



## Test Report

### ***Toxicity testing of a material extract, Cytotoxicity Test***

Test report number: ISO 202111-03295C\_engl

commissioned by:

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Test materials:

Dec 06<sup>th</sup> 2021

### **Stainless steel test specimens coated with zirconium nitride (ZrN) by PVD process**

Test material received: Nov 19<sup>th</sup> 2021

Test performed: Dec 03<sup>rd</sup> 2021

**Result: The stainless steel test specimens coated with zirconium nitride (ZrN) by PVD process did not cause a cytotoxic effect.**

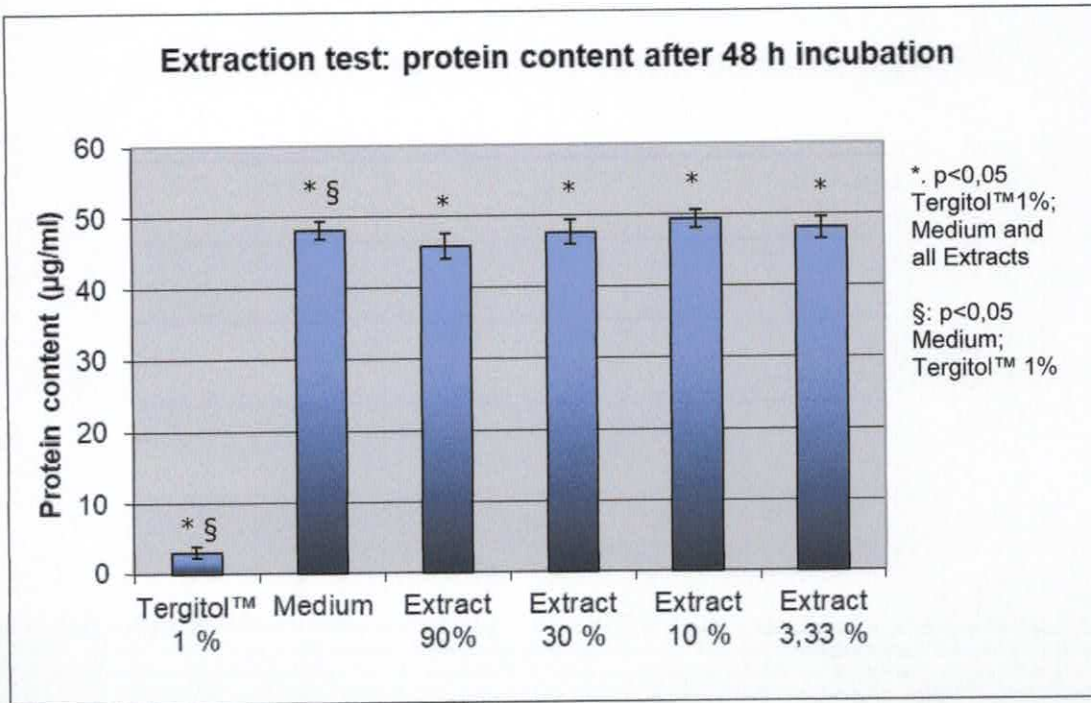
#### Description of the test procedure:

Normative References: ISO 10993-5 (2009); ISO 10993-1 (2018); ISO 10993-12 (2021)

The materials were extracted for 24 h at 37°C and a partial pressure of 5 % carbon dioxide in extraction medium (DMEM medium with antibiotics, without fetal calf serum [FCS]). The material surface / extraction volume ratio was 3 cm<sup>2</sup> per ml extraction medium. After extraction the extraction medium was sterile filtered and supplemented with sterile FCS (concentration of FCS in extraction medium: 10 %). The FCS-supplemented extraction medium was pipetted under sterile conditions on precultivated cells of the mouse fibroblastic cell line L929 and incubated for 48 h at 37°C and a partial pressure of 5 % carbon dioxide. The extract was tested in four dilutions (90 %, 30 %, 10 % and 3,3 %). Each dilution was tested in four parallel experiments.

Tergitol™ 1 % was used as a toxic control substance (concentration in the experiment: 1 % v/v). Cell culture medium was used as a non-toxic control. After the 48 h incubation period the protein content of the cell culture was determined by the method according to Bradford.

**Results:**



Result data	Protein content n=4					
	Tergitol™ 1 %	Culture medium	Extract 90 %	Extract 30 %	Extract 10 %	Extract 3,3 %
Mean	3,05	48,17	45,82	47,74	49,43	48,11
Standarddev.	0,85	1,30	1,78	1,66	1,29	1,56

In the presence of Tergitol™ 1% in the cell culture medium 6,3 % of the protein content compared to the negative control was reached. This value is within the valid range of 15 % protein content or less compared to the negative control. Materials are evaluated as cytotoxic, if the material extract leads to a protein content of the test cells of less than 70 % compared to the negative control. This was not the case in this test. The material extract did not show a cytotoxic effect.

**Result:** The stainless steel test specimens coated with zirconium nitride (ZrN) by PVD process did not cause a cytotoxic effect.

Explanatory notes:

none

Test performed by: Dr. D. Scheddin

authorized by: Dr. D. Scheddin  
( Dr. D. Scheddin / CEO CYTOX)

It is not allowed to publish only parts of this test report without written approval of CYTOX.