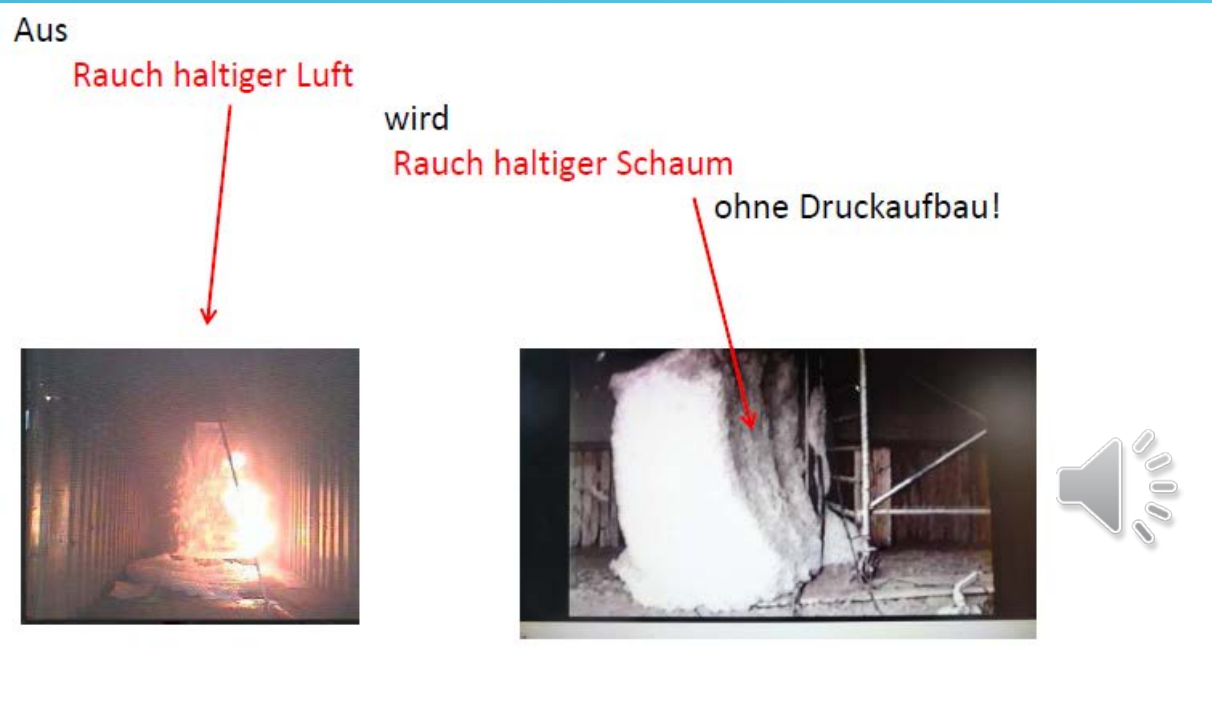


# Innovative Process Dry Cloud: EN Norm or NFPA compliance.

(DIN/EN13565-2 as example)



- 600 x foaming
- > 1.200 °C
- Strong stick effect.
- 9 hours stable
- Easy installation, not much costs overall
- Environment clean material
- All risks covered in Dry Cloud



Foam Dry Cloud example. Source IB Knopf Berlin

## FROM SMOKE TO DRY CLOUD- PRESSURELESS. STABLE FOAM > 8 HOURS. FOR HIGH FIRE LOADS LIKE LITHIUMBATTERIES



**Approach**


- The principle is sucking in pressureless smoke (-1400°C), substitution in cloud like stable, sustainable foam.,
- HF neutralization phase, H2 binding and neutralization. In fact, no smoke Emission. Jet flame stopped. Heat dissipation strongly reduced. Fire propagation contained.
- Easy to clean up.

Source: Envites Energy GmbH & IB Knopf

In the Dry Cloud foam ,long lasting the EV battery is inside, all harzadous material from the event fixed. Dry Cloud will neutralize HF, ...

Dry Cloud will be stable over the reaction period tbd >45 minutes to cover reaction time,  
**Will be stable 8 hours minimum!**

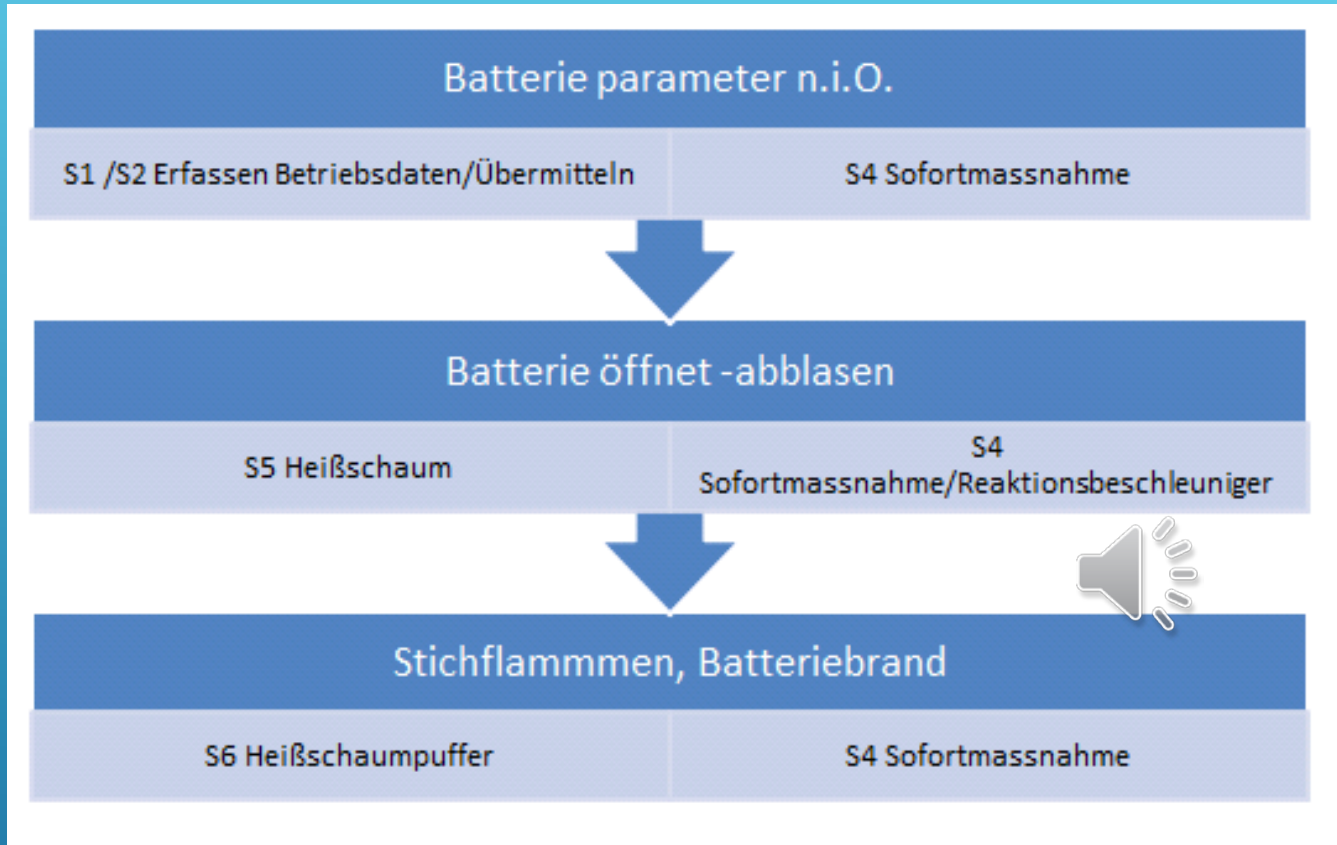
**Dry Cloud: No jet flame, pressure, smoke, dangerous heat: results on EV battery Test (13s25Ah) in Testcontainer Envites Energy in Nordhausen**

Specific Risk/Hazard	Dry Cloud
Jet flames	Strong suppression - no longer perceptible.
Fire	Strong suppression and cooling, stop the propagation effect, reduce the event on minimum: fast and efficient.
Smoke & Pressure	Since smoke is transferred into dry cloud material (solid), sustainable foam. No pressure!
HF- H2 – others , Can be breathed?	Tbd one step to neutralize /Inhibitor- no danger! No restriction on breathing, no dangerous heat (outside containment).
Ignition of explosive gas mixtures / Backfire in the flue gas/Explosion	 No free Gas, not possible. No open fire.
Environmental hazard in cleaning or disposal	Material itself is not environmentally dangerous, after the event some used material shall be special waste, in the EU regs no problem to handle.
How long does it works?	It is an engineered solution, for certain application you find normal inspection regime for, durable and returnable for many years. Dry Cloud ist stable still Happy Landing.

DRY CLOUD TECHNOLOGY FOR AVIATION SAFETY- LITHIUM-ION BATTERIES ARE SAFE!

## SPECIFIC HAZARDS VS. DRY CLOUD





S4 – Neutralizing HF and comprehensive integration of respiratory toxins, no propagation.

S5 - Dry Cloud itself. -1400°C.

S4 + S5 Again S4 + Reaction Accelerator + Inhibitor option.


S6 – Jet Flames, dangerous heat: Dry Cloud stable buffering, long lasting (reaction time of event could be significant)

S4 - immediate measure to address & to eliminate residual hazard

*Dry cloud will react to an event redundant and on the principle of safety first.*

**EXAMPLE DRY CLOUD PROCESS- PREDICATIVE PROCESS  
RECOMMENDED BY ENVITES ENERGY! DRY CLOUD WILL FLEXIBLE  
RESPOND TO THE EVENT, SAFETY FIRST!**

## PCT/EP2015/070885 and another 2 IP families (granted DPMA)

- ▶ We are currently in the situation of the IP/ patent generation, thus we do have granted rights from Germany (German initial small patents) already,
- ▶ Dry Cloud is also in new patent family in PCT/EU, will beeing published in beginning of 2016,
- ▶ As I as the owner and inventor will herewith declare: basically we will support and transfer to serious conditions the technology and our solutions to shorten time to market, 
- ▶ EV, HEV, Railway, Aviation, Military and stationary applications as well...

*Not at least:  
We follow  
Mr. Elon  
Musk  
of Tesla's  
initiative!*

**DRY CLOUD IS OPEN FOR COOPERATION IN ORDER TO DEVELOPE THE SAFETY: TIM SCHÄFER (OWNER AND INVENTOR / ENVITES ENERGY). DRY CLOUD FOR THE SAFE LITHIUM-ION BATTERY.**



Dry  
Cloud  
&  
sicherere  
Lithiumbatterien,  
  
Safety  
First!



(12) NACH DEM VERTRAG ÜBER DIE INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES PATENTWESENS (PCT) VERÖFFENTLICHTER INTERNATIONALE ANMELDUNG

(19) Weltorganisation für geistiges Eigentum  
Internationales Büro

(43) Internationales Veröffentlichungsdatum  
17. März 2016 (17.03.2016)

WIPO | PCT

(10) Internationale Veröffentlichungsnummer  
WO 2016/038207 A1

(51) Internationale Patentklassifikation:  
A62C 99/09 (2016.01) A62C 5/02 (2006.01)  
A62C 3/06 (2006.01) A62C 35/02 (2006.01)  
A62C 3/16 (2006.01) A62C 3/09 (2006.01)

(21) Internationales Aktenzeichen: PCT/EP2015/070885

(22) Internationales Anmeldedatum:  
11. September 2015 (11.09.2015)

(25) Einreichungssprache: Deutsch

(26) Veröffentlichungssprache: Deutsch

(30) Angaben zur Priorität:  
20 2014 007 301.5  
13. September 2014 (13.09.2014) DE

(71) Anmelder: ENVITES ENERGY GESELLSCHAFT FÜR UMWELTECHNIK UND ENERGIE-SYSTEME MBH [DE/DE]; Kohlensteinstraße 12 - Industriegebiet, 99734 Nordhausen a. Harz (DE).

(72) Erfinder: SCHÄFER, Thor; Am Sportplatz 15, 99768 Harzler (DE).

(74) Anwalt: PRÜFER & PARTNER GBR; Schmalzerstr. 12, 81479 München (DE).

(81) Bestimmungszustaten (soweit nicht anders angegeben, für jede verfügbare nationale Schutzrechtsart): AE, AG, AL, ...

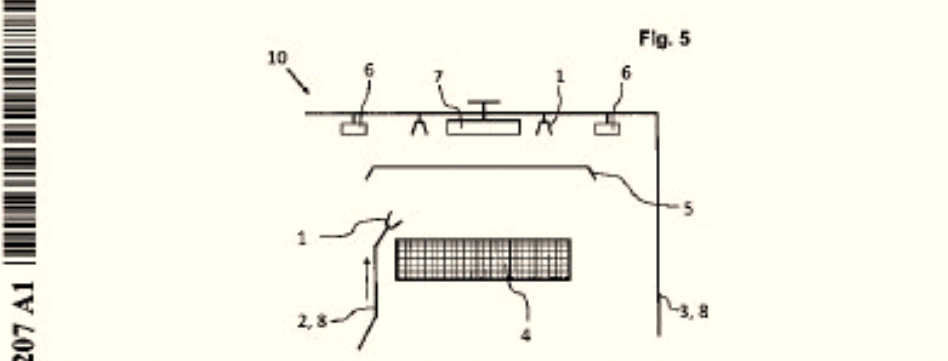
(86) Bestimmungszustaten (soweit nicht anders angegeben, für jede verfügbare regionale Schutzrechtsart): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), arabisches (AM, AZ, BY, KG, KZ, RU, TJ, TM), europäisches (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

ZW.

[Fortsetzung auf der nächsten Seite]

(54) Title: METHOD FOR OPERATING A DEVICE FOR CONTROLLING A FIRE OR RELEASE OF SUBSTANCES, IN PARTICULAR FOR LITHIUM BATTERIES

(54) Bezeichnung : VERFAHREN ZUM BETRIEB EINER VORRICHTUNG ZUR BEHERRSCHUNG EINES BRANDES ODER STOFFAUSTRITTES, INSBESONDERE FÜR LITHIUMBATTERIEN



(57) Abstract: The invention relates to a method for operating a device (10) for controlling a fire or release of substances, in particular for lithium batteries (4), which has a hot foam extinguishing system (20) and an apparatus for applying at least one neutralizer (8), comprising the steps: detecting a fire or release of substances, triggering an extinguishing effect depending on the detection of a fire or release of substances by means of: applying a hot foam (3) and/or applying the at least one neutralizer (8). The applying of the neutralizer (8) can be performed separately and chronologically before or after the applying of the hot foam (3), or simultaneously together with the applying of the hot foam (3).

(57) Zusammenfassung: [Fortsetzung auf der nächsten Seite]

WO 2016/038207 A1

to the acculations!

Source National News and Pictures, Dubai, Envites Energy, WIPO, 2016

**Envites Energy**  
reliability.safety.power to the acculations!™