Sensory Test DIAM

July – September 2015

In a nutshell: About me, the background, and my team

Rolf Cordes – for more than 23 years self-employed in the wine business. Because of my professional activity, I have tasted a great many wines from Germany, France, Spain, Italy, Montenegro….
Among all these wines, more than 100 ones bottled with the DIAM closure over the last five years.
Regardless of their origin, cultivar, style… I came across the same sensory perception in all of them…
… the atypical bitterness (ATB).
I started searching for the reason. Solely the bottle closure was common to all of them. In first own trials, I realized that wines and even water changed flavor after only two days in contact with DIAM stoppers.
In order to substantiate my observations and disclose them, I decided upon a sensory study. For that purpose, I acquired accredited professionals in sensory sciences, quality control, and enology. Wine producers, wine dealers, experienced consumers, and a reputable wine writer completed the team.

Important:

- I do not have any relationship with bottle closure manufacturers.
- As a matter of course, I do not receive any financial sponsoring from the closure industry.
- Neither do I get any financial support from government institutions
- All accruing costs are defrayed by me!

Rolf Cordes

1. The promises of the DIAM Bouchage company

To date, DIAM closures enjoy a benevolent acceptance by wine producers, enologists, and wine experts from most countries.
DIAM Bouchage, as a brand leader of technical corks, promises to remove the volatile and detrimental compounds of cork by its "DIAMANT®process"-technology and, thereby, eliminate the risk of TCA, commonly also designated as "cork taint".
The warranty of "sensorially perfect neutrality" associated to the low price of 9 to 18 eurocents per cork ensures a large acceptance for wines of the low-tier price segment. In the meantime, the DIAM 5 is also finding its way into the mid-range segment. DIAM 10 is designated for top-end wines with a storage of up to ten years.

Excerpt of the DIAM website – the warranties:

Diam is the only cork closure that provides both a perfect homogeneity between one bottle and another and perfect control over the different levels of permeability. The DIAMANT® method also provides incomparable sensorial neutrality.

***Clean:** Through an exclusive patented process, cork "de-aromatization", Diam and Mytik Diam are the only cork closures that are completely sensorially neutral, freed from the molecules causing organoleptic deviations including TCA, responsible for cork taint (TCA releasable ≤ 0.3 ng/l).*
The manufacturing process for Diam, Mytik Diam and Altop guarantees each single closure (not an average value per batch).

(cf. → http://www.diam-closures.com/Diam-Cork-Sensorial-neutrality-Consistency-Choice)

Trusted companions of fine wines, Diam, Mytik Diam and Altop closures help maintain an incomparable sensorial purity and ensure consistency throughout the life of bottled wine.

Choosing Diam Cork offers your consumers the guarantee of enjoying the purest result of the winemakers' work, bottle after bottle, year after year.

(cf. → http://www.diam-closures.com/TCA-Taint-Free-Cork-for-wine)

2. The flaw

The family of cork flaws displays, besides the traditional cork taint elicited by natural corks and the glue taint evoked by agglomerated corks, a third flaw having gone unnoticed up to now,
the atypical bitterness – in the following abbreviated as **ATB**. This sensory defect is related to the Diam cork. Since the manufacturing procedure is, according to published Diam Bouchage's statements, the same one for all kinds of Diam corks (model 1, 3, 5, and 10), all DIAM types are equally affected by this flaw.
In the wine industry, this sensory defect has not yet been identified for the following reasons:

1. The traditional cork taint is usually observed on single bottles and can easily be detected by comparison with other bottles. However, owing to the same production technology for all DIAM corks, no difference between bottles coming with this closure can be noticed. The flaw is present in all bottles of a given wine.

2. Wine producers, enologists, and quality control staff do not identify the flaw as what it is, but ascribe it to the intrinsic character of the wine or to the sensory impact of tannins or acidity. Consequently, tasters lack knowledge about the flaw, its sensory appearance, and its consequences for the wine.

3. High concentration levels of tannin, acidity, or residual sugars exacerbate its sensory perception.

4. The intensity of the flaw increases during the contact time Diam/wine and under conditions of oxygen uptake. The disharmony brought about thereby is striking, but assessing it requires a more in-depth quality control. Generally, this is not feasible for time reasons.

3. Sensory appearance of ATB – atypical bitterness

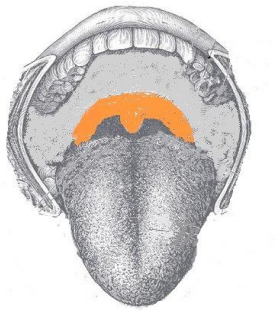
In comparison with the traditional cork taint, the ATB is very difficult to identify by means of olfaction. Only the direct comparison with the same wine bottled with a different closure allows for perceiving the sensory alterations induced on the olfactory level.

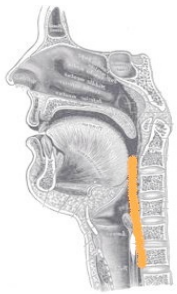
The primary alteration takes place on the palate. A few days after bottling with Diam corks, the wines present a lingering, puckering aftertaste drying out the mouth, the ATB – atypical bitterness. The perception of ATB is reinforced by high levels of acidity, tannins, and residual sugars.

These facts have been confirmed by numerous observations during tastings of wines closed with DIAM from Portugal, France, Italy, Spain, and Germany over many years.

Initial contact **Where does the ATB make itself felt?**

As soon as one takes the first sip of wine contaminated by ATB, a rough and contracting sensation starts to show up in the rear of the throat and in the uvular area. Upon swallowing the wine, the slipperiness of the esophagus becomes persistently reduced. There appears the sensation of a dry throat tending to make stuck any food. This sensation cannot easily be mitigated or eliminated by ingestion of food or other beverages.





For the reasons outlined above, the sensations caused by ATB are unambiguous and can be distinguished from those elicited by tannins and/or pronounced acidity. As it is generally known, these act on the palatal, cheek, and tongue areas for a short time and can easily be attenuated by dishes and beverages. Tannins and acidity do not cause a long lasting disturbance of the food flow after ingestion.

Development 1 **Aerated wine**

ATB increases under conditions of oxygen uptake. While it acts only on the throat and the esophagus at the beginning, there is a substantial impairment on taste during increasing aeration. A disharmony arises in the realm of tannins and acidity that compromises any further enjoyment.

Development 2 **Stored wines**

With increasing storage time, the grippy, puckering effect of ATB augments.
The disharmony is faster and more easily noticeable some time after opening of the bottle.

4. Sensory-Study - DIAM

The sensory study (July – September, 2015) was carried out by 11 tasters. The tasters: Volker Schneider (enologist), Jens Priewe (wine writer), Lukas Schmitt (technician in viticulture & enology and wine judge for DLG), Daniel Theisen (winegrower and wine judge at the board of agriculture). Additionally, experts in the areas of quality control, food and beverage inspection, and analytical chemistry as well as winegrowers, wine dealers, and consumers participated. The study took place under the supervision of Alexander Knoll, attorney.

Operative implementation

Eight wines and one water were filled in two identical containers each. The vessels containing the wines were codified as sets A – H, water was codified as R. One sample of each set was brought in contact with Diam corks, while the other sample did not undergo any treatment. Models of the Diam corks used and contact time were documented. All samples were bottled in identical flasks, codified (Set/No.), and forwarded to the tasters.

Results

The results of this study confirmed that DIAM corks, regardless of their model, are not sensorially neutral.

The flavor of the wines is significantly affected by the ATB flaw.nAfter only 32 hours of contact time of a dry Silvaner (D2) with Diam 5, the sensory changes of the wine generated by ATB were confirmed as "very significant**" Ten out of eleven tasters identified the ATB in this wine.

For the Diam models 1, 3, and 5, the existence of the ATB was rated as significant by the 11 tasters in seven of the eight wines. Among these wines, the ATB was identified as "significant*" (9 tasters) in three wines, as "very significant**" (10 tasters) in two wines, and as "highly significant***" (all 11 tasters) in another two. Pronounced acidity and minerality (B2 = dry Riesling, Nahe area, Germany) hampered the perception of ATB. For that reason, only 8 out of 11 tasters were able to identify the sample of this wine (B2) affected by ATB.

The evaluation shows that the wines of one set (treated *vs.* untreated sample) never tasted identically, though they had been the same before treatment with Diam. There was not a single taster classifying the wines as identical. Hence, it is proved once more that Diam corks are not neutral in sensory terms.

DIAM model – origin	**Set No.**	**wine**	**contact time with DIAM**	**tasters**	**tasters identifying ATP**	**tasters identifying ATB, %**	**wines 1 & 2 in the set are not equal**
D1 – Germany	C2	Müller-Thurg., half-dry, 2014	48 hours	11	10**	90.9	11 = 100 %
D1 - Germany	E2	Muskateller, dry, 2013	37 days	11	11***	100	11 = 100 %
D3(511) – Italy	G2	Syrah, Rosé, dry, 2011	72 hours	11	9*	81.8	11 = 100 %
D3(511) – Italy	F2	Pinot blanc, dry, 2011	41 days	11	9*	81,8	11 = 100 %
D5 – Germany	D2	Silvaner, dry, 2014	32 hours	11	10**	90.9	11 = 100 %
D5 – Germany	A2	Riesling, half-dry, 2013	72 hours	11	11***	100	11 = 100 %
D5 – Germany	B2	Riesling, dry, 2013	72 hours	11	8	72.7	11 = 100 %
D5 (193)513 – Switzerland	H2	Pinot noir, dry, 2014	94 days	11	9*	81.8	11 = 100 %
2 x D3 (511), 1 x D1 + D5 each	R2	water – reference	48 hours	11	8	72.7	11 = 100 %
			maximum		11	100	11 = 100 %