## eppendorf

### Eppendorf Purity Grades Selection Guide

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	Eppendorf Quality	Sterile*	PCR clean	PCR clean and Sterile*	Forensic DNA Grade*	Biopur®*
Continuous quality control for the foll	owing re <u>levant cr</u>	iteria				
Function, tightness, precision						
Low wetting						
High chemical resistance						
High thermal resistance						
High centrifugation stability**			-			
High transparency						
Precisely shaped						
Lot-specific certified for the following	a 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						
<b>Cell technology</b> > Stem cell research > Transgenic animals / plants						••
> Mansgeme 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.

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### 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<sup>-6</sup> indicates the probability of occurrence of one non-sterile item among 10<sup>6</sup> (1,000,000) sterilized items.

#### 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.

#### 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.

#### Human DNA-free

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.

#### DNase-free

DNases are enzymes which degrade DNA.

#### **RNase-free**

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

#### ATP-free

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

#### 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.

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#### www.eppendorf.com/consumables

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#### 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.

#### Importance

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

#### 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.

#### 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.

#### Importance

DNase contaminations can affect or even ruin DNA analysis.

#### 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.

#### 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.

#### 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.