

DIN EN ISO 27971:2023-12 (E)

Cereals and cereal products - Common wheat (*Triticum aestivum* L.) - Determination of Alveograph properties of dough at constant hydration from commercial or test flours and test milling methodology (ISO 27971:2023)

| Contents | | Page |
|-----------------|---|-------------|
| | European foreword | 4 |
| | Foreword | 5 |
| | Introduction | 6 |
| 1 | Scope | 7 |
| 2 | Normative references | 7 |
| 3 | Terms and definitions | 7 |
| 4 | Principle | 7 |
| 5 | Reagents | 8 |
| 6 | Apparatus | 8 |
| 7 | Sampling | 12 |
| 8 | Preparation of the wheat for laboratory milling | 12 |
| 8.1 | Cleaning the laboratory sample | 12 |
| 8.2 | Test portion | 12 |
| 8.3 | Wheat moisture content determination | 12 |
| 8.4 | Wheat preparation | 12 |
| 8.4.1 | General | 12 |
| 8.4.2 | Wheat with initial moisture content between 13 % and 15 % (one-stage moistening) | 13 |
| 8.4.3 | Wheat with a moisture content less than 13 % (two-stage moistening) | 13 |
| 8.4.4 | Wheat with a moisture content greater than 15 % (preliminary drying followed by moistening, as described above) | 13 |
| 9 | Laboratory milling | 13 |
| 9.1 | General | 13 |
| 9.2 | Milling procedure | 14 |
| 9.2.1 | Breaking | 14 |
| 9.2.2 | Reduction | 14 |
| 9.2.3 | Flour homogenization | 14 |
| 9.2.4 | Storage of the flour | 15 |
| 9.3 | Expression of milling results | 15 |
| 10 | Preparation and Alveograph test | 15 |
| 10.1 | Preliminary checks | 15 |
| 10.2 | Preliminary operations | 16 |
| 10.3 | Kneading | 18 |
| 10.4 | Preparation of dough test pieces | 20 |
| 10.5 | Alveograph test | 21 |
| 10.5.1 | Initial preparation | 21 |
| 10.5.2 | First operation: placing the patty on the lower plate | 21 |
| 10.5.3 | Second operation: biaxial extension | 23 |
| 10.6 | Expression of Alveograph test results | 23 |
| 10.6.1 | General | 23 |
| 10.6.2 | Maximum pressure parameter, <i>P</i> | 24 |

| | | |
|----------------|---|-----------|
| 10.6.3 | Mean abscissa at rupture, L | 24 |
| 10.6.4 | Swelling index, G | 24 |
| 10.6.5 | Elasticity index, I_e | 25 |
| 10.6.6 | Curve configuration ratio, P/L | 25 |
| 10.6.7 | Deformation work, W | 25 |
| 11 | Precision | 25 |
| 11.1 | Interlaboratory tests..... | 25 |
| 11.1.1 | Commercial flour..... | 25 |
| 11.1.2 | Flour obtained from laboratory milling..... | 25 |
| 11.2 | Repeatability limits..... | 26 |
| 11.2.1 | General..... | 26 |
| 11.2.2 | Commercial flour — Limits established by the interlaboratory test..... | 26 |
| 11.2.3 | Flour obtained from laboratory milling..... | 26 |
| 11.3 | Reproducibility limits..... | 27 |
| 11.3.1 | General..... | 27 |
| 11.3.2 | Commercial flour — Limits established by the proficiency tests..... | 27 |
| 11.3.3 | Flour obtained from laboratory milling..... | 28 |
| 11.4 | Uncertainty..... | 28 |
| 12 | Test report | 28 |
| Annex A | (informative) Characteristics of the mill suitable for obtaining a laboratory milled flour | 29 |
| Annex B | (normative) Quantity of water to be added to wheat for conditioning | 31 |
| Annex C | (informative) Sample milling sheet | 32 |
| Annex D | (informative) Conversion table from L to G | 34 |
| Annex E | (informative) Interlaboratory and proficiency test data for commercial flours | 36 |
| Annex F | (informative) Interlaboratory data for laboratory milled flour | 46 |
| Annex G | (informative) Routine maintenance instructions for the Alveograph | 58 |
| Annex H | (informative) Assessment of proteolytic activity in wheat (<i>T. aestivum</i> L.) or flour | 60 |
| | Bibliography | 62 |