

A risk register for powder coated tubular steel fencing

Risk Item	Consequence	Mitigation
The use of low quality steel (often the case with imported product).	<p>The steel may lack strength and rigidity resulting in the fence panel or post failing in its desired application. This may result in the fence not being compliant for its application such as being pool/ childsafe.</p> <p>The steel may be brittle resulting in cracking, splitting and deformation during fabrication again resulting in failure during service.</p>	<p>Supplier to use steel that complies with the applicable Australian Standards.</p> <p>Supplier to provide details of the strength of the steel.</p> <p><i>Bluedog can provide statements of compliance that the steel used complies with Australian Standards and can indicate the strength classification of the tube.</i></p>
The use of steel with a low zinc coating mass or no zinc coating on the inside of the steel tube (often the case with imported product).	A low zinc coating mass on the steel will result in the steel tube beginning to corrode sooner, particularly if the fence is installed in a high corrosion environment. Corrosion results in a poor aesthetic outcome, failure of the fence and reduced service life.	<p>Supplier to provide details of the zinc coating mass on the product.</p> <p><i>Bluedog can provide statements of compliance as to the zinc coating mass on the steel supplied.</i></p>
The fence design does not comply with the regulations, for example, pool fencing safety requirements (often the case with imported product).	A fence panel or gate that is non-compliant can result in penalties, and potentially result in a serious injury or death.	<p>Supplier to provide statement of compliance with applicable tests.</p> <p>Supplier to provide independent test certificates for applicable tests.</p> <p><i>Bluedog can provide statements of compliance and test certificates.</i></p>
The use of a standard mild steel weld rather than a silicon bronze weld (often the case with imported product).	A mild steel weld is hotter than a silicon bronze weld which compromises the zinc coating on the steel around the weld increasing the rate of corrosion in that area. The mild steel weld more readily corrodes as compared to the silicon bronze weld. The powder does not adhere well to a mild steel weld as compared the silicon bronze. This lack of powder adhesion results in a poor aesthetic outcome and further reduces the corrosion protection.	<p>Supplier to provide details of the weld used.</p> <p><i>Bluedog only uses silicon bronze weld.</i></p>
The use of low quality powders that lack Ultra-violet light stabilisers (often the case with imported product).	The powder will rapidly fade in colour and 'chalk' resulting in an old looking fence.	<p>Supplier to provide evidence of using powders in compliance with Australian Standard AS 4506-2005 Metal finishing - Thermoset powder coatings ("AS4506").</p> <p>Supplier to provide details of powder supplier and product data sheets.</p> <p>Supplier to provide details of any warranty on color fastness.</p> <p><i>Bluedog only uses Akzo Nobel powders (a world leader) and a 10 year warranty of the quality of powder coat (conditions apply).</i></p>





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The use of low quality powders (<i>often the case with imported product</i>).	The powder has poor mechanical and corrosion protection qualities. This results in poor barrier corrosion protection of the base material and poor aesthetics including chalking, chipping and cracking of powder over a short period of time.	Supplier to provide details of powder supplier and product data sheets. Supplier system to be operated in compliance with AS 4506-2005. Supplier to provide details of any warranty on film service life and adhesion. <i>Bluedog only uses Akzo Nobel powders.</i>
A poor quality (<i>or the absence of</i>) chemical pre-treatment process to prepare the steel for powder coating. For example, the inadequate cleaning preparation of steel tube using a manual wipe down of the product with a basic solvent/ degreaser to remove organic matter, mill oil, grease and dirt.	The steel surface (substrate) is not cleaned properly leaving contaminants such as oils on the surface of the steel to which the powder will not adhere resulting in delamination (peeling) of the film and corrosion of the film early in service life.	Supplier to provide details of its pre-treatment system. Supplier system to be operated in compliance with AS 4506-2005. <i>Bluedog uses a 7 stage metal pre-treatment system that includes two heated alkali degreasing stages that comprehensively cleans the surface of the steel. A clean steel surface maximises the quality of the adhesion of the powder to the steel.</i>
The absence of a conversion coating/ passivation stage in the pre-treatment process. This stage applies a fine crystalline structure on the surface of the steel that prevents oxidation of the 'clean' steel surface before powder coating and provides a 'key' for improved adhesion of the powder coating.	The steel surface oxidises (rusts) before powder coating and the surface is not 'best prepared' for powder adhesion resulting in reduced powder film adhesion service life.	Supplier to provide details of pre-treatment system. Supplier system to be operated in compliance with AS 4506-2005. <i>Bluedog uses a metal pre-treatment system that includes a final passivation/ conversion coating stage that applies a fine crystalline structure on the steel that prevents corrosion of the steel and acts as a "key" that maximises film adhesion service life.</i>
The use of manual application guns to apply the powder to the fencing resulting in greater inconsistency of amount of powder applied to the material.	Application of too much or too little powder can compromise the mechanical and corrosion protection qualities of the powder coat. This results in poor film adhesion service life. It can also result in a poor aesthetic outcome.	Supplier to provide details of powder coating system. <i>Bluedog use a conveyerised powder coating line with automatic reciprocating application guns. This achieves a very high level of consistency and accuracy in powder application.</i>
The under or over cure of the powder coat due to inadequate or poor operation of the heated curing ovens.	Under or over cure will compromise the mechanical and corrosion protection qualities of the powder coat.	Supplier to provide details of powder coating system. <i>Bluedog uses a conveyerised powder coating line with oven. This allows us to achieve a very high level of consistency and accuracy in curing time of the product.</i>
Quality Management: The failure to do Neutral Salt Spray (NSS) tests for the barrier protection qualities of the powder coating film.	Poor film adhesion service life resulting in poor aesthetics and corrosion of the fencing.	Supplier to achieve NSS performance benchmarks set out in AS4506. <i>Bluedog regularly send powder coated samples away for independent NSS testing and achieve or exceed the benchmarks in AS4506.</i>
The strength of the design of the fence panel.	The design of the fence panel does not provide enough strength/ rigidity so as to withstand the loads it will be subject to when in service and fails. This strength can be a function of the length of the panel, the height of the panel, the distance between the vertical pickets, the method by which the pickets are connected to the rails. The strength can have a range of adverse consequences including the panel not being compliant, through to creating a head entrapment risk for a child.	Supplier to provide details of the steel tube size and wall thickness (gauge) of the tube to be used. <i>Bluedog can warrant the panel design to meet the loads applied during its service life.</i>





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The strength of the steel tube used in the fence panel.	The size of the steel profiles or the wall thickness of the steel tube used in the panel does not provide enough strength/ rigidity so as to withstand the loads it will be subject to when in service and fails. This can have a range of adverse consequences including the cost of replacing the panel through to a serious injury or death.	Supplier to provide details of the steel tube size and wall thickness (gauge) of the tube to be used. <i>Bluedog can warrant the panel design to meet the loads applied during its service life.</i>
The strength of the bracket connecting the fence panel to the post.	The bracket does not provide enough strength so as to withstand the loads it will be subject to when in service and fails. This includes the material the bracket is made from, the gauge of the bracket, the number and type of fixings in the bracket to the fence post and rail, and the design of the bracket. Failure of the bracket can have a range of adverse consequences including the cost of replacing the bracket through to a serious injury or death.	Supplier to provide details of the proposed connection bracket to be used. <i>Bluedog can warrant the bracket to meet the loads applied during its service life.</i>
The strength of the fence post.	The size of the post profile or the wall thickness of the post does not provide enough strength/ rigidity so as to withstand the loads it will be subject to when in service and fails. This can have a range of adverse consequences including the cost of replacing the post through to a serious injury or death. This is particularly an issue for gate posts.	Supplier to provide details of the proposed post size and wall thickness (gauge), especially for gate posts. <i>Bluedog can warrant the post design to meet the loads applied during its service life.</i>
The strength of the fence post footing.	The size and depth of the post footing is not adequate so as to withstand the loads that will be applied to the fence and fails. This can have a range of adverse consequences including the cost of replacing the post footing through to a serious injury or death. This is particularly an issue for gate posts.	Supplier to provide details of the proposed post footing size, especially for gate posts. <i>Bluedog can warrant the footing design to meet the loads applied during its service life.</i>
The strength of the gate design.	The size of the steel profiles or the wall thickness of the gate frame does not provide enough strength/ rigidity so as to withstand the loads it will be subject to when in service and fails. This can have a range of adverse consequences including the cost of replacing the gate through to a serious injury or death.	Supplier to provide details of the proposed gate design. <i>Bluedog can warrant the gate design to meet the loads applied during its service life.</i>
The strength of the gate hinges.	The hinge is not strong enough to withstand the loads it will be subject to when in service and fails. This can potentially result in a serious injury or death.	Supplier to provide details of the proposed hinge design. <i>Bluedog can warrant the gate hinges offered to meet the loads applied during its service life.</i>
The strength of the gate locking hardware.	The latch or drop bolt is not strong enough to cope with the application and fails. The gate can become difficult to operate resulting in manual handling issues and inconvenience.	Supplier to provide details of the proposed locking hardware design. <i>Bluedog can warrant the hardware offered to meet the loads applied during its service life.</i>

