



Services

Engineering Services

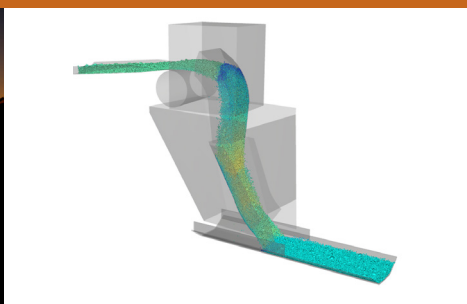
TUNRA Bulk Solids offers engineering services for all industries dealing with bulk solid materials. Each year, we complete between 200 and 250 major industrial consultancy projects which cover the entire spectrum of applications related to bulk solids storage, handling and transportation.

We provide engineering services to industry that include:

- ▶ Advanced analytics through numerical and computational modeling including:
 - Discrete Element Method (DEM) Modeling
 - Computational Fluid Dynamics (CFD)
 - Finite Element Analysis (FEA)
 - Smoothed Particle Hydrodynamics (SPH) for liquid, slurry and paste modeling
 - ▶ Belt, apron and screw feeder assessments.
 - ▶ Belt conveying design reviews and audits.
 - ▶ Conveyor motion resistance calculations.
 - ▶ Transfer chute conceptual design, troubleshooting and 3rd party design review using:
 - Discrete Element Method (DEM)
 - Continuum Modeling
- For:
- Hood & Spoon, ledge, and "rock box" type
 - Large/small vertical drop transfer chutes

- Stacker, reclaimer, chutes and bucket wheels
- Ship loaders
- Train loaders and discharge
- DEM of other complex equipment including vibratory feeders and screens
- ▶ Stockpile audits, reviews and conceptual design including:
 - Loads on trestle legs and buried columns
 - Stockpile draw-down and live capacity modeling and calculations
 - Conceptual design for optimum feeder interface geometry
 - Effective hopper geometry
 - Optimisation of number of hoppers, geometry and location to obtain required / maximum live capacity
 - Establishing dozer safety radii for safeguarding stockpile operations
- ▶ Feeder design and optimisation including:
 - Feeder design consultation
 - Effective feeder hopper design and choice of wall liners to obtain mass flow
 - Optimised feeder interfacing to ensure even draw-down and minimisation build-up
 - Determination of wall pressures and relative wear predictions
 - Feeder vertical and pull-out load calculations
 - Feeder volume calculations

TUNRA Bulk Solids develops custom solutions to suit the individual needs of our clients





- ▶ Bin and hopper audits, reviews and conceptual design including:
 - Effective hopper geometry and choice of wall liners to obtain mass flow
 - Multi-outlet bins and eccentric loading / discharge
 - Investigation of dynamic loads and pulse frequency
 - Determination of wall pressures and relative wear predictions
 - Optimum feeder interface geometry
 - Train load-out system designs
 - Scale modeling of bin/hopper and feeder
- ▶ General material handling design audits and review of existing designs.
- ▶ Hydraulic conveying including:
 - Feasibility studies
 - Bench scale and pilot scale tests to provide basic design data for the engineering of slurry and paste pipeline systems
 - Conceptual design which specifies system parameters, process design, key equipment and system operations and maintenance philosophy
 - Slurry and paste systems commissioning and technical support
- ▶ Pneumatic conveying services including:
 - Determination of pneumatic conveying characteristics for new systems or optimisation of existing systems
 - Review and troubleshooting
- ▶ Full engineering workshop services to enable prototyping of scale designs.
- ▶ Large-scale commercial and industrial research and development projects.
- ▶ Design optimisation to minimise wear and estimation of liner wear life/rate.
- ▶ Large-scale commercial and industrial research and development projects.

- ▶ TUNRA also offer on-site and in-house training, innovation and development workshops to ensure our industry partners are working with the best research and technology available.

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 ISO1 4001

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**