







# Eppendorf Purity Grades Selection Guide

|  |  |  |  |  |  |  |
|--|---|---|---|---|---|---|
|  | Eppendorf Quality™  | Sterile   | PCR clean   | PCR clean and sterile*  | Forensic DNA Grade*   | Biopur®*  |
| Continuous quality control for the following relevant criteria               |   |   |   |   |   |   |
| Function, tightness, precision   | ■   | ■   | ■   | ■   | ■   | ■   |
| Low wetting  | ■   | ■   | ■   | ■   | ■   | ■   |
| High chemical resistance   | ■   | ■   | ■   | ■   | ■   | ■   |
| High thermal resistance  | ■   | ■   | ■   | ■   | ■   | ■   |
| High centrifugation stability**  | ■   | ■   | ■   | ■   | ■   | ■   |
| High transparency  | ■   | ■   | ■   | ■   | ■   | ■   |
| Precisely shaped   | ■   | ■   | ■   | ■   | ■   | ■   |
| Lot-specific certified for the following purity criteria                     |   |   |   |   |   |   |
| Human DNA-free   |   |   | ■   | ■   | ■   | ■   |
| DNA-free (human + bacterial DNA)   |   |   |   |   |   | ■   |
| DNase-free   |   |   | ■   | ■   | ■   | ■   |
| RNase-free   |   |   | ■   | ■   | ■   | ■   |
| PCR inhibitor-free   |   |   | ■   | ■   | ■   | ■   |
| ATP-free   |   |   |   |   |   | ■   |
| Pyrogen-free (endotoxin-free)  |   | ■   |   | ■   |   | ■   |
| Sterile (Ph.Eur./USP)  |   | ■   |   | ■   |   | ■   |
| Methods (Examples)   |   |   |   |   |   |   |
| Applications requiring high general quality, but no checked special purities | ■   |   |   |   |   |   |
| Bacteria and yeast cultures  |   | ■   |   | ■   |   | ■   |
| Cell and tissue culture  |   | ■   |   | ■   |   | ■ ■   |
| Isolation and storage of DNA   |   |   | ■ ■   | ■   | ■ ■   | ■   |
| Isolation and storage of RNA   |   |   | ■   | ■   | ■   | ■ ■   |
| DNA analysis (PCR, restriction analysis, hybridization, sequencing, NGS)     |   |   | ■ ■   | ■   | ■ ■   | ■   |
| Mitochondrial DNA analysis   |   |   |   |   | ■ ■   | ■ ■   |
| Bacterial DNA analysis   |   |   |   |   |   | ■ ■   |
| RNA analysis   |   |   |   |   | ■   | ■ ■   |
| Application Areas (Examples)   |   |   |   |   |   |   |
| Routine application  | ■   |   |   |   |   |   |
| Molecular biology  |   |   | ■ ■   | ■   | ■ ■   | ■   |
| Microbiology   |   | ■   |   | ■   |   | ■   |
| Cell technology  |   | ■   |   | ■   |   | ■ ■   |
| > Stem cell research   |   |   |   |   |   |   |
| > Transgenic animals / plants  |   |   |   |   |   |   |
| Research   |   | ■   | ■   | ■   |   | ■ ■   |
| > Medical research   |   |   |   |   |   |   |
| > Agriculture & aquaculture research   |   |   |   |   |   |   |
| Quality control  |   | ■   | ■   | ■   |   | ■ ■   |
| > Food and beverage  |   |   |   |   |   |   |
| > Water supply   |   |   |   |   |   |   |
| > Environmental monitoring   |   |   |   |   |   |   |
| Forensic   |   |   | ■   | ■   | ■ ■   | ■   |

■ Recommended   ■ ■ Highly recommended

\* Increased safety due to availability of individually packaged / single-blistered products.

\*\* For accurate details regarding resistance to centrifugation, please refer to the product individual instruction for use.

# Importance of Purity Criteria

## Sterility

Per definition, a sterile product does not harbor any living organisms on its surface. The degree of sterilization is described by a residual probability of contamination. This probability is expressed as SAL (Sterility Assurance Level). Thus, an SAL value of  $10^{-6}$  indicates the probability of occurrence of one non-sterile item among  $10^6$  (1,000,000) sterilized items.

## Importance

Sterile products are required whenever the presence of germs may have a negative effect; for example, to prevent infection of samples or incorrect test results for microbiological experiments that would be caused by unsterile lab equipment.

## Pyrogen-free (endotoxin-free)

Thermostable substances (glycoproteins) from the outer membrane of bacteria and other microorganisms can cause fever in humans and impair the growth of cell cultures.

## Importance

Absence of pyrogen prevents endotoxin-based contamination in cell culture, pharmaceutical, and medical research laboratories.

## Bacterial DNA-free (E. coli)

DNA is found in all cells of living entities, and it is the carrier of genetic information. The highly sensitive PCR technique enables the amplification of smallest amounts of DNA.

## Importance

The presence of a DNA contamination could lead to false positive results for different applications involving DNA. Note: Autoclaving is not suitable for removing traces of DNA.

## Human DNA-free

Contamination belongs to the major concerns in DNA analysis, especially when working with human DNA. The Eppendorf manufacturing plant is highly automated and monitored by staff wearing protective clothing. Furthermore, access to the production area is severely restricted, and positive air pressure prevents the intrusion of particles. The final tests for the presence of human DNA are performed by an external laboratory accredited to ISO 17025.

## Importance

Contamination may lead to cross contamination of the sample or even false positive results. Even the fragment length of contaminating DNA could be important – e.g. in forensics, the relevant fragment length for DNA genotyping starts at approx. 70 bp. Therefore, the »Eppendorf Forensic DNA Grade«-consumables are tested with a highly sensitive qPCR targeting a multi copy human DNA fragment of 62 bp. This is one important aspect qualifying this purity grade for forensic DNA analysis.

## DNase-free

DNases are enzymes which degrade DNA.

## Importance

DNase contaminations can affect or even ruin DNA analysis.

## RNase-free

RNases are enzymes that degrade RNA. These enzymes are extremely resistant, even to autoclaving and irradiation.

## Importance

RNase-free products are an absolute must in the field of molecular biology because RNA is highly sensitive and can be destroyed very quickly by RNases.

## ATP-free

ATP is a part of all living cells; therefore, its presence can indicate biological contamination.

## Importance

The test procedure for the quantitative and qualitative detection of ATP is already an integral part of hygiene monitoring, e.g. in the pharmaceutical industry.

## PCR inhibitor-free

PCR – the replication of DNA – has established itself as one of the most important and commonplace molecular biology methods used in almost all fields of life sciences where DNA is analyzed. However, there are also substances that impair this reaction, so lab products must be free of these inhibitors.

## Importance

It is essential that the consumables used contain no impurities that could adversely affect PCR. This is particularly crucial if only low amounts of template DNA are available.

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