

Services

Bin & Hopper Design

Bin & Hopper Audits, Reviews and Conceptual Design

The procedures for the design of handling plants, such as storage bins, gravity reclaim stockpiles, feeders and chutes are well established and follow these four basic steps:

• Determination of the strength and flow properties of the bulk solids for the worst likely flow conditions expected to occur in practice.

Determination of the bin, feeder or chute geometry to give the desired capacity, to provide a flow pattern with acceptable characteristics and to ensure that discharge is reliable and predictable.

• Estimation of the loads on the bin and hopper walls and on the feeders and chutes under operating conditions.

Design and detailing of the handling plant including the structure and equipment.

Flow Properties Testing

The design of bulk solids handling plants requires knowledge of the flow properties of the material under a range of operating conditions. These operating conditions include varying consolidation pressures for instantaneous and extended time storage as well as environmental factors such as temperature, moisture and humidity. The comprehensive laboratory facilities at TUNRA Bulk Solids permit the characterisation of bulk material properties.

AUSTRALIA



Flow properties testing for bin design





What Services for Bins and Hoppers are available

With the track record of successful completion of hundreds of bin and hopper projects in various industries, TUNRA offers Design Audits / Reviews and Conceptual Design of new and existing storage systems:

- Effective hopper geometry and choice of wall liners to obtain mass flow
- Multi-outlet bins and eccentric loading/discharge
- Estimation of live capacity for funnel flow bins/silos
- Calculation of wall pressures based on Australian, European and American standards
- Determination of relative wear prediction
- Optimum hopper feeder interface geometry
- Calculation of belt/apron feeder load
- Discrete Element Method (DEM) modelling of filling and discharge of bins and hoppers for flow mode visualisation, wall load and quacking load evaluation, and relative wear prediction
- Scale modelling of bins and hoppers for flow mode, draw down, capacity, wall load, gate load, feeder load investigation
- Investigation of potential silo quaking by TUNRA approach, DEM modelling and scale modelling







DEM Modelling of Silo Discharge: a) silo eccentric discharge b) normal pressure circumferential variation at 1 m above transition level

Why TUNRA Bulk Solids?

Experience and Expertise

We have provided expert solutions to industry for over 45 years and are the leading organisation for materials handling research and consulting in Australia and internationally

Research and Development

We have a proven track record in research and development through the close association with The University of Newcastle

Quality Service

We have highly qualified, well-trained and specialist staff that are committed to delivering excellence

First Class Facilities

Our laboratory is a state of the art facility located within the Newcastle Institute of Energy and Resources (NIER) at The University of Newcastle

Industry Standards

We are accredited to ISO 9001, ISO 45001 and ISO 14001

Independent

We are independent and not for profit



Further information

- To access our Case Studies visit www.bulksolids.com.au
- To discuss your industry and business needs phone 02 4033 9055