

NAFLIC

National Association For Leisure Industry Certification

Standards & Related Documents Sub-Committee

TECHNICAL BULLETIN - NOVEMBER 1996

139. Aluminium roller coaster wheels

The majority of "steelies" (i.e. steel-structured roller coasters) use tyred wheels having aluminium centres. These tyres, as a result of wear, etc., are replaced regularly.

It is important to be aware that many aluminium alloys rely for their strength on hardening, heat treatment and ageing processes at the manufacturing stage. Strengths may be subsequently significantly reduced by excessive heating. For instance, some alloys may be locally reduced in strength to, say, 20% of the design value.

Re-tyring where it involves the application of heat (e.g. during vulcanisation) may significantly affect the strength of the wheel centres. We are aware that this has resulted in the short term break-up of wheels in some cases.

It is our opinion that the application of heat to an aluminium wheel may well result in changes to the structure of the wheel material which mean that a "modification" has been carried out. It is therefore our advice to designers (and Inspection Bodies carrying out Design Review, Conformity Assessment or Initial Test), that they should ensure that the required wheel strength is retained when new tyres are fitted. Specialist advice will need to be sought by those who are not competent to assess the effect of proposed work.

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