

## DEP SPECIFICATION

# DECANTER CENTRIFUGE SELECTION, DESIGN AND MANUFACTURE

DEP 31.27.00.31-Gen.

February 2013

ECCN EAR99

## DESIGN AND ENGINEERING PRACTICE



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## 1. INTRODUCTION

### 1.1 SCOPE

This new DEP specifies requirements and gives recommendations for design, selection, manufacture, shop assembly, shop testing, shop painting and delivery of horizontal solid bowl decanter centrifuges.

Data/requisition sheet DEP 31.27.00.93-Gen. is an integral part of this DEP.

Excluded from the scope of this DEP are pressure filters of the following types:

|                                                                                                                                                                                                                                                                                                                                                                                                |                                 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| disposable cartridge filters;<br>manually cleanable disposable cartridge filters;<br>manually cleaned metal candle filters;<br>filters packed with polypropylene wool blankets/mattresses;<br>automatic backwash or backflush filters;<br>deep bed filters;<br>automatic self-cleaning filters (advanced version of automatic backwash filters with unique and more efficient backwash design) | covered in DEP 31.27.00.25-Gen. |
| vacuum belt filters                                                                                                                                                                                                                                                                                                                                                                            | covered in DEP 31.27.00.29-Gen. |
| rotary drum vacuum filters                                                                                                                                                                                                                                                                                                                                                                     | covered in DEP 31.27.00.30-Gen. |
| filters for removing particles from hydro processor feeds (type selection and design rules)                                                                                                                                                                                                                                                                                                    | covered in DEP 31.27.21.10-Gen. |

The equipment covered by this DEP includes recessed plate and membrane plate designs. Flush plate and frame designs are not included in this DEP.

This new DEP includes information derived from and supersedes 10 GS-44.

### 1.2 DISTRIBUTION, INTENDED USE AND REGULATORY CONSIDERATIONS

Unless otherwise authorized by Shell GSI, the distribution of this DEP is confined to Shell companies and, where necessary, to Contractors and Manufacturers/Suppliers nominated by them. Any authorized access to DEPs does not for that reason constitute an authorization to any documents, data or information to which the DEPs may refer.

This DEP is intended for use in facilities related to oil refining. This DEP may also be applied in other similar facilities.

When DEPs are applied, a Management of Change (MOC) process shall be implemented; this is of particular importance when existing facilities are to be modified.

If national and/or local regulations exist in which some of the requirements could be more stringent than in this DEP, the Contractor shall determine by careful scrutiny which of the requirements are the more stringent and which combination of requirements will be acceptable with regards to the safety, environmental, economic and legal aspects. In all cases the Contractor shall inform the Principal of any deviation from the requirements of this DEP which is considered to be necessary in order to comply with national and/or local regulations. The Principal may then negotiate with the Authorities concerned, the objective being to obtain agreement to follow this DEP as closely as possible.

## 1.3 DEFINITIONS

## 1.3.1 General definitions

The **Contractor** is the party that carries out all or part of the design, engineering, procurement, construction, commissioning or management of a project or operation of a facility. The Principal may undertake all or part of the duties of the Contractor.

The **Manufacturer/Supplier** is the party that manufactures or supplies equipment and services to perform the duties specified by the Contractor.

The **Principal** is the party that initiates the project and ultimately pays for it. The Principal may also include an agent or consultant authorized to act for, and on behalf of, the Principal.

The word **shall** indicates a requirement.

The word **should** indicates a recommendation.

## 1.3.2 Specific definitions

| Term                        | Definition                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Area Equivalent             | Parameter that relates the separating ability of a solid-bowl decanter centrifuge to the area of an equivalent sedimentation tank. It is the product of the free surface area of liquid in the rotating bowl times the "g"-force.                                                                                                                                                                    |
| Limit Particle Diameter     | Smallest particle size that is retained at 99+ % of all particles of that size presented to the centrifuge. The limit particle size is defined as that size particle which enters the bowl from the most adverse position and is just barely separated at the centrate discharge weir. Particles smaller than the limit size may also be separated, depending on a favourable position at the inlet. |
| Scrolling Efficiency        | Ratio of the axial movement of the settled solids per scroll revolution, to the scroll pitch. Settled solids may fail to scroll when the frictional forces at the scroll are greater than those at the bowl.                                                                                                                                                                                         |
| Slenderness Ratio           | Inside length of the rotating bowl divided by the inside major diameter of the rotating bowl.                                                                                                                                                                                                                                                                                                        |
| Stokes' Equivalent Diameter | Diameter of a spherical particle of the same density and settling rate as an irregularly shaped particle. The Stokes' Equivalent Diameter is always smaller than the largest dimension of an irregularly shaped particle. Where a particle size is specified in this DEP, the Stokes' Equivalent Diameter shall be understood.                                                                       |

## 1.4 CROSS-REFERENCES

Where cross-references to other parts of this DEP are made, the referenced section number is shown in brackets ( ). Other documents referenced by this DEP are listed in (9).

## 1.5 SUMMARY OF MAIN CHANGES

This is a new DEP.