



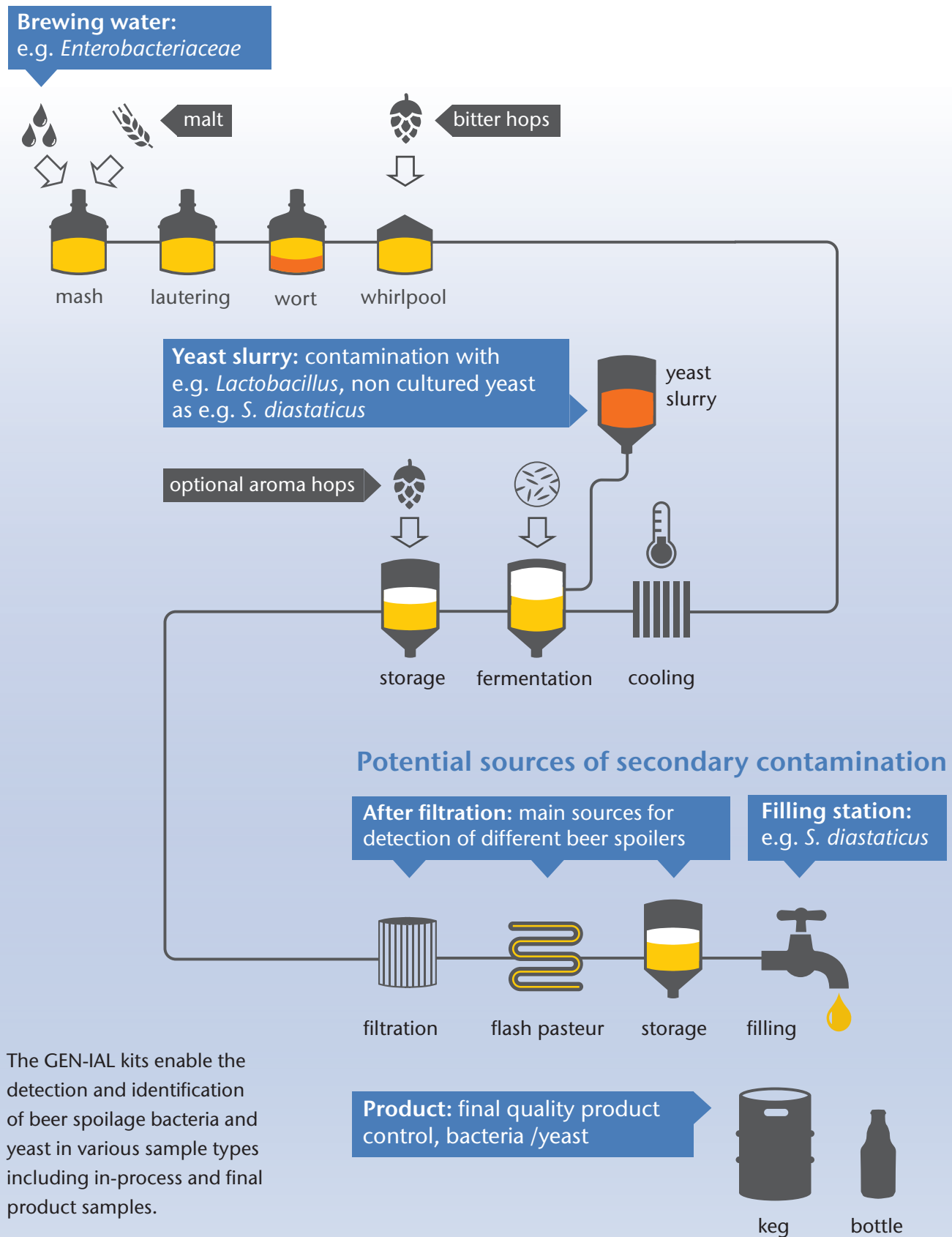
Real-time PCR beer screening – for a quick and GEN-IAL® result

- For yeast propagation, in-process control and/or for online final product control
- Avoid product recalls
- Reduce the risk of spoilage



5 potential sources of microbiological spoilage in beer brewing

Potential sources of primary contamination



Faster and more sensitive results with real-time PCR – customize your routine analysis

Either extremely fast or maximal sensitive detection or specific identification is possible by combining different methods of sample preparation and detection with real-time PCR.

Approaches for microbiological analysis in beer

Time requirement: ~ 2 hrs

Centrifugation

- Centrifugation, qPCR: 2 hours from sample to result
- Fast screening approach for specific applications
- Kit for detection of bacteria and (wild) yeast in yeast containing samples (yeast propagation or fermentation tank)



- + Extremely fast
- + Screening and/or identification
- + Only two hours to result

- Volume maximum 30 mL
- Sensitivity maximum 10 - 100 cfu/30 mL (without enrichment)

Time requirement: ~ 2 hrs

Filtration and qPCR

- Filtration, qPCR: 2 hours from sample to result
- Fast screening approach for specific applications



- + Extremely fast
- + Screening and/or identification
- + Only two hours to result

- Volume maximum 1 L (depending on sample type)
- Sensitivity maximum 100 cfus

Time requirement: ~ 50 hrs

Enrichment and qPCR

- Pre-enrichment and qPCR: 2 days and 2 hours from sample to result
- Modern established approach for beverage analytic



- + Fast
- + Screening and/or identification
- + Ensure absence of low cfu/sample volume

Time requirement: ~ 50 hrs

Polymer binding and qPCR

- Sampling via polymer, pre-enrichment and qPCR
- Very sensitive approach for highest demands



- + Highest sensitivity, suitable for beer based beverage mixes which will block filters
- + Up to 30 liter sample adsorption: kegs, in-process control, several bottles
- + Pre-enrichment of polymer ensures absence of few cfu/sample volume

PolyBIND® – the new approach to adsorb and concentrate spoilage bacteria from large volumes

The separation and enrichment of microorganisms from large sample volumes or viscous liquids is still challenging in the beverage industry.

Capturing bacteria with PolyBIND®

(Art. No. Q008)

For the first time, the newly developed PolyBIND® particles enable the quick and easy isolation of microorganisms and viruses from large sample volumes and highly viscous or solid-loaded liquids. PolyBIND® binds bacteria by adsorption. Using the sampling device, several bottles or new one keg up to 30 liters can be analyzed. Subsequent incubation in a medium of choice, allows state-of-the-art sampling for high demands/sensitivity of microbiological beverage testing.

Detection limit

The detection limit is 10 - 100 cells/analyzed volume.

PolyBIND® binding capacity and efficiency

The binding capacity of different microorganisms is between 10^5 and 10^6 cfu/100 mg PolyBIND®.

The binding efficiency depends on the pH-value of the liquid. The more acidic, the higher the binding efficiency. Optimal pH-values: 3 - 5. Sugar ingredients do not influence the binding efficiency.



Precoated PCR strips – a unique solution for convenient handling

Different combinations of screening and identification possibilities are available, thus allowing a cost effective and customized routine analysis.



The QuickGEN kits contain 8-well strips which are precoated with the reagents for up to 4 different parameters per tube. 8-well strips detecting one to four parameters can be used for 8 samples/reactions. As extension of this multiplexing each tube of a 8-well strip may contain different parameters – this allows a multiplex panel for up to 4×8 parameters for one sample in a 8-well strip.

Templates are available for MyGo Pro and BioRad CFX 96. These prepared templates contain the settings for dedicated kits and allow a direct start of the real-time PCR without the need to program the settings:

- 1 Open the template of dedicated kit/parameter
- 2 Add the sample names
- 3 Start run

* 4plex assays for MyGo Pro requires a specific kit (Qxy4, e.g. Q024, Q044).

** devices with heating blocks for high or low tubes - check the individual device

		
High	White	Low
<ul style="list-style-type: none"> • Agilent MX3005P • Applied Bioscience ABI 7500 or higher • ThermoFisher QuantStudio®5 or higher 	<ul style="list-style-type: none"> • Roche Lightcycler® 480 II and LC96 • BioRad CFX96™ • Analytik Jena qTOWER³ • ThermoFischer PikoReal 24 	<ul style="list-style-type: none"> • IT-IS MyGo Pro* • ABI 7500 FAST or higher • BioRad CFX96™

1. Group specific screening

An initial screening gives a group specific answer of for example yeast and bacteria in one assay.

Different group specific screening combinations of 3plex to 5plex kits are available:

	FAM	HEX	ROX	Cy5	Atto*
3plex	<i>Lactobacillus/ Pediococcus</i>	<i>Megasphaera/ Pectinatus</i>	–	Internal Amplification Control, IAC	–
4plex	<i>Lactobacillus/ Pediococcus</i>	<i>Megasphaera/ Pectinatus</i>	Q02x kits: yeast Q03x kits: – Q04x kits: <i>S. diastaticus</i> Q09x kits: <i>Dekkera</i> spp.	Internal Amplification Control, IAC	–
5plex	<i>Lactobacillus/ Pediococcus</i>	<i>Megasphaera/ Pectinatus</i>	<i>S. cerevisiae</i> var. <i>diastaticus</i>	Internal Amplification Control, IAC	<i>Dekkera</i> spp.

* The new QuickGen® Pentaplex kits requires dedicated qPCR thermocyclers, capable for 5plex assays as e.g. Agilent MX3005P, Roche Lightcycler® 480, BioRad CFX96.

2. Screening and differentiation in one assay

The most relevant beer spoilage bacteria and yeast can be identified in one assay for example with kit Q081 - Q083*. 12 strips of 8 wells allows for the detection of the most relevant spoilage organisms for 12 samples in one assay.

Tube	FAM	HEX	ROX
1	NTC	NTC	IAC
2	<i>Enterobacteriaceae</i>	<i>P. anomala</i>	<i>Saccharomyces cerevisiae</i> var. <i>diastaticus</i>
3	<i>P. damnosus</i>	<i>P. acidilactici/pentosaceus/parvulus/ inopinatus</i>	<i>P. claussenii</i>
4	<i>Pectinatus</i> spp.	<i>Megasphaera</i> spp.	<i>L. rossiae</i>
5	<i>L. brevis/L.parabrevis/L.brevisimilis</i>	<i>L. lindneri</i>	<i>L. casei/L.paracasei</i>
6	<i>L. buchneri/L. parabuchneri</i>	<i>L. collinoides/L. paracollinoides</i>	<i>L. perolens/L. harbinensis</i>
7	<i>L. plantarum/L. paraplantarum</i>	<i>L. coryniformis</i>	IAC
8	<i>L. acetotolerans</i>	<i>L. backii</i>	PTC

3. Detection and identification of yeast or bacteria only

Several kits are available for the detection of specific bacteria or yeast only. The kit Q541-Q543* allow the identification of 12 yeast species per sample. 12 samples can be tested per kit (12 strips).

Tube	FAM	HEX
1	NTC	IAC
2	<i>Rhodotorula</i> spp.	<i>Saccharomyces exiguus</i>
3	<i>Candida</i> spp.	<i>Saccharomyces cerevisiae</i> var. <i>diastaticus</i>
4	<i>Saccharomycodes ludwigii</i>	<i>Debaromyces hansenii</i>
5	<i>Torulaspora delbrückii</i>	<i>Saccharomyces cerevisiae</i> var. <i>diastaticus</i>
6	<i>Kluyveromyces marxianus</i>	<i>Hanseniaspora</i> spp.
7	<i>Dekkera</i> spp.	IAC
8	<i>Pichia</i> spp.	PTC

* Available for low, high and white tube profiles.

GEN-IAL® – products for beer analysis

Product	Description	No. of tests	Art. No.
Beer			
DNA preparation			
GEN-IAL® Simplex® Easy DNA kit	DNA preparation of beverage samples	100 preparations	Q001
GEN-IAL® QuickGEN® Sample preparation filtration	DNA preparation of beverage samples, filtration	100 preparations	Q004
GEN-IAL® QuickGEN® Sample preparation centrifugation	DNA preparation of beverage samples, centrifugation	100 preparations	Q002
GEN-IAL® QuickGEN® Sample preparation in yeast	For beverage samples mainly containing yeast	100 preparations	Q005
Beer – bacteria & yeast			
Qualitative multiplex real-time PCR			
GEN-IAL® QuickGEN® First-Beer Differentiation PCR Kit	Multiplex detection (30 species) and identification (19 species) of relevant beer spoilers	96 reactions/12 samples	Q081 Q082 Q083
GEN-IAL® QuickGEN® Pentaplex PCR kit Beer spoilage bacteria and yeast screening	Real-time PCR detection of beer spoilage bacteria (<i>Lactobacillus</i> , <i>Pediococcus</i> / <i>Megasphaera</i> , <i>Pectinatus</i>) and <i>S. cerevisiae</i> var. <i>diastaticus</i> and <i>Dekkera</i> spp.	48 reactions	Q061
GEN-IAL® QuickGEN® First-Beer yeast and bacteria differentiation	Multiplex detection and identification of beverage spoiling bacteria and yeasts	96 reactions/24 samples	Q071 Q072 Q073
GEN-IAL® QuickGEN® P1 Screening	DNA screening and differentiation of beer spoiling bacteria and yeasts (<i>Lactobacillus</i> , <i>Pediococcus</i> / <i>Megasphaera</i> , <i>Pectinatus</i>)	48 reactions	Q021 Q022 Q023 Q024
GEN-IAL® QuickGEN® P1 Screening	DNA screening and differentiation of beer spoiling bacteria and yeasts (<i>Lactobacillus</i> , <i>Pediococcus</i> / <i>Megasphaera</i> , <i>Pectinatus</i> /yeast)	50 reactions	Q025
GEN-IAL® QuickGEN® P1 Screening without yeast	DNA screening and differentiation of beer spoiling bacteria and yeasts (<i>Lactobacillus</i> , <i>Pediococcus</i> / <i>Megasphaera</i> , <i>Pectinatus</i>)	48 reactions	Q031 Q032 Q033 Q034
GEN-IAL® QuickGEN® P1 and <i>S. diastaticus</i> Screening	DNA screening and differentiation of beer spoiling bacteria and <i>Saccharomyces cerevisiae</i> var. <i>diastaticus</i>	48 reactions	Q041 Q042 Q043 Q044
GEN-IAL® QuickGEN® P1 and <i>S. diastaticus</i> Screening	DNA screening and differentiation of beer spoiling bacteria and <i>Saccharomyces cerevisiae</i> var. <i>diastaticus</i>	50 reactions	Q045
GEN-IAL® QuickGEN® P1 and <i>S. diastaticus</i> Screening and Hop resistance	DNA screening and differentiation of beer spoiling bacteria and hop resistance genes <i>horA</i> / <i>horC</i>	48 reactions	Q051 Q052 Q053 Q054
GEN-IAL® QuickGEN® P1 Screening	DNA screening and differentiation of beer spoiling bacteria and yeasts (<i>Lactobacillus</i> , <i>Pediococcus</i> / <i>Megasphaera</i> , <i>Pectinatus</i> / <i>Dekkera</i> spp.)	48 reactions	Q091 Q092 Q093 Q094
GEN-IAL® QuickGEN® First-Biofilm	Specific DNA detection of <i>Lactococcus lactis</i> , <i>Leuconostoc mesenteroides</i> and <i>Pichia anomala</i>	50 reactions	Q095
Beer – bacteria			
Qualitative real-time PCR			
GEN-IAL® QuickGEN® Pectinatus spp./Megasphaera spp.	Specific DNA detection and differentiation of <i>Pectinatus</i> and <i>Megasphaera</i>	50 reactions	Q927
GEN-IAL® QuickGEN® Pectinatus spp./Megasphaera spp.	Specific DNA detection and differentiation of <i>Pectinatus</i> and <i>Megasphaera</i>	48 reactions	Q112
GEN-IAL® QuickGEN® Enterobacteriaceae	DNA detection of <i>Enterobacteriaceae</i>	50 reactions	Q145
GEN-IAL® QuickGEN® Acetic acid bacteria	DNA detection of acetic acid bacteria	48 reactions	Q511 Q512 Q513 Q514
GEN-IAL® QuickGEN® Lactobacillus brevis/L.brevisimilis/ parabrevis	DNA detection of acetic acid bacteria	50 reactions	Q922
GEN-IAL® L.casei/L.paracasei/L.rhamnosus/L.zeae	DNA detection of <i>L.casei</i> / <i>L.paracasei</i> / <i>L.rhamnosus</i> / <i>L.zeae</i>	50 reactions	Q923
GEN-IAL® Lactobacillus lindneri	DNA detection of <i>Lactobacillus lindneri</i>	50 reactions	Q924
GEN-IAL® Lactobacillus plantarum/parapl./pen.	DNA detection of <i>Lactobacillus plantarum</i> /parapl./pen.	50 reactions	Q925
GEN-IAL® Lactobacillus rossiae	DNA detection of <i>Lactobacillus rossiae</i>	50 reactions	Q926
GEN-IAL® Pectinatus spp./Megasphaera spp.	DNA detection of <i>Pectinatus</i> spp./ <i>Megasphaera</i> spp.	50 reactions	Q927

New



GEN-IAL® – products for beer analysis

Product	Description	No. of tests	Art. No.
Qualitative real-time PCR			
GEN-IAL® Citrus Bark Cracking Viroid	RNA detection of Citrus Bark Cracking Viroid (CBCVd)	50 reactions	Q975
Beer – resistance genes			
Qualitative real-time PCR			
GEN-IAL® QuickGEN* hop resistance genes hor A and hor C/hit A and orf5	Specific DNA detection of hop resistance genes	50 reactions	Q105
Beer – yeast			
Qualitative real-time PCR			
GEN-IAL® QuickGEN* First-Yeast PCR Kit Wild Yeast 1	DNA screening and differentiation of wild yeast 1	50 reactions	Q525
GEN-IAL® QuickGEN* First-Yeast PCR Kit Wild Yeast 2	DNA screening and differentiation of wild yeast 2	50 reactions	Q535
GEN-IAL® QuickGEN* First-Yeast differentiation PCR Kit	DNA screening and differentiation of 12 yeasts	96 reactions/12 samples	Q541 Q542 Q543
GEN-IAL® QuickGEN® Yeast Dekkera bruxellensis	DNA detection of Dekkera bruxellensis	48 reactions	Q371 Q372 Q373
GEN-IAL® Dekkera anomala	Specific DNA detection of <i>Dekkera anomala</i>	50 reactions	Q929
GEN-IAL® Pichia anomala	Specific DNA detection of <i>Pichia anomala</i> (<i>Wickerhamomyces anomalus</i>)	50 reactions	Q175
GEN-IAL® Saccharomyces diastaticus	Specific DNA detection of <i>Saccharomyces cerevisiae</i> var. <i>diastaticus</i>	50 reactions	Q934
GEN-IAL® Pichia membranaefaciens	Specific DNA detection of <i>Pichia membranaefaciens</i>	50 reactions	Q930
GEN-IAL® Bottom fermented yeast	Specific DNA detection of bottom fermented yeast	50 reactions	Q933
GEN-IAL® QUICK GEN* Bottom fermented yeast	Specific DNA detection of bottom fermented yeast	48 reactions	Q161 Q162 Q163
GEN-IAL® Top fermented yeast	Specific DNA detection of top fermented yeast	50 reactions	Q931
GEN-IAL® QUICK GEN* Top fermented yeast	Specific DNA detection of top fermented yeast	48 reactions	Q151 Q152 Q153
GEN-IAL® QuickGEN* Yeast Zygosaccharomyces bailii	DNA detection of <i>Zygosaccharomyces bailii</i>	48 reactions	Q561 Q562 Q563
GEN-IAL® accessories			
Real-time PCR			
GEN-IAL® Dekkera bruxellensis Standards	DNA standards for <i>Dekkera bruxellensis</i> quantification	200.000 cfu	Q360
Color Compensation Kit LightCycler® 480	Color compensation kit for multiplex assays	5 reactions	Q800
Washing solution	Washing solution for SEW 0100	43 ml	Q301

Wild yeast 1: *Dekkera anomala*, *Dekkera bruxellensis*, *Dekkera custersiana*, *Dekkera naardenensis*, *Debaromyces hansenii*, *Hanseniaspora guilliermondii*, *Hanseniaspora osmophila*, *Hanseniaspora uvarum*, *Issotchenkia orientalis*, *Kazachstania Exigua*, *Kluyveromyces marxianus*, *Metschnikowia pulcherrima*, *Pichia anomala*, *Pichia fermentans*, *Pichia membranaefaciens*, *Saccharomyces cerevisiae* var. *diastaticus*, *Saccharomycodes ludwigii*, *Torulaspora delbrückii*

Wild yeast 2: *Candida glabrata*, *Candida albicans*, *Candida kefyr*, *Candida intermedia*, *Candida parapsilosis*, *Candida sake*, *Candida tropicalis*, *Naumovozyma dairenensis*, *Pichia guilliermondii*, *Zygosaccharomyces bailii*, *Zygosaccharomyces rouxii*

* QuickGEN kits deliver a rapid, easy one-step DNA lysis and amplification method. Pre-enriched samples as well as centrifuged or filtrated samples may be used with Q002, Q004 or Q005 and subsequent QuickGEN detection kits. Please be aware, for non-QuickGEN detection kits, the DNA preparation kit Q001 must be used, not Q002-Q005.

Benefits

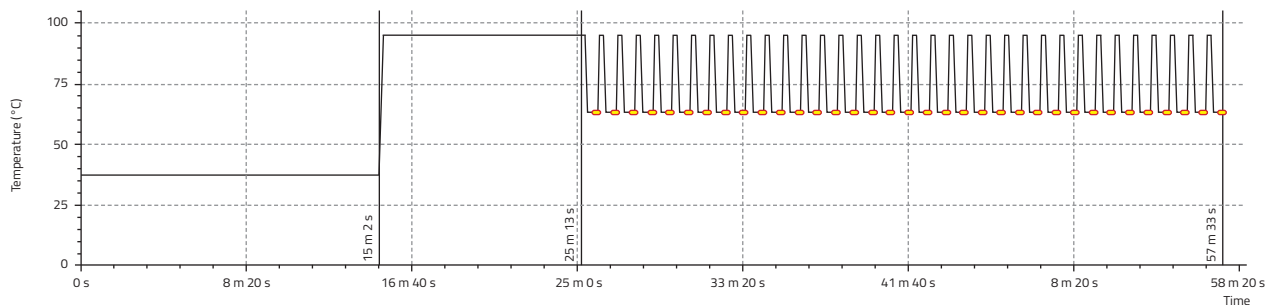
+ DNA Extraction – easy one-step DNA lysis method

- One DNA extraction method for the detection of bacteria and yeast
- The yeast lysis is integrated in the qPCR reaction - no external mechanical disruptor, ultrasonic bath or heating block is required.

+ Real-time PCR assays

- Ready to use consumables – tube stripes pre-coated with lyticase, primer and probes (depending on the thermocycler, different versions of kits are available, further information is available on request)
- Simultaneous detection of the most relevant beer spoiling bacteria and yeast in one assay

Temperature Profile



Contact your R-Biopharm sales representative for more information.