



# Quality control of Polymers (PE, PP, PET, Polyamide)

Fast results with NIR pre-calibrations

## HIGHLIGHTS

- Chemical and physical parameters
- Based on real product spectra
- Can be used by non-specialists

# Pre-calibrations expedite and simplify quality control of PE, PP, PET, and Polyamide

**Metrohm offers a turnkey solution for the determination of various quality parameters. The measurement device consists of a DS2500 Near-Infrared Analyzer with pre-calibration models based on a large collection of real product spectra. This solution enables polymer producers and polymer processors, such as compounders and injection molders, to save time and reduce the cost of their analyses while improving the quality of their product.**

The polymers PE, PP, PET, and Polyamide find widespread use in the packaging industry, the production of injection molded parts, and in the textile industry. Several important parameters are typically checked on a batch-by-batch basis, such as melt flow rate, density, intrinsic viscosity, and relative viscosity. These parameters are still often determined in a laboratory by using chemical or physical measurements, which are time consuming, utilize hazardous chemicals, and/or require cleaning of the equipment afterwards.

Near-Infrared Spectroscopy (NIRS), on the other hand, requires neither chemicals nor sample preparation, it can even be used by non-chemists and provides results in less than a minute. Furthermore, multiple chemical and physical parameters can be determined simultaneously. The combined benefits of this technology make NIRS the ideal solution for a large number of daily QA/QC measurements or ad-hoc at-line analysis.



## **Reliable results from day one**

The robust pre-calibration model allows precise and accurate determination of various parameters with excellent reproducibility. The Metrohm solution can be used directly without any method development.

## **Straightforward and intuitive operation**

The pre-calibrations are operated by the intuitive Vision Air software. Vision Air is tailored to the needs of different users: Shift workers can only start a measurement and get clear pass/fail results, whereas authorized users get full control of the instrument, can create SOPs, and can easily review and filter data.



### EASY TO USE

- Ready-to-use solution
- Results at the push of a button
- No expertise required



### COST-MINIMIZING

- No solvents, no reagents
- No waste disposal



### FAST

- No sample preparation
- Analysis results within 30 seconds
- More than 15 minutes' time saving compared to reference methods



### CLEAN

- Non-destructive, chemical-free method
- Minimum of impact on health and environment

Polymer	Part. No	Parameters	Range	SECV	R <sup>2</sup>
PET	6.6072.310	Intrinsic viscosity	0.55–0.88 dL/g	0.015 dL/g	0.939
		Diethylene glycol	1.47–2.25%	0.066%	0.931
		Isophthalic acid	1.87–4.47%	0.085%	0.995
		Acid number	1.1–6.2 mg KOH/g	0.143	0.991
Polyamide (PA 6)	6.6072.311	Intrinsic viscosity	2.411–3.601 dL/g	0.055 dL/g	0.986
		Carboxyl end groups	29.5–130.4 mEq/g	11.1 mEq/kg	0.972
		Amine end groups	9.5–55.2 mEq/g	4.1 mEq/kg	0.981
PE	6.6072.308	Intrinsic viscosity	1.0–3.5 dL/g	0.214 dL/g	0.978
		Density	0.860–0.964 g/cm <sup>3</sup>	0.0016	0.9968
PP	6.6072.309	Melt Flow Rate	1.4–64.0 g/10 min	7.00 g/10 min	0.865

### Trust in our expertise

Pre-calibrations are calibration models based on numerous real product spectra. By using these solutions, you can benefit immediately from the experience Metrohm has gained with those applications.

### Customized service and support

Metrohm supports users by updating the pre-calibrations on demand with customer-specific samples. This can improve the performance of the method and/or extends it to additional quality parameters, e.g., additive content.

## ORDERING INFORMATION

Pre-calibration for	
6.6072.308	polyethylene (PE)
6.6072.309	polypropylene (PP)
6.6072.310	polyethylene terephthalate (PET)
6.6072.311	polyamide (PA 6)

  

Requires hardware	
2.922.0010	NIRS DS2500 Analyzer

  

Requires software	
6.6072.111	Vision Air local

  

Requires certified standards	
6.7450.000	NIRS reflection standard, set of 2

  

Accessories	
6.7402.050	NIRS DS2500 large sample cup
6.7425.100	NIRS DS2500 Iris

## COMPLETE PACKAGE: METROHM POLYMER ANALYZER

8.922.1000	DS2500 Polymer Analyzer (comprised of):
2.922.0010	DS2500 Solid Analyzer
6.7425.100	DS2500 Iris
6.7402.050	DS2500 large sample cup
6.7490.480	Lid for large sample cup black
6.6072.208	Vision Air Complete
See above	Pre-calibration for polymers (choose 1)