

Tetraamine Copper Nitrate (TACN)

Mine sites that store or use chemicals that contain ammonia, such as explosives containing ammonia or ammonium nitrate (i.e. ANFO, TNT), in an area that has exposed copper or copper alloy components are at risk of TACN formation. TACN is created when copper or a copper alloy is exposed to ammonia. The mixture of air, moisture, electricity, and ammonia can cause the formation of TACN on copper-containing components, making mine site production and storage facilities a prime environment for TACN to form if proper precautions aren't followed.

Commonly, a deep blue copper nitrate corrosion is found on copper in these environments. However, there is also the risk for TACN to form on copper-containing components in these same environments. Its deep purple colour can identify TACN and the salt crystals it produces, which, when in a dry crystallized form are highly unstable and susceptible to impact, leading to a very high risk of explosion. *See photos¹ – TACN forming on copper-containing brass lever clamps.*

Recommendations

- Avoid the use of equipment that contains copper or copper alloys; consider using alternative metals such as stainless steel or aluminum
- If there is no way to avoid the use of copper, follow good house-keeping practices by regularly inspecting and cleaning equipment to ensure TACN formation is prevented
- Develop a safe work procedure for employees who work in environments where TACN may be encountered
- Train workers to identify and handle TACN correctly and safely

Health, Safety and Reclamation Code for Mines in BC (Code)

Workplace Conditions – Code S.1.9.1: The manager shall take all reasonable and practicable measures to ensure that the workplace is free of potentially hazardous agents and conditions which could adversely affect the health, safety, or well-being of the workers.



Consult the Health, Safety and Reclamation Code for Mines in BC for regulatory requirements

¹Photos (edited) used with permission from the New South Wales (NSW) Resources Regulator from a 2016 Safety Bulletin regarding TACN – #SB16-05