

	PROCESS DESIGN MANUAL UTILITY & EFFLUENTS	SPD0018ERN
		REV. : 2
		PAGE 1 OF 7
DATE : 2013.04.30		

PROCESS DESIGN MANUAL SPD0018ERN UTILITY & EFFLUENTS REV. : 2 DATE : 2013.04.30



	PROCESS DESIGN MANUAL UTILITY & EFFLUENTS	SPD0018ERN
		REV. : <u>2</u>
		PAGE 2 OF 7
DATE : <u>2013.04.30</u>		

CONTENTS

	PAGE
1. UTILITIES, CATALYSTS AND CHEMICALS	
1.1. SCOPE -----	3
1.2. FORMAT -----	3
1.2.1 Utilities -----	3
1.2.2 Catalysts and Chemicals -----	3
1.3. UTILITIES -----	3
1.3.1 General -----	3
1.3.2 Utilities to be Considered -----	3
1.4. CATALYSTS AND CHEMICALS -----	4
1.4.1 General -----	4
1.4.2 Catalysts and Packings -----	4
1.4.3 Chemicals -----	4
1.4.4 Others -----	4
2. EFFLUENTS	
2.1. SCOPE -----	5
2.2. GENERAL -----	5
2.3. FORMAT -----	5
2.4. GASEOUS EFFLUENTS -----	5
2.5. LIQUID EFFLUENTS -----	6
3. REVISION HISTORY -----	7

	PROCESS DESIGN MANUAL UTILITY & EFFLUENTS	SPD0018ERN
		REV. : <u>2</u>
		PAGE 3 OF 7

1. UTILITIES, CATALYSTS AND CHEMICALS

1.1. SCOPE

This manual covers the minimum requirements for preparing engineering document to utilities, catalysts and chemicals.

1.2. FORMAT

1.2.1 Utilities

The utilities shall be stipulated in the form of Utility Summary. The summary sheet shall be prepared for instrument and plant air, and inert gas, as necessity thereof arises.

1.2.2 Catalysts and Chemicals

The catalysts and chemicals shall be stipulated in the form of "Catalysts and chemicals".

1.3. UTILITIES

1.3.1 General

The consumption and/or generation of all utilities required for the plant operation shall be calculated for each user, and these utilities be summarized under each type of utility.

The utility consumption shall be stipulated in its net value.

The utility consumption of pumps, compressors, and air fin coolers, etc. shall be updated on the basis of vendors' information, if the consumption of these utilities is determined by the vendors.

This utility consumption summary will constitute a design basis of utility facilities. Therefore the maximum & minimum consumption and/or generation of utilities under abnormal conditions, such as these of alternate operation, and emergency operation, etc. shall be stipulated in addition to the normal consumption.

1.3.2 Utilities to be Considered

The following utilities shall be summarized.

- (1) Electric power (including rotary machineries)
- (2) Steam (including steam turbines)
- (3) BFW and condensate
- (4) Cooling water (including mechanical cooling water)
- (5) Industrial water
- (6) Fuel oil & gas
- (7) Instrument and plant air
- (8) Inert gas / Nitrogen

Note: Stipulate working interval as for intermittently used utilities

	PROCESS DESIGN MANUAL UTILITY & EFFLUENTS	SPD0018ERN
		REV. : <u>2</u>
		PAGE 4 OF 7

1.4. CATALYSTS AND CHEMICALS

1.4.1 General

Regarding all catalysts and chemicals required for the plant operation, the quantity required for the initial filling and subsequent consumption thereof shall be calculated, and catalysts and chemicals shall be summarized.

All of these requirements shall be stipulated in their net value, and in the case where these catalysts and chemicals are actually purchased, orders shall be placed for the same in the gross value taking into account some allowances (including filling and others loss).

1.4.2 Catalysts and Packings

The following catalysts and packings shall be stipulated.

- (1) Catalyst
- (2) Adsorbent
- (3) Desiccant
- (4) Sand and rock salt for dehydrator
- (5) Iron-exchange resin
- (6) Ceramic balls for catalyst supporting and holding

1.4.3 Chemicals

The following chemicals shall be stipulated.

- (1) Nitrogen, hydrogen, etc.
- (2) NaOH, H₂SO₄, HCl, etc.
- (3) Inhibitors for corrosion, fouling, polymerization, etc.
- (4) Antifoamer
- (5) BFW additive
- (6) MEA, DEA, DIPA, etc.
- (7) Glycol, methanol, etc.
- (8) Refrigerant
- (9) Emulsion breaker, filter aids, etc.
- (10) PH control agent

1.4.4 Others

Lube oil and seal oil required for the operation of rotary machineries, etc. shall be summarized later by the project engineer or rotary machinery engineer.

	PROCESS DESIGN MANUAL UTILITY & EFFLUENTS	SPD0018ERN
		REV. : <u>2</u>
		PAGE 5 OF 7

2. EFFLUENTS

2.1. SCOPE

This manual covers the minimum requirements [for](#) the preparation [of](#) the data sheet in relation to gaseous and liquid effluents. Those for solid waste shall be specified [separately](#).

2.2. GENERAL

Since air and water pollution controls are strictly required by the legislations of the [concerned](#) country or its local regulations, the discharge amount of pollutants shall be confirmed in advance of the public application of a plant. Should the [calculated amounts exceed the limits set forth by applicable regulations, appropriate treatment facilities shall be designed with proper approvals by the government authorities obtained in advance](#). For that purpose, this effluent summary sheet is considered important.

Therefore, the discharge amounts of all the pollutants which will pollute environment shall be calculated prior to the preparation of this summary so that there will be no missing items.

2.3. FORMAT

The individual pollutants shall be described in [the](#) form "Effluent Summary". The unit to be applied shall be the same as those used in the specified values.

Generally, the following units are applied.

Pollutants in gaseous effluents: mg/Nm³ or vol ppm

Pollutants in liquid effluents : g/m³ or wt ppm

2.4. GASEOUS EFFLUENTS

Regarding the gaseous effluents to be discharged to the atmosphere such as fired heater flue gas, boiler flue gas, vent gas and etc., the discharging amounts of the pollutants described below shall be calculated for a source.

- (1) SO_x
- (2) NO_x
- (3) Solid Particles
- (4) H₂S, NH₃, HCl, HF, etc.
- (5) Cl₂ , F₂
- (6) CO
- (7) Hydrocarbons
- (8) Metal and its compounds, Hg, Cu, As, Pb, Cd, etc.

	PROCESS DESIGN MANUAL UTILITY & EFFLUENTS	SPD0018ERN
		REV. : <u>2</u>
		PAGE 6 OF 7
DATE : <u>2013.04.30</u>		

2.5. LIQUID EFFLUENTS

Regarding the liquid effluents to be discharged from processes such as process waste water, rain water, boiler blowdown water, cooling water, cooling tower blowdown water, ballast water, waste water from research laboratory and etc., the discharge amounts of the pollutants described below shall be calculated for a source.

- (1) pH
- (2) Oil (Note 1)
- (3) COD (Note 2), BOD
- (4) Total Suspended Solids
- (5) Metals, Cd, Cr, Cu, Pb, Hg, Ni, Zn, Ag, etc.
- (6) HCN, H₂S, HCl, NH₃, etc.
- (7) Phenol

Note:

- 1: State clearly the analytical method
- 2: State clearly whether the COD means Mn or Cr

	PROCESS DESIGN MANUAL UTILITY & EFFLUENTS	SPD0018ERN
		REV. : <u>2</u>
		PAGE 7 OF 7
DATE : <u>2013.04.30</u>		

3. REVISION HISTORY

Rev.No	Date	Scope	Description
0	98.04.17	전 페이지	신규 제정 - 작성부서 : 공정팀 - 작성자 : 구영열 이주열 - 검토자 : 이봉일 조석범 노재철 - 승인자 : 오성국
1	2010.11.25.		- Document number change due to new numbering system - Written at Process Eng'g Dept.II Written by : C.H.Yun Checked by : J.H.Park Approved by : Y.Y.Koo
<u>2</u>		<u>All pages</u>	- <u>Typo is corrected.</u> - <u>Nitrogen is added. (section 1.3.2)</u> - <u>Written at Process Eng'g Dept.</u> <u>Written by : J.W.Lee</u> <u>Checked by : S. M. Jeong</u> <u>Approved by : S.B.Lee</u>