



Application Note AN-R-030

# Oxidation stability comparison of AOCS Cd 12b-92 and EN ISO 6886

## No difference found between Metrohm method and norms

The two most commonly used norms for determining the oxidation stability of animal fats and vegetable oils are AOCS Cd 12b-92 and EN ISO 6886. The standard method recommended by Metrohm for this is based on EN ISO 6886.

This Application Note describes the determination and comparison of the oxidation stability of sunflower oil according to AOCS Cd

12b-92, EN ISO 6886, and the recommended method from Metrohm with an 892 Professional Rancimat.

Despite different parameters of the norms and the Metrohm method, it is shown that there is no significant difference found between the results of these experiments.

## SAMPLE AND SAMPLE PREPARATION

The sunflower oil sample is measured directly with the Rancimat without any preparation

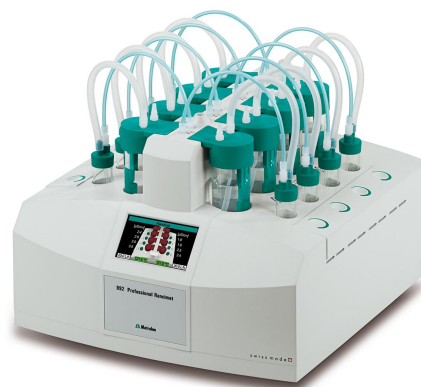
## EXPERIMENTAL

For analysis, an appropriate amount of the raw sunflower oil is weighed into the reaction vessel and the analysis is started.

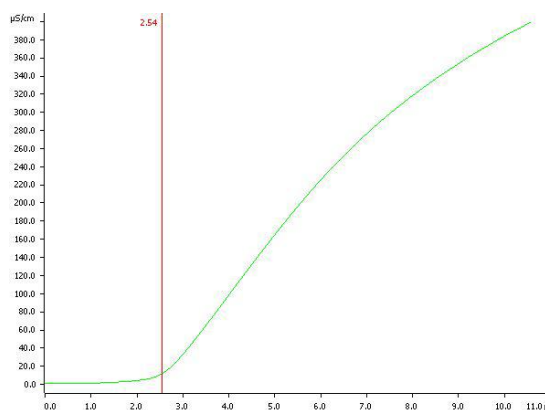
With the Rancimat method, the sample is exposed to an airflow at a constant temperature of 100–180 ° C (Figure 1). Highly volatile secondary oxidation products are transferred into the measuring vessel with the airflow where they are absorbed in the measuring solution. Here, the conductivity is continuously registered.

The formation of secondary oxidation products leads to an increase in the conductivity. The time until occurrence of this marked conductivity increase is referred to as the «induction time», which is a good indicator for the oxidation stability (Figure 2).

steps.



**Figure 1.** 892 Professional Rancimat equipped with measuring and reaction vessels for the determination of oxidation stability.



**Figure 2.** Determination of the oxidation stability of sample 4. Induction time is determined to be 2.54 h.

**Table 1.** Overview of the different measuring parameters for the samples. Sample 1 is prepared with 60 mL measuring solution, and samples 2–6 are made with 50 mL measuring solution.

Sample	According to	Sample size (g)	Gas flow (L/h)
1	Metrohm	3.00 ± 0.01	20.0
2	EN ISO 6886	3.00 ± 0.01	10.0
3	AOCS Cd 12b-92	2.50 ± 0.01	9.0
4	AOCS Cd 12b-92	5.00 ± 0.01	9.0
5	AOCS Cd 12b-92	2.50 ± 0.01	20.0
6	AOCS Cd 12b-92	5.00 ± 0.01	20.0

**Table 2.** Results of the oxidation stability of sunflower oil with the 892 Professional Rancimat. Determinations were carried out in four-fold for each parameter set mentioned in the norms.

Sample (n = 4)	Mean value (h)	SD(abs) in h	SD(rel) in %
Sample 1	2.57	0.05	1.8
Sample 2	2.51	0.06	2.4
Sample 3	2.53	0.08	3.4
Sample 4	2.51	0.04	1.5
Sample 5	2.75	0.06	2.1
Sample 6	2.56	0.04	1.5

## CONCLUSION

A mean value of 2.57 h induction time is found over all samples (n = 24), with SD(abs) = 0.06 h and SD(rel) = 2.1%. These values meet both the repeatability and the reproducibility requirements listed in AOCS Cd 12b-92 and EN

ISO 6886.

Furthermore, all demonstrated methods delivered acceptable values for all samples with SD(rel) 10% (Table 2).

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## CONFIGURATION



### 892 Professional Rancimat

892 プロフェッショナルランシマツは、長年世界で使われているランシマツメソツによって自然の油脂および油の酸化安定性を簡単かつ安全に測定するための分析システムです。加熱フロック2つに8つの測定ホシジョンがあります。内蔵式ディスプレイには装置およびそれぞれの個々の測定ホシジョンのステータスが表示されます。各測定ホシジョンのスタートキーによって装置の測定をスタートできます。洗浄にかかる手間およびコストは、実用的である使い捨て反応容器および洗浄機に耐えられる付属品の使用によって最小限に抑えることかてきます。これによって時間とコストを削減し、精度と再現性を著しく改善することかてきます。測定実施のために必要な全ての付属品は同梱されています。装置の制御、データの記録、評価、保存のためには、StabNetソフトウェアが必要です。



Equipment for determination of temperature correction with Rancimats and PVC Thermomats.

Set for exact temperature adjustment



**Measuring vessel cover for stability measuring instruments**

With built-in conductometric measuring cell.