

**Contribution by Marquardt GmbH, Rietheim-Weilheim, Germany
to RoHS Stakeholder Consultation, Questionnaire Exemption No. 8b (renewal request)**

Dear consultation committee,

we as the power tool section of switch maker company Marquardt would like to contribute some more information to the Consultation Questionnaire Exemption No. 8b (renewal request).

Previously we had been involved in and contributed to the corresponding activities lead by NEMA (including ZVEI).

In general we do agree to the statements given by NEMA in the name of the applicants.

However, we would like to point out that for us in the world of “switches for power tools” the focus is clearly on user safety aspects.

Financial or economic aspects are secondary, if we are looking for safe solutions to replace AgCdO contacts in our power tool switches.

Wherever there are Cadmium-free solutions available and technically proven, we are introducing them in accordance with our power tool customers.

So, here are our specific answers on the questionnaire:

1. Please provide information concerning possible other substitutes or developments that may enable reduction, substitution or elimination, at present or in the future, of “Cadmium and its compounds in electrical contacts”;**a. In this regard, please provide information as to alternatives that may cover part or all of the applicability range of “Cadmium and its compounds in electrical contacts”;**

Marquardt answer:

Years ago it was very common to use AgCdO contacts in power tool switches. Also Marquardt, as world leading professional power tool switches supplier used AgCdO contacts due to their premium electrical and high product safety properties described already in the NEMA document.

However, when the health risks created by Cadmium in electric appliances were published and discussed, Marquardt started immediately to search for alternative Cadmium-free solutions together with the leading European suppliers of contact materials. For many applications in the power tool world Marquardt was successful with AgNi or AgSnO contacts.

b. Please provide quantitative data as to application specifications to support your views.

Marquardt answer:

This success in eliminating AgCdO is shown by the fact that already in year 2007 93,5% of our power tool switches were equipped with Cadmium-free contacts. Due to our continued efforts together with our power tool customers and the material suppliers we have been able to further increase this percentage to 98.2% Cadmium-free in year 2014.

Since year 2007 all new power tool switch families launched on the world market by Marquardt were using Cadmium-free contacts.

However, there are still power tool applications where we have not been able so far to replace the AgCdO contacts despite of remarkable efforts on our and on customer side.

So, still in 2014 1.8% of our switches for power tools were including AgCdO contacts, which resulted in an annual use of CdO in a range of 4.7kg per year in total. In 2007 these numbers were 6.5% and 16.4kg. Please note that these numbers include also spare part switches for tools in repair. So, the actual number of switches with AgCdO going into new power tools is even lower.

The affected switches, still using AgCdO contacts, are used mainly in high power and heavy duty power tools like angle grinders, hammers and drills. These tools are very powerful, so a non-safe failure like not switching off due to welded contacts can result in high health risks for the user.

We can assure that we will continue with our efforts to further replace AgCdO in our switches. But this is consuming time and testing resources on our and our customer's side. Therefore it is our plan to produce in 2018 99.3% of our switches with Cadmium-free contacts, which will result in an annual usage of only 2.9kg CdO. In 2020 this should be further reduced to 0.9kg per year, meaning that 99.9% of our switches will have Cadmium-free contacts. The remaining switches might be only spare parts for tool repairs and highly specialized switches like for High Frequency Angle Grinders as made by German company Fein and others.

Table: Marquardt Powertool switches cadmium-free contacts

History: Marquardt cadmium-free contacts used in Powertool Switches						Target		
Affected Powertool Switches								
	2007	2008	2010	2012	2014	2016	2018	2020
Annual number of Powertool Switches sold	29.400.000	28.500.000	27.200.000	29.960.000	30.460.000	30.500.000	32.000.000	33.500.000
Powertool Switches with Cadmium-Free Contacts	27.500.000	26.900.000	26.400.000	29.460.000	29.910.000	30.050.000	31.775.000	33.475.000
Powertool Switches with Contacts containing Cadmium, including spare parts for product repairs	1.900.000	1.600.000	800.000	500.000	550.000	450.000	225.000	25.000
New introduced switch families with AgCdO Contacts	0	0	0	0	0	0	0	0
Estimated Mass (Kg) of CdO in the affected Powertool Switches	16,4	13,8	6,9	4,3	4,7	3,9	2,9	0,9
Ratio of Cadmium Free Powertool Switches	93,5%	94,4%	97,1%	98,3%	98,2%	98,5%	99,3%	99,9%

2. The applicants requested the renewal of Ex. 8b of Annex III with the same wording and for another maximum validity period of five years:

“Cadmium and its compounds in electrical contacts”

a. Do you agree with the scope and proposed formulation of the exemption as proposed by the applicants? Please take into account the answers to above questions).

Marquardt answer:

We agree with the proposed formulation as proposed by the applicants.

b. Please suggest an alternative wording and explain your proposal, if you do not agree with the proposed exemption wording.

Marquardt answer:

If this formulation should not be accepted, we would propose to further restrict or limit the use of Cadmium in electrical contacts to switches for heavy duty corded and cordless power tools.

An even further going restriction or wording might be

- for cordless power tools rated 20A at 18VDC and more
- as well as for corded power tools rated with 1500W and more (6A 250VAC, 12A 125VAC)
- as well as for specialized heavy duty power tools used with high frequency power supply (200Hz and more)".

c. Please explain why you either support the applicants' request or object to it. To support your views, please provide detailed technical argumentation / evidence in line with the criteria in RoHS Art. 5(1)(a).

Marquardt answer:

Yes, we are supporting the request. The reasons have been explained in the documents forwarded by Nema and Fein.

3. Please provide information as to research initiatives which are currently looking into the development of possible alternatives for some or all of the application range of Cadmium and its compounds in electrical contacts.

a. Please explain what part of the application range is of relevance for such initiatives (in what applications substitution or elimination may be possible in the future).

Marquardt answer:

In cooperation with our contact material suppliers we have built up switch samples using the newest AgSnO contact material versions (using special production processes), recommended by these suppliers. These switches have been submitted in Q2 2015 to one of our key customers for testing. We are expecting this test program to be finished until end of 2015 or early 2016. If the test program should be finished with positive result, we will submit these switch versions to the approval agencies. So, an introduction into the market could happen not before mid of 2016. This initiative is targeting high frequency angle grinder applications, which we deem to be the hardest challenge in replacing AgCdO contacts.

There is a second initiative, which will be started if the first one should fail (earliest beginning of 2016). This will start with testing an alternative switch family in specifically modified grinders and finally request a redesign of the tool handles of the above mentioned angle grinders. The time line for this activity will require 3-5 years in total. However, the success is not guaranteed.

There is a third initiative which we have started focusing on heavy duty cordless applications with rated voltage of 24V and more. Our internal test program has been started with encouraging results so far. We have to do more testing until end of 2015. So, in 2016 we can approach our key customers with new samples, so they can do their testing. Since this will include practical testing under real use conditions besides testing in the lab, this will be time consuming. So, the test program might take until end of 2016, meaning an introduction into production might happen not before 2017.

b. Please provide a roadmap of such on-going research (phases that are to be carried out), detailing the current status as well as the estimated time needed for further stages.

Marquardt answer: please see above (3.a) and table under 1b.

4. Are there any other aspects you deem to be of importance for the requested exemption?

Marquardt answer: Yes.

We would like to point out that for us in the world of “switches for power tools” the focus is clearly on user safety aspects.

Financial or economic aspects are absolutely secondary if we are looking for solutions to replace AgCdO contacts in our power tool switches.

Wherever there are Cadmium-free solutions available and technically proven, we have introduced and continuously will introduce them in accordance with our power tool customers. All we need is more time for continued testing.

Submitted to the committee October 16th 2015, resubmitted January 15th 2016, updated and resubmitted January 22nd 2016.

Mit freundlichen Grüßen / Best regards

MARQUARDT VERWALTUNGS-GmbH
Zweigniederlassung Schaffhausen
TDCP-SC – Systems Engineering Switches and Controls for Powertools

i. A. Klaus Fiederer

Tel.: +41 52 644-3110

Fax: +41 52 644-3070

klaus.fiederer@marquardt.ch
<http://www.marquardt.ch>