Marine Oil Cooler

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Abstract **- This project is based on current application "oil coolers" in industrial system and marine system .the primary advantages of oil coolers is reducing the heat of hot oil which is coming from an engine. we think to provide an extra heat reducing system for oil coolers. that is providing an extra heat reducing system for oil coolers. that is providing an**
"aluminium knurling function" within the oil coolers. here we make the project only the bundle that is inside function or main function of oil cooler. this project is known as the "marine oil cooler with aluminium knurling function

INTRODUCTION:

Oil cooler is one of the most useful application for reducing heat of the hot oil which is coming from the engine.The hot oil is to be cooled by the oil cooler inside the cooler that is bundle area. in this area the oil passing to the oil coolers through the inlet valve. in bundle there are some copper tubes are provided. it is passing the water for cooling the hot oil. copper is a good heat conducting material, so it can be used. the oil is passing around the copper tubes, and water is passing inside the tubes. the hot oil coming inside and going away in vertical manner. the water is passing inside the tubes in horizontal manner. then the hot oil(which is coming from the engine)passing inside the cooler, water is cooled the oil which carried by the aluminium tubes. then after the cooling of oil, it is again supplying to the engine through the outlet valve of oil cooler. inside the shell (the shell side).heat is transferred from one fluid to the other through the tube walls, either the tube side to shell side or vice versa. the fluids can be either liquids or gases on either the shell or the tube side. in order to transfer heat efficiently, a large heat transfer area should be used. leading to the use of many tubes. in this way waste heat can be put to use. this is an efficiently way to conserve energy.

CONSTRUCTION:

COPPER TUBES:

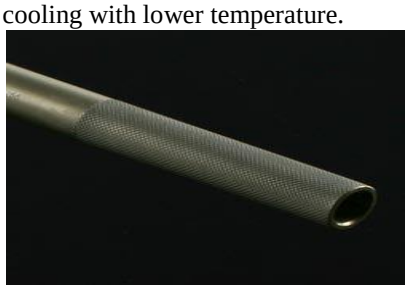
Here we are using copper tubes for water passes. we know that copper material is one of the best conducting material and also having the anti-corrosion property.

ALUMINIUM OUTER BODY:

In this type of coolers the outer cover is made of aluminium. We know that aluminium is the one of the most using material and also light weight. material and easily it can be machinable

ALUMINIUM PIPES WITH KNURLING FUNCTION:

In this project we provide an extra system for cooling process. That is an extra setup of aluminium pipes with knurling function on the copper tubes. This makes extra cooling for heated oil. By doing this heat is reducing very slowly and heated oil comes out after the cooling with lower temperature.



CONCEPT OF THE PROJECT

Before starting every project its planning is to be done. planning a project is a very important task and should be taken up with great care as the efficiency of the hole project largely depends up on its planning. Anticipation should be carefully considered with all the relative provisions aspects.

MATERIAL REQUIREMENTS

The list of material required for manufacture is prepared from the drawing. The list is known as “bill of materials”. Availability of these materials is surveyed and purchased from the market. The mainly used material of this project is copper and Aluminium. Aluminium will dissipate the heat faster than the copper.that’s why we are select the Aluminium material.

OPERATION PLANNING

Next work of planning is to “select the best method” manufacture the product, so that the wastage of materials, labor, machines and time can be eliminated by considering various methods. The best method and proper person and the purposes of operation, necessity operation, proper machine planning.

DESIGN PROCEDURE

DESIGN OF ALUMINIUM PIPE

Aluminium pipe =380mm

Outer diameter =12mm

Inner diameter =10mm

DESIGN OF OUTER BODY

Outer body length =390mm

Outer body inner diameter =80mm

Outer diameter =95mm

DESIGN OF INNER BUNDLE

Inner bundle diameter =75mm

Inner bundle length =400mm

DESIGN OF BRASS SIDE COVERS

Inner diameter =80mm

MACHINING OF COVERS

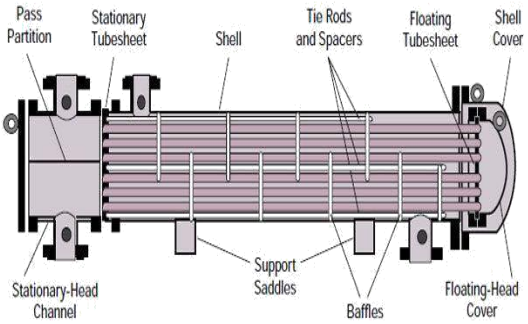
After the casting of outer body having same unnecessary surfaces. we should eliminate that in the machining process and threading process also doing in this machining process.

EXPANDING OF COPPER TUBES

After arranging the aluminium tubes in the brass covers. we should expand the aluminium tubes for avoiding the leakage of pressure or liquid.

DESIGN AND DRAWING

Having decided about the project to be manufactured at must be designed. Design work should be done very considering all the relevant factors. after design the project detailed drawing are prepared. detailed specification for raw material and finished products should be decided carefully along with the specification of the machine required for the manufacture.

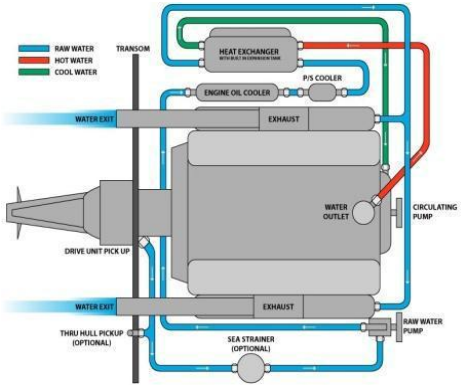


EQUIPMENT PROCEDURE

Results obtained from "operation planning" and machine loading help in calculating the equipment require specification of the equipment should be laid down by considering then drawings. Drawings will also help in the deciding the necessary requirement of tools and accessories.

WORKING PRINCIPLE

Two fluids, of different starting temperatures, flow through the heat exchanger. Once flows through the tubes (the tube side) and other flows outside of the tube but inside the shell (the shell side). Heat is transformed from one fluid to the other flows through the tube walls, either from tube side to shell side or vice versa. Heat exchangers with only one phase (liquid or gas) on each side can be called one - phase or single - phase heat exchangers. Two - phase heat exchangers can be used to heat to liquid to boil into a gas (Vapor), sometimes called boilers, or cool a vapor to condence it into a liquid (called condensers), with the phase change usually occurring on the shell side. Boilers in steam engine locomotives are typically large, usually cylindrically - shaped shell - and-tube heat exchangers. In large power plants with steam-driven turbines. Shell - and- tube surface condensers are used to condence the exhaust steam exiting the turbine into condensate water which ie recycled back to be turned into steam in the steam generator.



COST ESTIMATION

MATERIALS USED	MATERIAL QUANTITY(no)	MATERIAL AND PREPARATION COST
Copper pipes	14	2500
Aluminium pipes	14	1500
Aluminium outer body	1	1500
Casting side cover	2	1000
Brass side cover	2	1200
Partition plates	20	800
Total		8500

ADVANTAGES

- Less expensive as compared to plate type coolers.
- Can be used in system with higher operating temperatures and pressures.
- Pressure drop across a tube cooler is less.
- Tube leaks are easily located and plugged since pressure test is comparatively easy.
- Tubular coolers in refrigeration system can act as receiver also.
- Using sacrificial anodes protects the whole cooling system against corrosion.
- Tube coolers may be preferred for lubricating oil cooling because of the pressure differential.

APPLICATIONS

- Industrial cooling system(Fresh water and tube oil cooling).
- Marine engine cooling system.

CONCLUSION

The purpose of this shell and tube oil cooler project is to show the viability of a technology that is new or unfamiliar to local industry. It may also show that the technology is not viable. In this shell and tube oil cooler project, oil cooling shown to be a technology that performs as expected. The main purpose is to prove that the technology works. This was done. The secondary purpose is to show a level of energy savings that supports the installation of the system and reducing the temperature level. By using aluminium knurling pipes takes place on the copper tubes, we can reduce the heat of the oil more than the copper pipes used oil coolers. Aluminium is the very good heat conducting material and it is releases the heat so fast. For this purposes aluminium takes place in the shell and tube oil cooler. In this shell and tube oil cooler project aluminium material having a special position. This project prove that the technology works and heat reducing process is more efficient than the previous models.

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