

Nitriding

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1 Scope

This factory standard contains determinations for nitriding of steel. It shows effects of deviations at exceeding or deceeding of the chosen nitriding hardness depth.

2 References

The following documents, cited in part or in whole, shall apply for the use of this standard. In case of dated references, only the referenced edition applies; in case of undated references, the latest edition of the referenced document (including all amendments) applies. The applicable version of the standards listed below shall apply to all contents not covered by this factory standard.

DIN 3990-5	Calculation of load capacity of cylindrical gears; endurance limits and material qualities
DIN 17022-4	Heat treatment of ferrous materials - Methods of heat treatment - Part 4: Nitriding and nitrocarburizing
DIN EN ISO 683-5	Heat treatable steels, alloy steels and free-cutting steels - Part 5: Nitriding steels
DIN EN ISO 4885	Ferrous materials - Heat treatments - Vocabulary
DIN EN ISO 6507-1	Metallic materials - Vickers hardness test - Part 1: Test method
DIN EN ISO 18265	Metallic materials - Conversion of hardness values
DIN ISO 15787	Technical product documentation - Heat-treated ferrous parts - Presentation and indications
ISO 6336-1...6	Calculation of load capacity of spur and helical gears
RN 830	Delivery Conditions for nitriding steel; 31CrMoV9
RN 840	Delivery Conditions for quenched and tempered steel; 34CrNiMo6
RN 850	Delivery Conditions for quenched and tempered steel; 42CrMo4

3 Terms and definitions

Nitriding refers to the enrichment of the edge layer with nitrogen. Ammonia is used as a nitrogen donor under normal pressure.

For the use of this document, the following terms and definitions apply.

<i>acc. to DIN 6773 (old)</i>		<i>acc. to ISO 15787</i>	
<i>Abbreviation</i>	<i>Definition</i>	<i>Abbreviation</i>	<i>Definition</i>
<i>VS</i>	<i>Bond layer thickness</i>	<i>CLT</i>	<i>Compound Layer Thickness</i>
<i>Nht</i>	<i>Nitriding hardness depth</i>	<i>NHD</i>	<i>Nitriding Hardness Depth</i>

4 Calculation of the required nitriding hardness depth

The determination of the nitriding hardening depth with regard to maximum tooth flank and tooth root loading is based on technical possibilities. This is based on economic principles on the one hand and customer or classification requirements on the other.

As a rule, a HRC value of $58 + 2$ is to be assumed for REINTJES gearings.

5 Inspection and documentation

The inspection is carried out at REINTJES on sample material provided by the supplier according to DIN 17022-4 (HV0.5).

The surface hardness is determined by microhardness testing (HV1).

The achieved nitriding hardening depth is to be checked and documented, including a curve of the hardness profile. The batch size and index number(s) of the components must be traceable in the documentation.

For counter-inspection of all transmitted test results, REINTJES must be sent the coupon samples. These must be identical in material to the delivered component.

6 Process

The gas nitriding process is to be used, and the drawing specifications are to be observed.

A careful pre-treatment and cleaning of the components according to DIN 17022-4 is to be carried out.

The treatment duration is to be chosen depending on the required nitriding hardening depth, with a simultaneous temperature of max. 530 °C.

The nitriding hardening depth, including any additional allowance for grinding, must be at least 0.6; if the drawing specifications differ, these are to be given priority. Any different allowance for grinding is to be specified separately in the order.

All threaded holes according to the drawing specifications are to be covered.

In the event of any deviations from the specified requirements, the supplier must contact REINTJES before executing the order. Deviating or special delivery terms can be agreed upon between the supplier and REINTJES and must be documented in writing.