from the two points of view, i.e.: physical condition and use.

By the definition, people who find the textiles may not be easy to recognize and compare them with others. In this case, they try to know textile from individual parts in a certain region, a group of textiles from different regions, or in certain country's textile with others. The recognition might be based on stylistic analysis, i.e.: motifs, colors, materials, technical terms and others (Vandiver, 1990: xx).

Wahyono says that Indonesian textiles are only applied 'plain weave' and Geirnaert-Martin classified them based on structural analysis (Wahyono, 1987: 2-3). The distinction by identification, naming and classification on such textiles possibly surpasses the hopeful information. They are categorized by materials and technique, and not just the assertion of general design principles. Moreover, by the paradigmatic model, as on figure 2, the structure and properties are measured to reconstruct human behavior involved in processing and performance of material culture (Vandiver, 1990: xix).

The study of Indonesian textiles was started on archaeological artifacts found in Bali. The reconstruction of specimens indicated fabrics with '*ikat*' technique (Wahyono, 1987:21). There is also an expert's opinion that textile material was found in Indonesia in the Bronze period (800-200 BC); and plaiting work was available in the Neolithic Period (3000-2000 BC). Using information on the materials analysis promised the opinion, if that is based on studies on the manufacturing process and historical records. The history is mentioning in materials, origin, date, distribution, trading, etc.

Fortunately, we are now able to find many written articles about material sciences or other more developed methodological research based on the historic textiles, including Indonesian textiles. They inform us about defined materials, analytical methods, and so on. In the last International Symposium on Indonesian textiles (at Basel, Switzerland), for example, Haake (1991) and Soerjanto (1991) contributed a new method of stylistic analysis for defined motifs. In the philosophic context, Heringa (1989) discussed the meaning of textile colors from a certain village in East Java.

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Holmgren (1989), in his book *Early Indonesian Textiles*, discussed textiles with floral and animal motifs made by unique and complex techniques. The other authors wrote about Indonesian textiles with various motifs, colors, materials, and techniques from the socio-cultural aspects. However, no author described the four major elements of textiles systematically, i.e.: materials, ornamental designs, technicalities and uses. This author's intent is to approve the socio-cultural studies with an analogy of textile condition, origin, date, and so on.

Unfortunately, this author has found many textiles with incomplete physical condition and incorrect descriptions in the catalog books and labels of museum collections. Additionally, many old objects that are important to research are in poor condition and may therefore receive inadequate protection.

## **B. OBJECTIVE AND METHODOLOGY**

In an effort to introduce the aspects of Indonesian textile, the author has developed a conceptual system skeleton. It contains a total systematic approach to scientific research, conservation/ restoration, manpower development, educational development, tourism and socio-cultural developments.

This paper illustrates an adoption of Vandiver's paradigmatic model and the author's taxonomy of the textiles. This mnemonic classification field comes from structural, material and technical analyses shown in figure 1. The results are classified as on figure 2, The Taxonomy of Indonesian Textiles.

The examination of more than 2000 textiles resulted in the major terms on Indonesian textiles, and how to recognize them as shown on table 1, Analytical Methods for Indonesian Textiles.

## **C. OBSERVATION METHOD OF THE INDIVIDUAL PARTS AND THE RESULTS**

This author treated material attributes and mnemonic terms on Indonesian textiles (see figure 1 and 2) by using methods of technical and materials analysis (see table 1). Observations might be simplified by understanding the processing activities (see group B, on figure 2). The process producing textile objects (physical condition). See group A, on figure 2. The process is divided into two parts of technicality, i.e.: weaving/ non-weaving and coloration.

### C.1. Weaving/ Non-Weaving: Technical Terms and Origin

The Indonesian textiles include woven and non-woven objects with many forms and uses. They are made from various materials and techniques. There are *tapa* (bark-cloth), felt, and (woven/ non-woven) fabrics.

Widjaya (1988) describes at least 14 species of plaiting fibers producing plant. Bell tells us of eight species of bark-cloth producing plants, such as: papyrus, *tapa*, amate and rice paper. He considered that the production of thin-pounded bark cloth suggested the possibility of making felt and paper. The technology of agriculture, *tapa* and traditional paper making came to Indonesia from China in 3000 BC. *Tapa* is also believed to have been used as a writing medium and as material for the *wayang bêbêr* (theatrical scroll) in Sumatera, Java and Madura (Bell, n.d.).

The simplest instrument (a loom) used for weaving consists of: a. warp beam (*penggulung-ani*); b. cloth-roll (*penggulung-kain*); c. harnesses (*kisi-gun*); d. heddles (*suri*); and e. shuttle (*anak torak*). In the primitive loom, e.g.: a back-strap loom (*alat tenun gendong*), a warp beam tied on a tripod and a cloth roll on the front of the weaver. To ease the weaving process, the cloth-roll is connected to the bar on the weaver's back for stretching of the warp yarns. Sometimes, the harnesses and heddles are replaced with wooden swords. The weaver's fingers take over the harnesses' function and the shuttle is replaced with a simple filling

threads carrier. The simple loom is able to produce woven and non-woven (*nir-tenun*) fabrics.

Weaving includes plain-weave (*silang polos*), twill (*silang kêpar* or anam kêpang), satin (a woven fabric with weft floats in five or more warps) and tapestry (a woven fabric with many more wefts than warps)<sup>2</sup>. These first three weaves are called the basic weave producing the ground fabrics. Example of those techniques may be found on Indonesian textiles. For a good example, the author examined the twilled (8/2) and tapestry woven fabrics from Dayak Kalambi (jacket) of Kalimantan.

The non-weaving techniques are applied to ornament the designs or motifs, such as: plaiting, twining, braiding, knotting, netting, brocade, *pilih*, *songkèt*, *sungkit*, and the various embroidery types with inlay patterning characteristics. The embroideries are appliqué (*pêrca*), couching (*sulam cucuk* or *danpèl* = *kelindan tèmpe*l), simple embroidery (*sulam biasa*), embroidery tufted (*lamkorjang* = *sulam berekor panjang*) and quilting (*calam* = *pêrca sulam*).

The tapestry weave (*tenun permadani*) is found on many textiles from Sumatera, Kalimantan and Timor. This tapestry technique is divided into two types, i.e.: simple tapestry weave (*tenun permadani biasa*) and *kêlim*. The first weaving technique is primarily functioned to lock the two ends of woven textiles, because the wefts of tapestry conceal the warps tightly. (For examples see the collections from Batak, Dayak and Timor). In some cases, it is also used to ornament stripe patterns of textiles (see textiles from Batak and Timor).

The *kêlim* is a tapestry weave technique patterning with interlocked or slit pattern weft thread concealing the warp. The interlocked pattern weft thread concealing the warp is called 'an interlocked tapestry weave' (*tenun permadani berkait*), because the end of pattern wefts interlock with others. The slit pattern weft thread concealing the warp is called 'slit tapestry weave' (*tenun permadani terpisah*), because the end of pattern wefts do not interlock. Therefore, it may be slitted or separated. These two types of *kêlim* are generally found on Dayak kalambi.

The simple embroidery (*sulam biasa*) is the simplest stitching technique for designs, and is completely needle work. Its physical appearance is similar to damask. That is, a cloth with a flat reversible design made by combining warp-faced and weft faced satin or twill weave in plain color. However, embroidery and damask constructions and color combinations are completely different from each other.

Appliqué (*pêrca*) is superimposition of one piece of material upon another, usually sewed together with ornate stitches. Couching (*danpèl*) is an inlay by stitching technique of colored/ metal threads, sequins or mirrors on the surface of fabric. Quilting (*calam*) is stitching designs into padded areas on fabric. The first type of embroidery is found in Aceh, West Sumatera, Java, Bali, Sulawesi and several parts of Indonesia. The later three techniques (appliqué, couching and quilting) are found on Dayak and Lampungese textiles. The author's finding of satin and damask background fabric with *sungkit* technique are considered to be imported articles.

Brocade can be easily distinguished from *songkèted* cloth. The first work is identical with jacquard loom's work which produces conventional and geometrical patterns. Definitely, *songkèt* is supplementary colored/ metal warp or weft thread on tabby weave (1/1) or on basket weave (2/2). Therefore, the supplemental weft runs from selvage to selvage; and the supplemental warps run from end to end of the fabric.

*Songkèting* is done during the weaving process. Therefore, *songkèting* does not use a needle for inserting the ornamental threads. Swords are utilized, except in the use of *songkèt* on *tapa* or bark cloth. Brocade is weft patterning that is usually of bright colors and is floated on the basic background tabby weave. The weft-patterning of brocade is usually an inlay pattern in both sides (in same

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<sup>2</sup> This tapestry is similar to (same as) 'weft faced plain weave'.

motif), or that of the weft patterning floats concealing the background fabric. Brocading work is balanced on either the weft or warp faces. The brocaded patterns (wefts) can be arranged on satin or warp faced twill ground fabrics.

There are two variations of songkèt, that is: *sungkit* and *pilih*. Sungkit is similar to songkèt, but the first term is defined as discontinuous supplementary wefts (none or rare for warps). The supplemented weft runs in a specific area or motif only. Pilih, meaning to choose, is an inserting technique in order to supplement the weft threads (never warps) with a shuttle or needle between the regular wefts that results in cross-concealing one or two warps. The pilih technique may be applied on tabby, *rèp* (a woven fabric with much more warps than wefts)<sup>3</sup> or tapestry woven fabric. The pilih technique results in an inlay pattern on both sides. The appearance of the pilih pattern is similar to tapestry. The sungkit or pilih might be worked during or after the weaving process.

Embroidery can be found on textiles from Sumatra, Kalimantan, Java, Bali and Sulawesi. However, we must be aware of the similar appearance of brocade, pilih, songkèt, sungkit and tapestries. Songkèt and sungkit techniques are distributed widely. Palembang, Samarinda and Bugis are dominant regions producing the textiles with a sungkit technique. Pilih may be found on textiles from Kalimantan and Timor. The pilih on *rèp* or tapestry woven background fabric completed with (double) weft twining and plaiting techniques are especially developed by the Dayak of Kalimantan. There is also a special embroidery technique from Sumba called 'embroidery tufted'. The author named the last technique in Indonesian 'sulam berekor panjang' (long tailed embroidery), and abbreviated as '*lamkorjang*'.

Braiding (*képanjang*) is a finger-weaving work. This technique is used for the fringes (untaian ujung kain). Crocheting or lace (*réndang*) is fine interlacing work, therefore it differs from knotting (*réndang-simpul*) and knitting (*rajut*). These four techniques interlace the yarns and are classified as non-weaving techniques (*teknik nir-tenun*). They were commonly applied on primitive work, and found on textiles from Eastern Indonesia with indication of grass or vegetable fibers. In some cases, the techniques are also found on Sumateran textiles using metal threads.

### C.2. Coloration: Materials, Technical Terms and Origin

The colorant can be divided into pigment and dye. The colorant may be applied to fabrics to enrich the ornamental designs. There are two coloration (coloring substance application) techniques, i.e.: dyeing (*pêncêlupan*) and pigmentation (*pigmentasi*). We are familiar with technical terms for such coloration; for dyeing: *ikat*, *batik* and *plangi*; and for pigmentation: *sablon* (printing), *colèt* (free-hand painting) and *prada* (gilding). See figure 2.

Dyeing techniques may have been applied in Indonesia as early as the 2nd century B.C. (Suwati, 1987). Schaublin (1991) mentions the popularity of gilding (*prada*) for the Madjapahit Kingdom in about 1292 to 1528. Miksic (1989) discusses the sources, manufacturing process, and archaeological evidence of gold in Indonesia.

There are three resist dyeing processes applied on Indonesian textiles, i.e.: batik, ikat, and plangi. Batik is a resist-dye process in which wax is applied onto a cloth surface. And there are two kinds of batik, that is: *batik tulis* (free-hand batik) and *batik cap* (stamp batik). Ikat is a resist-dye process, the string tied on the threads (wefts or warps). Plangi is, in a certain region called as *jumputan* or, in special cases called *tritik*, a resist-dye technique in which a string is tied or wound on the fabrics. When dyed, the patterns are reserved in color of foundation. The latest technique produces the fabric with crepe like effects.

There are three textile pigmentation terms: *sablon*, *colèt* and *prada*. Sablon or printing is a technique producing patterns, designs or motifs of one or more colors onto fabrics with block, roller, screen, or others. Principally, printing defined

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<sup>3</sup> Rep is similar to (same as) 'warp faced plain weave'.

to 'color(s) transfer to form large colored patterns, motifs or designs in one process'. Therefore, it clearly differs from *colèt* which refers to 'color(s) transferred to form small colored patterns, motifs or designs in one process'. This *colèt* technique is usually worked with a tool like a brush, bamboo-stick or others.

According to the materials analysis, the *colèt* may apply gold powders or dusts. In special cases, the gold or silver application is termed as 'prada' or gilding. Gilding with gold or silver powders is called '*prada air or prada yèh*' (water-prada), and application of gold or silver leaves is called '*prada pèl-pèl*' (sticking-on prada).

Sumatera, Kalimantan, Java, Madura, Bali, Nusa Tenggara and Sulawesi are the most dominant regions producing fabrics with the resist-dyeing method. Jambi, Java and Madura are well known for batiked textiles. Palembang, Java and Bali are the primary areas producing *colèt* and prada techniques. There are also representative articles with *colèt* technique from the islands of Eastern Indonesia.

#### D. CONCLUSION

Textile 'weaving and non-weaving' techniques vary from region to region within Indonesia. Polychromatic dyes, pigments, various metal threads, beads, sequins and mirror applications are used to complete the ornamental designs on such textiles. At last, the author considers the results of structural, materials and technical analysis (on the special *relational databases management system*)<sup>4</sup> to predict Indonesian textiles' origin and relative date.

This paper information promises a new-method in classification of Indonesian textiles. It describes similarities-dissimilarities between part of, individual or total textiles and the methods for structural, material and technical analysis in detail. The classification of the textiles collection of Museum National of Indonesia is divided into two groups, i.e.: 1. physical condition and 2. processing activities.

These groups are then arranged into five subgroups for group 1 and into 2 subgroups for group 2. These subgroups cover all defined Indonesian textiles terms (called '*mnemonic terms*' or '*derivative names*'). At last 'the terms' will be simplified by the *notations* (codes/ symbols).

It was reasoned to say that such classification based on the structural, material or technical conditions provides indicators of the textile origin and possibly the age.

The author clearly provides the classification system in which the defined terms of each object come from the textile condition and presence. The beneficial aspect of Indonesian textiles focuses on the exciting new opportunities to assess premodern behavior and cognition based on structural, material and technical studies of material culture. It includes the efforts in theoretical and empirical studies in the establishment of 'Taxonomy of Indonesian Textiles', that may be used for the purposes of conservation/ restoration, socio-cultural developments and so on.

This paper serves to encourage and guide people interested in Indonesian textiles on a wide-range of aspects.

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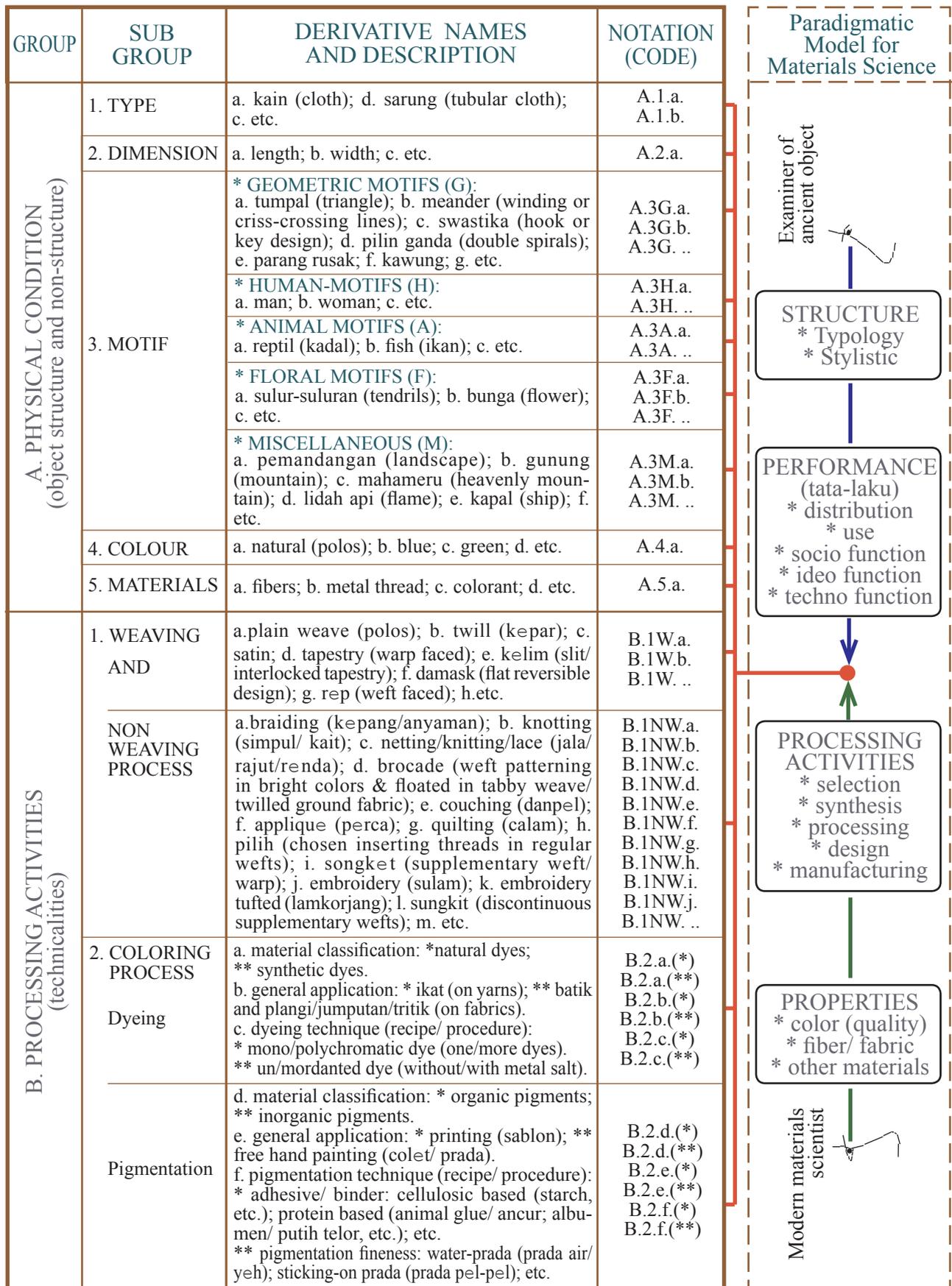
<sup>4</sup> The author established the System of Museum Objects Management (SysMOM), that is the real relational databases management system (RDBMS) with the capability to recognize textual data, image, sound and full-motion image (video); plus LAN and WAN (Internet) connections.

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**Figure 2. THE TAXONOMY OF INDONESIAN TEXTILES**



**Table 1. ANALYTICAL METHODS FOR INDONESIAN TEXTILES**

SUBJECTS			ANALYTICAL METHODS
Orientation	Description	Notation	
PROVENANCE Ethnographic Features: origin, function, etc.	COMPLETE OBJECT (object and their attributes: formal, stylistic and technical)	A.1-5. and B.1-2.	Socio Cultural Anthropology, Ethnography, Art History, Semiotic - Iconography, etc.
OBJECT STRUCTURE	COMPLETE STRUCTURE (form, design/ layout, etc.)	A.1.a. to B.2.f.	Typology, Stylistic Analysis, etc.
MACRO STRUCTURE	STRUCTURAL OR TEXTURAL GREATER THAN 0.1 MM (fabric construction, metal thread structure, etc.)	A.1-5. and B.1.	Visual Examination (eye, glass, microscope) Ultra-Violet Light Examination
MICRO STRUCTURE	STRUCTURAL OR TEXTURAL SMALLER THAN 0.1 MM (fiber morphology, cross- section materials, etc.)	A.5. or B.2.	Optical Examination (transmission, reflection) Electron Microscopy (SEM, TEM, STEM) Electron Microbeam Analysis
CRYSTAL STRUCTURE	METALLIC ELEMENTS AND OTHERS (weighting metal salts, mordant, corrosion products, etc.)	B.2.c. (**) B.2.d. (**)	Diffraction (x-ray, neutron, optical and electron)
ELEMENTAL STRUCTURE and COMPLEX COMPOUNDS	METALLIC ELEMENTS, DYES AND OTHERS (pigments, dyes, adhesives, polymers, etc.)	B.2.a. (*/**) B.2.c. (*/**) B.2.d. (*/**) B.2.f. (*/**)	Spectroscopic Examination (neutron, infra-red, optical and x-ray) Chromatographic Analysis (paper, TLC, GC, PyGC and HPLC)