

## **Base of the Selection/Application Data:**

If at the time of the technical selection no or not all application relevant parameters are known, the selections mentioned before are exclusively based on a reproduction which is as identical as possible to the performance data of the foreign mixer which have been found out on the base of its type designation code or are completely or partially based on assumptions of internationally accepted and application related standard values such as dry solids content, sludge volume index, density ... as well as on optimal hydraulic conditions (installations, restrictions of the flow section or quantity and positioning of inlets/outlets etc. have not been considered ). WILO SE will not assume any warranty and liability for a selection made under the aforementioned conditions until receipt of the written confirmation of the parameters indicated in each selection data sheet by the customer and until the transmission of an expressive tank drawing as dwg or dxf file.

Furthermore it is expressly pointed out that because of the aforementioned reasons it is not possible for WILO SE to make energetically optimized mixer selections as well as project related interpretations of the standard positioning proposals which are made in connection with the selections.

*If the application parameters on which the selections are based (see mixer selection data sheet) differ from the requirement/reality, WILO SE strongly recommend a new selection based on corrected parameters. In such cases WILO SE ask to send detailed application related information and an expressive tank drawing without prior request.*

## **Preliminary cleaning/ operating quality in the intended application:**

The function and lifetime of units which are operated in the biological cleaning stage of a municipal wastewater treatment plant depend inter alia significantly on the operation quality of the plant components installed in the mechanical cleaning stage (preliminary cleaning). Therefore, as far as no other stipulations were made, the selections of WILO SE are optimized on the base of the internationally accepted standard for preliminary cleaning.

Which means: „A fine screen\* as well as a combined gravel, sand and grease collector are basic requirements for a preliminary cleaning tank“. Mineral fractions such as gravel and sand which can cause a high wear of material and deposits are excluded from the activation process according to the international standard. This enables WILO SE to make a standardised mixer selection and contributes considerably to minimise the costs which have been caused by abrasive wear.

Subject to the gap width of the fine screen\* the following scenarios are possible:

- ≤ 5 mm -> no significant appearance of fibres and trumpets
- ≤ 10 mm -> increased appearance of fibres
- ≥ 10 mm -> strong appearance of fibres and significantly increased risk of formation of trumpets

### **Installation proposal/installation drawing:**

The submitted installation proposal is not to scale and is serving as orientation guide during the quotation period and for which no liability can be assumed. At the placing of an order an explicit and cost-free installation drawing will be made in dwg or dxf format which is based on customer requirements, as far as these are compatible with the enclosed valid installation instructions of WILO SE. In case of unauthorized modifications of installation drawings which have already been approved by WILO SE the approval and any resulting warranty and/or liability will expire, if the approving department has not been informed about the modifications without prior request and promptly.

### **Replacement of third-party products:**

The quality of an energetically optimized mixer selection which has been made for a replacement is considerably based on the significance of the selection parameters submitted for the selection. A selection on the base of outdated type codes of WILO SE or type codes of third-party products presents a potential for errors and is inappropriate for a well-founded statement. Therefore, a selection which is based on actual application parameters is always recommended to exploit the full energy saving potential, especially in case of older installations.

For the adaption of mixers of WILO SE on existing lowering devices of a third-party product latest ***before*** the placing of the order detailed drawings of all lowering device types in relation with the replacement of the mixers must be submitted, if the third-party lowering device is not in its original condition or cannot clearly be identified on the base of the type code of the third-party product. Basically WILO SE will not assume any liability for damages and/or consequential damages, which have been caused by plant components which have not been delivered by WILO SE or by a pre-damaged and statically inappropriate third-party lowering device.

### **Chemical resistance/material selection:**

If at the time of the technical selection/submittal of the quotation a detailed chemical analysis of the liquid is not available for WILO SE for the evaluation of the chemical/abrasive resistance of the production materials, WILO SE will reject any warranty for the chemical/abrasive resistance, unless expressive chemical analyses and/or information about abrasive components are available. In this case WILO SE strongly recommend to check independently the chemical/abrasive resistance of the used production materials against all possible chemical/abrasive attacks or to have them checked by a third party. The correct material selection is mainly based on the ph value, salt content [ $\mu\text{S}$ ], chloride content [ $\text{mg/l}$ ], chemical analysis with indication of the concentration of the single components, liquid temperature and a detailed list of the abrasive ingredients.

## **Proofs/measurements:**

### ★ ***Directed flow***

From the hydraulic point of view the proof of a given flow velocity is only useful in circulation channels, meander tanks and annular tanks (see measuring specification of WILO SE).

### ★ ***Undirected flow***

In all other tank geometries there will not be a directed flow, but turbulent mixing for physical reasons. In case of a well-founded measurement strongly varying measuring values per measuring point would arise under such non-stationary flow conditions which would not induce the required result because of the range of variation, unless the negative velocities of the spatial directions (X, Y, Z) which have been determined by an appropriate sensor are also included in the calculation as a positive value.

Zones of weak flow due to the tank geometry are excluded from the warranty.

### ★ ***Mixing and circulation***

The proof of the homogenisation by means of a flow velocity measurement is not useful in sludge applications > 2 % dry solids content because of the non-newtonic flow behaviour of the liquid and therefore it should basically be provided by means of a dry solids concentration measurement. According to the VDMA norm 24656 sufficiently homogeneous mixing is assumed, when 90 % of the measured values show a deviation  $\leq 12$  % of the average value.

## **Tolerances:**

The tolerances stated in the norm ISO 21630 are the base of our quotation which is based on standard products and are considered as agreed in case of an order, unless no other contract specific deviations are contradictory to that regulation.

## **Wear parts:**

Basically all rotating or mobile parts are subject to continuous abrasive wear, depending on the ingredients of the surrounding liquid, and must be considered as wear parts for which any warranty is excluded.

## **Leakages:**

The unique protection sleeve and the highly wear resistant mechanical shaft seal material silicon carbide ensure safe sealing, even in problematic sewage, if a functioning mechanical preliminary cleaning (fine screen, gravel, grit and grease collector) is installed upstream. In spite of the mechanical shaft seals of high technical quality leakages of the mechanical shaft seals on the liquid side cannot always completely be excluded. This is especially the case, when the mixer is set into highly frequent vibrations by inadmissible external influences or when there are components in the liquid which have not been known at the time of the selection and which are small and stable enough to get between the sealing surfaces permanently (e.g. long fibrous components with mechanically stable consistency). Such minor leakages can basically be compensated by an existing pre-chamber. Regular maintenance and the moisture probe which is available optionally help to protect precious components (gearbox, motor) against consequential damages which could occur, when a penetration through the mechanical shaft seal on the liquid side would not be realized for a very long period of time which can almost completely be excluded.

## **Technical changes reserved!**

in case the ordered product is no longer available in conformity with the purchase order, WILO SE basically reserve the right to deliver a product which is technically equivalent, but has been improved by implemented innovations.

Furthermore WILO SE always reserve the right to adapt ordered products to the intended technical requirements in accordance with the customer, if during order processing it turns out that the profile of requirements exceeds the capabilities of the product or if there are requirements of any kind which oppose to the product specific technical application limits and would involve a lasting damage of the product. If there is no agreement with the customer or the customer does not agree with the adaptation, WILO SE is authorized to withdraw from the purchase order without compensation. In this case any claims or claims for damages of the customer are excluded.

## **Violations of protective rights:**

WILO SE exclude any claims resulting from violations of protective rights of third parties, if the components which have induced the violation of protective rights are not part of a direct delivery of a purchase order placed to WILO SE.