

## THE MKII PLANT

The Plant in the photo is specifically designed for the treatment of Slop Oils and Oily Sludges. Its capacity is determined mainly by the viscosity of the feed. For example slop oils with a viscosity in the range of Cst30 at 50°C can be treated at 10 m<sup>3</sup>/hr whereas a sludge having a Cst600 at 50°C can be treated at 2 m<sup>3</sup>/hr. We therefore recommend to treat at a temperature of 95°C to maximize the plant capacity and to improve the overall separation performance to produce the highest quality oil. A major variable in treating slops are the concentrations of common contaminants, water & solids.

**G-force** applies 3000-g force 2-phase decanters to handle any load of solids normally associated with slops. This plant is designed to handle solid contaminants from any range up to 30% in the feed without affecting performance. Following the decanter

**G-force** apply 6000-g 3-phase centrifuges to separate the water and any remaining sediments from the oil phase for the purpose of achieving the highest quality treated oil in the smallest operational footprint. The 3-phase vertical disc-stack centrifuge used by **G-force** is unique for the treatment of oily waste, when compared to 3-phase horizontal scroll decanters, in that they are not sensitive to changes in oil, water and solids feed ratios common to these type wastes. This feature eliminates the requirement of batch blending residence tanks and as a result produces a higher quality treated oil phase. The plants are designed to the new EU ATEX specifications and/or Class I Div 2 for compliance involving Oilfield operations. A special design feature is the interconnecting pipe works where all plant components centrally flange thereby minimizing space requirements, making installation and commissioning a quick, simple and easy task and providing excellent operations logic and safety monitoring as required for the treatment of the various classifications of slops and sludges.



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## PRINCIPLE OF OPERATIONS

The feedstock is picked up by the plant-installed pumps for feeding into the plant process. Process heat is provided by **G-force** through our Heat Exchangers whereby hot water (from a boiler system) or steam (if available) is utilized to heat the slop oil to the required range of 95°C by the time it is fed to the 3-phase Centrifuge. The oily waste feed is first pumped into the 2-phase decanter. The primary application of the decanter is to remove 97% to 99 % of the solids. After the solids are removed in the decanter the effluent is ready for treatment in the 3-phase centrifuge. Depending on the contamination volume of water contained in the oil phase, the oil-water droplet sizes and the volume of particle sizes in the range of 5 μm to 10 μm determines if Treating Chemicals are required in the separation process. Normally at 6000-g the treatment of low viscosity slop oils can be accomplished without the use of Treating Chemicals thereby significantly reducing cost. If however treating chemicals are required the plant is delivered with a static mixer where treating chemicals are first injected to mix with the contaminated oil. Immediately following the static mixer the feed enters the **G-force** RTR Dynamic Residence Blender to insure the treating chemicals come into direct contact with the water phase droplets and the sediment particles so as to de-emulsify or coalesce them for separation. The treated slop oil leave the RTR Blender and immediately enter the 6000 g-force High Speed Centrifuges to separate the oil-water-sediments. The separated oil is immediately

transfer to the clean oil export tank and ready to be returned to the client or sold into the market place. The separated water is pumped to the client's wastewater treatment facility or if needed **G-force** can provide a small water concentration centrifuge (see this unit at the right in the above photo) to treat the water separated from the 3-phase centrifuge so that it meets the disposal regulation for land or sea. Finally the solids separated from the decanter are deposited directly to a waste skip and centrifuge solids are directly conveyed into a solids thickener-dryer (optional) for final disposal and declassification. **G-force** specializes in the design and manufacture of custom plants to meet any defined capacities specific to the needs of our customers. This is achieved by the simple addition of multiples of the main components.

#### INSTALLATION & SERVICEABILITY

**G-force** plants are supplied with one-year of spares and come with a recommended maintenance schedule based on each 2000 hours of operations (4 times per year). All primary equipment is supplied as a complete package including special tools and is ready for installation on a level concrete pad. A team of **G-force** engineers supervise the plant installation and commissioning on site, which normally takes ~14-days. Installation tools and special equipment servicing tools are also provided with the delivery of the plant. Immediately following plant commissioning the actual operations are ready to commence. **G-force** will provide on site training to the clients assigned Plant Operator to insure a smooth handover. No other requirements are needed except for the client to bring service points to the concrete pad for hook up purposes. If required **G-force** also supplies all climate buildings dimensionally specific for the plant footprint as delivered.

#### DIMENSIONS & UTILITIES



Basically, if the client orders a plant with a heat supply from **G-force**, the only utility requirements is electrical power, diesel for the Hot Water Boiler and plant operations water. If the client has a steam heat supply only electricity and water are needed. The kW and water depend on plant size and options chosen, details of which are provided with our quotations. For the plant shown in the photo the electrical requirement is 75 kW of installed power and the footprint is ~L8m x ~W3.5m (includes walkways)

#### DELIVERY TIMEFRAME, PLANT CERTIFICATION & EQUIPMENT WARRANTIES

Delivery, from the time of approved order placement up to ex-works, requires **G-force** 12 weeks and is dependent upon the delivery timeframe of the major components. It is the policy of **G-force** that before shipment the plant is fully assembled at the factory and undergoes a complete Factory Mechanical Completion Certification. The buyer is asked to attend this certification. During the last 14-day period of plant fabrication **G-force** invites two of the Buyers assigned engineers to our manufacturing facility in Holland for schooling and hands on training. **G-force** provides the Buyer a Mechanical Warranty to certify that the plant delivered is under warranty for 100% of the supply against any defects for the first year of operations, starting from the date of commissioning, or for a period of 18 months from the date of ex-works delivery, whichever comes first.