

Eppendorf PCR Consumables – Compatibility Guide for PCR and qPCR Cyclers

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Abstract

One of the key issues regarding PCR consumables performance (plates, stripes and respective sealing options) is their compatibility with several cycler systems available on the market. In this Application Note, Eppendorf PCR/qPCR Consumables were tested for compatibility with the most important cycler brands via a physical fit test with the cycler blocks as well as through exemplary PCR and qPCR assays for some instruments.



Introduction

PCR and qPCR consumables vary in numerous parameters. Among them material properties and quality, well/skirt dimensions, well thickness and surface characteristics play the most important role. These differences together with various sealing options lead to often substantial variances when changing from one consumable brand to another and can influence overall PCR/qPCR assay performance.

It is therefore of much importance to identify whether a given consumable is compatible with a given PCR/qPCR platform. Here we present an overview of the Eppendorf twin.tec® PCR Plates, Eppendorf PCR Tube Strips as well as Eppendorf Cap Strips and their compatibility with the major cycler brands currently on the market.

Materials and Methods

Compatibility with standard PCR and qPCR devices

In most cases, the compatibility of the Eppendorf PCR Consumables was determined by their fit in the corresponding cycler block in combination with the closure of the cycler lid. Some systems were also tested for their performance in an PCR or qPCR assay.

Of course, these experiments are not representative.

Therefore, it will always be necessary for each user to test the consumables in their own application.

PCR assay: Amplification of gDNA (Promega®) in a PCR.

After the PCR assay the samples were separated by agarose gel electrophoresis (E-Gel®, Invitrogen®) and documented. Compatibility and assay performance was evaluated by presence and quality of PCR products on the gel (data not shown).

qPCR assay: For the qPCR assay performance, a standard assay with lambda DNA (Promega) and KAPA™ SYBR® Fast qPCR Mastermix (KAPA Biosystems®) was used. Three independent qPCR assays over six concentration logs of the lambda DNA template (10^1 - 10^6) and 3 replicates for each concentration were performed. Compatibility was evaluated based on following qPCR reaction parameters: C_t mean, C_t SD, CV, melting curves analysis (data not presented).

Results

Table 1: Compatibility with Standard PCR cyclers

PCR Instrument	twin.tec PCR Plate 96						twin.tec PCR Plate 384	Tube Strips		Cap Strips	
	unskirted, divisible (standard profile)	unskirted (standard profile)	unskirted, low profile, divisible	unskirted, low profile	semi-skirted (standard profile)	skirted (low profile)		PCR Tube Strips 0.2 mL	PCR Tube Strips 0.1 mL	Cap Strips, domed	Cap Strips, flat
ABI® GeneAmp® 2700/2720	+	+	-	-	+	-	-	+	-	+	+
ABI GeneAmp 9600	+	+	-	-	+	-	-	+	-	+	+
ABI GeneAmp 9700 (96-well)	+	+	-	-	+	-	-	+	-	+	+
ABI GeneAmp 9700 (384-well)	-	-	-	-	-	-	+	-	-	-	-
ABI GeneAmp 9800 Fast	-	-	+	+	-	-	-	-	+	+	+
ABI MiniAmp®	+	+	-	-	+	-	-	+	-	+	+
ABI SimpliAmp®	+	+	-	-	+	-	-	+	-	+	+
ABI VeritiPro Thermal Cycler	+	+	-	-	+	-	-	+	-	+	+
ABI ProFlex® (96-well)	+	+	-	-	+	-	-	+	-	+	+
ABI Veriti® 96-well	+	+	-	-	+	-	-	+	-	+	+
ABI Veriti 96-well Fast	-	-	+	+	-	-	-	-	+	+	+
ABI Veriti 384-well	-	-	-	-	-	-	+	-	-	-	-
Agilent® Surecycler® 8800 (96-well)	+	+	-	-	+	-	-	+	-	+	+
Analytic Jena Alpha SC	-	-	+	+	-	+	-	-	+	+	+
Apollo ATC-201	+	+	+	+	+	+	-	+	+	+	+
Bioer Gene Explorer (96-well)	+	+	n.d.	n.d.	+	-	-	+	n.d.	+	+
Biometra® Tadvanced (96 /96 G / 96 S / 96 SG)	+	+	+	+	+	+	-	+	+	+	+
Biometra Tadvanced (384-well)	-	-	-	-	-	-	+	-	-	-	-
Biometra Tgradient 96	+	+	+	+	+	+	-	+	+	+	+
Biometra TOne	+	+	+	+	+	+	-	+	+	+	+
Biometra Tpersonal (combi block)	+	-	-	-	-	-	-	+	-	+	+
Biometra Tprofessional (96, 96 Gradient)	+	+	+	+	+	+	-	+	+	+	+
Biometra TRIO (combi block)	+	-	-	-	-	-	-	+	-	+	+
Biometra Uno	+	+	+	+	+	+	-	+	+	+	+
Bioer GeneExplorer 96	+	+	-	-	+	-	-	+	-	+	+
BIONEER® AllInOneCycler™ (96-well)**	+	+	-	-	+	-	-	+	-	+	+
Bio-Rad® C1000, C1000 Touch, S1000 (96-well)	+	+	+	+	+	+	-	+	+	+	+
Bio-Rad C1000, C1000 Touch, S1000 (384-well)	-	-	-	-	-	-	+	-	-	-	-
Bio-Rad iCycler (96-well)	+	+	-	-	+	-	-	+	-	+	+
Bio-Rad MyCycler	+	+	-	-	+	-	-	+	-	+	+
Bio-Rad PTC 200 (96-well)	+	+	+	+	+	+	-	+	+	+	+
Bio-Rad PTC Tempo Thermal Cycler 96-Well	+	+	+	+	+	+	-	+	-	+	+
Bio-Rad T100	+	+	-	-	+	-	-	+	-	+	+
G-Storm® GS1 (96-well)	+	+	+	+	+	+	-	+	+	+	+
HiMedia® Prima-96	+	+	n.d.	n.d.	+	-	-	+	n.d.	+	+
peqLab® peqSTAR® 96X	+	+	+	+	+	+	-	+	+	+	-
peqLab® peqSTAR® XS32	-	-	-	-	-	-	-	+	-	-	-
TaKaRa® Dice TP600	+	+	+	+	n.d.	-	-	n.d.	n.d.	n.d.	n.d.
Techne® Touchgene (96-well)	+	+	+	+	+	+	-	+	+	+	+
Techne TC-412 (96-well)	+	+	+	+	+	+	-	+	+	+	+
Techne TC-PLUS (96-well)	+	+	+	+	+	+	-	-	+	-	+
VWR® Collection UNO ⁹⁶	+	+	+	+	+	+	-	+	+	+	+
VWR® XT 96	+	+	+	-	+	-	-	+	-	+	+

(+): compatible, (-): not compatible, (n.d.): no data

*with ABI adapter, Standard accessory included with the respective cycler unit

**Cannot be used with low profile tubes or plates

Table 2: Compatibility with qPCR cyclers

qPCR Instrument	twin.tec PCR Plate 96						twin.tec PCR Plate 384	Tube Strips		Cap Strips	
	unskirted, divisible (standard profile)	unskirted (standard profile)	unskirted, low profile, divisible	unskirted, low profile	semi-skirted (standard profile)	skirted (low profile)		PCR Tube Strips 0.2 mL	PCR Tube Strips 0.1 mL	Cap Strips, domed	Cap Strips, flat**
ABI 7300, 7500 Real-time PCR system	+	+	-	-	-	-	-	-	-	-	+
ABI 7500 Fast Real-time PCR system	-	-	+	+	-	-	-	-	+	-	+
ABI 7900HT Real-Time PCR System (Standard 96-well block)	+	+	-	-	-	-	-	-	-	-	+
ABI 7900HT Real-Time PCR System (Fast 96-well block)	-	-	+	+	-	-	-	-	+	-	+
ABI 7900HT Real-Time PCR System (384-well block)	-	-	-	-	-	-	+	-	-	-	-
ABI QuantStudio® 3, 5, 6, 7, 12 K Real-time PCR System (96-well 0.2 mL block)	+	+	-	-	+	-	-	-	-	-	+
ABI QuantStudio 3, 5, 6, 7, 12 K Real-time PCR System (96-well 0.1 mL block)	-	-	+	+	-	-	-	-	+	-	+
ABI QuantStudio 5, 6, 7, 12 K Real-time PCR System (384-well block)	-	-	-	-	-	-	+	-	-	-	-
ABI StepOnePlus®	-	-	+	+	-	-	-	-	+	-	+
Agilent Mx3000P®/Mx3005P® qPCR System	+	+	-	-	-	-	-	-	-	-	+
Agilent AriaMx® qPCR System	-	-	+	+	-	+	-	-	+	-	+
Analytik Jena® QTower³ (G, touch)	n.d.	n.d.	+	+	n.d.	n.d.	-	-	n.d.	-	n.d.
Analytik Jena QTower³ 84	-	-	-	-	-	-	+	-	-	-	-
Bio-Rad CFX96 Touch™	-	-	+	+	-	+	-	-	+	-	+
Bio-Rad CFX96 Touch Deepwell™	+	+	+	+	+	+	-	-	+	-	+
Bio-Rad CFX384 Touch™	-	-	-	-	-	-	+	-	-	-	-
Bio-Rad iQ, iQ-5, myiQ PCR System	+	+	-	-	+	-	-	-	-	-	+
KogeneBiotech PowerAmp96™	+	+	-	-	-	-	-	-	-	-	+
Roche® LightCycler® 96	-	-	+	+	-	-	-	-	+	-	+
Roche LightCycler 480 (96-well block)	-	-	-	+	-	-	-	-	+	-	+
Roche LightCycler 480 (384-well block)	-	-	-	-	-	-	-	-	-	-	-

(+): compatible, (-): not compatible, (n.d.): no data

Note: Eppendorf twin.tec PCR Plates and Eppendorf Tube Strips are also available as real-time PCR variants with white wells. These exhibit a higher signal intensity during the reaction. The Eppendorf Tube Strips 0.2 mL with the attached domed caps as well as the domed Eppendorf Cap Strips fit into many of the real-time cyclers listed here, but are not suitable for qPCR where detection is performed from the top. Therefore, these products are marked as "not compatible".

* With Eppendorf twin.tec Adapter for LC480: Cat. #0030 133.412,

** With LightCycler 8-Tube Strip Adapter Plate (Roche Cat. #06612598001)

***Eppendorf Cap Strips, flat are generally suitable for real-time PCR. However, depending on the instrument, experimental setup, and/or reagents, using standard caps might interfere with signal detection. For optimal performance, use Eppendorf Masterclear Cap Strips with their inverted dome optimized for maximum light transmission.

Conclusion

We present here a comprehensive overview of the compatibility of Eppendorf PCR/qPCR consumables on the major cycler brands currently on the market. The results show broad range of compatibility of Eppendorf consumables on the main cycler platforms.

Ordering information

Description	Order no. International	Order no. North America
Eppendorf twin.tec® PCR Plates 96, skirted	0030 128 648	951020401
Eppendorf twin.tec® PCR Plates 96, semi-skirted	0030 128 575	951020303
Eppendorf twin.tec® PCR Plates 96, unskirted	0030 133 366	0030133366
Eppendorf twin.tec® PCR Plates 96, unskirted, divisible	0030 133 374	0030133374
Eppendorf twin.tec® PCR Plates 96, unskirted, low profile	0030 133 307	0030133307
Eppendorf twin.tec® PCR Plates 96, unskirted, low profile, divisible	0030 133 358	0030133358
Eppendorf twin.tec® PCR Plate 384	0030 128 508	951020702
Eppendorf twin.tec® <i>real-time</i> PCR Plates 96, skirted	0030 132 513	951022015
Eppendorf twin.tec® <i>real-time</i> PCR Plates 96, semi-skirted	0030 132 548	951022055
Eppendorf twin.tec® <i>real-time</i> PCR Plates 96, unskirted, low profile	0030 132 700	0030132700
Eppendorf twin.tec® <i>microbiology</i> PCR Plates 96, skirted	0030 129 300	0030129300
Eppendorf twin.tec® <i>microbiology</i> PCR Plates 96, semi-skirted	0030 129 326	0030129326
Eppendorf twin.tec® <i>microbiology</i> PCR Plates 384	0030 129 342	0030129342
PCR Tubes Strips 0.1 mL without caps	0030 124 804	0030124804
PCR Tubes Strips 0.2 mL	0030 124 359	951010022
<i>real-time</i> PCR Tubes Strips 0.1 mL without caps	0030 132 882	951022102
Cap Strips, flat	0030 124 847	0030124847
Cap Strips, domed	0030 124 839	0030124839
Masterclear® Cap Strips	0030 132 874	951022089
Masterclear® <i>real-time</i> PCR Film, adhesive	0030 132 947	0030132947
PCR Foil, adhesive	0030 127 790	0030127790
PCR Film, adhesive	0030 127 781	0030127781
Heat Sealing Foil	0030 127 854	0030127854
Heat Sealing Film	0030 127 838	0030127838

Note: Order numbers for twin.tec PCR Plates and twin.tec *real-time* PCR Plates correspond to colorless and white skirts respectively. There are other skirt colors as well as more consumables variants available from Eppendorf. Please refer to the order information in the Eppendorf Catalog or at www.eppendorf.com.

Your local distributor: www.eppendorf.com/contact

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