

T-10 Filtration, immovable infrastructure of PLO

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INTRODUCTION

Removing impurities from liquids is one of the oldest technical problems which may be encountered in virtually all areas in which the working fluid (eg. Medicine, energy, engineering, food and petrochemical industries). In terms of services PHM has this particular problem of having to clean liquid fuel types.

Cleanliness PHM has a direct link to the combat readiness of military equipment. ? The contemporary diesel technology is the number of components and systems requiring high-quality fuel, both in terms of their physico-chemical and performance, and in terms of their purity. Increased content of mechanical impurities and water in fuel can cause rapid engine damage or aggregates and thus considerable material damage.

1. DIRTS IN LIQUIDS

Dirts in PLO

means any ingredient

- solid,
- liquid,
- Gas state,

that objectively changes the quality parameters of that type of fuel.

1. DIRTS IN LIQUIDS

Gaseous impurities cause during short-term pollution

- Reduction in pump efficiency,
 - misrepresentation of flow meters,
- large amount of air can form in the fittings so called steam stopper.

1. DIRTS IN LIQUIDS

Solid impurities

Solid impurities are formed from different materials. They may be products of corrosion, metal parts, rubber parts aging, aging fuels, paint chips, dust etc..

At solid impurities is necessary to assess their levels of PHM, hardness and dimensions (shape). All impurities has tendency to clog the flow areas in fuel, lubrication and hydraulic systems. In addition, hard dirt may cause a further increase in the number of particles in a liquid to participate in the abrasion fricted components of the process equipment..

2. FILTERS AND FILTER MATERIALS

Filter efficiency

It is the amount of collected particulate matter relative to the total amount of the incoming particles to the filter.

$$E = \left(1 - \frac{G_1}{G_2}\right) \cdot 100$$

G1 is the amount of uncaptured particles , G2 is the amount of the incoming particles to the filter.

Expression G_1 / G_2 is called penetration of filter

Effectiveness varies during the filtering process due to filter clogging particles (see. Chapter 3.1.1 "Non-stationary filtration")

2. FILTERS AND FILTER MATERIALS

Pressure drop

Expresses resistance of filter against flow of disperse environment. It is the opposite of the permeability of the filter. The objective is to find the filter with high efficiency and low pressure drop. Calculation:

$$\Delta p = p_1 - p_2,$$

p_1 is pressure drop in front of filter and p_2 behind filter.

The pressure gradient changes during the filtering process due to clogging of the filter trapped particles. Its growth is usually given filter life - either increases in value when no longer be required volume of the dispersion medium transport through the filter, or will damage the filter or decrease efficiency.

2. FILTERS AND FILTER MATERIALS

Filter lifetime

It expresses the length of the filters can be expressed as the number of particles that the filter is able to capture before there is an increase in the pressure gradient defined (critical) threshold. Life is determined by the speed of the filter clogging and particle concentration upstream of the filter.

Based on the standard EN 799 is defined as "Dust holding capacity":

$$J = E_s \cdot m_p$$

where E_s is the middle value of efficiency and m_p is the number of particles deposited on the filter until the moment when it reaches a value of 250, or 450 Pa. Knowledge of particle concentration can be estimated the time of life of the filter.

3. IMMOVABLE INFRASTRUCTURE OF PLO

Basic terms

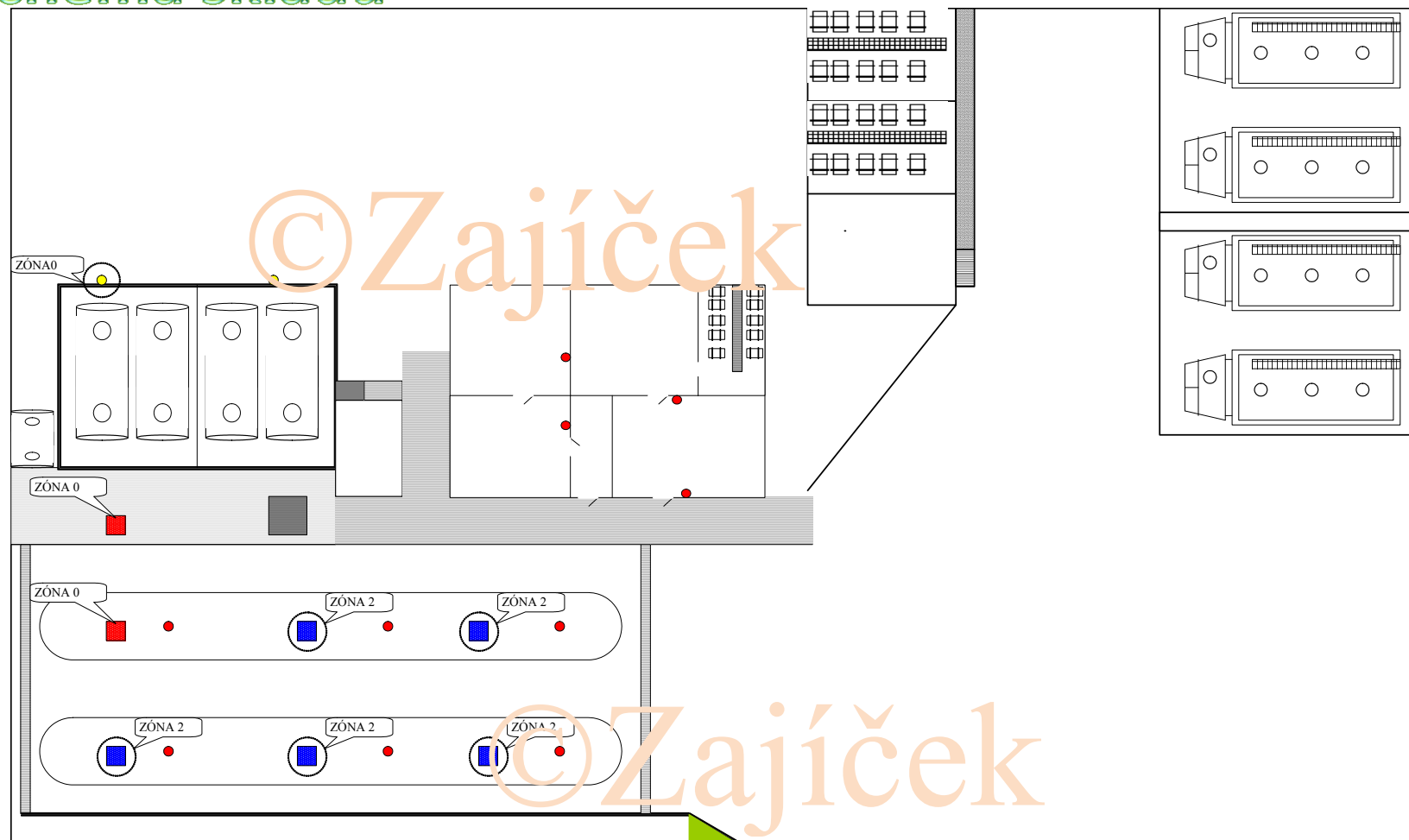
- **Handling area** is an area, where are handled flammable liquids or fuel oil.
- **Catching reservoir** is reservoir preventing to spill flammable liquids or heat oil escaped from tanks .
- **Underground tank** is tank, which is covered by soil in prescribed thickness.

3. IMMOVABLE INFRASTRUCTURE OF PLO

- **Aboveground tank** is a tank that is not covered by a layer of soil in the prescribed thickness or building structures with prescribed thickness.
- **Double-walled tank** is tank with double jacket the outer shell acts as emergency sump.

3. IMMOVABLE INFRASTRUCTURE OF PLO

Schéma skladu



3. IMMOVABLE INFRASTRUCTURE OF PLO

Filling station

je prostor určený k doplňování pohonných hmot do techniky. Jsou zde umístěny výdejní stojany, které umožňují vydávat nejen pohonné hmoty, ale ze speciálních stojanů lze čerpat i motorové oleje. Plnicí stanice musí být zastřešena a zajištěna nepropustnost manipulační plochy. Komunikace je ze strany příjezdu i odjezdu ohraničena záchytnou drenáží, aby z této plochy nemohli pohonné hmoty při úniku proniknout mimo prostor plnicí stanice. Drenáž slouží také k zabránění vnikání dešťové vody na manipulační plochu.