

Selecting Non-Metallic Components for API Separators

API separator sludge is heavy and viscous, therefore chain and flight collector components must be equally heavy duty. A number of collector chains and flights are available—use the following to help determine your chain and flight selection:

- Metallic chain has been used with varying degrees of success. Types available include cast iron, cast steel and stainless steel. Metallic chain is much heavier than non-metallic chain, sometimes hindering installation, and cast iron and steel components can deteriorate over time and require replacement. Stainless steel components, while less prone to corrosion, are significantly more expensive than cast iron or steel.
- The success of non-metallic chain is directly related to the material composition of the chain. Some non-metallic chains are prone to chemical attack from organic compounds in the wastewater, while other types of non-metallic chain can stretch due to high wastewater temperature. This stretching, or elongation of the chain, can result in premature failure of the collector system as the chain disengages from the sprockets. Grit in the wastewater can also cause excessive wear and premature failure on chain connector pins if the chain pins are not properly designed. The biggest advantage to non-metallic chain is its light weight and ease of installation and maintenance. With proper material selection and design, non-metallic chain can provide the same strength and durability as metallic chain, for less cost, both in materials and labor.
- Like chain, both metallic and non-metallic style collector sprockets are available, having the same



advantages and disadvantages, with one exception. Motor drive sprockets and collector head shaft sprockets have a significant amount of torque and load on them. Some non-metallic sprockets suitable for use on idle shafts may not be suitable for drive, or high torque, applications because of material strength.

- In the past, collector flights had been made of redwood. Today, most facilities use non-metallic, fiberglass flights. When selecting a fiberglass flight, note that many resins do not hold up well to the organic compounds found in refinery and petrochemical plant wastewater, and the flights can quickly delaminate. Also, the moment of inertia of the design and the modulus of elasticity of the material both affect the strength and stiffness of the flight. The proper combination is needed to ensure proper movement of sludge.
- Chain and flight collector components normally have wear shoes attached to them. The wear shoes ride on wear strips attached to the tank floor on the bottom collecting run, and to carrying tracks on the top skimming run. The wear shoes are normally made of steel when using metallic collector components and polyethylene when using non-metallic collectors. Since non-metallic wear strips can expand under heated conditions and carbon steel wear strips can corrode, stainless steel wear strips should be used in most cases.

Siemens
Water Technologies
301 West Military Road
Rothschild, WI 54474
Tel: 715.359.7211
Fax: 715.355.3532
www.siemens.com/water

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