

# Araeometer

## Density-spindle to determine the concentration of alcohol (IPA) in the dampening solution

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The araeometer is used to control the vol-% of alcohol within the circulating system of offset presses.

The added measuring cylinder shall be filled with fountain solution from the circulating system. The spindle is to be put carefully into the cylinder. Attention should be paid on the spindle swimming free. Where the spindle scale meets the liquid level, you can read the volume percentage of alcohol.

**Never measure direct in the circulating system!**

Due to the extended diameter and length of the spindle, there is a high degree of exactness in reading. The figures on the scale are placed opposite each other to make reading easier.

The araeometer has been calibrated in IPA volume percentage for a measuring temperature of 15 °C. The scale ends at 15 volume percent, because higher degrees of IPA are normally not used. The value (% IPA) is exact at 15 °C. The deviation is small in the temperature range between 10 – 20 °C.

### The Fountain Solution Concentrate

The fountain solution concentrate can increase the density of the dampening solution mixture, depending on chemical characterisation and input concentration. If density is increased, the spindle will not dive so much and will, therefore, pretend a lower concentration of IPA.

The table on the backpage helps to determine the real alcohol concentration in vol.-% at different fountain solution concentrations. The density of the fountain solution concentrate can be seen at the product label or safety data sheet.



		Real Alcohol in Vol.-%									
		4	6	8	10	12	14	16	18		
Dampening Solution Concentration (Vol.-%)	1	3,5	5,5	7,0	9,0	11,0	13,0	14,7	16,8	1,05	Density of dampening water additive (g/cm³)
	2	3,0	5,0	7,0	9,0	10,5	12,5	14,2	16,1		
	3	3,0	4,5	6,5	8,0	10,0	12,0	13,7	15,5		
	4	2,5	4,5	6,0	8,0	9,5	11,5	13,1	14,9		
	1	3,0	5,0	7,0	8,5	10,5	12,5	14,3	16,1	1,10	
	2	2,5	4,5	6,0	8,0	10,0	11,5	13,2	15,0		
	3	2,0	3,5	5,5	7,0	9,0	10,5	12,2	13,9		
	4	1,0	3,0	4,5	6,0	8,0	9,5	11,2	12,8		
	1	3,0	4,5	6,5	8,5	10,	12,0	13,8	15,6	1,15	
	2	2,0	3,5	5,5	7,0	9,0	10,5	12,2	14,0		
	3	1,0	2,5	4,0	6,0	7,5	9,0	10,7	12,3		
	4	0,0	1,5	3,0	4,5	6,0	7,5	9,2	10,7		
	1	2,5	4,5	6,0	8,0	9,5	11,5	13,3	15,0	1,20	
	2	1,5	3,0	4,5	6,5	8,0	9,5	11,2	12,9		
	3	0,0	1,5	3,0	4,5	6,0	7,5	9,2	10,8		
	4	-1,5	0,0	1,5	3,0	4,5	6,0	7,2	8,6		

Source: Wordel, H.: Die Bestimmung des tatsächlichen Alkoholgehaltes des Feuchtmittels.  
Wiesbaden / München: Bundesverband Druck E. V / FOGRA, 1988. – Informationen

Numbers in the blue field refer to the reading of the IPA concentration on the spindle.  
The real IPA concentration is shown in the first line (dark blue field).

### Example:

		Real Alcohol in Vol.-%									
		4	6	8	10	12	14	16	18		
Dampening Solution Concentration (Vol.-%)	1	3,5	5,5	7,0	9,0	11,0	13,0	14,7	16,8	1,05	Density of dampening water additive (g/cm³)
	2	3,0	5,0	7,0	9,0	10,5	12,5	14,2	16,1		
	3	3,0	4,5	6,5	8,0	10,0	12,0	13,7	15,5		
	4	2,5	4,5	6,0	8,0	9,5	11,5	13,1	14,9		
	1	3,0	5,0	7,0	8,5	10,5	12,5	14,3	16,1	1,10	
	2	2,5	4,5	6,0	8,0	10,0	11,5	13,2	15,0		
	3	2,0	3,5	5,5	7,0	9,0	10,5	12,2	13,9		
	4	1,0	3,0	4,5	6,0	8,0	9,5	11,2	12,8		

Density of fountain solution concentrate: **1,05** g/cm³

Input concentration: **2** %

Measured alcohol concentration: **9** %

Real alcohol concentration: **10** %