



**DEPARTMENT OF MINERALS AND ENERGY
WESTERN AUSTRALIA**

EXPLOSIVES & DANGEROUS GOODS DIVISION
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SIGNIFICANT INCIDENT REPORT NO. 49

HAZARD ALERT

AUGER MIXERS

Ammonium Nitrate and Ammonium Nitrate Mixtures

Chief Inspectors of Explosives throughout Australia have been made aware of the potential problem involving augers used to move Ammonium Nitrate (AN) and AN mixtures (including explosives). This may include auger mixers used to manufacture ANFO and those mixers commonly called “coxon mixers”.

Problems

The problems have been identified in several areas as set out below.

- Foreign materials such as tramp metal, loose bolts or fibrous material from bags etc, getting caught in between the auger spiral and the auger casing and generating heat, sparks and other ignition problems.
- Possible corrosion of materials used in construction of the auger.
- Build up of fines of AN or AN mixture within the machine.

Action

If you are using such an auger or mixer or know of anyone who is or may be doing so, the following items should be checked.

1. At least one end plate of the auger assembly should be flanged or designed in such a way that it can be removed to allow for inspection. Your auger may need to be substantially modified to achieve this.
2. The check should include a review for bolts, pins, nuts or protrusions within the auger tube which may come loose and rub or foul resulting in heat or sparks being generated. This may result in ignition of the AN or explosive. Particular note should be taken of how the stub shaft (if any) is attached to the auger shaft if a demountable internal connection is used.

The preferred construction will have no nuts, bolts or protrusion inside the auger tube, nor will it have any internal connections on the auger shaft.

3. End bearings should be external to the end plates and any seals which are on the inside of the auger tube should be attached by a method which ensures that bolts or screws cannot come loose inside the tube.

Seals and bearings should not have cotton or other fibrous materials as part of their construction as such seals have been known to overheat and ignite.

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As a general rule packed glands should not be used and should be replaced with lip seals or similar seals which minimise the chance of overheating and do not allow AN or explosives mixtures to become confined.

Materials which are not readily ignited are preferred materials for seals or bearings.

4. There shall be an air gap between the bearing mounts and the adjacent seals to allow any leakage from the seals to fall free and not enter the bearing.
5. All parts should be checked for corrosion and wear. Any damaged part or part which is likely to fail, become detached or loose or generate heat or sparks, must be replaced.

The behaviour of the material used in construction should be critically assessed; for example, mild steel will corrode at a faster rate than stainless steel.

6. Tolerances between the auger spiral and the auger tube should be checked to ensure that they have not deteriorated from the design specifications.

You are asked to inspect and check for the above matters. Inspectors of Explosives may ask to see the records of your review in due course.

Caveat

You are reminded of the need to carefully and thoroughly wash down the equipment and check for foreign material such as tramp metal, fibres, metal grindings, rust flakes etc. on a regular basis.

Washdown is particularly important immediately before any welding or cutting operations take place, to ensure there is no entrapped AN or AN mixtures in the equipment you are working on. Entrapped AN has been known to explode when heated in such operations.

Further Action

Please advise the Inspectorate [Tel. (09) 222 3413 or Fax. (09) 222 3525] of the name and supplier of any equipment used to auger AN or AN mixtures in your organisation so that steps can be taken to follow up these matters with the designers and manufacturers of the equipment.

General Duty of Care

The owner/operator of equipment has the responsibility to ensure that equipment is suitable for its intended use and at all times equipment is maintained in safe conditions.

K Price
CHIEF INSPECTOR OF EXPLOSIVES
AND DANGEROUS GOODS

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