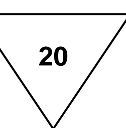
Microgen® STREP-ID

An identification system for Streptococci and Enterococci from Clinical, Veterinary, Food and Environmental sources

Instructions for Use

REF **MID-62**



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MICROGEN STREP-ID

Quick Reference

CONFIRMATION	Perform: Gram stain (Gram positive cocci in pairs or chains), Catalase (catalase negative)and note haemolysis on a blood plate for α or β-haemolysis. Record haemolytic reactions on the report form provided.
INOCULUM	Prepare a 2.0 MacFarland suspension in suspending medium.
INOCULATION	Add 3-4 drops (100µl) of the inoculum prepared in the suspending medium per well of the MID 62 microwell test strip. Add 3 drops of the Hippurate solution to the the tube provided and inoculate with a loopful of cultured organism. Seal the tube with the cap provided and incubate.
OVERLAY WITH OIL	Well 12 – Arginine
INCUBATION TIME	18 - 24 hours
TEMPERATURE	35 - 37°C
INITIAL READINGS	Read all tests and record colour changes
ADDITION OF REAGENTS	Well 8: VP - Add 1 drop of VPI Reagent followed by 1 drop of VPII Reagent and read after 15 - 30 minutes. Well 11: PYR – Add 1 drop of PYR reagent and read after 5 -10 minutes Hippurate Test – Carefully add 3 drops of Ninhydrin Reagent, do not mix. Incubate at room temperature for 10 – 15 minutes and read.
FINAL READING	Record results on report form provided, calculate Octal Code and interpret using MID Software

Note: A black circle around the top of a well indicates a well requiring the addition of mineral oil prior to incubation.

A green circle around the top of a well indicates a well requiring addition of reagents after incubation.

INTENDED USE

The Microgen Strep-ID system employs 12 standardised biochemical substrates in a microwell test strip and three additional tests to identify members of the genus *Streptococcus*, *Enterococcus* and related species of importance to medical, veterinary, food and environmental laboratories. The kit is intended for in vitro diagnostic use only.

PRINCIPLE OF THE TEST

The Microgen Strep-ID system comprises 15 biochemical tests of which 12 are performed in the standardised 12 microwell test strip, a hippurate test (provided), and 2 based on observations of the colonial morphology of isolates on blood agar medium. All of these tests have been selected on the basis of extensive computer analysis (1) of published databases for the identification of the genus *Streptococcus* (2, 3, 4). The dehydrated substrates in each well a suspension of the organism in the suspending medium provided. If the individual substrates are metabolised by the organism, a colour change occurs during incubation or after addition of specific reagents (see Substrate Reference Table). The permutation of metabolised substrates can be interpreted using the Microgen Identification System Software (MID-60) to identify the test organism.

CONT	**KIT PRESENTATION**		
BROTH	MID-62b	STREP-ID Suspending Broth	20 x 3ml
TEST STRIPS	MID-62c	STREP-ID Microwell Test Strip	20 Test strips

Microwell test strips containing 12 biochemical substrates for identification of Streptococcus and Enterococcus organisms - see data tables

HIPPURATE	MID-62d	Hippurate	2.8ml

Holding frame for microwell test strips
Tubes with caps for Hippurate test (24)
Result forms
Instructions for Use

Additional Requirements:

1) Microgen Identification System Software (MID-60) - Provides identification based on probability, % probability and likelihood with an analysis of the quality of separation. Full definition of these terms is provided with the software Help manual.
   MID-60 software (V 1.1.16.19 onwards) which does not contain the Streptococcus database may be updated to include the Strep-ID data, from the Microgen Bioproducts website (www.microgenbioproducts.com)
2) Sterile physiological saline
3) Mineral Oil
4) VP I + VP II Reagents
5) PYR Reagent (5)
6) Ninhydrin Reagent (6)
7) Sterile pipettes, swabs and bacteriological loops
8) Gram stain reagents
9) Hydrogen Peroxide
10) Incubator, not fan-assisted (35 - 37°C)
11) Bunsen burner.

Items 3 , 4 , 5 and 6 can be purchased from Microgen Bioproducts Ltd.

WARNINGS AND PRECAUTIONS

Safety:

1. The reagents supplied in this kit are for *in vitro* diagnostic use only
2. Appropriate precautions should be taken when handling or disposing of potential pathogens. After use, dispose of all contaminated materials by autoclaving, incineration or immersion in an appropriate disinfectant e.g. sodium hypochlorite at a final concentration of 3% for 30 minutes. Liquid waste containing acid must be neutralised before treatment.
3. Care should be taken when handling additional reagents as they may contain corrosive or irritant materials. Refer to the individual reagent bottles for further information.

Procedural:

1. The Microgen Strep-ID system should be used according to the kit instructions.
2. The microwell test strips must **not** be incubated in a CO_2 incubator
3. Incorrect incubation, inadequate filling of wells, or inadequate inoculum density may give false results.

STORAGE AND SHELF LIFE

Microgen Strep-ID microwell test strips are stable in unopened foil pouches at 2 - 8°C until the expiry date on the label. Opened pouches of microwell test strips can be stored for up to 14 days at 2 - 8°C provided that the pouch is resealed and contains the desiccant sachets.

Hippurate is stable at 2 - 8°C until the expiry date on the label.

SPECIMENS

A pure 18 - 24 hour culture of the bacterial isolate to be identified must always be used.

PROCEDURE - INOCULATION AND INCUBATION

1. Carry out a Gram stain (Gram positive cocci in pairs or chains), catalase test (catalase negative).
2. Note any haemolysis produced on a blood plate (α or β-haemolysis) and record the observed reactions on the report form provided .
3. To prepare the inoculum for the microwell test strip(s), if possible remove sufficient identical, isolated colonies from the primary isolation medium and emulsify in the suspending medium supplied in the kit to produce a suspension equivalent to 2.0 MacFarland. Mix thoroughly. If insufficient colonies are available, subculture a single isolated colony onto a suitable non-selective differential medium (Blood agar is recommended). Incubate the plate aerobically at 35 - 37°C for 18 - 24 hours. After incubation, remove sufficient growth using either a sterile bacteriological loop or swab and emulsify in the suspending medium provided so as to produce a 2.0 MacFarland suspension.
4. Add 3 drops of Hippurate solution to an empty tube, then take a small sweep of bacteria using a sterile bacteriological loop and emulsifiy in the Hippurate solution in the tube, cap the tube and incubate for 18-24 hours at 35 - 37°C.
5. Carefully peel back the adhesive tape(s) sealing the microwell test strip(s), but do not remove completely. **Do NOT discard the adhesive tape(s) as they will be required later.**
6. Using a sterile pasteur pipette, add 3 - 4 drops (approximately 100µL) of the bacterial suspension to each well of the microwell test strip(s).
7. As a purity check, transfer 1 drop of the bacterial suspension on to a purity plate using a non-selective differential medium (Blood agar is recommended). Incubate the plate aerobically at 35 - 37°C for 18 - 24 hours.

6. After inoculation, overlay well 12 with 3-4 drops of mineral oil. This well is highlighted with a black circle around the well to allow easy identification of the correct well.
7. Seal the top of the microwell test strip(s) with the adhesive tape(s) removed earlier and incubate aerobically at 35 - 37°C. The microwell test strip(s) are read after 18-24 hours incubation.

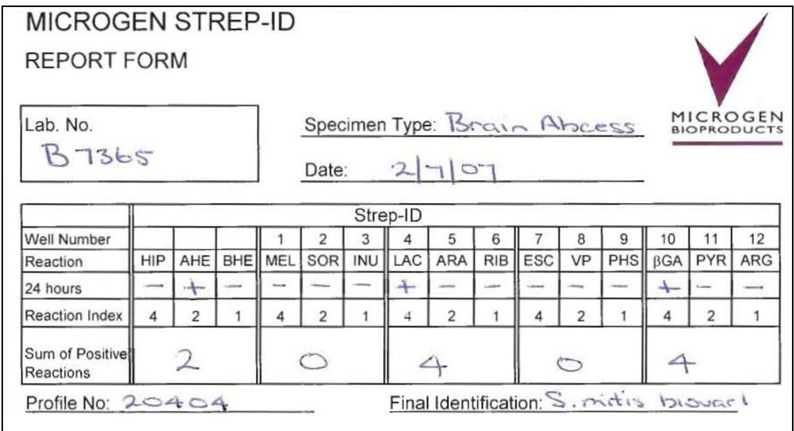
PROCEDURE - READING AND ADDITION OF REAGENTS

1. Remove the adhesive tape(s) and record all positive reactions with the aid of the colour chart (included in this booklet). Record the results on the forms provided.
2. Add the appropriate reagents to the following micro-wells:
   a) Perform the VP test on well 8 by adding 1 drop of VP I followed by 1 drop of VPII to the well and read after 15 - 30 minutes. The development of a light pink to dark red colour indicates that VP reaction is positive. A clear background indicates a negative VP reaction.
   b) Add 1 drop of PYR reagent to well 11 and read after 5 - 10 minutes. Formation of pale pink to a very deep red colour indicates a positive result.
   c) Carefully add 3 drops of Ninhydrin reagent to the Hippurate test. Do not mix the reagent into the test, the reagent should overlay the inoculum. Incubate at room temperature for 10 – 15 minutes and read. The development of a purple colour in the upper reagent layer indicates a positive Hippurate reaction. A clear colour in the upper reagent level indicates a negative reaction.
3. Record these additional results on the forms provided.

IDENTIFICATION

On the Microgen Strep-ID Report Form, the substrates have been organised into triplets (sets of 3 reactions) with each substrate assigned a numerical value (1, 2 or 4). The sum of the positive reactions for each triplet forms a single digit of the Octal Code that is used to determine the identity of the isolate. The Octal Code is entered into the Microgen Identification System Software (MID-60), which generates a report of the five most likely organisms in the selected database. The software provides an identification based on probability, % probability and likelihood with an analysis of the quality of separation. Full definitions of these terms and an explanation of their usefulness in interpretation are provided with the software Help manual.

Example of Report Form:



MICROGEN STREP-ID
REPORT FORM

MICROGEN BIOPRODUCTS

Lab. No. B7365

Specimen Type: Brain Abscess

Date: 2/7/07

	Strep-ID														
Well Number				1	2	3	4	5	6	7	8	9	10	11	12
Reaction	HIP	AHE	BHE	MEL	SOR	INU	LAC	ARA	RIB	ESC	VP	PHS	βGA	PYR	ARG
24 hours	−	+	−	−	−	−	+	−	−	−	−	−	+	−	−
Reaction Index	4	2	1	4	2	1	4	2	1	4	2	1	4	2	1
Sum of Positive Reactions	2			0			4			0			4		

Profile No: 20404

Final Identification: S. mitis biovar 1

Important:

The Microgen Strep-ID microwell test strips + external tests will generate a 5 digit Octal Code.

LIMITATIONS OF USE

1. Results should be interpreted by the clinician in the context of all available clinical and laboratory information.
2. The Microgen Strep-ID system is intended for identification of those organisms included in the database. It should not be used to identify any other bacteria.
3. Test only pure, single colonies since mixed colonies may give erroneous results.
4. Reactions obtained using Microgen Strep-ID may differ from published data obtained using alternative substrate formulations or reagents.
5. Some bacterial strains may have atypical biochemical reactions and may be difficult to identify.
6. Computer generated identification results should be interpreted by suitably trained personnel.
7. When determining the final identification of an isolate, the source of the isolate, gram staining, colonial morphology, additional tests and tests against the suggested identification should be considered.
8. The recording α or β-haemolysis must be performed on all isolates prior to inoculation into the Microgen Strep-ID microwell test strip. A 5 digit Octal Code is required to interpret the results using the Microgen Identification System Software.
9. *S. pneumoniae* and some other α-Haemolytic species (*S. mitis and S. sanguinis*) may not always be clearly separated using the substrates included in the Microgen Strep-ID. It is recommended that an Optochin Sensitivity and/or Bile Solubility test be performed to clarify the identification of these two species:

    1. Optochin Sensitivity
        1. Subculture a single colony onto a 5% blood agar plate.
        2. Spread the inoculum over the surface of the plate.
        3. Place a 5µg optochin disc onto the inoculated surface of the agar plate.
        4. Incubate at 35 - 37ºC in a 5% CO_2 atmosphere for 18 – 24 hours.
        5. Sensitive: Growth inhibited around disc (14mm or greater with 6mm disc) – *S. pneumoniae.* Resistant: Growth not inhibited around disc or growth up to and around disc – *S. mitis* or *S. sanguinis.*

    2. Bile Solubility

        1. Subculture a single colony onto a 5% blood agar plate in such a way as to ensure well isolated colonies.
        2. Place a loopful or drop of 2% deoxycholate (pH 7.0) directly onto a single well-isolated colony.
        3. Incubate the plate at 35 - 37ºC, aerobically for 30 minutes. (Do not invert the plate)
        4. Bile Soluble: Colony disintegrates (disappears) under the drop leaving an area of haemolysis where the colony had been – *S. pneumoniae*. Bile insoluble: colony remains intact and visible – *S. mitis* or *S. sanguinis*.

10. Some species belonging to the same group may be poorly separated e.g. *S. intermedius* and *S.anginosus* belong to the Anginosus group. The Microgen Identification System Software indicates where species belong to the same group.

QUALITY CONTROL

The performance of the Microgen Strep-ID system should be monitored using appropriate control strains. The following cultures are recommended for independent laboratory assessment:

Streptococcus salivarius ATCC 13419
Streptococcus mutans NCTC 10449/ ATCC 25175
Streptococcus mitis biovar 1 ATCC 6249
Enterococcus gallinarum ATCC 49573

	HIP	AHE	BHE	MEL	SOR	INU	LAC	ARA	RIB	ESC	VP	PHS	BGA	PYR	ARG
S. salivarius ATCC 13419	-	+	-	-	-	+	+	-	-	+	+	-	-	-	-
S. mutans NCTC 10449 / ATCC 25175	-	+	-	+	+	+	+	-	-	+	+	-	+	-	-
S. mitis biovar 1 ATCC 6249	-	+	-	+	-	-	+	-	-	-	-	+	+	-	-
E. gallinarum ATCC 49573	+	-	-	+	-	+	+	+	+	+	+	-	+	+	+

DATABASE

Microgen Strep-ID is based on standard biochemical testing methods. The data provided for interpretation of reaction profiles is based on established literature sources (2,3,4,5).

PERFORMANCE CHARACTERISTICS

Microgen Strep-ID (MID-62) has been evaluated in comparison with an established commercially available product for identification of cultured bacterial isolates.

	Number Tested	MID-62	Competitor
E. avium	1	1	1
E. durans	2	2	1
E. faecalis	10	10	10
E. faecium	5	5	5
E. gallinarum	1	1	0
E. hirae	1	1	0
G. haemolysans	1	1	1
S. acidominimus	1	1	0
S. agalactiae	5	5	5
S. anginosus	3	3	2
S. bovis	1	1	1
S. constellatus	3	2	3
S. dysgalactiae ssp. equi	1	1	1
S. equi subsp. equi	2	2	2
S. equi subsp.zooepidemicus	1	1	1
S. gordonii	1	1	0
S. intermedius	1	1	0
S. mitis	9	9	5
S. mutans	4	3	4
S. parasanguinis	1	1	0
S. pneumoniae	5	4	2
S. pyogenes	3	3	3
S. salivarius	4	4	3
S. sanguinis	2	0	2
S. uberis	1	1	1
S. vestibularis	1	1	0
TOTAL	70	65	53

A total of 70 organisms, comprising cultures from recognized culture collections and clinical isolates were examined. Microgen Strep-ID correctly identified 65 (93%). The competitor product identified 53 (76%) of the isolates tested.

REPRODUCIBILITY

Intra-batch: A panel of bacterial cultures was tested using one batch of Microgen Strep-ID, on three occasions using a different operator on each occasion. Test results obtained by the three operators correlated very closely giving an overall intra-batch reproducibility of 99%.

Inter-batch: Three batches of Microgen Strep-ID were tested using a panel of five bacterial cultures. This gave an overall inter-batch reproducibility of >99%.

REFERENCES

1. Lapage S.P, Bascombe S, Willcox W.R and Curtis M.A. (1973) Identification of Bacteria by Computer: General Aspects and Perspectives J.Gen. Microbiol. **77**: 273 -290
2. Murray P.R. (Ed) (2007) Manual of Clinical Microbiology 9th Edition. American Society for Microbiology, Washington, DC
3. Flackham R. (2002) What Happened to Streptococci: Overview of Taxonomic and Nomenclature Changes. Clin. Microbiol. Reviews. **15**: 613 – 630
4. Bascomb S. and M. Manafi (1998) Use of Enzyme Tests in Characterization and Identification of Aerobic and Facultatively Anaerobic Gram – Positive Cocci. Clin. Microbiol. Reviews. **11**: 318 – 340
5. Ellner P.D., Williams D.A., Hosmer M.E. and A. Cohenford. (1985) Preliminary evaluation of a rapid colorimetric method for the presumptive identification of group A streptococci and enterococci. J. Clin. Microbiol. **22**: 880 – 881
6. Hwang M, and G.M. Ederer (1975) Rapid hippurate hydrolysis method for presumptive identification group B streptococci. J. Clin.Microbiol **1**: 114 - 115

SUBSTRATE REFERENCE TABLE

Well	Reaction	Description	Positive	Negative
1	Melibiose	Sugar Fermentation – Phenol red changes from red to yellow as a result of acid produced from the carbohydrate fermentation.	Yellow – Yellow/ Orange	Red/ Deep Orange
2	Sorbitol			
3	Inulin			
4	Lactose			
5	Arabitol			
6	Ribose			
7	Esculin	Hydrolysis of Esculin to glucose and esculetin which produces a black compound in the presence of Ferric ions.	Black	Light Brown
8	Voges Proskauer (VP)	Acetoin production from glucose is detected by the formation of a pink / red complex after the addition of alpha naphthol and creatine in the presence of KOH.	Pale Pink/ Red	Clear
9	Alkaline Phosphatase	Hydrolysis of p-nitrophenyl phosphate by alkaline phosphatase results in the production of yellow p-nitrophenol.	Yellow	Colourless
10	β-Galactosidase	Hydrolysis – p-nitrophenyl-β-D-galactopyranoside by B-galactosidase results in the production of yellow ortho-nitrophenol.	Yellow	Colourless
11	PYR	Hydrolysis of L-pyrrolidonyl-α-naphthylamide by the enzyme pyrrolidonyl arylamidase.	Pale Pink/ Red	Colourless
12	Arginine	Arginine is converted to ornithine, ammonia and CO_2 by arginine dihydrolase resulting in an increase in pH and a change in colour of the bromothymol blue from green to blue. At 48 hours green reactions are negative.	Green/ Blue Blue	Yellow
13	Hippurate	Hippurate is hydrolysed to the amino acid Glycine which is detected using the Ninhydrin reagent.	Purple	Clear
14	α-Haemolysis	Visual recording of haemolysis on blood agar	(1)	
15	β-Haemolysis	Visual recording of haemolysis on blood agar	(2)	

(1). α-Haemolysis - Presents as a zone of partial haemolysis of red blood cells on blood agar medium. This is characterised by the development of a green discolouration of the medium immediately surrounding colonies.

(2). β-Haemolysis – Presents as a zone of complete haemolysis of red blood cells on blood agar medium. This is characterised by the development of a complete clearing of the medium immediately surrounding colonies.

Species Identified using Microgen Strep-ID

***Enterococcus* spp.**

E. avium
E. casseliflavis
E. cecorum
E. dispar
E. durans
E. faecalis
E. faecium
E. gallinarum
E. hirae
E. mundtii
E. raffinosus

***Gemella* spp.**

G. haemolysans

***Streptococcus* spp.**

S. acidominimus
S. agalactiae
S. anginosus
S. bovis
S. canis
S. constellatus
S. dysgalactiae subsp*. dysgalactiae*
S. dysgalactiae subsp*. equisimilis*
S. equi subsp*. equi*
S. equi subsp*. zooepidemicus*
S. equinus
S. gordonii biovar 1
S. gordonii biovar 2
S. gordonii biovar 3
S. intermedius
S. mitis biovar 1
S. mitis biovar 2
S. mutans
S. oralis
S. parasanguinis
S. pneumoniae
S. porcinus
S. pyogenes
S. salivarius
S. sanguinis biov 1
S. sanguinis biov 2
S. sanguinis biov 3
S. sanguinis biov 4
S. suis
S. uberis
S. vestibularis

Streptococcus Data Table

	HIP	AHE	BHE	MEL	SOR	INU	LAC	ARA	RIB	ESC	VP	PHS	BGA	PYR	ARG
E. avium	45	90	1	30	99.9	0.1	99.9	85	99	99.9	60	0.1	85	92	0.1
E. casseliflavis	0.1	50	0.1	99.9	13	90	99.9	99	99	99	95	0.1	99	99	58
E. cecorum	0.1	90	5	99.9	0.1	99.9	99.9	0.1	99	99.9	99.9	99.9	75	24	0.1
E. dispar	60	22	0.1	99.9	0.1	0.1	99.9	0.1	99	99.9	99.9	0.1	99.9	99.9	99.9
E. durans	45	64	20	20	0.1	0.1	95	5	99	99.9	97	0.1	82	99.9	99.9
E. faecalis	90	12	24	0.1	95	0.1	95	0.1	99	99.9	99.9	5	24	99.9	99.9
E. faecium	80	60	0.1	95	8	2	98	95	99	99.9	92	0.1	50	99.9	90
E. gallinarum	91	50	0.1	99.9	20	82	99.9	99	99	99.9	96	0.1	55	96	70
E. hirae	70	0.1	0.1	98	0.1	0.1	99.9	0.1	99	99.9	90	0.1	80	99.9	92
E. mundtii	0.1	0.1	0.1	99.9	80	15	99.9	99	99	99.9	99.9	0.1	99.9	99.9	91
E. raffinosus	35	25	0.1	99.9	99.9	0.1	99.9	99	99	99.9	65	0.1	0.1	99	0.1
G. haemolysans	0.1	0.1	1	0.1	5	0.1	0.1	0.1	0.1	0.1	50	60	0.1	81	0.1
S. acidominimus	80	40	0.1	0.1	0.1	0.1	99.9	0.1	0.1	0.1	0.1	0.1	99.9	8	40
S. agalactiae	99	0.1	98	20	7	0.1	70	0.1	99	0.1	75	99.9	5	0.1	99.9
S. anginosus/ intermedius	0.1	40	0.1	12	0.1	0.1	85	0.1	0.1	99.9	80	90	30	0.1	99.9
S. bovis	0.1	32	0.1	99.9	10	50	99.9	30	99	90	85	0.1	16	0.1	0.1
S. canis	0.1	0.1	99.9	0.1	0.1	0.1	97	0.1	99	99	0.1	99	90	0.1	99
S. constellatus	0.1	0.1	80	18	0.1	0.1	52	0.1	0.1	99.9	99.9	99	70	0.1	99
S.dysgalactiae ssp. dysgalactiae	0.1	60	2	0.1	70	0.1	80	0.1	99	0.1	0.1	99	0.1	0.1	99
S.dysgalactiae ssp. equisimilis	15	0.1	95	0.1	0.1	0.1	99.9	0.1	98	0.1	0.1	99	99	0.1	99
S. equi subsp. equi	0.1	0.1	99	0.1	0.1	0.1	0.1	0.1	0.1	88	0.1	99	0.1	0.1	99
S.equi subsp.zooepidemicus	0.1	0.1	97	0.1	99	0.1	99.9	0.1	99	80	0.1	99	20	0.1	99
S. equinus	0.1	58	0.1	10	0.1	15	5	0.1	50	99.9	28	0.1	0.1	0.1	0.1
S. gordonii biovar 1	0.1	99	0.1	99.9	0.1	99.9	99.9	0.1	0.1	99.9	0.1	99.9	99.9	0.1	99.9
S. gordonii biovar 2	0.1	99	0.1	0.1	0.1	75	99.9	0.1	0.1	99.9	0.1	99.9	65	0.1	99.9
S. gordonii biovar 3	0.1	99	0.1	0.1	0.1	99.9	99.9	0.1	0.1	99.9	0.1	99.9	45	0.1	99.9
S. intermedius/ anginosus	0.1	50	45	9	0.1	0.1	96	0.1	6	99.9	99.9	99.9	99.9	0.1	99.9
S. mitis biovar 1	0.1	89	0.1	42	0.1	0.1	99.9	0.1	5	0.1	0.1	35	60	0.1	2
S. mitis biovar 2	0.1	85	0.1	99.9	38	0.1	99.9	0.1	7	0.1	0.1	60	80	0.1	85
S. mutans	0.1	40	1	99.9	99.9	99.9	99.9	0.1	50	99.9	90	0.1	35	0.1	0.1
S. oralis	0.1	99	0.1	99.9	0.1	0.1	99.9	10	90	0.1	0.1	85	96	0.1	0.1
S. parasanguinis	0.1	99	0.1	45	0.1	0.1	99.9	0.1	0.1	42	0.1	65	45	0.1	85
S. pneumoniae	0.1	90	0.1	5	0.1	60	99.9	0.1	0.1	37	0.1	0.1	98	25	24
S. porcinus	27	0.1	95	0.1	90	0.1	10	0.1	99	99	95	98	1	5	90
S. pyogenes	0.1	0.1	99.9	0.1	0.1	0.1	99.9	0.1	0.1	20	0.1	99.9	0.1	99.9	99.9
S. salivarius	0.1	40	0.1	20	0.1	55	45	0.1	35	99.9	55	35	57	0.1	0.1
S. sanguinis biov 1	0.1	95	0.1	0.1	5	80	99.9	0.1	0.1	99	0.1	0.1	99.9	0.1	98
S. sanguinis biov 2	0.1	95	0.1	0.1	1	73	99.9	0.1	0.1	98	0.1	0.1	50	0.1	98
S. sanguinis biov 3	0.1	96	0.1	0.1	25	78	99.9	0.1	0.1	99	0.1	0.1	38	0.1	98
S. sanguinis biov 4	0.1	95	0.1	0.1	1	64	99.9	0.1	0.1	92	0.1	0.1	99.9	0.1	98
S. suis	0.1	99	1	50	0.1	99.9	99	0.1	0.1	99	0.1	5	50	40	99
S. uberis	99	50	0.1	46	99.9	75	50	0.1	98	99.9	95	40	40	40	50
S. vestibularis #	0.1	95	0.1	0.1	0.1	0.1	99.9	0.1	0.1	80	80	0.1	99.9	0.1	82

S. vestibularis is also known as S. vestibularius

Colour chart/Farbtafel/Tableau 'de couleurs

Microgen™ Strep-ID (MID-62)

Read strips at 18 to 24 hours

WELL/NAPFCHEN /GODET	1 to 6	7	8	9 to 10	11	12	
Reaction	Carbohydrate Fermentation	Esculin	Voges Proskauer	PHS, βGA	PYR	Arginine	Hippurate
Negative							
Positive							

CAUTION: Keep out of direct sunlight. Due to laminate discolouration and paper ageing, the colours on this chart will change.

These colours are provided as general guide to the range of test colours.

Legend:

- Appropriate reagents to be added **at 18 to 24 hours**, prior to reading.
- Overlaid with sterile mineral oil.

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