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Att: Mr. Torbjörn Fredrikzon
Björnax AB.

Subject:
Evaluation regarding Transport classification on products from BJÖRNAX AB according to transport regulation ADR.
This document contains of 4 pages.

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1. PURPOSE.

Undersigned has performed the work to clarify if Björnax products shall be classified as dangerous goods according to law transport of dangerous goods (2006:263) and ADR 2017.
Undersigned has at a number of occasions participated and himself performed tests on mentioned products, and will with this conclusion finally give an recommendation regarding this matter.

Dangerous goods are divided into nine (9) major classes, the classes that may be subject for mentioned products are:
Class 1 (Explosive substances and articles),
Class 4.1 (Flammable solid substances/articles).
Class 5.1 (Oxidizing substances/articles).

According to available praxis shall evaluation be performed on the goods in its transport ready packaging, witch in this case means that the products will go under the category articles.

3. CONCLUSIONS.

According to law Transport of Dangerous Goods, wich defines what shall be considered as dangerous goods, and all available transport regulations, including UN (Model Regulations , version19 and Test and Criteria's version 6, is it the shippers obligation, to make an assumption what goods that should be considered as dangerous goods.

Class 1 Explosive substances and articles.

According to conclusion and verdict in Swedish court (matter: 10318-01) has finally been stated on May 17 year 2002 that these products does not show any dangerous ability's according to Class 1.
No changes have been performed up to today in the legislation used to make this verdict by the court.
This conclusion is also based on the fact that there are other products on the market today that without any doubt fall within the scope of explosives but still are excluded from class 1, these mentioned products does also show higher dangerous ability's then Björnax products within same tests.
This means that exclusion out of class 1 is possible for pyrotechnic products that without any doubt fall within the juridical scope of explosives in both CLP, ADR and the UN regulations.
With support of all the tests that has been performed by Undersigned, company Safepac, the producing company Björnax AB and verdict by Swedish Court so is my conclusion that these products cannot be considered as Explosive.
Reference Literature and Testing material for evaluation and conclusion by Undersigned and Swedish court are as listed below.
As the products is CE certified at an approved EU body as 1.4S and cat: P1, generic name Smoke Generator, then the UN number 0432 shall be used.

Conclusion: The products does not fulfil criteria for inclusion in class 1.
My recommendation is:
UN number: 0432. Non-packaged product, (product itself without any packaging).
Not Dangerous Goods for packaged product, according to performed tests 1, 2 & 3. Below and the above stated.

References: Ref. no 1: ADR chapt. 2.2.1.1.5, 2.2.1.1.6 and Model Regulations, chapt. 2.1.1.4 (d), 2.1.2.1.1, 2.1.3.6, Björnax AB Test series as below listed.

Reference Litterature:

1. ADR 2017
2. CLP 1272/2008
3. UN Recommendations on the transport of Dangerous Goods, Model Regulations, 19:th revised edition.
4. UN Manual of Tests and Criteria, 6:th revised edition.

Authority´s consulted:

The Swedish Chemicals Agency (CLP, GHS),
MSB – Swedish Civil Contingencies Agency (ADR-transport, explosive division)

Tests performed:

Summary of test program on Smoke Products produced by Björnax AB:

Tests are carried out according to the UN Recommendations on the transport of dangerous gods, Model Regulations and Tests and Criteria.

These tests are listed on page 4.

Class 4.1 Flammable solid substances.

With support of all the tests that has been performed by Undersigned, company Safepac, and by the producing company Björnax AB (see references below), so are my conclusion that these products cannot be considered as flammable.

All products are produced with the intention of not producing flames, which also itself is a criteria that exclude from this class.

Conclusion: The products does not fulfil criteria for inclusion in class 4.1

References: CLP 1272/2008, *Ref.no. 1 ADR chapt. 2.2.41.1 and Ref. no 2. Model Regulations chapt. 2.4.2 and Ref. no 3 Tests and Criteria chapt. 33.2.1 and Ref. no 4*

Team Safepac AB test protocol 951211, and Ref. no 5. Björnax AB Test series with No: 01.1.6.1, 01.9.6.2, 01.5.6.1, 01.9.6.1 on own products and reference test on all weather matches, test no: 01.0.6.1 that are classified in class 4.1. packaging group III witch are the lowest group.

Class 5.1 Oxidizing substances.

This class should be the one that in its description, the definition".....or articles that include such substances". If we look into today available reference literature under class 5.1, and then investigate witch articles that could be subject to use as reference articles than it is only articles UN 3356 Oxygen generator chemical. This product is constructed in purpose to produce free oxygen, witch defiantly not is the purpose with Björnax products which are to be considered.
With support of earlier performed tests, and an evaluation of ingoing substances in the formula, so shall not the products be included in class 5.1.

Conclusion: The products does not fulfil criteria for inclusion in class 5.1

References: CLP 1272/2008, *Ref. no 1. ADR chapt. 2.2.51.1.1 and Ref. no 2. Model Regulations chapt. 2.5.2 and Tests and Criteria, chapt. 34.4.1 and Ref. no 4. Test Safepac AB test protocol 951211.*

4. TRACK RECORD.

Since 1959 has Björnax AB manufactured over 100 million various unique units that have been transported both Nationally and on Export.
There are to my knowledge not any reports regarding accidents where these products should have been subject to cause accidents or increased risks in above mentioned Classes.

5. REFERENCE INDEX.

In this evaluation has following literature been used.

1. ADR 2017
2. CLP 1272/2008

3. UN Recommendations on the transport of Dangerous Goods, Model Regulations, 19:th revised edition.
4. UN Manual of Tests and Criteria, 6:th revised edition. Following tests has been performed and/or evaluated.

Following Tests have been performed and/or evaluated.

1. Protocol: Team Safepac AB 951211, External Fire Test, test 6 c, *BFT-990901-AL*.

2. *Friction sensitivity test.*
   Spark sensitivity test.
   Heat to ignition test.
   Small scale External Fire Test, packaged products.
   External Fire Test, test 6 c, product Brandax VS.
   Class 5.1 and. 4.1 Test, Test method was so called comparing model.
   Tests on the products confinement and inner packaging.
   Toxicity investigation on produced smoke.
   Drop test 12 meter, packaged products.
   Internal deflagration temperature test.
   Internal ignition test, inside complete package.

3. Protocol: Björnax test series on own products and reference product, and tests *01.1.6.1, 01.9.6.2, 01.5.6.1, 01.9.6.1, 01.0.6.1*

Following authorities have been consulted.

1. KEMI - Swedish Chemicals Agency (CLP legislation).
2. MSB – Swedish Civil Contingencies Agency (ADR-transport, explosive division).

With kind regards.

Mr. Thomas Sandberg

SAFEPAC

Safety advisor authorized by
MSB – Swedish Civil Contingencies Agency

Validity confirmation.

Mr. Torbjörn Fredrikzon

BJÖRNAX AB Smoke Products EST[D] 1959

MD/CEO

BJÖRNAX AB
Sweden

By signing this document Björnax AB hereby confirms the validity of shared and attached test results, verdict from Swedish court, conclusion from consulted authority's and any information given to company SAFEPAC to perform this evaluation.