

Doc. Title:	Submersible Pit Pump Case Study	Issue Date:	Feb 12 th 2021
Customer:	Various BOP Municipality Waste Water Dept.	Author	D Bell

Submersible Pump Discharge Flange & Foot Piece Leakage



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1. Vocation & Current Issues. Down-Hole Component Corrosion – Erosion is largest single cause of Submersible Pit Pump Leakage leading to massive pump inefficiencies and energy waste due to constant recycling of waste fluid back into collection pit. See below for graphic examples of such problems.



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2. Coating Solutions: There are two Metaline solutions offered by OPNZ for existent leak problems

- a. “Flange Sock”™ fitted over discharge flange of pump, the flange sock uses a unique retention skirt that folds around the back of the flange, preventing the seal from being displaced or “knocked” off of the flange during reinstallation of the pump back in the pit. The soft / flexible property of the Shore A 65 elastomer conforms to surface variations in both the pump flange face and footpiece face to enhance sealing and prevent leakage. The “Flange Sock”™ solution is ideal for reduced down time intervention as a leaking pump can be raised from the pit, the pump quickly washed down and the “Flange Sock”™ installed over the discharge flange and the pump is then lowered back into the pit onto its footpiece with an approximate < 20 Minute time window.
- b. “Flange Seal”™, for seriously corroded – eroded discharge flanges or on pumps undergoing periodical maintenance. OPNZ offers a direct application service of a shore A 65 elastomer to the pump discharge flange face, this “Flange Seal”™ can be applied in varying thickness to accommodate the level of erosion- corrosion on the corresponding foot piece. By bonding the elastomer directly to the discharge flange, the flange face requires no machining, significant surface variations are filled by the elastomer and the direct bond totally eliminates one potential leak path in the instance of debris becoming trapped between pump and footpiece during reinstallation of pump. OPNZ Require the pump Volute only for 2-3 days to process the direct application of ML 760 to a discharge flange. Bond strength of such an application is > 18 N/mm² on correctly prepared substrate. “Flange Seal”™ solutions can be applied to severely wear compromised Foot pieces also in conjunction with Metaline XL series ceramic Repair compound for rehabilitation of changed out components
- c. “Flange Sock”™ can be manufactured to fit many different brands of Pit Pump from following flange size guide.

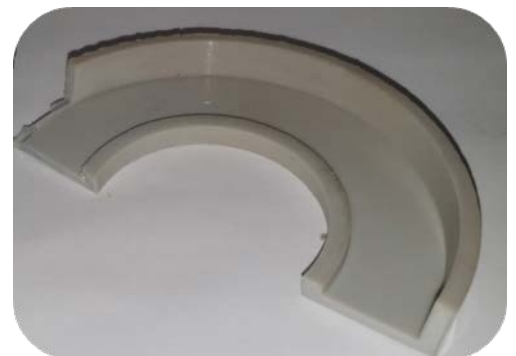
Flange Ø	Flange Thickness	Bore	Flush / Upset
130mm	15mm	80mm	Flush
130mm	25mm	80mm	Upset
200mm	25mm	80mm	Flush
220mm	20mm	100mm	Flush
220mm	25mm	100mm	Flush
225mm	25mm	100mm	Flush
235mm	25mm	100mm	Flush
285mm	25mm	150mm	Flush
285mm	28mm	140mm	Flush

Suitable for Most Major Pump vendors Such as Grundfos, Sulzer, Gould, HOMA, ABB, Flygt etc. (Key flange Dimensions required with Order) Bespoke flange size socks can be made to order (flange drawing required & Minimum quantity's may Apply)

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Selection of "Flange Sock"[™] in Shore 60 / 80 / 90



Optional Internal upset to seat in seal pocket of High Head FLYGT Pumps



OPNZ "Retention Skirt" wrapping around back of flange

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3. Intervention Results with Metaline 700 Series:

- a. Significant reduction in Pump Run Time resulting in >30% energy savings per pit.
- b. Instant cessation of leakage visible from Pit top when treated pump turned on.
- c. Prolong Service life of worn Foot pieces and Pump Volutes
- d. Significant life extension (> 90%) of pump & pit components when treated from new, especially pump impellers and volutes used in High Grit / Sand Load pump stations



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