

Technical Documentation Standard for PCC Rokita S.A.

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PCC Rokita S.A.

ul. Sienkiewicza 4

56-120 Brzeg Dolny

kontakt@pcc.rokita.pl

www.pcc.rokita.pl

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1. INTRODUCTION

To improve all processes related with design and maintenance works, the global leading companies representing chemical, petrochemical, refinery and pharmaceutical sectors developed their own standards for technical documentation and process identification systems.

Technical documentation standard was created to standardize process identification system and whole documentation occurred on the production units located in PCC Rokita SA in Brzeg Dolny.

Standard was prepared based on the existing technical documentation by the long-term experience engineers and experts working in the PCC Rokita, with supervision and support of the external company Weyer Poland Sp. Ltd.. It is the basic instructions for preparation (or recovery) documentation by the a local or external engineering companies which provide such services for PCC Rokita SA

The scope of standard includes specification of documentation nomenclature, standard for the drawing formats, symbols, identification system for equipment and devices working at PCC Rokita S.A. production units and the principles for creation and record documentation from the process, mechanical, instrumentation, control, electrical and plant safety branches existing in the production units.

2. NOMENCLATURE

2.1 Standards nomenclature

Standards for the appropriate branches were designated as following:

SDT	X-0
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SDT – abbreviation of "the Standard of Technical Documentation"

X-0 – "X" represents documentation branches (see – Table 2.1);
 „0" – it's a number of the successive document

Table 2.1. Branches letter code

B	Civil
C	Instrumentation and control
E	Electrical
G	General
M	Mechanical
P	Process
S	Plant safety

2.2 Attachment nomenclature

The attachments naming structure is as following:

Attachment	X-0	/	0
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Attachment – Attachment for the appropriate branches

- X – "X" represents appropriate branches (see – Table 2.1)
- 0/0 – The first „0” – is a successive number of attachment; the second „0” is optional, only if a group of attachments exist

2.3 Lists, technical specification, datasheets

Nomenclature structure for the lists, technical specifications, etc. is as following:

XY	00
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- X – Represents appropriate branches (see – Table 2.1);
- Y – Document letter code (see – Table 2.2);
- 00 – Number of successive document

Table 2.2. Docs letter code:

E	Equipment
I	Instrumentation and control
S	General sheets, lists

2.4 ACAD symbols

For the BFD, PFD, P&ID and isometric drawings symbols database was developed (see [Attachment P2](#), [Attachment P3/\(1÷26\)](#), [P4/\(3÷7\)](#)).

Each symbols were compiled on the tables with appropriate numeric code which represents separate symbol according to the following key:

XY	000
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- X – Group of symbols e.g. E – equipment; I – instruments and control devices
- YY – (1÷2 letters) symbol subgroups e.g. EK – column; EKl – column internals;
IL – signal lines; IF – function identification
- 000 – represents the number of a symbol in the group / subgroup

3. LIST OF SDT DOCUMENTS

3.1 General documentation (G)

Main documentation

Table of contents	SDT G-0
Documentation nomenclature	SDT G-1
Process identification system	SDT G-2
Drawing standard	SDT G-3
Documentation developing standard	SDT G-4

Attachment

Plant identification system	Attachment G-1
Engineering units	Attachment G-2
Documentation structure	Attachment G-3

3.2 Process department (P)

Main documentation:

Table of contents	SDT P-0
Process description	SDT P-1
Block flow diagram (BFD)	SDT P-2
Process flow diagram (PFD)	SDT P-3
Mass and heat balance	SDT P-4
Piping and instrumentation diagram (P&ID)	SDT P-5
Media list	SDT P-6

Attachments

Data to tables in PFD i P&ID	Attachment P-1
General symbols	Attachment P-2
Symbols for equipment, apparatus and fittings	Attachment P-3
Vessels, tanks, storage tanks	Attachment P-3/1
Vessels with internals, columns with internals, chemical reactors with internals	Attachment P-3/2
Facilities for cooling and heating	Attachment P-3/3
Heat exchangers, steam generators, furnaces	Attachment P-3/4

Filters, liquid filters, gas filters	Attachment P-3/5
Sifters, screening devices, screening machines, sorting devices, sorting machines	Attachment P-3/6
Separators	Attachment P-3/7
Centrifuges	Attachment P-3/8
Driers	Attachment P-3/9
Crushing machines, grinding machines	Attachment P-3/10
Agitators, stirrers	Attachment P-3/11
Mixers, kneaders	Attachment P-3/12
Processing machines, shaping machines	Attachment P-3/13
Pumps	Attachment P-3/14
Liquid pumps, compressors, vacuum pumps, blowers, fans	Attachment P-3/15
Lifting, conveying and transport	Attachment P-3/16
Scales	Attachment P-3/17
Proportioners, feeders and distribution facilities	Attachment P-3/18
Motors, engines, drives	Attachment P-3/19
Miscellaneous items of equipment	Attachment P-3/20
Shut-off valves	Attachment P-3/21
Check valves	Attachment P-3/22
Control valves	Attachment P-3/23
Valves and fittings with safety function	Attachment P-3/24
Fittings	Attachment P-3/25
Other graphical symbols	Attachment P-3/26
Instrumentation symbols	Attachment P-4
Identification letters	Attachment P-4/1
The most commonly used instrumentation codes	Attachment P-4/2
Instrumentation device and function symbols	Attachment P-4/3
Function identifications	Attachment P-4/4
Line symbols:	Attachment P-4/5

Actuators symbols for control valves	Attachment P-4/6
Identification of working type for control valves	Attachment P-4/7
Pipelines nomenclature on P&ID	Attachment P-5
Media – nomenclature	Attachment P-5/1
Nominal pressures	Attachment P-5/2
Material classes	Attachment P-5/3
Norms/standards	Attachment P-5/4
Heating/Cooling types	Attachment P-5/5
Insulation types	Attachment P-5/6

Lists

Mass and heat balance	PS01
Media list	PS02

3.3 Mechanical department (M)

Main documentation

Table of contents	SDT M-0
Isometric drawings	SDT M-1
Plant layout drawings	SDT M-2
3D model	SDT M-3

Attachments

Symbols used in the isometric drawings	Attachment M-1
3D model checking list	Attachment M-2

Lists

Process equipment list	MS01
Process equipment insulation list	MS02
Fitting and material list	MS03
Storage tanks list	MS04
Rotating equipment list	MS05
Line list	MS06
Pipeline fitting list	MS07
Pipeline insulation list	MS08

Spare parts list	MS09
Nozzle list	MS10
<u>Datasheets</u>	
Air cooler	ME01
Column	ME02
Agitator	ME03
Static mixer	ME04
Metering pump	ME05
Centrifugal pump	ME06
Centrifugal pump (Vertical)	ME07
Liquid ring – vacuum pump	ME08
Reciprocating pump	ME09
Rotary positive displacement pump	ME10
Reactor	ME11
Centrifugal compressor	ME12
Reciprocating compressor	ME13
Fan	ME14
Blowers	ME15
Storage tanks	ME16
Vessel	ME17
Ejector	ME18
Filter	ME19
Bagfilter	ME20
Empty	ME21
Silos	ME22
Bucket elevator	ME23
Screw conveyor-feeder	ME24
Belt conveyor-feeder	ME25
Steam trap	ME26
Safety-relief valve	ME27

Repture discs	ME28
Gear	ME29
Motor	ME30
Shell and tube heat exchanger	ME31
Plate and frame heat exchanger	ME32
Spiral heat exchanger	ME33

3.4 Instrumentation and control (C)

Main documentation

Table of contents	SDT C-0
Loop diagrams	SDT C-1
Interlock diagrams	SDT C-2
Sequence diagrams	SDT C-3
Documents list for Instrumentation and Control	SDT C-4

Breakdown, lists

Measurement points list	CS01
Spare parts list	CS02
Interlock summary list	CS03
Interlock diagram sheet	CS04

Datasheets (instrument specification sheets)

Control valve	CE01
On/Off Valve(XV)	CE02
Safety valve	CE03
Solenoid valve(XY)	CE04
Valve with limit switches	CE05

Magnetic Flowmeter (FT)	CI01
Coriolis Mass Flowmeter (FT)	CI02
Vortex Flowmeter (FT)	CI03
Venturi tube Flowmeter (FT)	CI04
Rotameter (FI)	CI05

Thermal mass flowmeter (FT)	CI06
Ultrasonic flow meter (FT)	CI07
Hydrostatic mass flowmeter (LT)	CI08
Level switch (LS)	CI09
Level Transmitter (LT)	CI10
Pressure Regulator (PCV)	CI11
Pressure differences Transmitter (PDT)	CI12
Manometer (PI)	CI13
Pressure Switch (PS)	CI14
Pressure Transmitter (PT)	CI15
Temperature sensor(TE)	CI16
Temperature Indicator (TI)	CI17
Temperature Transmitter (TT)	CI18
Turbine flowmeter (FI)	CI19
Oval gear flowmeter (FI)	CI20
Flow switch (FS)	CI21

3.5 Electric department (E)

Main documentation

Table of contents	SDT E-0
Electric diagrams	SDT E-1
Electric layout	SDT E-2

Attachments

Symbols for electric diagrams	Attachment E-1
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Breakdown, lists

Cable lay-out	ES01
Electric consumer list	ES02

3.6 Safety department (S)

Main documentation

Table of contents	SDT S-0
Classification of fire zones	SDT S-1
HAZOP analysis	SDT S-2

Attachments

List of objects	SS01
Flammables and explosives safety datasheet	SS02
Fire zones list	SS03
HAZOP – worksheet	SS04