ICX-ALL-IN-ONE® DRILLS

MECHANICAL INTEGRITY AND PHYSICAL SAFETY ASSESSMENT FOR AIO DRILLS

CHECK REPORT FOR INTEGRITY OF ZrN COATING

Drill: ICX All-in-One drill
Coating: Zirconium nitride (ZrN)

DISCOVER THE ICX DIFFERENCE.

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1 TEST SUMMARY

AIO Pre-Drill Ø2 AIO-014-200000 ZrN Coating	Test start date: Test end date: Test performed by:	02.06.2022 10.08.2022 Oliver Conzeth*, Elena Maquet
AIO Drill Ø4.8 D1 AIO-014-007480 ZrN Coating	Test start date: Test end date: Test performed by:	18.08.2022 07.11.2022 Oliver Conzeth*, Elena Maquet
AIO Drill Ø3.75 x 15 AIO-014-375150 ZrN Coating	Test start date: Test end date: Test performed by:	29.09.2022 01.03.23 Oliver Conzeth*, Elena Maquet
Documentation: Jens Conzeth		

* Tests and examinations carried out by Oliver Conzeth, Machinist, c/o Walporzheimer Str. 48-52, 53474 Bad Neuenahr-Ahrweiler, tests carried out from 02.06.2022 to 01.03.2023).

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2 TEST TARGET

The aim of the test is to check the adhesion and durability (adhesion test) as well as corrosion (test for corrosion after cleaning, disinfection and sterilisation) of the ZrN coating. The aim of the test is to confirm a homogeneous coating which, after the test sequence described below, does not exhibit any
in the form of wear or other signs of wear.

3 ORDER OF THE TESTS

The test sequence is repeated a total of 60 times. The test sequence is carried out on 3 different drills with 480 holes each.

1. visual inspection of the coating incl. pictorial documentation
2. 480 holes in artificial bone material (PCF 40)
3. cleaning in Cydezym cleaner 4. sterilisation

4 EXPLANATION OF THE TEST SEQUENCE

1 The drills are visually inspected under the Leica (see 1 page 5); the following three images are always documented

- 2x overview image
- 1x main cutting edge
- 1x secondary cutting edge

2. The burrs are drilled with the W&H surgical motor (see 2 page 5).

- 400 rpm
-PCF 40 (artificial bone material)
- Drilling depth approx.15mm

3. The parts are cleaned for 5 minutes in an ultrasonic bath with a Cydezym cleaner (see 3 page 5) and then rinsed with clear water.

4. Sterilisation is carried out with the programme „Porous 134°C“ (see 4 page 5).

5 DESCRIPTION OF THE TEST SPECIMENS

A dental twist drill was tested, which was manufactured from the steel with the number 1.4108. steel. This drill was then hardened to 58-62 HRC and coated with a zirconium nitride layer.

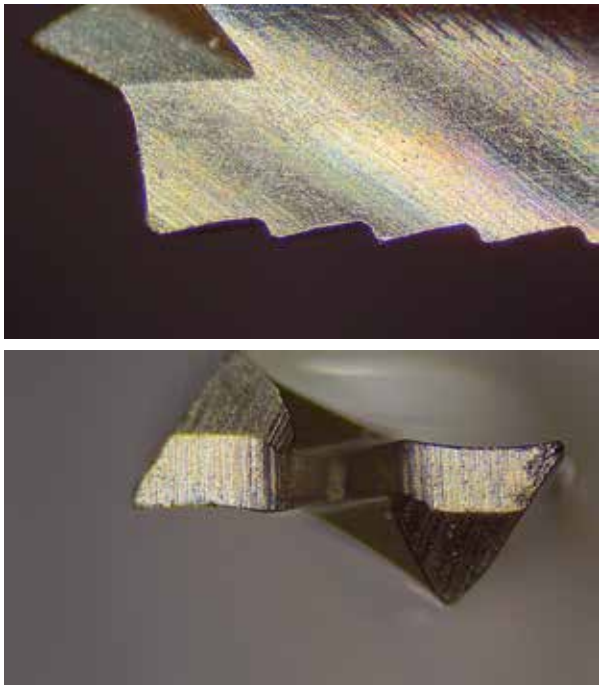
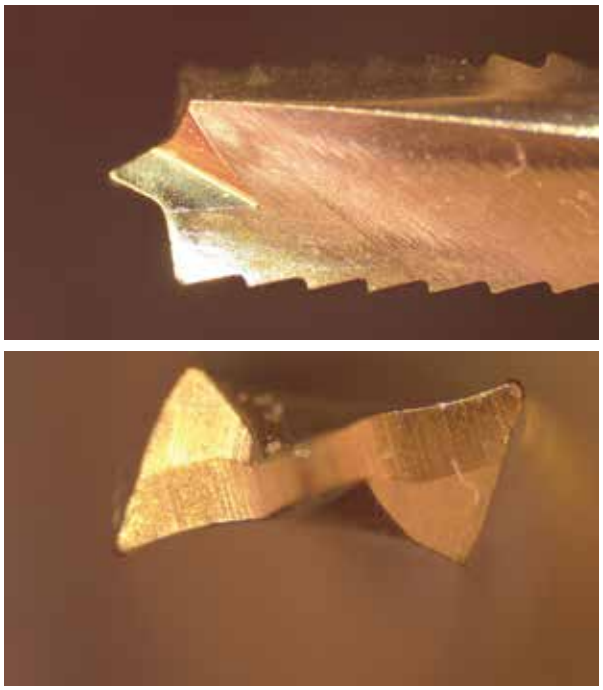
TEST SPECIMEN-1		
	Article number	**LOT number**
	AIO-014-200000	349137-A-D
TEST SPECIMEN-2		
	Article number	**LOT number**
	AIO-014-007480	349158-A-D
TEST SPECIMEN-3		
	Article number	**LOT number**
	AIO-014-375150	349145-B-D

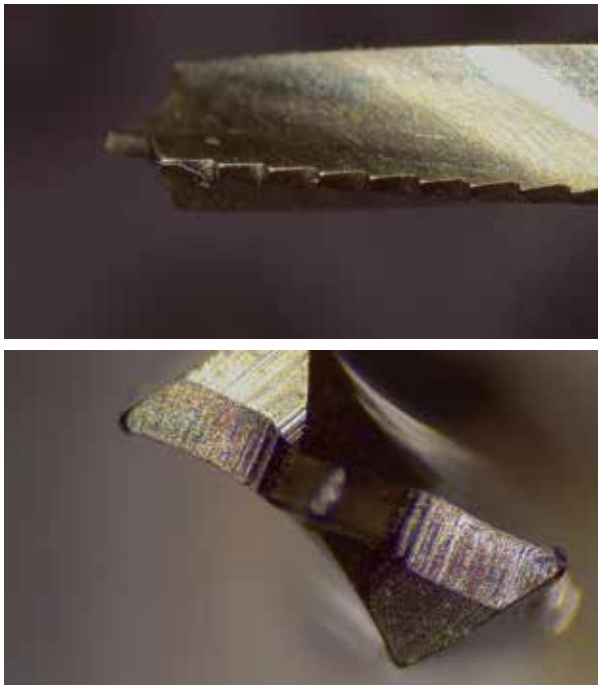
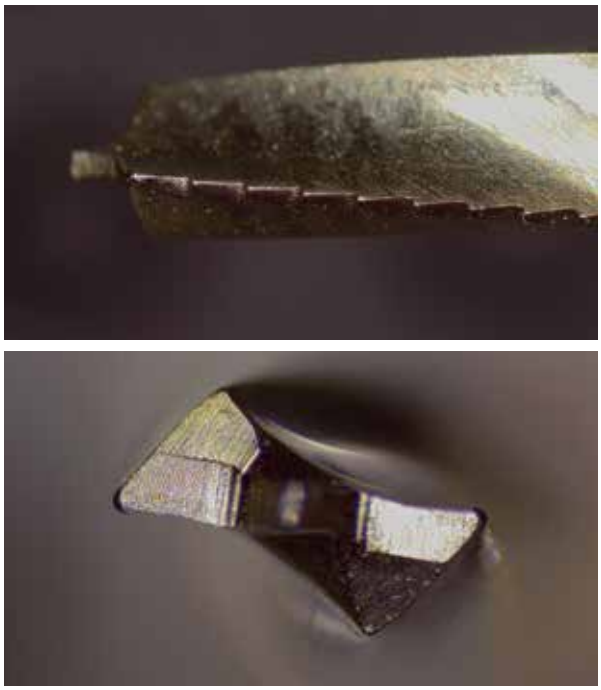
6 DESCRIPTION OF TESTING AND AUXILIARY EQUIPMENT

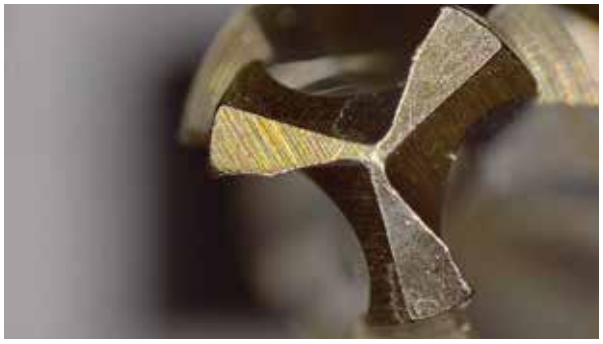
TESTING METHOD	TEST INSTRUMENT	
Visual inspection	1) Leica S9i Serial no. 6186878	
Drilling tests	2) W&H Chirurgie Motor Serial no.08463	
Cleaning	3) Bandelin Ultraschallgerät Serial no. 3210.00128828.002	
Sterilization	4) Mammooth Sterilisator Serial no. ZB22VH0080	

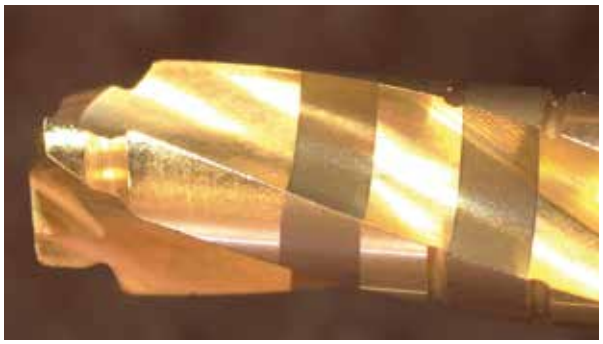
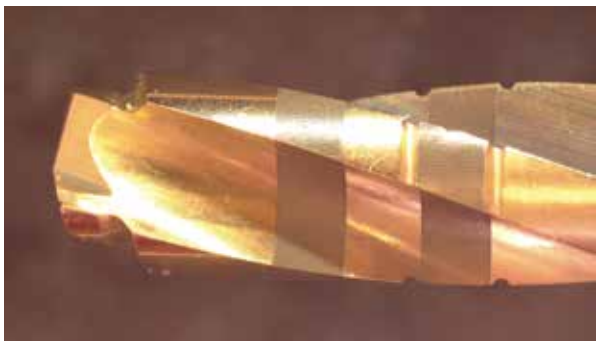
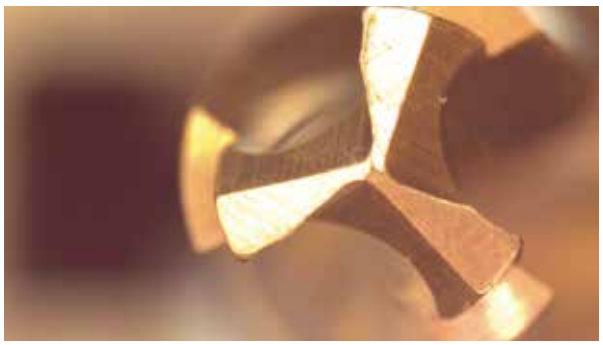
7 RESULTS

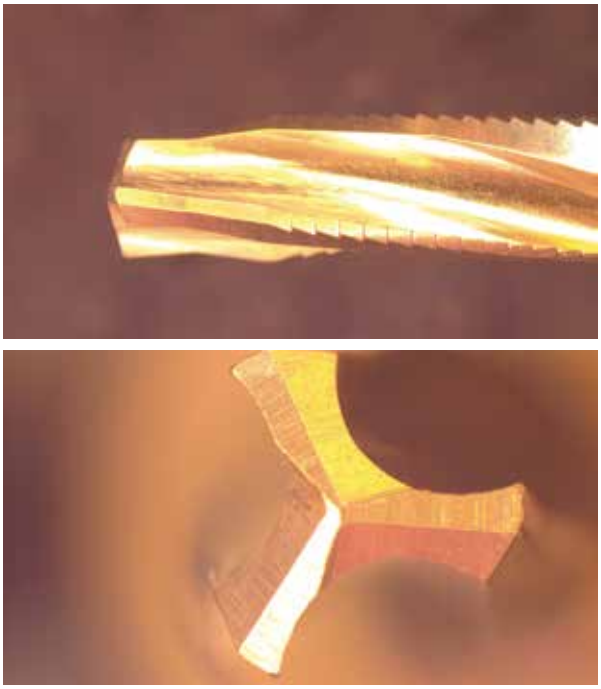
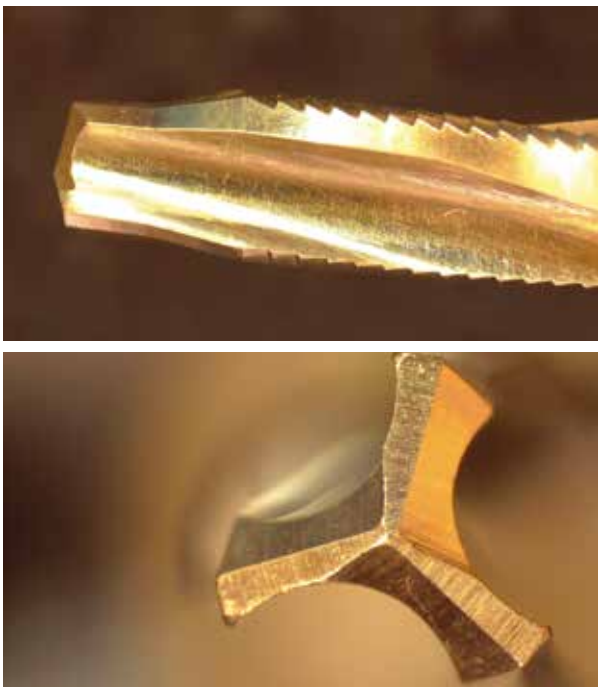
Due to the complexity of the test, only sample images (all 160, 320 and 480 drills) and results are shown.

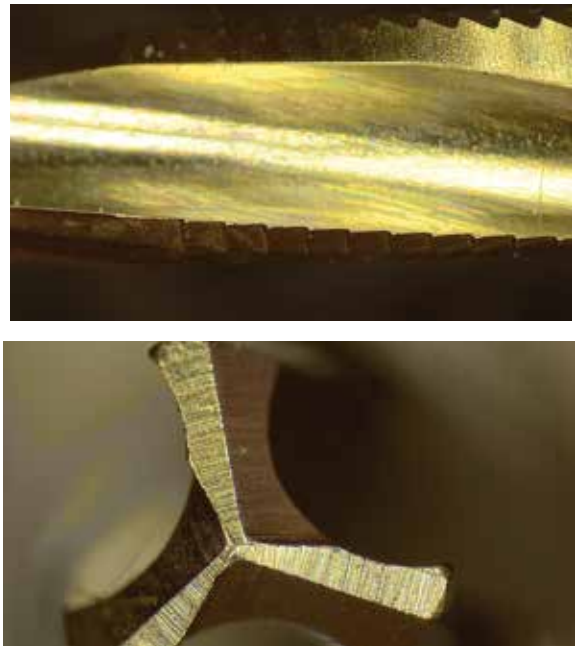
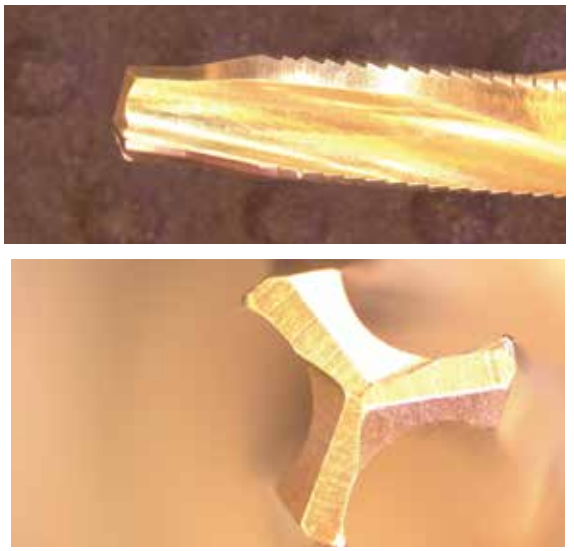
TEST SPECIMEN-1: AIO-014-200000		
Image	Drilling	Note
	0 Drillings	A homogeneous layer
	160 Drillings	No change from 0 drillings

TEST SPECIMEN-1: AIO-014-200000		
Image	Drilling	Note
	320 Drillings	No change from 0 drillings
	480 Drillings	No change from 0 drillings

TEST SPECIMEN-2: AIO-014-007480		
Image	Drilling	Note
 	0 Drillings	A homogeneous layer
 	160 Drillings	No change from 0 drillings

TEST SPECIMEN-2: AIO-014-007480		
Image	Drilling	Note
 	320 Drillings	No change from 0 drillings
 	480 Drillings	No change from 0 drillings

TEST SPECIMEN-3: AIO-014-375150		
Image	Drilling	Bemerkung
	0 Drillings	A homogeneous layer
	160 Drillings	No change from 0 drillings

TEST SPECIMEN-3: AIO-014-375150		
Image	Drilling	Bemerkung
	320 Drillings	No change from 0 drillings
	480 Drillings	No change from 0 drillings

8 SUMMARY

The drills in combination with the zirconium nitride layer show no signs of wear, chipping or corrosion after the tests.

HINWEIS: Docu. Identfr.: MI11_Integrity_of_ZrN_coating_on_AIO-Drills_TEST-REPORT.docx

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MECHANICAL INTEGRITY AND PHYSICAL SAFETY ASSESSMENT FOR AIO DRILLS

CHECK REPORT FOR INTEGRITY OF ZrN COATING

Drill: ICX All-in-One drill

Coating: Zirconium nitride (ZrN)

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