TECHNICAL REPORT

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Digital codification of dental laboratory procedures

Codification numérique des procédures au laboratoire dentaire

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

In exceptional circumstances, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example), it may decide by a simple majority vote of its participating members to publish a Technical Report. A Technical Report is entirely informative in nature and does not have to be reviewed until the data it provides are considered to be no longer valid or useful.

Attention is drawn to the possibility that some of the elements of this Technical Report may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO/TR 15599 was prepared by Technical Committee ISO/TC 106, *Dentistry*, Subcommittee SC 3, *Terminology*.

Annexes A and B of this Technical Report are for information only.

Introduction

Generally speaking, the aim of a "digital codification of dental laboratory procedures" is, in accordance with the codes of oro-dental health status and interventions (COSI), to introduce the advantages of standardization into the procedures of communication between the dental surgery (dental office, in the USA) and the dental laboratory.

Provisionally, the country code used in the examples herein is that of the international cable telephone. Some new developments presently occurring in the maintenance of the ISO country codes and its proposed use for Internet could make convenient a revision of this choice. A decision on that is pending.

Digital codification of dental laboratory procedures

1　Scope

This Technical Report provides a code of dental laboratory procedures which is digital so as to render it language-independent. This makes it convenient to use as a basic reference (a hub) for existing or future dental codes, and ensures their compatibility through simple softwares, which is the fundamental goal of the exercise.

In addition the digital code is intended to provide, as a result of built-in indexing functions:

— the identification and traceability of dental prostheses and materials, epidemiology and forensic dentistry, investment planning, teaching, research, industry, insurance systems, social services and regulatory authorities;

— the creation of performing databases for the field evaluation of materials, design and construction techniques of dental prostheses, and their effects, wanted or unwanted;

— the possibility of communication between the dental professions, dental industry and trade, on both qualitative and quantitative scales.

2　Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this Technical Report. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this Technical Report are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 3950:1984, *Dentistry — Designation system for teeth and areas of the oral cavity*

ISO 8601:1988, *Data elements and interchange formats — Information interchange — Representation of dates and times*

ISO/TR 13668:1998, *Digital coding of oral health and care*

3　Principle

This proposal for a digital codification of dental laboratory procedures has the unique character of being based on:

a)　the OSI Index, through which the need for prosthetic procedures can be directly deduced from the oral status of the patient;

b)　a decimal logic, providing, through the individual value of the digit and its rank in a 13-element digital phrase compatible with most bar codes, easy identification and evaluation of the various characteristics of the prosthetic procedure;

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c) additional codes (not present in ISO 3950):

— missing tooth or teeth to be replaced in each quadrant shall be coded as follows:

— 91 each missing tooth in the upper right quadrant;

— 92 each missing tooth in the upper left quadrant;

— 93 each missing tooth in the lower left quadrant;

— 94 each missing tooth in the lower right quadrant;

— missing <u>temporary</u> tooth or teeth to be replaced in each quadrant shall be coded as follows:

— 95 each missing temporary tooth in the upper right quadrant;

— 96 each missing temporary tooth in the upper left quadrant;

— 97 each missing temporary tooth in the lower left quadrant;

— 98 each missing temporary tooth in the lower right quadrant;

— <u>supernumerary</u> teeth shall be indicated by repeating the code of the closest normal tooth.

Access to the data is protected to make sure that only the authorized user can use them.

4 Syntax

4.1 Software opening file line

Such a file line is useful in the case when, in a dental surgery, the dentist may not need to open this software every day. On the other hand, this software may be in constant operation in the dental laboratory. Having an opening file line provides this possibility.

EXAMPLE "isolab.e" for "ISO 15599 code for dental laboratory procedures, English version".

4.2 Dentist's identification code line

This code line reads as follows:

a) 3 digits are presently dedicated to the identification of the country: International cable telephone code or ISO country code;

b) 2 digits are for the subdivision in the country: county, state, territory or other administrative area division;

c) 3 digits are for the concerned activity;

d) 5 digits for the dentist's individual registration number.

Country	Area	Activity	Dentist
ØØØ	ØØ	ØØØ	ØØØØØ
– – –	– –	– – –	– – – – –
3 digits	2 digits	3 digits	5 digits

4.3 Laboratory identification code line

This code line reads as follows:

a) 3 digits are dedicated to the identification of the country;

b) 2 digits are for the subdivision in the country: county, state, territory or other administrative area division;

c) 3 digits are for the concerned activity;

d) 5 digits are for the identified manufacturer inside the considered profession.

Country	Area	Activity	Manufacturer
ØØØ	ØØ	ØØØ	ØØØØØ
– – –	– –	– –	– – – – –
3 digits	2 digits	3 digits	5 digits

4.4 Code line for the identification of a custom-made medical device

This code line reads as follows:

a) 6 digits for the requested date of delivery (ISO 8601);

b) 1 digit for the OSI Index (ISO/TR 13668), according to the main intended use;

c) 2 digits for the number of teeth concerned and/or replaced by the device(s);

d) 3 digits for the laboratory device production number (these may be assigned, following the decision of the laboratory management, to a random or chronological order, by day, week or month);

e) 1 digit as opening key of the following code line, or closure of the code line (for instance, label printing).

a.	b.	c.	d.	e.
ØØØØØØ	Ø	ØØ	ØØØ	Ø
– – – – – –	–	– –	– – –	–
6 digits	1 digit	2 digits	3 digits	1 digit

4.5 Code line for the description and site of the medical device

This code line reads as follows:

a) 2 digits for the type of device, according to COSI (ISO/TR 13668);

b) 1 digit for the number of different materials of which the device is made;

c) 2 digits for the number of teeth replaced, restored or modified;

d) 2 digits reserved for further description of the device, for instance: age of the patient (when the patient is more than one hundred years old, code 00);

e) 4 digits (2+2) for the concerned sectors or sextants or areas (ISO 3950);

f) 1 digit for the number of different devices;

g) 1 digit for closure of the code line or as opening key to the following code line.

a.	b.	c.	d.	e.	f.	g.
ØØ	Ø	ØØ	ØØ	ØØØØ	Ø	Ø
– –	–	– –	– –	– – – –	–	–
2 digits	1 digit	2 digits	2 digits	4 digits	1 digit	1 digit

4.6 Identification and origin of the device constituent materials

ISO code material(s)	Dental metals and alloys				Ceramic materials or polymers				Closure key
	Nature Base Clause 6	Type Second constituent Clause 6	Class Standard number Clause 6	2 digits by which the laboratory codes the origin of the product	Category Clause 7	Classification Clause 7		2 digits by which the laboratory codes the origin of the product	
ØØ[a] – –	Ø –	Ø –	Ø –	ØØ – –	Ø –	Ø –	Ø –	ØØ – –	Ø –
[a] = If the number is 84? or 88 or 89?, another code line is opened.									

This code line reads as follows:

a) 2 digits for the general identification of material or materials;

b) 3 digits for the identification of:

— nature or base;

— type or second constituent;

— class or applicable standard;

c) 2 digits by which the laboratory codes the manufacturer or provider of the materials constituting the medical device;

d) 3 digits for the individual identification of the second material, if applicable;

e) 2 digits by which the laboratory codes the manufacturer or provider of the second material constituting the medical device;

f) 1 digit for closure of the code line or as opening key to the following code line.

a.	b.	c.	d.	e.	f.
ØØ	ØØØ	ØØ	ØØØ	ØØ	Ø
– –	– – –	– –	– – –	– –	–
2 digits	3 digits + 2 digits		3 digits + 2 digits		1 digit

4.7 Optional code line for the identification of missing tooth/teeth to be replaced in individual prostheses

The individual prosthesis can be further described (see ISO 3950 and clause 3). This code line reads as follows:

a) 2 digits for the 1st tooth on one side (from ISO 3950);

b) 2 digits: for no tooth;

c) 2 digits: for the 2nd tooth on the other side;

d) 2 digits: for the 3rd tooth on one side;

e) 2 digits for no tooth;

f) 2 digits for the 4th tooth on the other side;

g) 1 digit for key to open one other line or to close the code.

EXAMPLE 1   16 91 13 23 92 26 8 = between 16 and 13: No tooth; between 23 and 26: no tooth ;

EXAMPLE 2   91-15 = posterior edentalus.

write codes from 18 to 28
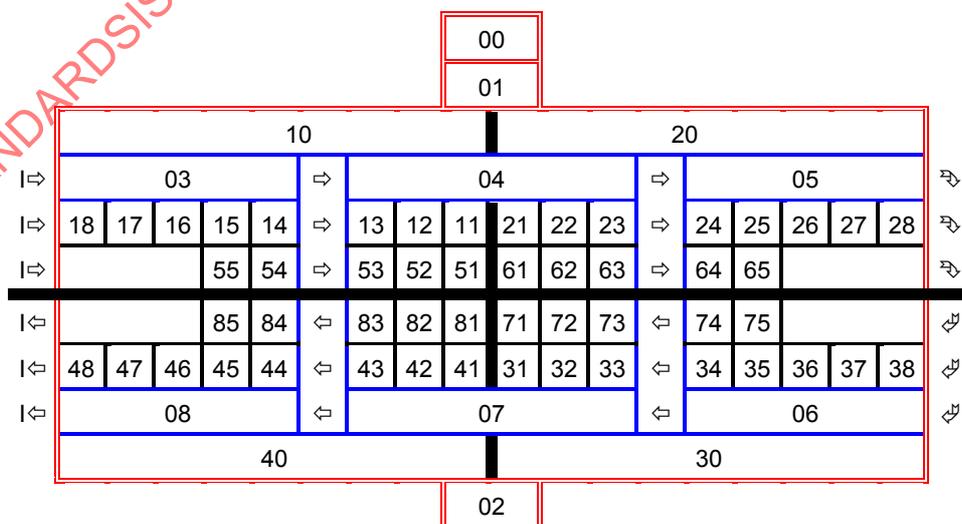
← = write codes from 38 to 48

Write codes from 18 to 28 and from 38 to 48.

Dental codes	From 18 to 48 or from 55 to 85			For temporary teeth		Key
ØØ	ØØ	ØØ	ØØᵃ	ØØᵃ	ØØᵃ	Ø
– –	– –	– –	– –	– –	– –	–
2 digits	2 digits	2 digits	2 digits	2 digits	2 digits	1 digit
ᵃ When applicable. If not: 00						

5 Descriptions and definitions of codes

5.1 Codes for dental laboratory procedures

— code 0: General;

— code 1: Models, Study, Project(s);

— code 2: Professional surface care.

2	0	0	0	0	Professional surface care
2	2	1	0	0	** Bleaching splint
2	6	1	0	0	* Fluoridation splint

— code 3: Orthodontics

3	0	0	0	0	Orthodontics
3	1	2	0	0	* Aids to diagnosis: – Study and rehabilitation model
3	1	3	0	0	* Impression tray
3	2	2	0	0	* Progress record model
3	3	0	0	0	** Prefabricated device
3	4	0	0	0	Retainer, removable
3	5	0	0	0	Retainer, fixed
3	6	0	0	0	Positioner, removable
3	7	0	0	0	Positioner, fixed
3	8	0	0	0	Not assigned
3	8	7	0	0	* Orthopaedic craniofacial rehabilitation (see also: 88.700 and 98.700)
3	9	0	0	0	Not coded: Documentation attached

— code 4: Periodontics

4	0	0	0	0	Periodontics
4	2	0	0	0	** Protection splint-mouth guard
4	8	0	0	0	** Contention splint custom-made EXAMPLE: Custom-made mouth protector

— code 5: Single tooth restoration

5	0	0	0	0	Single tooth restoration
5	7	0	0	0	** Laboratory preform (made in laboratory): EXAMPLE: Crown made in laboratory
5	8	0	0	0	** Factory-prefabricated product EXAMPLE: Prefabricated crown

— code 6: Not assigned

— code 7: Oro/dental surgery

7	0	0	0	0	Oro/dental surgery
7	4	0	0	0	Splint for fracture contention
7	7	0	0	0	Cosmetic and functional surgery/Restoration, monitoring and maintenance

↰		↰ *	⇐	Additional codes (Not in ISO/TR 13668)
		↰ * *	⇐	Additional lines (Not in ISO/TR 13668)

— code 8: Fixed prosthesis

8	0	0	0	0	Fixed prosthesis
8	1	0	0	0	Study model
8	2	0	0	0	
8	3	0	0	0	Bonded to enamel
8	4	0	0	0	Crown or inlay, cemented
8	5	0	0	0	Crown, inlay and implants, cemented
8	6	0	0	0	Bone-implanted abutment only
8	7	0	0	0	
8	8	0	0	0	
8	9	0	0	0	Not coded: documentation attached

— code 9: Removable prosthesis

9	0	0	0	0	Removable prosthesis
9	1	0	0	0	Aid to realization, study model
9	2	0	0	0	Partial prosthesis: Tooth and/or implant borne
9	3	0	0	0	Partial prosthesis: Tooth and/or implant and mucosa borne
9	4	0	0	0	Partial prosthesis: Mucosa borne
9	5	0	0	0	Full prosthesis: Residual root and mucosa borne
9	6	0	0	0	Full prosthesis: Mucosa borne - Implant attached
9	7	0	0	0	Full prosthesis, mucosa borne
9	8	0	0	0	Not coded: Documentation attached
9	9	0	0	0	

↰				1: From ISO/TR 13668, annex A
	↰			2: From ISO/TR 13668, annex A + (** additional lines) not in ISO/TR 13668
		↰		3: Not assigned (see: * additional codes) not in ISO/TR 13668
			↰	4: Not assigned
				↰	5: Not assigned

5.2 Codes for materials (see ISO/TR 13668)

Codes for definition of products: 2 digits followed by codes for the contents, for example 86 = metal ceramic system, followed by (at random): 254 = noble alloy, or other code to be defined, followed by (at random) 345 = manufacture reference of ceramic used. The choice of three-digit codes and their use is left to the manufacturer.

80	Any factory- or custom-formed material
81	Metal
82	Polymer
83	Ceramic or cast glass
84	Metal + Polymer
85	Metal + Ceramic
86	Metal/ceramic system
87	Polymer + Ceramic
88	Metal + Polymer + Ceramic
89	Not coded: Mandatory information attached

5.3 Codes for laboratory steps (see ISO/TR 13668)

	70	Any laboratory step
	71	Working or study model
	72	Pattern for bite registration
	73	Assembly — Preforms — Teeth
	74	Assembly — Preforms — Wire/metal
	75	Pattern investment
	76	Final form
	77	* Repair and/or extend
	78	* Rebase
	79	Not coded: Information attached
* Additional codes (not present in ISO/TR 13668)		

6 Classification of dental metals and alloys

A	1st digit	= Base	
B	2nd digit	= Second constituent	
C	3rd digit	= Standard number	if 9: Mandatory document attached
D	+ 2 digits	= 2 digits by which the laboratory codes the origin of the product	
E			

Column A: Base		Column B: Second constituent		Column C: Standard number		Columns D and E: 2 digits	
Ti	0	Nothing =	0	N° 1	not assigned	by which the laboratory codes the origin of the product	
Au	1	Au	1	N° 2	not assigned		
Pt	2	Pt	2	N° 3	= ISO 6871-1		
Ag	3	Ag	3	N° 4	= ISO 6871-2		
Pd	4	Pd	4	N° 5	= ISO 8071		
Ni	5	Ni	5	N° 6	= ISO 1562		
Co	6	Co	6	N° 7	not assigned		
	7	Cr	7	N° 8	not assigned		
Fe	8	Mo	8				
Others	9	Cu	9	N° 9	= information attached	N° 9	= information attached

7 Classification of non-metallic materials

7.1 Ceramic codes

Column:

A	1st digit	= category of ceramic; if 9: mandatory document attached
B	2nd digit	= classification: occlusal wear; if 9: mandatory document attached
C	3rd digit	= not assigned; if 9: mandatory document attached
D + E	+ 2 digits	= 2 digits by which the laboratory codes the origin of the product; if 9: mandatory document attached

A   1 = classical ceramic on platinum foil

2 = all-ceramic system (lost wax technique)

3 = very low fusion ceramic for metallo-ceramic system on titanium or titanium alloys

4 = low fusion ceramic for metallo-ceramic system

5 = not assigned

6 = ceramic for metallo-ceramic system on alloys with gold base

7 = not assigned

8 = ceramic prefabricated teeth

9 = mandatory document attached

B   0 to 8 = not assigned; if 9: mandatory document attached

C   not assigned; if 9: mandatory document attached

D and E   = 2 digits by which the laboratory codes the origin of the product

7.2   Polymer codes

Column

A	1st digit	= category of polymer; if 9: mandatory document attached
B	2nd digit	= classification: occlusal wear; if 9: mandatory document attached
C	3rd digit	= not assigned; if 9: mandatory document attached
D + E	+ 2 digits	= 2 digits by which the laboratory codes the origin of the product; if 9: mandatory document attached

A   1 = resin of copolymer base (classical acrylic)

2 = injection-moulded resin

3 = polyvinyl

4 = tooth-coloured resin for jacket crowns and veneers

5 = composite resin

6 = heat- and pressure-processed resin

7 = composite resin and associated acrylic for prefabricated teeth

8 = resin for acrylic rapid-erosion prefabricated teeth for temporary prosthesis

9 = mandatory document attached

B   0 to 8 = not assigned

9 = mandatory document attached

C   not assigned; if 9: mandatory document attached

D and E   = 2 digits by which the laboratory codes the origin of the product

Annex A
(informative)

COSI (from ISO/TR 13668:1998, annex A)

COSI = Codes for Oral Status & Interventions

Basic decimal principle: Health = 0			Handicap/Dependence = 1					

ORAL STATUS (e.g. intervention needed):

Assess/Record.	Instruction	Surface	and support care	Tooth-restoration	Removal	Hard and soft tissue replacement	see ICD
0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	– 1

DECIMAL CLASSIFICATION OF PROCEDURES (Interventions column, 1st digit):

0	1	2	3	4	5	6	7	8	9
Exam. & Aids to diagnosis	Explan. Exercise	Professional surface care	Orthodont.	Periodont.	Enam/dentin restoration	Endodont.	Surgery	Fixed prosthesis	Removable prosthesis

CODES FOR PROCEDURES

00Ø OSI Examination/record	**20Ø Professional surface care**	**40Ø Periodontics**	**60Ø Endodontics**	**80Ø Fixed prosthesis**
01Ø General preliminary exam.	21Ø Exam./Plan/Explain/ Prescr.	41Ø Exam./Plan/Explain./ Prescr.	61Ø Exam./Plan/Explain./ Prescr.	81Ø Exam./Plan/Explain./ Prescr.
02Ø Diagnosis	22Ø	42Ø	62Ø Temporary dressing	82Ø .....
03Ø Microbiological sampling	23Ø Stain removal	43Ø Recontour	63Ø Lining	83Ø Enamel bonded
04Ø Bite-wing X-ray	24Ø Calculus removal, light	44Ø Root cleaning	64Ø Capping, indirect	84Ø Crown/inlay cemented
05Ø X-ray, intra-oral film	25Ø Calculus removal, heavy	45Ø Curetage	65Ø Capping, direct	85Ø Crown/inlay + Implant cem.
06Ø X-ray, extra-oral film	26Ø Caries preventive applicat.	46Ø Applied medication	66Ø Chamber	86Ø Bone-implanted abut. only
07Ø Biopsy	27Ø Pits and fissures sealing	47Ø	67Ø Root canal(s)	87Ø .....
08Ø Cytological sampling	28Ø	48Ø	68Ø Root canal re-treatment	88Ø .....
09Ø Not coded: Description mandatory	29Ø Not coded: Description mandatory	49Ø Not coded: Description mandatory	69Ø Not coded: Description mandatory	89Ø Not coded: Description mandatory
10Ø Instruct/Exercise/ Monitor	**30Ø Orthodontics**	**50Ø Single tooth restoration**	**70Ø Oro/dental surgery**	**90Ø Removable prosthesis**
11Ø Exam./Plan/Explain/ Prescr.	31Ø Exam./Plan/Explain/ Prescr.	51Ø Exam./Plan/Explain/ Prescr.	71Ø Exam./Plan/Explain/ Prescr.	91Ø Exam./Plan/Explain/ Prescr.
12Ø General oral health, diet	32Ø Monitor development	52Ø Direct insertion, metallic	72Ø Extraction, tooth	92Ø Partial, tooth/implant borne
13Ø Mucosal exam.	33Ø	53Ø Direct insertion, non-metallic	73Ø Access to other procedure	93Ø Partial, t./i.& mucosa borne
14Ø Gingival exam.	34Ø Retainer, removable	54Ø Direct insertion, metallic, late	74Ø Trauma, fracture reduct.	94Ø Partial, mucosa borne
15Ø Enamel exam.	35Ø Retainer, fixed	55Ø Direct insertion, non-metallic, late	75Ø Lesion, foreign body, etc.	95Ø Full denture, roots/m. borne
16Ø Force/position control	36Ø Positioner, removable	56Ø Direct insert extended/repaired	76Ø Tumour	96Ø Full denture, implants attached
17Ø Pain relief/desensitizat.	37Ø Positioner, fixed	57Ø Laboratory preform	77Ø Cosmet/funct. Rest/maint.	97Ø Full denture, mucosa borne
18Ø	38Ø ..... Not yet assigned	58Ø Factory preform	78Ø Pain-control procedure	98Ø .....
19Ø Not coded: Description mandatory	39Ø Not coded: Description mandatory	59Ø Not coded: Description mandatory	79Ø Not coded: Description mandatory	99Ø Not coded: Description mandatory