

## Technical Specification

# Specification for Labelling of Equipment on ITER Project

It is essential for the successful operation of the site that equipment is marked appropriately. The following details the rules applicable to equipment tags, it details colours, formats and the presentation and location of the tags.

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<i>Change Log</i>			
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<i>Version</i>	<i>Latest Status</i>	<i>Issue Date</i>	<i>Description of Change</i>
v0.0	In Work	07 Jul 2016	
v1.0	In Work	07 Jul 2016	Upload of document to be reviewed
v1.1	In Work	07 Jul 2016	error in first
v1.2	Revision Required	08 Jul 2016	Version with Laurents comments, please review
v2.0	Revision Required	28 Jul 2016	Version incorporating comments from reviewers
v3.0	Signed	07 Sep 2016	Update to incorporate comments and results of discussions
v3.1	Signed	21 Sep 2016	Changes incorporated, i did not incorporate the following please fastrack asap  You could also have pointed out that the information in the QR code shall attributes/data linked to the functional tag/component only. But the content of your example is ok.
v3.2	In Work	22 Sep 2016	last minute additions
v3.3	Approved	22 Sep 2016	minor change

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# 1 Purpose

It is essential for the successful operation of the site that equipment is labelled appropriately. This can only be achieved by correctly defining the rules for all equipment to be installed on site. The following details the rules applicable to equipment labels, it details colours, formats and the presentation and location of the labels. This document differentiates labels from tags by the following definitions

**LABEL)** An object attached to mechanical or electrical equipment which carries information. Colour coding, fluid flow, safety information. As specified in [ITER Site Signage & Graphics Standards \(4ALJEU\)](#).

**TAG)** The information which enables users to identify the object using the standard IO approach for equipment identification. As specified in ([Specification for Labelling of Equipment on ITER Project \(TL25DK\)](#))

# 2 Reference Documents

- IO\_21\_CS\_4ALJEU\_ITER\_v02.4 - Site Signage & Graphics Standards
- \_ITER\_28QDBS\_v2.0 - ITER Numbering System for Components and Parts
- \_ITER\_RZC23K\_v3.0 - Specification for the additional cover page to be added on documents handed over from CMIS-A to CMIS-B

# 3 Materials

The material used for the labels shall retain its mechanical properties throughout its service life during both normal and exceptional conditions. This service life will be based on the expected service life of the equipment and not the ITER plant. The labels can be made of two different types of media

- on a 3mm self coloured vinyl media, with the inscriptions obtained by serigraphy
- on a media comprised of stratified materials obtained by pressing layers of different colours

The material can be subjected to the following

- temperature -5 Winter and summer +45
- potential radiation field (neutron bombardment) (in this case the subcontractor will justify its position)
- humidity range from 0 to 100%
- plastic components will be M2 classification for fire resistance

## 4 Proposed Label

### 4.1 Dimensions

Figure 1 shows the label to be used. It is referred to as the standard label, and will be used for mechanical and electrical equipment. Variations will be developed for special cases when necessary from the basic principles contained within this label.

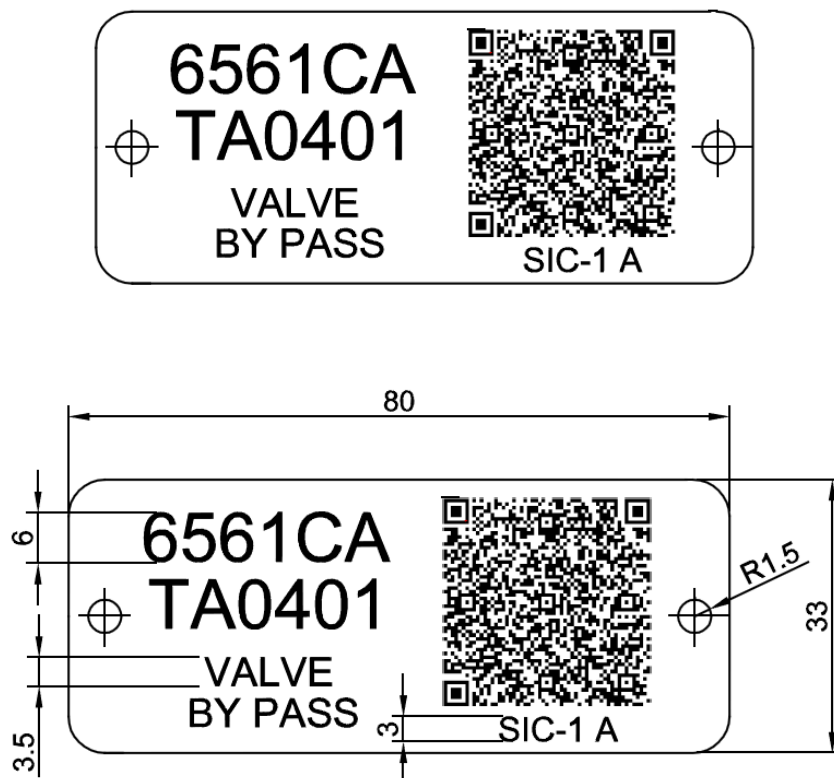


Figure 1 Standard Label

The following information along with a bar code is engraved on the label.

- Functional Category Designator of the equipment (Code 12 Digits)
- Designation of the equipment (Name)
- Bottom right it will be noted if SIC with the train if any

## 4.2 QR Barcode

The QR barcode will be a tool to incorporate all the information required for the operation, maintenance and eventual dismantling of the equipment. The barcode appears on the right of the Label. To avoid inconsistency in the information contained in the QR barcode (or to have to change the label), the QR code shall not contain any information related to physical item or part: no part identification number (PNI), no serial number (SN) or information related to these object (manufacturer, etc.).

For example a pipe label will include the following information, it should include all pertinent information (safety, maintenance) which serves a clear purpose.

6561CA-TA-0401

Nature of fluid: Compressed Air

Fluid Phase: Gas

Nominal Diameter

Nominal Temperature

Vol:10m<sup>3</sup>

Max pressure: 1MPa

Spec:AMNG

Safety Level :PIC

Train:N/A

Elec: Class IV

Quality: Class 3

Weight (For Equipment)

ESPN/PED Classification

Cleanliness Group (RCC M)

Material

Wall Thickness

Hydro test Pressure

And a link to the database: <http://go.iter.org/component/6561CA-TA-0401>

The Use of QR Barcode within the ITER Numbering System for components is as follows, the label will be tagged with the functional reference which defines its specific position in a system or plant. The part number and serial number will not be contained within the bar code information as shown above. The advantage to this is that the functional reference will remain throughout the service life (unless the function is changed). The functional category designator and the sequential number as essential for the tag to allow the end of erection control which will be based on diagrams (isometrics/Prides etc.)

A database will be created to contain the information linked to each functional reference i.e. the part number and serial number. This will be linked to the care and maintenance schedule.

The categorisation of bulk items with the functional reference will allow substitution of one piece for another without the need to change the tag, this will be handled in the database.

As OC have a contract to maintain systems for 2 years after takeover, it is essential that the labels can interface with IOs Smartplant Plant Operator and the proposed system/methods to be used by OC. As the IO asset management system is the smartplant software suite the references will be compatible with smartplant and linked to IO's Plant maintenance software

### **4.3 Part Number and Serial number**

The part number (manufacturers code for a collection of items) and the serial numbers (identifying physical item) will be shown on the material name plate and not on the label, it will be integrated into the database but not shown in the QR barcode data. For some of this equipment the name plate will be a requirement of European Directives (Pressure Equipment Directive). A guiding principal will be to not duplicate information within the QR barcode when it is on the name plate.

### **4.4 Special Format Labels**

For very large equipment, the size of the labels and the text will be increased as a function of equipment size (eg tanks), viewing distance etc. The following principles must nevertheless be respected

- Label sizes should be uniform for identical equipment
- Minimum character height is 3mm
- All the letters on the same line must have the same height for readability
- Text must be in capital letters

### **4.5 SIC Classification**

As stated previously the SIC classification (when applicable) will be engraved on the right section of the label, on the lower section of the label

## 5 Piping and Associated Materials Labeling

The labels background colour corresponds to the circuit colour which is based on ITER D 4ALJEU Signage and Graphics Standards (reference 1). The basic colour distinguishes the basic nature of the fluid or service. Refer to the table below for basic colour. The basic colour should be applied as a broad band or panel but may be applied to the full run of the pipeline.

System	Basic Colour	RAL	PANTONE
Water	Green	6018	363
Steam	Dark Red	3004	491
Combustible Liquids (Oils - Minerals, Synthetics)	Brown	8001	471
Acids	Orange	2004	1655
Alkalis	Violet	4001	682
Air	Grey	7001	444
Fire Protection System	Red	3000	484
Oxygen	Blue	5015	3015
COMBUSTIBLE & TOXIC GASES (Either Gaseous or Liquefied Condition except Air)	Yellow	1021	1235
Other Gases and Liquids	Black	9004	Black Noir 6

Regarding drain valves and vents, the selected colour will relate to the fluid usually contained in the device (water, vapour, air, nitrogen).

The following is a non comprehensive list of items which will be marked

- Pumps
- Exchangers
- Tanks
- Skid
- Line components (differential pressure device, filter, flowmeter, etc.)
- Valves (hand-, motor-operated shut off, regulating, check, etc.)
- Instrumentation valves (pressure, level measurement, etc.)
- Pipes



## 6 Electrical Component Labelling

As stated in the ITER signage and graphics standards the purpose of the label is to choose a colour which enables identification with a view to correctly identifying equipment and distinguishing the safety trains and voltage levels and function by colour. The following is the colour to be adopted for the electrical labels

Safety Class	Train	Colour	RAL ID
SIC	Train A	Orange	2000
SIC	Train B	Green	6016
NON SIC	-0	Black	9005

## 7 Colours for Electrical Equipment Labelling

Electrical equipment including electrical power supply equipment e.g. SSEN and PPEN components. The following table details the colour code for voltage level and function of electrical equipment

Category	Voltage Level	Colour	RAL ID
HV	Higher than 50kV	Yellowish Orange	1003
MV	From 1kV up to 50kV	Yellow	1018
LV-AC	400V, 230V	Yellowish Grey	1013
LV-DC	48V, 110V	Grey	7001
Control Cubicle	Local Control Box	Dark Grey	7043
	I&C Cubicles	Blue	AFNOR 2550

## 8 General Arrangement Details

### 8.1 Colour of the characters

The colour of the characters will be chosen to contrast with the label and will be either black or white

Base Colour	Characters
orange, green, dark red, brown, light blue, purple, black, light brown	white
white, yellow,	black

## 9 Outgoing Cables

The cables leaving electrical boxes and control cabinets will have distinct labels with just one line of text (unique identification) which is developed according to ITER Numbering System for Parts/Components (ITER\_D\_28QDBS).

## 10 Fixing labels to supports

The labels shall be either attached directly onto the equipment when the surface is flat, or by using a support component in the case of curved surfaces, if this is not possible they can be attached using the equipment bolts unless they have a safety function, or as a last resort onto a wall, floor or a support structure close to the equipment to be marked.. For piping and process equipment (pipe/valves/pumps, etc) as stated the preferred option is to use an intermediate support component which will be used on the pipe directly next to the equipment (preventing the possibility of removing the tag and tag support with the equipment upon replacement. This will be composed of two sections:

- a support component to be fixed to the equipment using a SERFLEX type clamp (figure 2).
- a label (see figure 1) which will be fixed to the support component by 2 POP type rivets and/or crimping tool



figure 2

For insulated piping the label support component can, as a variation, be adapted to allow it to be fixed onto the protective metallic exterior of the insulation

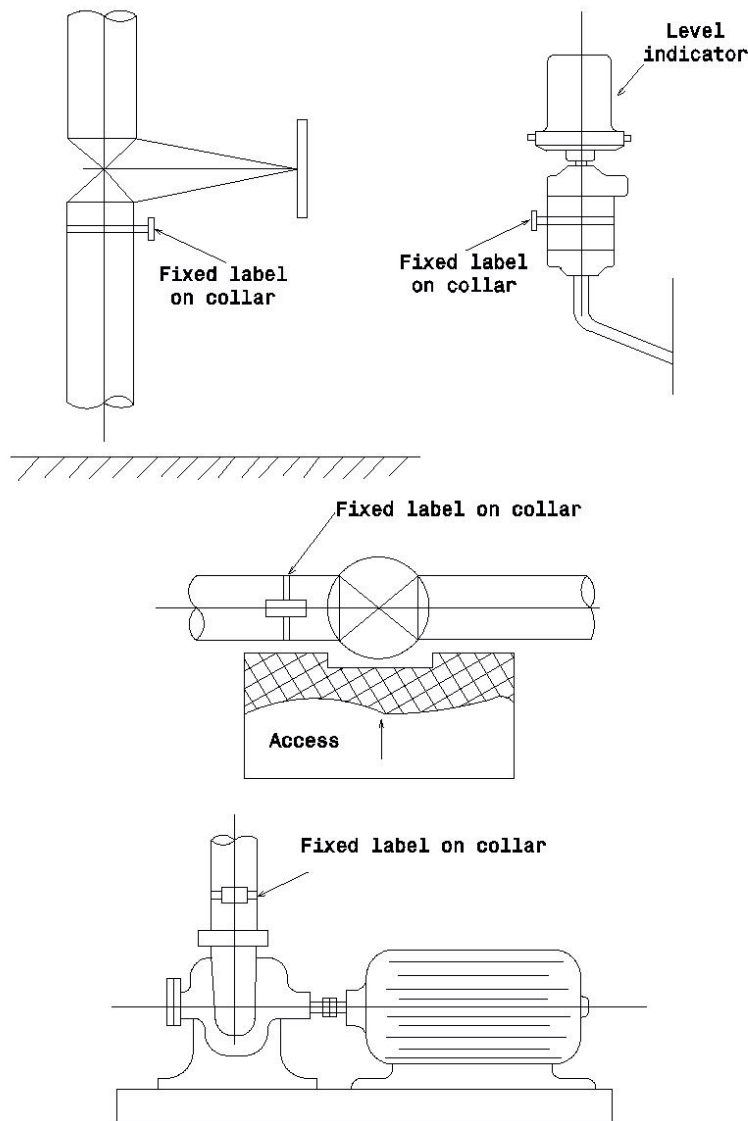
The component support will be installed as close as possible to the equipment.

For electrical equipment the labels will be screwed in place using parker type screws in such a way that they can be easily removed. If this is not possible they can be glued or applied with another suitable method. For this purpose 2 x 3mm holes have been made in the labels

Note) Under no circumstances shall the label supports be welded onto the pipes

## **11 Location of Tags**

The following diagram shows some examples of the location of the labels and highlights the need for visibility



## 12 Information from Contractor

The following is the minimum information required by the erection contractors for the installation of labels which must be included in the equipment labelling specification to be issued by each of the plant contractors

- The rules and recommendations for the installation of label supports (position in relation to equipment / position in relation to the operator - visibility - insulated equipment. Taking into account the requirements of this chapter
- Sketches of different types of support to be used together with criteria for the selection of each type
- rules for fixing labels to their supports.