Elemental Impurities

Starches

Product group:	Starch
Brand name:	Solani Amylum, Prejel PA5 PH
Product description:	Pregelatinized potato starch, Native potato starch
Document No.:	PD-0620

Dear Customer,

In framework of the ICH Q3D (R2) guideline, DFE Pharma tested batches of Starches, originating from the production sites located in Europe (Tilburg, The Netherlands, Lüchow, Germany) representing the brand names mentioned above.
Neither the elements listed below, nor other elements classified as class 2B, are intentionally added during the production process.
DFE Pharma performed analysis on relevant elemental impurities categorized as class 1, class 2A and some class 2B, class 3 and other relevant elements by the ICH Q3D (R2) guideline (according to table 5.1: Elements to be considered in the Risk Assessment – Oral Dosage Form).
Analysis was performed using the analysis technique ICP-MS (Inductively Coupled Plasma-Mass Spectrometry) conforming to USP-NF <233> and Ph. Eur 2.4.20.

Table 1: Table of elemental impurities following ICH Q3D

Metal	Class	Limit in ppm oral	Required for oral route	Tested at DFE Pharma
Cadmium	1	0.5	Yes	Yes
Lead	1	0.5	Yes	Yes
Arsenic	1	1.5	Yes	Yes
Mercury	1	3.0	Yes	Yes
Cobalt	2A	5	Yes	Yes
Vanadium	2A	10	Yes	Yes
Nickel	2A	20	Yes	Yes
Selenium	2B	15	No	Yes
Lithium	3	55	No	Yes
Antimony	3	120	No	Yes
Barium	3	140	No	Yes
Molybdenum	3	300	No	Yes
Copper	3	300	No	Yes
Tin	3	600	No	Yes
Chromium	3	1100	No	Yes
Aluminium	None	-	No	Yes
Strontium	None	-	No	Yes

*[1]: Limits are based on option 1 of the ICH Q3D (R2) guidelines, based on administration of not more than 10g of drug product per day (stated in table A.2.2).

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In Table 2 and 3 the data of Prejel PA5 PH and Solani Amylum is presented.
Neither the elements listed in Table 1, nor other elements classified as class 2B, are intentionally added during the production process.

Table 2: Results of elemental impurities in Prejel PA5 PH

Product and Batch			Prejel PA5 PH 10B0JZT (ppm)	Prejel PA5 PH 10BP7HD (ppm)	Prejel PA5 PH 10FBZ0N (ppm)
Metal	**Limit (ppm)**	**Report limit (ppm)**			
Cadmium	0.5	0.005	<0.005	<0.005	<0.005
Lead	0.5	0.01	<0.01	<0.01	<0.01
Arsenic	1.5	0.005	<0.005	<0.005	<0.005
Mercury	3	0.006	<0.006	<0.006	<0.006
Cobalt	5	0.005	<0.005	<0.005	<0.005
Vanadium	10	0.002	0.004	0.003	0.004
Nickel	20	0.030	<0.03	<0.03	<0.03
Selenium	15	0.004	<0.004	<0.004	<0.004
Lithium	55	0.004	0.012	0.010	0.007
Antimony	120	0.005	<0.005	<0.005	<0.005
Barium	140	0.005	0.410	0.150	0.370
Molybdenum	300	0.020	<0.02	<0.02	<0.02
Copper	300	0.010	0.140	0.680	0.410
Tin	600	0.25	<0.01*	<0.25	<0.25
Chromium	1100	0.030	0.033	<0.03	0.053
Aluminium	None	0.200	0.54	0.35	0.63
Strontium	None	0.005	1.3	0.97	1.2

*At time of measurement the reporting limit was different

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Table 3: Results of elemental impurities in Solani Amylum

Product and Batch			Solani Amylum 10BoMXH (ppm)	Solani Amylum 10CMKN9 (ppm)	Solani Amylum 10FN8K8 (ppm)
Metal	**Limit (ppm)**	**Report limit (ppm)**			
Cadmium	0.5	0.005	<0.005	<0.005	<0.005
Lead	0.5	0.01	<0.01	<0.01	<0.01
Arsenic	1.5	0.005	<0.005	<0.005	<0.005
Mercury	3	0.006	<0.006	<0.006	<0.006
Cobalt	5	0.005	<0.005	<0.005	<0.005
Vanadium	10	0.002	0.002	0.004	0.003
Nickel	20	0.030	<0.03	<0.03	<0.03
Selenium	15	0.004	<0.004	<0.004	<0.004
Lithium	55	0.004	<0.004	0.007	<0.004
Antimony	120	0.005	<0.005	<0.005	<0.005
Barium	140	0.005	0.006	0.007	0.007
Molybdenum	300	0.020	<0.02	<0.02	<0.02
Copper	300	0.010	<0.010	<0.010	<0.010
Tin	600	0.25	<0.01*	<0.25	<0.25
Chromium	1100	0.030	<0.03	<0.03	<0.03
Aluminium	None	0.200	0.63	1.3	0.73
Strontium	None	0.005	0.0070	0.014	0.011

*At time of measurement the reporting limit was different

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A risk assessment was performed. This document and raw data are available for review during audits. Conclusion of the risk assessment is that all values obtained are below 30% of the limits and thus do not need additional control, the change control procedure is the key to maintain this situation. The levels of ICH Q3D relevant elemental impurities are monitored on regular basis.

This statement substitutes all previous versions issued for the brand names mentioned above.
We trust this information, which is made up to the best of our knowledge, will be helpful to you.

With kindest regards,

Name : Peter Ebben
Job title : Global Quality Control Manager
Signature :

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