

MATERIALS OF CONSTRUCTION-DOSING

5.4 Pump head materials.

5.4.1 Polypropylene (PP)

Polypropylene

Polypropylene is a white powder and converted to white, black or coloured granules, powders or yarn. It is insoluble in water.

Polypropylene is a crystalline thermoplastic and one of the major members of the polyolefins family.

It is the lightest of the widely used thermoplastics with the exception of plastic foams. With a specific gravity of less than one, polypropylene will float on water.

Polypropylene when ignited, will burn with a non smoky flame rather like a candle and melt into waxy drops, with a slightly acrid burning smell. It has no taste or odour and is non toxic.

Polypropylene, whilst having excellent chemical resistance to a very wide range of chemicals, is attacked however by strongly oxidising reagents, e. g. concentrated nitric and sulphuric acid, dry chlorine and bromine gas. In the presence of certain organic solvents such as benzene, toluene and mineral oils, some swelling may occur with polypropylene at room temperature due to absorption.

5.4.2 PVDF (PV)

Polyvinylidene Fluoride

PVDF is a high molecular weight thermoplastic polymer with excellent chemical inertness. It is highly resistant to oxidizing agents and halogens and is almost completely resistant to aliphatic, aromatics, alcohols, acids and chlorinated solvents. It is resistant to most acids and bases.

Properties:

Mechanically strong. High dielectric strength. Thermally stable and non-toxic. Resistant to low temperatures. Stable to ultraviolet and extreme weather conditions.

5.4.3 Stainless steel (SS)

AISI 316 (W.no.1.4401)

Offers higher corrosion resistance than AISI 304 (W.no.1.4301) due to the addition of molybdenum. This type is also highly resistant to pitting and withstands corrosive actions of acids, dyes, and salts used in the process, textile, and pulp industries. Applications include the manufacture of pumps, valves, textile and chemical equipment.

Due to its diverse properties; corrosion resistance, suitability in extreme temperatures, hygienic properties, aesthetic appearance, strength and formability, stainless steel is used for many different reasons.

5.4.4 EPDM (E)

Ethylene Propylene Rubber

This elastomer is a copolymer of ethylene and propylene and is sometimes compounded with a third monomer (EPT). Good to excellent compression set resistance is obtained by the addition of peroxide cures during vulcanisation. Ethylene propylene materials have excellent resistance to phosphate es-

ters, water and steam, acids, alkali, salt solutions, ketones, alcohol's, glycol's, and silicone oils and greases. EPDM has very poor resistance to petroleum oils and diester-base lubricants.

5.4.5 FKM (V)

Fluorocarbon

Fluorocarbon elastomers are highly fluorinated, carbon backboned polymers used in applications to resist harsh chemical and ozone attack with a thermal stability to 232°C/550°F. Fluorocarbons also offer low compression set and excellent aging characteristics. FKMs provide excellent service in oil, gasoline, hydraulic fluids, hydrocarbon solvents and extended fuels.

5.4.6 CSM (H)

Chlorosulfonated Polyethylene

Chlorosulfonated polyethylene is the base polymer for CSM synthetic rubbers.

CSM provide excellent ozone, oxidation, sunlight (colour degradation), and weather resistance. They are also capable of providing excellent resistance to alkalis and acids. CSM (provides good resistance to ozone and excellent resistance to abrasion, weather, and heat. Useful temperature range is -67° F to +320° F (-50° C to +160° C).

5.4.7 PTFE (T)

Polytetrafluoroethylene

PTFE shows a remarkable chemical resistance and it is insoluble in all known solvents. It is attacked only by molten alkali metals and by fluorine at high temperatures. PTFE is incombustible and may be used up to 260 °C (300 °C for short periods). Its coefficient of friction is extremely low and it shows the effect of self lubrication with constant mechanical properties which makes it particularly suitable for bearings, joints, O-rings, stirring bars, etc. It may be shaped by compression and sintering into bottles and beakers where its chemical stability and non-wettability make it suitable for use in extreme circumstances.

5.4.8 Centellen C* (A)

WS3844

The material 3844 consist of caoutchouc-bonded synthetic fibres. The colour is white. Centellen C was especially developed for the application against media of the chemical industry and is resistant to both polar and homopolar products, as for example alcohols, esters, ketones, solvents (chlorinated as well), mineral oils and petroleum products, water and steam (up to max. 250 °C) and aqueous solutions. Suitable against strong acids and alkalies, like hydrochloric acid, caustic soda solution, caustic potash solution, at temperatures up to approx. 50°C. For higher temperatures the individual case has to be examined, also in the case of nitric acid.

*Hecker trademark.

5.4.9 Ceramics (C)

Aluminium oxide, Al₂O₃

Aluminium oxide is the most widely used oxide ceramic, either in pure form or as raw material to be mixed with other oxides. It is manufactured synthetically, and therefore its quality can be controlled.

Aluminium oxide is excellent in hardness, abrasion resistance, mechanical strength, chemical corrosion resistance and electrical insulation. It can be made inexpensively and is applicable widely to mechanical, chemical, high temperature-resistant and electrical members.

5.4.10 Glass (G)

Glass

Glass are dimensionally stable, resist corrosion and chemical absorption and can withstand thermal shock and extended exposure to temperatures of up to 600 F (290° C). Density varies depending on the type of glass used to manufacture the ball. Glass are highly resistant to most acids but has poor resistance to alkalis.

5.4.11 PVC

Polyvinyl chloride

PVC is a heavy, stiff, ductile and medium strong amorphous (transparent) material. By adding softeners a range of softer materials can be achieved, ranging from a flexible to an almost rubber-like elastic soft material.

Softeners also help to increase the manufacturability. PVC has brilliant resistance to acids and bases, but is affected by some solvents. Soft PVC is exceptionally resistant to most chemicals.