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Eppendorf Purity Grades Selection Guide













	Eppendorf Quality	Sterile[1]	PCR clean	PCR clean and Sterile[1]	Forensic DNA Grade[1]	Biopur®[1]
Continuous quality control for the following relevant criteria						
Function, tightness, precision	■	■	■	■	■	■
Low wetting	■	■	■	■	■	■
High chemical resistance	■	■	■	■	■	■
High thermal resistance	■	■	■	■	■	■
High centrifugation stability[2]	■	■	■	■	■	■
High transparency	■	■	■	■	■	■
Precisely shaped	■	■	■	■	■	■
Lot-specific certified for the following purity criteria						
Human DNA free: 294 bp fragments and <2 pg			■	■		■
Human DNA free: 62 bp fragments and <0.5 pg (ISO 18385)[3]					■	
Bacterial DNA free						■
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

[1] Increased safety due to availability of individually packaged / single-blistered products.

[2] For accurate details regarding resistance to centrifugation, please refer to the product individual instruction for use.

[3] Purchase of Eppendorf Forensic DNA Grade consumables enables customers to request a check against Eppendorf staff DNA exclusion database to support investigations of potential DNA contamination.

Importance of Purity Criteria

Sterility	Importance
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.	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)	Importance
Thermostable substances (glycoproteins) from the outer membrane of bacteria and other microorganisms can cause fever in humans and impair the growth of cell cultures.	Absence of pyrogen prevents endotoxin-based contamination in cell culture, pharmaceutical, and medical research laboratories.

Bacterial DNA-free (E. coli)	Importance
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.	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	Importance
Contamination belongs to the major concerns in DNA analysis, especially when working with human DNA. The Eppendorf manufacturing plant is higly 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.	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. The test parameters and sensitivity level of the "Eppendorf Forensic DNA Grade" correspond to the requirements of the ISO 18385 standard. In accordance with the requirements of the standard, a staff-DNA exclusion database has been established in order to be able to support a forensic laboratory in solving a potential DNA contamination. There is also the possibility to register your LOT to be notified in case of product recalls.

DNase-free	Importance
DNases are enzymes which degrade DNA.	DNase contaminations can affect or even ruin DNA analysis.

RNase-free	Importance
RNases are enzymes that degrade RNA. These enzymes are extremely resistant, even to autoclaving and irradiation.	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	Importance
ATP is a part of all living cells; therefore, its presence can indicate biological contamination.	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	Importance
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.	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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