

# **MITSUI ENGINEERING & SHIPBUILDING CO.**

## **Berthold Technologies U.S.A., LLC File No. 502930**

### **PROJECT DESCRIPTION**

This project is for density/level measurement on a single key vessel of a new process being engineered and constructed by Mitsui for ExxonMobil at Baton Rouge, LA USA.

Loop GBL-001 will be used to control the interface level, or “rag” layer, in a polymerization process. With temperature and pressure changes the vessel, which is always full of fluid, will experience changes in the rag level depth, as well as its position vertically in the vessel. This is a new process and has only been operated on a smaller scale pilot plant. Thus there is considerable lack of precise information on the actual operating parameters. As a result, the configuration of the instrumentation has gone through considerable evolution since the project was originally bid in mid-2001. Berthold USA has had extensive correspondence with both Mitsui and Exxon and together we have arrived at the current configuration. This consists of seven 50 mCi Co-60 point sources suspended in a single dip pipe with LB491 50/50 Uniprobe density units located on the outside of the vessel, giving the density at various levels. The sources are shown with initial positioning at even spacing. After the process is stabilized, the positions of both sources and detectors will be adjusted.

It appears the factors resulting in selection of Berthold were:

1. Use of Co60 sources, which gave reasonable count rate levels with medium size sources.
2. The proposal to use a “guide tube bundle” with a single source per tube. This “guide tube bundle” consists of seven small tubes welded together that will fit inside the larger dip tube supplied by the vessel manufacturer. This bundle of tubes serves to make the insertion of the sources easier, and prevents them from moving inside the larger dip tube and becoming entangled.
3. The relative small size of the shield to be mounted on the vessel nozzle.
4. A system for mounting the LB 490 Uniprobes so the vertical position could be easily adjusted.

Berthold was required to agree to the diameter of the dip tube and spacing from the wall several months ago, as the design of the vessel was being “frozen”.

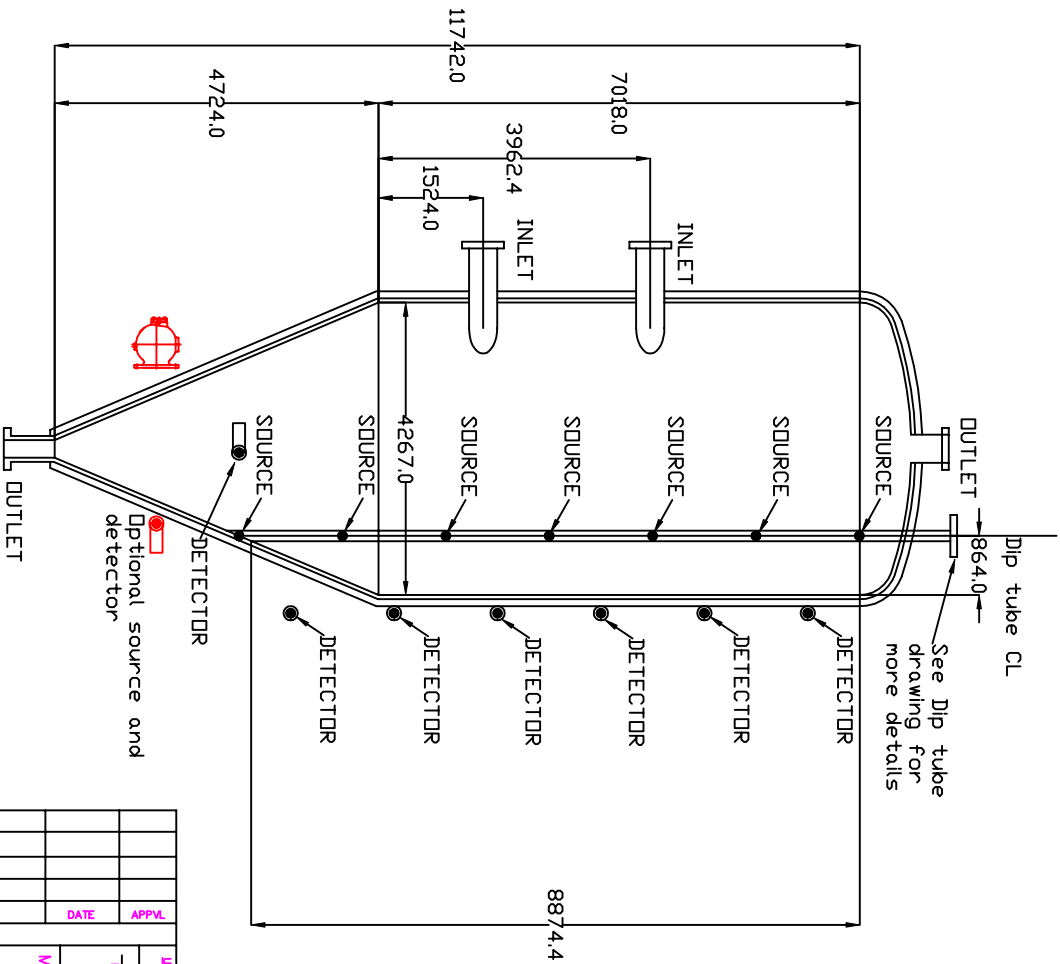
The bottom of the dip tube is configured so as to accommodate differential expansion during heat-up and cool-down cycles.

After reviewing the drawings and installations of other insertion type sources, Berthold Technologies USA technical department made the decision to go with a shield without a shutter to simplify manufacturing and assembly. Essentially the shield will contain seven P-2602-100 sources, with a holder that encloses the source capsules and provides attachment for an inert plug that will eliminate the need for a shutter and prevent high radiation at the bottom of the dip tube. Initially it was thought that an auxiliary shield might be required for personnel protection, but now that the actual dip tube dimensions and metal thickness are known, the auxiliary shield appears unnecessary.

The plan is to manufacture the insertion tube bundle, adapter plate and special detector mount in the USA. A "gauge" plate ¼" thick will be made in Oak Ridge and sent to Wildbad to be used to insure correct dimensioning and alignment between the Wildbad manufactured shield flange and USA adapter plate.

Evaluation units are intended to be standard LB 491 density Uniprobes with 50/50 NaI crystals. A "HART" communicator is included in Berthold's scope of supply.

The contract requirement is for the equipment to be ready to ship by October 25,2002.



REV	ECN NUMBER	DATE	APPL

UNLESS OTHERWISE NOTED DIMENSIONS IN INCHES  
DO NOT SCALE THIS DRAWING

TOLERANCES ARE	ANGLES	FINISH
FRACTIONS: ± 1/64	± 0.30°	
DECIMALS: ± .005		

MATERIAL:  316

FINISH:  316

APPLIED PRACTICES:  316

**BERTHOLD TECHNOLOGIES**

OAK RIDGE, TENNESSEE 37831 U. S. A.

EXXON CHEMICAL COMPANY  
VESSEL V5300G

DATE	DATE	DATE	DATE	DATE	DATE
1/29/02					

Quote # 502930  
Mitsui/Exxon Chemical

Scale: NONE

Sheet: 1 of 1

SIZE: B