



TECHNICAL CRACK DEFINITION FOR WHEELS

ES 3.25

Page 1/3

DEFINITION VON TECHNISCHER RISS FUER RAEDER

Définition de Fissure Technique pour roues

Changes:

- 10/2010 – First release
- 10/2016 – Added aluminum alloy wheels for truck and trailers
- 06/2017 – Crack Definition Update

References:

No external references.

Content:

- 1. - Scope 2
- 2. - Field of application 2
- 3. - Fatigue crack..... 2
- 4. - Technical crack definition 2
- 5. - Crack detection procedure 2
- 6. - Technical crack maximum dimensions..... 3

1. - Scope

This EUWA Standard gives a definition of Technical Crack for Wheels. The dimensions characterizing these cracks, in the typical wheel areas, are different, depending on the wheel construction.

This definition is intended to give a reference for the acceptance criteria of fatigue test results.

2. - Field of application

The following standard is valid only for fully processed new wheels which have been tested on fatigue test rigs.

The procedure shall be applied only to steel and aluminum alloy wheels.

3. - Fatigue crack

A Fatigue Crack is a thin discontinuity in the material, generated by stress cycles.

The crack is characterized by two dimensions: length and depth.

The crack length is the linear distance between crack start and crack end on the component surface.

The crack depth is the maximum crack penetration measured in normal direction to component surface.

4. - Technical crack definition

The Technical Crack is a fatigue crack that does not compromise the wheel function, and is defined as a crack the dimensions of which are lower or equal to those described in Table 1.

Minor modification of the wheel rigidity may be observed in presence of technical cracks.

5. - Crack detection procedure

Before estimating the crack dimension, the wheel shall be cleaned with soaped water. Any mechanical or chemical cleaning that may cause abrasions shall not be used. Naked eye view can be used to estimate the crack length with aid of an appropriate gauge. In case of doubt, die penetration crack detection shall be used.

Crack depth can be verified with good accuracy only by destructive methods:

- micrographic analysis of crack section;
- crack opening and crack surface analysis.

A rough estimation of the crack depth can be obtained either by die penetration or ultrasonic method.

6. - Technical crack maximum dimensions

The following table defines the maximum dimensions of technical cracks, for the different types of wheels. Crack's depth and length are defined in percentage of material thickness in the specified area. A protruding crack means 100% of thickness and is not allowed except in ventilation and stud holes area.

Wheel Material	Wheel Construction	Crack Area	Depth (%)	Length (%)
Steel	One piece passenger car	Hub fixing area	(-)	100
		Ventilation and stud holes	100	100
		Nose of disc	(-)	100
		Welding and rim (*)	(-)	150
	One-piece wheels for trucks or agricultural, industrial and other heavy duty vehicles	Hub fixing area	20	200
		Ventilation and stud holes	100	100
		Welding and rim (*)	(-)	150
	Multi-piece wheels for trucks or agricultural, industrial and other heavy duty vehicles	Hub fixing area	20	200
		Ventilation and stud holes	100	100
		Welding and rim (*)	(-)	150
		Side and lock rings	(-)	100
Aluminum alloy	One-piece wheels for trucks or trailers	Hub fixing area	15	200
		Ventilation and stud holes	100	100
		Rim (*)	(-)	150

(-) Any depth less than 100%.

(*) Air leak not allowed