Load Data in Weighfeeder Planning-in Drawings

Weighfeeders exert loads (forces) on support points during operation.
The forces compose as follows:

1) Dead loads, i.e. forces resulting from weighfeeder mass
2) Material loads, i.e. forces resulting from material in surge hopper impacting on weighfeeder
3) Support loads, i.e. forces resulting from mechanical construction (steel structure) impacting on weighfeeder

Ad 1) Dead loads

The specified accuracy is influenced by the components weight tolerances (particularly drives, conveyor belts, number and design of carrying idlers,...), number of options, material load on belt and bulk density.
Included in planning-in drawings (in N / load point), the load data assume that the system is mounted on a level site, so that the load is symmetrically distributed (LH/RH).
The load data do not include the forces resulting from the material load on weighfeeder.
However, the load data are generously rounded and safely accommodate errors resulting from manufacturing process, bought-out items and smaller modifications.
Schenck Process acquires and guarantees the dead loads.

Ad 2) Forces resulting from material load on weighfeeder

The forces resulting from the material load on weighfeeder depend on the following criteria:

- material properties (e.g. density, internal friction angle)
- surge hopper characteristics as a function of material properties (e.g. wall friction angle, horizontal load ratio)
- size of entire weighfeeder, feed hopper and surge bin configuration (e.g. strength of steel structure, resulting relative movements)
- operating mode (e.g. use of guards upon initial filling).

As the situation may be, the resulting forces may vary by factors > 10:
approximate data without knowledge of local conditions are at best indicative.
The above items show that correct load data can be acquired only if reliable process and statics data are available.

When sizing surge hopper (or silo) and steel structure, the local regulations should be referenced. Some regions require the calculations to be verified by qualified experts.
When sizing the weighfeeder, Schenck Process assumes certain limit values so that both the strength (or defined elasticity) of the weighfeeder and proper operation in conformance with material and conveying requirements are ensured. However, this does not lead to sufficiently safe load data for the support points in terms of structural analysis.

The plant designer is responsible for correct dimensioning.
Upon request, Schenck Process will support the design process.
Furthermore, the operating instructions given in manuals should be observed. Alternate modes can produce significantly higher loads that can be destructive to the weighfeeder.

Ad 3) Forces resulting from mechanical construction impacting on weighfeeder

As a rule, the weighfeeder is not designed to pick up loads from the mechanical systems of surge hopper (silo) or prefeeders. Forces from relative movements (lowering under load) of surge hopper (silo) should be avoided by suitable design (clearances, gaps > possible distances), or decoupling devices like transfer chutes or compensators.

The plant designer is also responsible for proper execution and dimensioning.
On request, Schenck Process will support the planning process in the form of suggestions and check of drawings.

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