

## STYLI AND ACCESSORIES

AN ESSENTIAL GUIDE OF MITUTOYO PRECISION  
TOOLS AND INSTRUMENTS

GENERAL



# STYLI FOR CMM

## Probe components from Mitutoyo: Add the touch of perfection to your quality assurance.

Industrial quality assurance requires increasing universality, flexibility and the ideal shape for absolute precision. Mitutoyo styli encompass maximum precision, pioneering innovation and economic savings.

It is not only the technical capabilities of Mitutoyo styli that stand out from the crowd. Equally impressive is the integrated nature of the entire concept, from beginning to end, in a seamless service environment. This forms the customer-focused foundation for a multi-faceted range of services that open up a new dimension of quality assurance for every user—world-class measuring technology from Mitutoyo.

Steel, aluminium or ceramics? Ruby, zirconium oxide or silicon nitride?

The Mitutoyo product line includes more than 600 probe components, as well as highly specialized equipment, to provide the best solution for your specific measurement needs.

As the world's leading measurement technology specialists, Mitutoyo provides experience, competence and performance you can count on, along with unparalleled customer service.

Mitutoyo: performance made perfect.

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# Styli made by Mitutoyo

Which stylus is best suited, and under which conditions, for use with your measuring equipment and specific measuring task? With more than 30 years of experience in developing and manufacturing styli, Mitutoyo experts know which material and combination enable you to achieve your goals—reliably and accurately.

## Materials used for contact points

### Ruby

As the hardest of all probe element materials, ruby is the perfect all-around material when it comes to manufacturing spherical contact points that must be highly resistant to wear. Contact points made of ruby have been used for most standard applications for decades. The low specific density of ruby enables the mass of the stylus tip to be kept as small as possible, effectively eliminating false triggers caused by mass inertia when the CMM moves or vibrates.



### Zirconium oxide

Because of the specific surface properties of contact points made of zirconium oxide - a ceramic compound - they are acknowledged as the best choice for aggressive scanning of abrasive surfaces, such as workpieces made of cast iron. Zirconium oxide has virtually the same hardness and wear-resistant properties as ruby.



### Silicon nitride

Silicon nitride is extremely hard and wear-resistant, with the least surface roughness of all ball materials. Specific advantage: because silicon nitride has a higher resistance to soft metal alloy material (such as brass, aluminum), materials adhere to the surface of the stylus less than other ball materials such as ruby or zirconium oxide.



## Materials used for bases and styli stems

### Steel

The primary material of choice for high-strength precision styli enables very accurate measuring tasks. Its superb material strength makes steel an excellent choice of material for manufacturing styli or reference probe elements.



### Carbon-fiber tube

Thermal expansion coefficient range is virtually undetectable at temperatures between 59 and 104 degrees Fahrenheit (15 to 40 degrees Celsius) Mitutoyo uses carbon-fiber tube for styli with outstanding quality, sophisticated styli configurations and probe extensions.



### Aluminum alloy

Lightweight and stable, and therefore frequently used for probe extensions, styli stems or extensions made of aluminum alloy perform best in measuring labs with stable temperatures, and accordingly, the lowest possible temperature gradients.



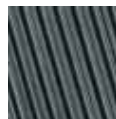
### Carbon fiber

The highest-quality material with an expansion coefficient of virtually zero at ambient temperatures of up to 113 degrees Fahrenheit (45 degrees Celsius). Carbon fiber is very lightweight and extremely stiff, making it particularly suitable for the manufacture of long styli.



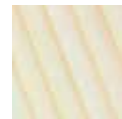
### Tungsten carbide

Bend-resistant styli stems made from tungsten carbide are ideal for virtually all standard applications in the measuring lab with its stable ambient temperature. A durable material that has proven its worth.



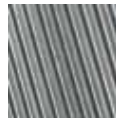
### Ceramic

Very lightweight and extremely stiff, ceramic is an ideal material, particularly for long stems. A low tendency to expand in higher temperatures makes ceramic styli suitable for use in production surroundings.



### Titanium

Titanium is remarkably stiff, yet has a relatively low density. Probe components made of titanium are extremely rigid and stable, yet surprisingly lightweight. Mitutoyo uses the material primarily for bases, connecting pieces and extensions for measuring styli.



## TECHNICAL SUPPORT - CHECKLIST

- The shortest, most stable styli available must be used. When using longer styli parts, always check that they are sufficiently stable.
- To ensure that the mount is secure, make sure that your styli are free from defects, particularly on the seating area and thread.
- Make sure the probe component is securely attached to minimize variations.
- Remember to replace older styli regularly.
- Take account of the ambient temperature and conditions when using thermally stable components.
- Always refer to sensor manufacturer's instructions for setting up stylus configurations for the permitted mass of the sensor being used.
- Use as few individual components as possible and keep unnecessary thread connections to a minimum.
- It is advisable to use silicon nitride balls when scanning soft metal alloys (aluminum, brass etc.)
- Maximum stylus diameter should be used whenever possible. Large diameter styli perform as mechanical filter function on the workpiece surface. Due to their size, they have little impact on the surface's fine structure, thus eliminating outliers or random measurement variations.
- When possible you should always place the styli at right angles to the surfaces you are measuring. You can use angled cubes and knuckles to align styli correctly on angled measuring planes. Use the same methods to measure angled bores.
- Make sure to employ the right dynamics and measuring strength for the stylus components you are working with. Decrease these as needed when working with small ball, slim-stemmed styli.

# Technical data

## Material characteristics

### Diameter and Form Deviations

| Grade | Ball ø to | VDws max. | Ra max.  | tDws    |
|-------|-----------|-----------|----------|---------|
| G3    | 12.7 mm   | 0.08 µm   | 0.010 µm | 0.08 µm |
| G5    | 12.7 mm   | 0.13 µm   | 0.014 µm | 0.13 µm |
| G10   | 25.4 mm   | 0.25 µm   | 0.020 µm | 0.25 µm |
| G16   | 25.4 mm   | 0.40 µm   | 0.025 µm | 0.40 µm |
| G20   | 38.1 mm   | 0.50 µm   | 0.032 µm | 0.50 µm |

**VDws** Difference between the largest and smallest of the single diameters of ball

**Ra max.** Surface roughness

**tDws** Deviation from the perfect spherical form

### Characteristics of ball materials

| characteristics                            | unit                  | sapphire        | ruby            | Aluminum oxide  | Silicon nitride   | Zirconium oxide |
|--|-----------------------|-----------------|-----------------|-----------------|-------------------|-----------------|
|  |                       |                 |                 |                 | gehipt (HP-Si3N4) | ATZ             |
| chemical formula                           |                       | Al2O3           | Al2O3           | Al2O3           | SiN4              | ZrO2            |
| consistence                                | weight %              | 99.99           | 99              | 99.8            | >90               | 76/20/4         |
| density                                    | g/cm 3                | 3.99            | 3.99            | 3.86            | 3.2               | 5.5             |
| hardness                                   | HV                    | 2300            | 2300            | 1900            | 1600              | 1400            |
| pressure resistance                        | MPa                   | 2100            | 2100            | 2500            | 3000              | >2000           |
| equivalent fiber                           | MPa                   | 400-700         | 400-700         | 350             | 850               | 2400            |
| fracture toughness K1c                     | MN/m 3/2              | 1               | 1               | 3.5             | 7                 | 10              |
| elasticity modules                         | GPa                   | 430             | 430             | 350             | 320               | 220             |
| heat expansion                             | 10-6/K                | 5.4             | 5.4             | 7.8             | 3.2               | 9               |
| heat conductance                           | W/mK                  | 36              | 36              | 29              | 40                | 6               |
| specific heat                              | J/kgK                 | 755             | 755             | 900             | 750               | 600             |
| maximum application temperature of the air | °C                    | 1800            | 1800            | 1900            | 1100              | 1000            |
| chemical resistance                        | (acids)<br>(leaching) | optimal<br>good | optimal<br>good | optimal<br>good | optimal<br>good   | good<br>good    |

# STYLI KITS



# Kits M2 / M3

## Styli Kit M2 Starter



| Part No. | Contents            | Description          | ø S | L  |
|----------|---------------------|----------------------|-----|----|
| K651376  |                     |                      |     |    |
|          |                     | Wooden box           |     |    |
|          | 1x Part No. K651012 | Stylus steel-ruby M2 | 1   | 10 |
|          | 1x Part No. K651019 | Stylus steel-ruby M2 | 2   | 20 |
|          | 1x Part No. K651021 | Stylus steel-ruby M2 | 3   | 20 |
|          | 1x Part No. K651022 | Stylus steel-ruby M2 | 4   | 20 |
|          | 1x Part No. K651038 | Extension steel M2   |     | 10 |
|          | 1x Part No. K651039 | Extension steel M2   |     | 20 |
|          | 2x Part No. K651223 | Pin spanner ø 1.2 mm |     | 23 |

## Styli Kit M2 Addition



| Part No. | Contents            | Description            | ø S | L   |
|----------|---------------------|------------------------|-----|-----|
| K651382  |                     |                        |     |     |
|          |                     | Wooden box             |     |     |
|          | 1x Part No. K651058 | 5-way stylus holder M2 |     | 7.5 |
|          | 1x Part No. K651040 | Extension steel M2     |     | 30  |
|          | 1x Part No. K651039 | Extension steel M2     |     | 20  |
|          | 4x Part No. K651038 | Extension steel M2     |     | 10  |
|          | 1x Part No. K651022 | Stylus steel-ruby M2   | 4   | 20  |
|          | 1x Part No. K651021 | Stylus steel-ruby M2   | 3   | 20  |
|          | 5x Part No. K651019 | Stylus steel-ruby M2   | 2   | 20  |
|          | 1x Part No. K651012 | Stylus steel-ruby M2   | 1   | 10  |
|          | 2x Part No. K651223 | Pin spanner ø 1.2 mm   |     | 23  |

## Styli Kit M2 Basic 1



| Part No. | Contents            | Description                 | ø S | L   |
|----------|---------------------|-----------------------------|-----|-----|
| K651377  |                     |                             |     |     |
|          |                     | Wooden box                  |     |     |
|          | 1x Part No. K651012 | Stylus steel-ruby M2        | 1   | 10  |
|          | 1x Part No. K651014 | Stylus steel-ruby M2        | 2   | 10  |
|          | 1x Part No. K651019 | Stylus steel-ruby M2        | 2   | 20  |
|          | 1x Part No. K651016 | Stylus steel-ruby M2        | 3   | 10  |
|          | 1x Part No. K651021 | Stylus steel-ruby M2        | 3   | 20  |
|          | 1x Part No. K651022 | Stylus steel-ruby M2        | 4   | 20  |
|          | 1x Part No. K651031 | Cylinder stylus steel M2    | 3   | 13  |
|          | 1x Part No. K651062 | Adaptor M2                  |     | 7   |
|          | 1x Part No. K651054 | 5-way stylus M2             | 2   | 30  |
|          | 1x Part No. K651083 | Disk stylus steel M2        | 18  | 7.5 |
|          | 1x Part No. K651085 | Disk stylus steel - ruby M2 | 6   | 10  |
|          | 1x Part No. K651038 | Extension steel M2          |     | 10  |
|          | 1x Part No. K651039 | Extension steel M2          |     | 20  |
|          | 2x Part No. K651223 | Pin spanner ø 1.2 mm        |     | 23  |

Unit: mm



# STYLI KITS

## Styli Kit M2 Basic 2



| Part No. | Contents             | Description                     | ø S | L   |
|----------|----------------------|---------------------------------|-----|-----|
| K651354  |                      |                                 |     |     |
|          |                      | wooden box                      |     |     |
|          | 1x Part No. K651235  | Stylus tungsten carbide-ruby M2 | 0.5 | 20  |
|          | 1x Part No. K651249  | Stylus tungsten carbide-ruby M2 | 1   | 20  |
|          | 1x Part No. K651019  | Stylus steel-ruby M2            | 2   | 20  |
|          | 1x Part No. K651347  | Stylus carbon fiber-ruby M2     | 4   | 50  |
|          | 1x Part No. K651348  | Stylus carbon fiber-ruby M2     | 5   | 50  |
|          | 1x Part No. K651349  | Stylus carbon fiber-ruby M2     | 6   | 50  |
|          | 1x Part No. K651350  | Stylus extension CRP M2         |     | 40  |
|          | 1x Part No. K651351  | Stylus extension CRP M2         |     | 50  |
|          | 1x Part No. K651352  | Stylus extension CFK M2         |     | 70  |
|          | 1x Art.:Nr.: K651353 | Stylus extension CFK M2         |     | 90  |
|          | 1x Part No. K651058  | 5-way stylus holder M2          |     | 7.5 |
|          | 1x Part No. K651223  | Pin spanner ø 1.2 mm            |     |     |

## Styli Kit M2 Expansion



| Part No. | Contents            | Description                     | ø S | L   |
|----------|---------------------|---------------------------------|-----|-----|
| K651378  |                     |                                 |     |     |
|          |                     | Wooden box                      |     |     |
|          | 1x Part No. K651236 | Stylus tungsten carbide-ruby M2 | 0.7 | 10  |
|          | 1x Part No. K651248 | Stylus tungsten carbide-ruby M2 | 1   | 20  |
|          | 2x Part No. K651257 | Stylus tungsten carbide-ruby M2 | 1.5 | 30  |
|          | 1x Part No. K651233 | Stylus tungsten carbide-ruby M2 | 0.3 | 10  |
|          | 1x Part No. K651276 | Stylus tungsten carbide-ruby M2 | 0.5 | 10  |
|          | 1x Part No. K651012 | Stylus steel-ruby M2            | 1   | 10  |
|          | 1x Part No. K651013 | Stylus steel-ruby M2            | 1.5 | 10  |
|          | 1x Part No. K651014 | Stylus steel-ruby M2            | 2   | 10  |
|          | 1x Part No. K651015 | Stylus steel-ruby M2            | 2.5 | 10  |
|          | 2x Part No. K651020 | Stylus steel-ruby M2            | 2.5 | 20  |
|          | 1x Part No. K651032 | Cylinder stylus-ruby M2         | 2   | 20  |
|          | 1x Part No. K651052 | 4-way stylus-ruby M2            | 1   | 10  |
|          | 1x Part No. K651098 | Tip stylus tungsten carbide M2  |     | 10  |
|          | 1x Part No. K651083 | Disk stylus steel M2            | 18  | 7.5 |
|          | 1x Part No. K651084 | Disk stylus steel M2            | 25  | 7.5 |
|          | 1x Part No. K651041 | Extension steel M2              |     | 40  |
|          | 2x Part No. K651223 | Pin spanner ø 1.2 mm            |     | 23  |

Unit: mm



# Kits M2 / M3

## Styli Kit M2 Professional



| Part No.    | Contents | Description                     | ø S | L   |
|-------------|----------|---------------------------------|-----|-----|
| K651379     |          |                                 |     |     |
|             |          | Wooden box                      |     |     |
| 1x Part No. | K651236  | Stylus tungsten carbide-ruby M2 | 0.7 | 10  |
| 1x Part No. | K651248  | Stylus tungsten carbide-ruby M2 | 1   | 20  |
| 1x Part No. | K651233  | Stylus tungsten carbide-ruby M2 | 0.3 | 10  |
| 2x Part No. | K651276  | Stylus tungsten carbide-ruby M2 | 0.5 | 10  |
| 2x Part No. | K651012  | Stylus steel-ruby M2            | 1   | 10  |
| 1x Part No. | K651013  | Stylus steel-ruby M2            | 1.5 | 10  |
| 3x Part No. | K651014  | Stylus steel-ruby M2            | 2   | 10  |
| 5x Part No. | K651019  | Stylus steel-ruby M2            | 2   | 20  |
| 1xPart No.  | K651015  | Stylus steel-ruby M2            | 2.5 | 10  |
| 2xPart No.  | K651020  | Stylus steel-ruby M2            | 2.5 | 20  |
| 1x Part No. | K651016  | Stylus steel-ruby M2            | 3   | 10  |
| 2x Part No. | K651021  | Stylus steel-ruby M2            | 3   | 20  |
| 3x Part No. | K651017  | Stylus steel-ruby M2            | 4   | 10  |
| 3x Part No. | K651022  | Stylus steel-ruby M2            | 4   | 20  |
| 2x Part No. | K651018  | Stylus steel-ruby M2            | 5   | 10  |
| 2x Part No. | K651024  | Stylus steel-ruby M2            | 6   | 10  |
| 1x Part No. | K651025  | Stylus steel-ruby M2            | 8   | 11  |
| 1x Part No. | K651030  | Cylinder stylus steel M2        | 1.5 | 11  |
| 1x Part No. | K651031  | Cylinder stylus steel M2        | 3   | 13  |
| 1x Part No. | K651032  | Cylinder stylus-ruby M2         | 2   | 20  |
| 1x Part No. | K651062  | Adaptor M2                      |     | 7   |
| 1x Part No. | K651052  | 4-way stylus-ruby M2            | 1   | 10  |
| 1x Part No. | K651053  | 5-way stylus-ruby M2            | 2   | 18  |
| 1xPart No.  | K651054  | 5-way stylus-ruby M2            | 2   | 30  |
| 1xPart No.  | K651097  | Tip stylus steel M2             |     | 15  |
| 1xPart No.  | K651098  | Tip stylus tungsten carbide M2  |     | 10  |
| 1x Part No. | K651083  | Disk stylus steel M2            | 18  | 7.5 |
| 1x Part No. | K651084  | Disk stylus steel M2            | 25  | 7.5 |
| 1xPart No.  | K651085  | Disk stylus steel - ruby M2     | 6   | 10  |
| 1xPart No.  | K651090  | Hollow ball ceramic M2          |     | 11  |
| 1xPart No.  | K651058  | 5-way stylus holder M2          |     | 7.5 |
| 4xPart No.  | K651037  | Extension steel M2              |     | 5   |
| 2x Part No. | K651038  | Extension steel M2              |     | 10  |
| 2x Part No. | K651039  | Extension steel M2              |     | 20  |
| 2xPart No.  | K651040  | Extension steel M2              |     | 30  |
| 2x Part No. | K651041  | Extension steel M2              |     | 40  |
| 2x Part No. | K651223  | Pin spanner ø 1.2 mm            |     | 23  |

Unit: mm

# STYLI KITS

**Styli Kit M3  
CRP 1**



| Part No. | Contents            | Description                 | ø S | L  |
|----------|---------------------|-----------------------------|-----|----|
| K651318  |                     |                             |     |    |
|          |                     | Wooden box                  |     |    |
|          | 1x Part No. K651297 | Stylus carbon fiber-ruby M3 | 3   | 21 |
|          | 1x Part No. K651298 | Stylus carbon fiber-ruby M3 | 4   | 21 |
|          | 1x Part No. K651301 | Stylus carbon fiber-SiNi M3 | 4   | 21 |
|          | 1x Part No. K651299 | Stylus carbon fiber-ruby M3 | 4   | 31 |
|          | 1x Part No. K651300 | Stylus carbon fiber-ruby M3 | 4   | 40 |
|          | 1x Part No. K651303 | Stylus carbon fiber-ruby M3 | 5   | 50 |
|          | 1x Part No. K651223 | Pin spanner ø 1.2 mm        |     |    |

**Styli Kit M3  
CRP 2**



| Part No. | Contents            | Description                 | ø S | L  |
|----------|---------------------|-----------------------------|-----|----|
| K651319  |                     |                             |     |    |
|          |                     | Wooden box                  |     |    |
|          | 1x Part No. K651302 | Stylus carbon fiber-ruby M3 | 5   | 21 |
|          | 1x Part No. K651304 | Stylus carbon fiber-ruby M3 | 5   | 21 |
|          | 1x Part No. K651303 | Stylus carbon fiber-ruby M3 | 5   | 50 |
|          | 1x Part No. K651305 | Stylus carbon fiber-ruby M3 | 6   | 50 |
|          | 1x Part No. K651306 | Stylus carbon fiber-ruby M3 | 6   | 75 |
|          | 1x Part No. K651223 | Pin spanner ø 1.2 mm        |     |    |

**Styli Kit M3  
CRP 3**



| Part No. | Contents            | Description                 | ø S | L   |
|----------|---------------------|-----------------------------|-----|-----|
| K651320  |                     |                             |     |     |
|          |                     | Wooden box                  |     |     |
|          | 1x Part No. K651302 | Stylus carbon fiber-ruby M3 | 5   | 21  |
|          | 1x Part No. K651304 | Stylus carbon fiber-ruby M3 | 5   | 21  |
|          | 1x Part No. K651303 | Stylus carbon fiber-ruby M3 | 5   | 50  |
|          | 1x Part No. K651306 | Stylus carbon fiber-ruby M3 | 6   | 75  |
|          | 1x Part No. K651309 | Stylus carbon fiber-ruby M3 | 8   | 100 |
|          | 1x Part No. K651223 | Pin spanner ø 1.2 mm        |     |     |

**Styli Kit M3  
Linear Height**



| Part No. | Contents            | Description          | ø S  | L  |
|----------|---------------------|----------------------|------|----|
| K650986  |                     |                      |      |    |
|          | 1x Part No. K681867 | s-receiver           |      |    |
|          | 1x Part No. K651223 | Pin spanner ø 1.2 mm |      |    |
|          | 1x Part No. K651157 | Extension steel M3   |      | 20 |
|          | 1x Part No. K651156 | Extension steel M3   |      | 10 |
|          | 1x Part No. K651172 | Disk stylus steel M3 | 12.7 | 33 |
|          | 1x Part No. K651151 | Stylus steel-ruby M3 | 4    | 31 |
|          | 1x Part No. K651148 | Stylus steel-ruby M3 | 3    | 21 |
|          | 1x Part No. K651147 | Stylus steel-ruby M3 | 2    | 21 |
|          | 1x Part No. K651146 | Stylus steel-ruby M3 | 1    | 21 |

Unit: mm

# Styli Kits M3 / M4

## Styli Kit M3 Starter



| Part No. | Contents            | Description          | ø S | L    |
|----------|---------------------|----------------------|-----|------|
| K651380  |                     |                      |     |      |
|          |                     | Wooden box           |     |      |
|          | 1x Part No. K651146 | Stylus steel-ruby M3 | 1   | 21   |
|          | 1x Part No. K651147 | Stylus steel-ruby M3 | 2   | 21   |
|          | 1x Part No. K651148 | Stylus steel-ruby M3 | 3   | 21   |
|          | 1x Part No. K651151 | Stylus steel-ruby M3 | 4   | 31   |
|          | 1x Part No. K651152 | Stylus steel-ruby M3 | 5   | 33.5 |
|          | 1x Part No. K651157 | Extension steel M3   |     | 20   |
|          | 1x Part No. K651159 | Extension steel M3   |     | 35   |
|          | 2x Part No. K651223 | Pin spanner ø 1.2 mm |     | 23   |

## Styli Kit M4



| Part No. | Contents            | Description            | ø S | L    |
|----------|---------------------|------------------------|-----|------|
| K651383  |                     |                        |     |      |
|          |                     | Wooden box             |     |      |
|          | 1x Part No. K651184 | Stylus ceramic-ruby M4 | 8   | 100  |
|          | 1x Part No. K651182 | Stylus ceramic-ruby M4 | 8   | 50   |
|          | 1x Part No. K651216 | Adaptor ceramic M4/M3  | 7   | 100  |
|          | 1x Part No. K651215 | Adaptor ceramic M4/M3  | 7   | 75   |
|          | 1x Part No. K651214 | Adaptor ceramic M4/M3  | 7   | 50   |
|          | 1x Part No. K651204 | Extension ceramic M4   | 7   | 50   |
|          | 1x Part No. K651203 | Extension ceramic M4   | 7   | 30   |
|          | 1x Part No. K651170 | Adaptor M3/M2          | 4   | 5    |
|          | 1x Part No. K651208 | Adaptor M4/M3          | 7   | 9    |
|          | 2x Part No. K650346 | Pin spanner            | 1.7 | 49   |
|          | 2x Part No. K651223 | Pin spanner            | 1.2 | 23   |
|          | 1x Part No. K651058 | 5-way stylus holder M2 | 7   | 7.5  |
|          | 1x Part No. K651169 | 5-way stylus holder M3 | 10  | 13   |
|          | 1x Part No. K651206 | 5-way stylus holder M4 | 15  | 18   |
|          | 1x Part No. K651186 | Stylus steel-ruby M4   | 1   | 19.5 |
|          | 4x Part No. K651187 | Stylus steel-ruby M4   | 2   | 19   |
|          | 1x Part No. K651188 | Stylus steel-ruby M4   | 4   | 18   |

Unit: mm

# Components for measuring heads WITH M2 THREAD

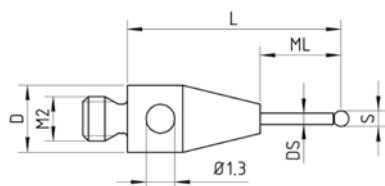
TP20  
TP200  
MH20i  
TP2



# Styli M2

**Stylus: tungsten carbide**

base: stainless steel  
stem: tungsten carbide  
ball: ruby



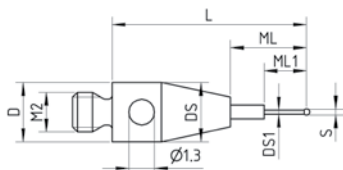
| Part No. | S   | L    | ML   | ML1 | D | DS  | DS1 | Mass |
|----------|-----|------|------|-----|---|-----|-----|------|
| K651236  | 0.7 | 10   | 4    |     | 3 | 0.5 |     | 0.23 |
| K651237  | 1   | 10   | 6    |     | 3 | 0.8 |     | 0.24 |
| K651246  | 1   | 15   | 11   |     | 3 | 0.8 |     | 0.5  |
| K651248  | 1   | 20   | 7    |     | 3 | 0.7 |     | 0.48 |
| K651249  | 1   | 20   | 12.5 |     | 3 | 0.8 |     | 0.39 |
| K651256  | 1   | 27.5 | 20.5 |     | 3 | 0.7 |     | 0.4  |
| K651322  | 1   | 52   | 37   |     | 3 | 0.7 |     | 0.89 |
| K651238  | 1.5 | 10   | 4    |     | 3 | 1   |     | 0.32 |
| K651250  | 1,5 | 20   | 12.5 |     | 3 | 1   |     | 0.46 |
| K651257  | 1.5 | 30   | 22.5 |     | 3 | 1   |     | 0.56 |
| K651239  | 2   | 10   | 5    |     | 3 | 1   |     | 0.34 |
| K651240  | 2   | 10   | 6    |     | 3 | 1   |     | 0.29 |
| K651247  | 2   | 15   | 11   |     | 3 | 1   |     | 0.33 |
| K651251  | 2   | 20   | 15   |     | 3 | 1   |     | 0.45 |
| K651258  | 2   | 30   | 22.5 |     | 3 | 1.5 |     | 0.96 |
| K651263  | 2   | 40   | 32.5 |     | 3 | 1.5 |     | 1.22 |
| K651323  | 2   | 58   | 52   |     | 3 | 1.5 |     | 1.63 |
| K651241  | 2.5 | 10   | 5    |     | 3 | 1.5 |     | 0.42 |
| K651252  | 2.5 | 20   | 14.5 |     | 3 | 1.5 |     | 0.69 |
| K651259  | 2.5 | 30   | 25   |     | 3 | 2   |     | 1.44 |
| K651264  | 2.5 | 40   | 32.5 |     | 3 | 2   |     | 1.93 |
| K651242  | 3   | 10   | 6.5  |     | 3 | 1.5 |     | 0.45 |
| K651253  | 3   | 20   | 16.5 |     | 3 | 1.5 |     | 0.72 |
| K651260  | 3   | 30   | 27.5 |     | 3 | 2   |     | 1.46 |
| K651265  | 3   | 40   | 37.5 |     | 3 | 2   |     | 1.88 |
| K651268  | 3   | 50   | 47.5 |     | 3 | 2   |     | 2.35 |
| K651261  | 4   | 30   | 30   |     | 3 | 2   |     | 1.56 |
| K651266  | 4   | 40   | 40   |     | 3 | 2   |     | 2    |
| K651269  | 4   | 50   | 50   |     | 3 | 2   |     | 2.52 |
| K651243  | 5   | 10   | 10   |     | 3 | 2   |     | 0.77 |
| K650866  | 5   | 20   | 20   |     | 3 | 2   |     | 1.15 |
| K651254  | 5   | 20   | 20   |     | 3 | 2.5 |     | 1.47 |
| K651262  | 5   | 30   | 30   |     | 3 | 2.5 |     | 2.18 |
| K651267  | 5   | 40   | 40   |     | 3 | 2.5 |     | 2.89 |
| K651270  | 5   | 50   | 50   |     | 3 | 2.5 |     | 3.6  |
| K651244  | 6   | 10   | 10   |     | 3 | 2   |     | 0.96 |
| K651255  | 6   | 25   | 25   |     | 3 | 2   |     | 1.63 |

Unit: mm Mass: g

# STYL M2

## Stylus: tungsten carbide

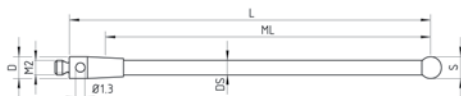
base: stainless steel  
stem: tungsten carbide  
ball: ruby



| Part No. | S   | L  | ML | ML1 | D | DS  | DS1 | Mass |
|----------|-----|----|----|-----|---|-----|-----|------|
| K651233  | 0.3 | 10 | 4  | 2   | 3 | 0.7 | 0.2 | 0.27 |
| K651234  | 0.5 | 10 | 4  | 2   | 3 | 1   | 0.3 | 0.29 |
| K651276  | 0.5 | 10 | 4  | 3   | 3 | 0.7 | 0.3 | 0.26 |
| K651235  | 0.5 | 20 | 12 | 2   | 3 | 1   | 0.3 | 0.45 |

## Stylus: ceramic

base: stainless steel  
stem: ceramic  
ball: ruby



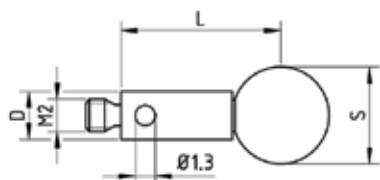
| Part No. | S | L    | ML   | ML1 | D | DS  | DS1 | Mass |
|----------|---|------|------|-----|---|-----|-----|------|
| K651009  | 3 | 50   | 47.5 |     | 3 | 2   |     | 0.84 |
| K651325  | 3 | 83.5 | 68.5 |     | 3 | 2   |     | 1.56 |
| K651231  | 4 | 10   | 10   |     | 3 | 2   |     | 0.38 |
| K651004  | 4 | 20   | 20   |     | 3 | 2   |     | 0.51 |
| K651006  | 4 | 30   | 30   |     | 3 | 2   |     | 0.67 |
| K651008  | 4 | 40   | 40   |     | 3 | 2   |     | 0.77 |
| K651010  | 4 | 50   | 50   |     | 3 | 2   |     | 0.9  |
| K651327  | 4 | 98   | 98   |     | 3 | 3   |     | 2.91 |
| K651232  | 5 | 10   | 10   |     | 3 | 2   |     | 0.65 |
| K651005  | 5 | 20   | 20   |     | 3 | 2   |     | 0.63 |
| K651007  | 5 | 30   | 30   |     | 3 | 2   |     | 0.79 |
| K651011  | 5 | 50   | 50   |     | 3 | 2.5 |     | 1.3  |
| K651328  | 5 | 97.5 | 97.5 |     | 3 | 3   |     | 2.99 |
| K651003  | 6 | 10   | 10   |     | 3 | 2   |     | 0.69 |

Unit: mm Mass: g

# Styli M2

## Stylus: steel

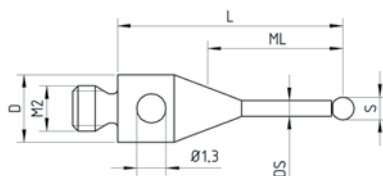
base: stainless steel  
ball: ruby



| Part No. | S | L  | ML | ML1 | D | DS | DS1 | Mass |
|----------|---|----|----|-----|---|----|-----|------|
| K651026  | 6 | 25 | 25 |     | 3 |    |     | 1.7  |
| K651023  | 8 | 9  | 9  |     | 3 |    |     | 1.4  |

## Stylus: steel

base: stainless steel  
ball: ruby



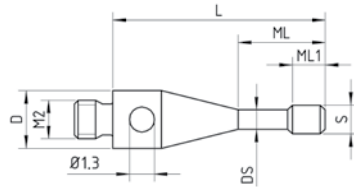
| Part No. | S   | L  | ML   | ML1 | D | DS  | DS1 | Mass |
|----------|-----|----|------|-----|---|-----|-----|------|
| K651012  | 1   | 10 | 4.5  |     | 3 | 0.7 |     | 0.23 |
| K651013  | 1.5 | 10 | 4.5  |     | 3 | 0.7 |     | 0.25 |
| K651014  | 2   | 10 | 6    |     | 3 | 1   |     | 0.24 |
| K651019  | 2   | 20 | 14   |     | 3 | 1.4 |     | 0.43 |
| K651015  | 2.5 | 10 | 6    |     | 3 | 1   |     | 0.26 |
| K651020  | 2.5 | 20 | 14   |     | 3 | 1.4 |     | 0.45 |
| K651016  | 3   | 10 | 7.5  |     | 3 | 1.5 |     | 0.34 |
| K651021  | 3   | 20 | 17.5 |     | 3 | 1.5 |     | 0.51 |
| K651324  | 3   | 68 | 60   |     | 3 | 1.5 |     | 1.22 |
| K651017  | 4   | 10 | 10   |     | 3 | 1.5 |     | 0.42 |
| K651022  | 4   | 20 | 20   |     | 3 | 1.5 |     | 0.51 |
| K651326  | 4   | 68 | 68   |     | 3 | 2   |     | 1.82 |
| K651018  | 5   | 10 | 10   |     | 3 | 2.5 |     | 0.63 |
| K651024  | 6   | 10 | 10   |     | 3 | 2.5 |     | 0.82 |
| K651025  | 8   | 11 | 11   |     | 3 | 2.5 |     | 1.49 |

Unit: mm Mass: g



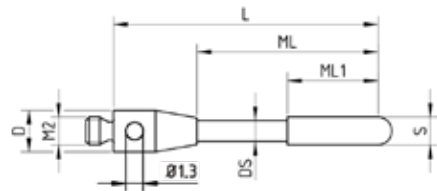
# STYLII M2

**Cylinder stylus: steel**  
stainless steel



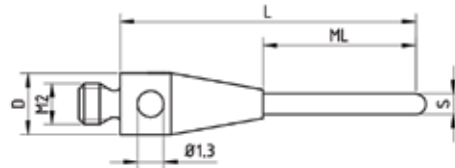
| Part No. | S   | L  | ML  | ML1 | D | DS  | DS1 | Mass |
|----------|-----|----|-----|-----|---|-----|-----|------|
| K651030  | 1.5 | 11 | 4.5 | 1.7 | 3 | 1   |     | 0.28 |
| K651031  | 3   | 13 | 8   | 4   | 3 | 1.5 |     | 0.49 |

**Cylinder stylus: ruby**  
base: stainless steel  
stem: tungsten carbide  
tip: ruby



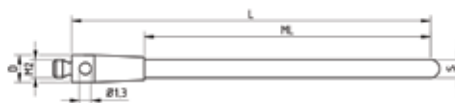
| Part No. | S | L  | ML | ML1 | D | DS  | DS1 | Mass |
|----------|---|----|----|-----|---|-----|-----|------|
| K651032  | 2 | 20 | 13 | 6.5 | 3 | 1.5 |     | 0.47 |
|          | 4 | 20 | 13 | 8.5 | 3 | 2   |     | 0.9  |

**Cylinder stylus: ruby**  
base: stainless steel  
tip: ruby



| Part No. | S   | L     | ML   | ML1 | D | DS | DS1 | Mass |
|----------|-----|-------|------|-----|---|----|-----|------|
| K651034  | 1   | 14.5  | 7.5  |     | 3 |    |     | 0.28 |
| K651035  | 1.5 | 14.25 | 7.25 |     | 3 |    |     | 0.3  |

**Cylinder stylus: tungsten carbide**  
base: stainless steel  
tip: tungsten carbide

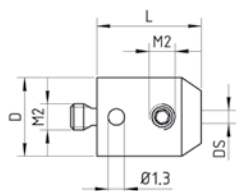


| Part No. | S | L  | ML | ML1 | D | DS | DS1 | Mass |
|----------|---|----|----|-----|---|----|-----|------|
| K651036  | 2 | 39 | 31 |     | 3 |    |     | 1.87 |

Unit: mm Mass: g

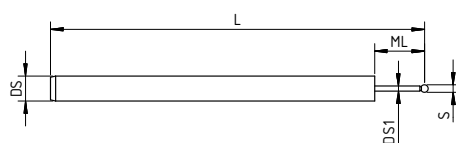
# Styli M2

**Stylus holder**  
stainless steel



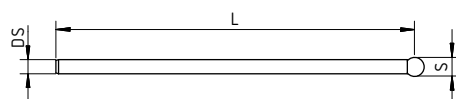
| Part No. | S | L | ML | ML1 | D | DS     | DS1 | Mass |
|----------|---|---|----|-----|---|--------|-----|------|
| K651065  |   | 8 |    |     | 6 | 1.0 G7 |     | 1.54 |
| K651066  |   | 8 |    |     | 6 | 1.5 G7 |     | 1.51 |
| K651067  |   | 8 |    |     | 6 | 2.0 G7 |     | 1.47 |

**Stylus for holder**  
stem: tungsten carbide  
ball: ruby



| Part No. | S   | L     | ML   | ML1 | D | DS | DS1 | Mass |
|----------|-----|-------|------|-----|---|----|-----|------|
| K651068  | 0.3 | 15.15 | 2.15 |     |   | 1  | 0.2 | 0.14 |
| K651069  | 0.5 | 15.25 | 2.25 |     |   | 1  | 0.3 | 0.15 |
| K651070  | 0.6 | 15.3  | 4.3  |     |   | 1  | 0.4 | 0.13 |
| K651071  | 0.8 | 15.4  | 4.4  |     |   | 1  | 0.6 | 0.14 |
| K651072  | 1   | 15.5  | 4.5  |     |   | 1  | 0.8 | 0.15 |

**Stylus for holder**  
stem: tungsten carbide  
ball: ruby

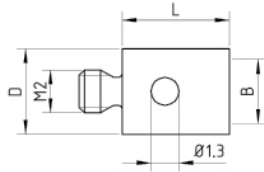


| Part No. | S   | L     | ML | ML1 | D | DS  | DS1 | Mass |
|----------|-----|-------|----|-----|---|-----|-----|------|
| K651073  | 1.3 | 25.7  |    |     |   | 1   |     | 0.28 |
| K651074  | 1.5 | 25.75 |    |     |   | 1   |     | 0.29 |
| K651075  | 2   | 26    |    |     |   | 1.5 |     | 0.65 |
| K651076  | 2.5 | 26.25 |    |     |   | 1.5 |     | 0.67 |
| K651077  | 3   | 26.5  |    |     |   | 2   |     | 1.24 |
| K651080  | 3   | 36.5  |    |     |   | 2   |     | 1.62 |
| K651078  | 4   | 27.2  |    |     |   | 2   |     | 1.37 |
| K651079  | 5   | 27.5  |    |     |   | 2   |     | 1.51 |

Unit: mm Mass: g

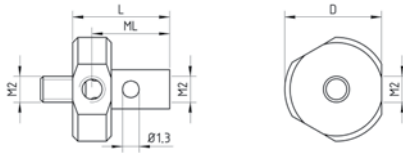
# STYLUM2

## Adaptor stainless steel



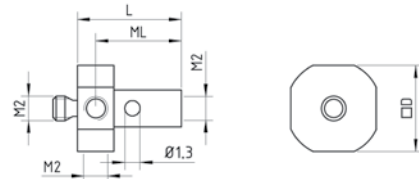
| Part No. | S | L  | ML | ML1 | D | DS | B  | Mass |
|----------|---|----|----|-----|---|----|----|------|
| K651061  |   | 5  |    |     | 4 |    | M3 | 0.29 |
| K651062  |   | 7  |    |     | 4 |    | M3 | 0.42 |
| K651063  |   | 10 |    |     | 4 |    | M3 | 0.58 |
| K651064  |   | 10 |    |     | 5 |    | M4 | 0.79 |

## 4-way stylus holder stainless steel, rotatable



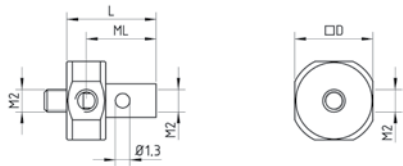
| Part No. | S | L   | ML | ML1 | D   | DS | DS1 | Mass |
|----------|---|-----|----|-----|-----|----|-----|------|
| K651056  |   | 7.5 | 6  |     | 7.5 |    |     | 1.07 |

## 5-way stylus holder stainless steel, fixed



| Part No. | S | L   | ML | ML1 | D | DS | DS1 | Mass |
|----------|---|-----|----|-----|---|----|-----|------|
| K651057  |   | 8.5 | 7  |     | 7 |    |     | 0.96 |

## 5-way stylus holder stainless steel, rotatable



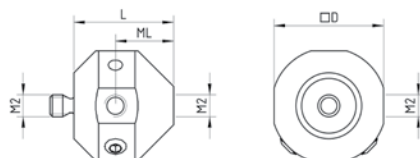
| Part No. | S | L   | ML | ML1 | D | DS | DS1 | Mass |
|----------|---|-----|----|-----|---|----|-----|------|
| K651058  |   | 7.5 | 6  |     | 7 |    |     | 0.92 |

Unit: mm Mass: g

# Styli M2

## 5-way stylus holder, large

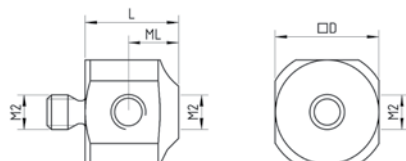
stainless steel, rotatable



| Part No. | S | L   | ML  | ML1 | D  | DS | B | Mass |
|----------|---|-----|-----|-----|----|----|---|------|
| K651059  |   | 9.1 | 5.3 |     | 10 |    |   | 3.62 |

## 5-way stylus holder, small

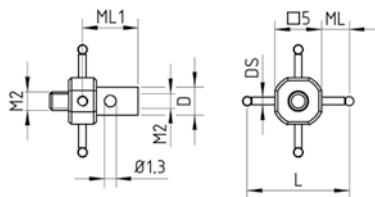
stainless steel, fixed



| Part No. | S | L   | ML  | ML1 | D | DS | B | Mass |
|----------|---|-----|-----|-----|---|----|---|------|
| K651060  |   | 5.4 | 2.9 |     | 6 |    |   | 0.94 |

## 4-way stylus

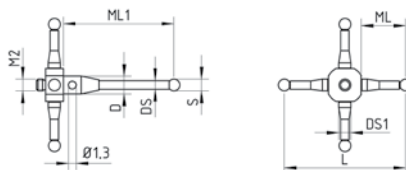
base: stainless steel  
stem: tungsten carbide  
ball: ruby



| Part No. | S | L  | ML  | ML1 | D | DS  | DS1 | Mass |
|----------|---|----|-----|-----|---|-----|-----|------|
| K651052  | 1 | 10 | 2.5 | 6   | 3 | 0.7 |     | 0.5  |

## 5-way stylus

base: stainless steel  
stem: tungsten carbide  
stainless steel  
ball: ruby



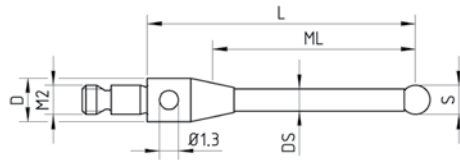
| Part No. | S | L  | ML    | ML1  | D   | DS  | DS1 | Mass |
|----------|---|----|-------|------|-----|-----|-----|------|
| K651053  | 2 | 18 | 5.25  | 16.5 | 2H7 | 1.4 | 2   | 1.54 |
| K650451  | 2 | 20 | 7.2   | 18.5 | 2H7 | 1.4 | 2   | 1.74 |
| K651054  | 2 | 30 | 10.75 | 16.5 | 2H7 | 1.4 | 2   | 1.88 |

Unit: mm Mass: g

# STYLII M2 M2

## Stylus for 5-way stylus

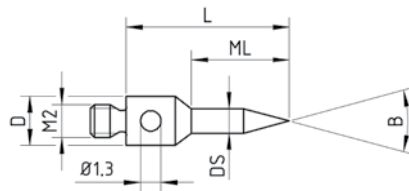
base: stainless steel  
stem: tungsten carbide  
ball: ruby



| Part No. | S | L    | ML   | ML1 | D | DS  | DS1 | Mass |
|----------|---|------|------|-----|---|-----|-----|------|
| K650449  | 2 | 18.5 | 12.5 |     | 3 | 1.5 |     | 0.63 |
| K651055  | 2 | 16.5 | 11   |     | 3 | 1.4 |     | 0.57 |

## Tip stylus: steel

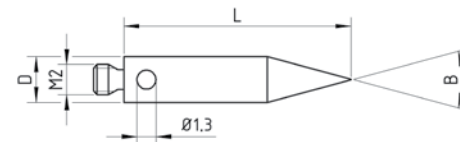
steel, hardened



| Part No. | S | L  | ML | ML1 | D | DS  | B   | Mass |
|----------|---|----|----|-----|---|-----|-----|------|
| K651095  |   | 10 | 6  |     | 3 | 1.5 | 30° | 0.26 |
| K651096  |   | 10 | 6  |     | 3 | 1.5 | 60° | 0.27 |

## Tip stylus: steel

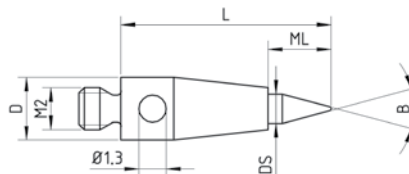
steel, hardened



| Part No. | S | L  | ML | ML1 | D | DS | B   | Mass |
|----------|---|----|----|-----|---|----|-----|------|
| K651097  |   | 15 |    |     | 3 |    | 30° | 0.61 |

## Tip stylus: tungsten carbide

base: stainless steel  
stem: tungsten carbide



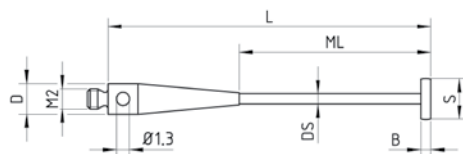
| Part No. | S | L  | ML | ML1 | D | DS  | B   | Mass |
|----------|---|----|----|-----|---|-----|-----|------|
| K651098  |   | 10 | 3  |     | 3 | 1.4 | 30° | 0.37 |

Unit: mm Mass: g

# Styli M2

## Disk stylus: ruby

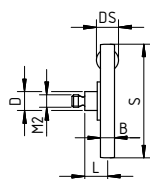
base: stainless steel  
stem: tungsten carbide  
disk: ruby



| Part No. | S | L  | ML | ML1 | D | DS  | B   | Mass |
|----------|---|----|----|-----|---|-----|-----|------|
| K651086  | 4 | 32 | 19 |     | 3 | 1   | 1   | 0.78 |
| K651087  | 8 | 32 | 19 |     | 3 | 1.5 | 1.5 | 1.38 |

## Disk stylus: steel

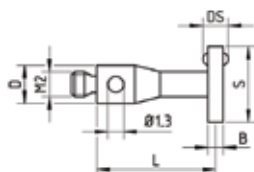
base: stainless steel  
disk: hardened steel



| Part No. | S  | L   | ML | ML1 | D | DS      | B   | Mass |
|----------|----|-----|----|-----|---|---------|-----|------|
| K651081  | 18 | 2.6 |    |     | 3 | 3       | 2.3 | 4    |
| K651082  | 25 | 2.5 |    |     | 3 | no ball | 3.1 | 5    |
| K651083  | 18 | 7.5 |    |     | 3 | 2.5     | 1.6 | 4.5  |
| K651084  | 25 | 7.5 |    |     | 3 | 2.5     | 1.6 | 6.6  |

## Disk stylus: ruby

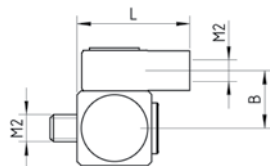
base: stainless steel  
disk: ruby



| Part No. | S | L  | ML | ML1 | D | DS | B   | Mass |
|----------|---|----|----|-----|---|----|-----|------|
| K651085  | 6 | 10 |    |     | 3 | 2  | 1.2 | 0.6  |

## Knuckle joint

stainless steel

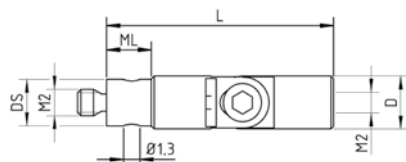


| Part No. | S | L | ML | ML1 | D | DS | B   | Mass |
|----------|---|---|----|-----|---|----|-----|------|
| K651100  |   | 8 |    |     |   |    | 4.5 | 1.67 |

Unit: mm Mass: g

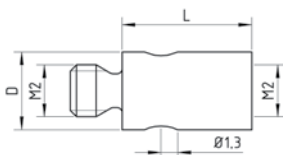
# STYLI M2

## Knuckle/swivel joint stainless steel



| Part No. | S | L    | ML  | ML1 | D | DS  | DS1 | Mass |
|----------|---|------|-----|-----|---|-----|-----|------|
| K651101  |   | 17.2 | 3.4 |     | 4 | 3.5 |     | 1.38 |

## Extension steel stainless steel



| Part No. | S | L  | ML | ML1 | D | DS | DS1 | Mass |
|----------|---|----|----|-----|---|----|-----|------|
| K651037  |   | 5  |    |     | 3 |    |     | 0.2  |
| K651038  |   | 10 |    |     | 3 |    |     | 0.41 |
| K651039  |   | 20 |    |     | 3 |    |     | 0.96 |
| K651040  |   | 30 |    |     | 3 |    |     | 1.53 |
| K651041  |   | 40 |    |     | 3 |    |     | 2.05 |
| K651042  |   | 60 |    |     | 3 |    |     | 2.7  |
| K651043  |   | 90 |    |     | 3 |    |     | 3.8  |

## Extension ceramic end pieces: stainless steel stem: ceramic



| Part No. | S | L  | ML | ML1 | D | DS | DS1 | Mass |
|----------|---|----|----|-----|---|----|-----|------|
| K651044  |   | 30 |    |     | 3 |    |     | 0.99 |
| K651045  |   | 40 |    |     | 3 |    |     | 1.26 |
| K651046  |   | 50 |    |     | 3 |    |     | 1.54 |
| K651047  |   | 60 |    |     | 3 |    |     | 1.82 |

Unit: mm Mass: g



# Components for measuring heads WITH M3 THREAD

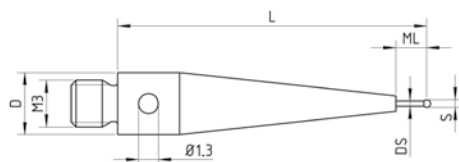
TP8  
SP25M



# STYLII M3

## Stylus: tungsten carbide

base: stainless steel  
stem: tungsten carbide  
ball: ruby



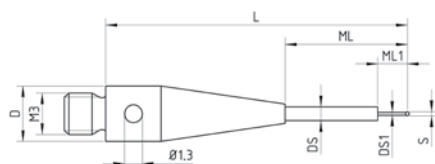
| Part No. | S   | L     | ML   | ML1 | D   | DS   | DS1 | Mass |
|----------|-----|-------|------|-----|-----|------|-----|------|
| K651111  | 0.5 | 20    | 2    |     | 4   | 0.35 |     | 1.09 |
| K651107  | 1   | 10    | 5    |     | 4   | 0.8  |     | 0.53 |
| K651329  | 1   | 22    | 12   |     | 4   | 0.8  |     | 0.8  |
| K651330  | 1   | 32    | 25   |     | 4   | 0.8  |     | 0.81 |
| K651112  | 1.5 | 20    | 12.5 |     | 4   | 1    |     | 0.82 |
| K651118  | 1.5 | 21.25 | 9    |     | 4   | 1    |     | 1.05 |
| K651119  | 1.5 | 30    | 22.5 |     | 4   | 1    |     | 0.92 |
| K651109  | 2   | 20    | 14.5 |     | 4   | 1    |     | 0.71 |
| K651113  | 2   | 21    | 10   |     | 4   | 1    |     | 1.01 |
| K651120  | 2   | 30    | 22   |     | 4   | 1.5  |     | 1.28 |
| K651127  | 2   | 40    | 32.5 |     | 4   | 1.5  |     | 1.54 |
| K651114  | 2.5 | 21    | 14   |     | 4   | 1.5  |     | 1.07 |
| K651121  | 2.5 | 30    | 22   |     | 4   | 2    |     | 1.79 |
| K651128  | 2.5 | 40    | 32   |     | 4   | 2    |     | 2.28 |
| K651110  | 3   | 20    | 15.5 |     | 4   | 1.5  |     | 1.25 |
| K651122  | 3   | 30    | 22.5 |     | 4   | 2    |     | 1.79 |
| K651126  | 3   | 38.5  | 22   |     | 5.5 | 2    |     | 3.87 |
| K651129  | 3   | 40    | 32.5 |     | 4   | 2    |     | 2.22 |
| K651132  | 3   | 50    | 42.5 |     | 4   | 2    |     | 2.49 |
| K651332  | 3   | 64    | 50   |     | 4   | 2    |     | 3.61 |
| K651115  | 4   | 21    | 16.5 |     | 4   | 2    |     | 1.54 |
| K651123  | 4   | 30    | 27   |     | 4   | 2    |     | 1.8  |
| K651130  | 4   | 40    | 36   |     | 4   | 2    |     | 2.35 |
| K651133  | 4   | 50    | 46   |     | 4   | 2    |     | 2.69 |
| K651333  | 4   | 59    | 52   |     | 4   | 2    |     | 3.15 |
| K651116  | 5   | 21    | 21   |     | 4   | 2    |     | 1.64 |
| K651124  | 5   | 31    | 31   |     | 4   | 2    |     | 2.01 |
| K651131  | 5   | 40    | 40   |     | 4   | 2    |     | 2.49 |
| K651134  | 5   | 50    | 50   |     | 4   | 2    |     | 2.98 |
| K651117  | 8   | 21    | 21   |     | 4   | 3    |     | 3.14 |

Unit: mm Mass: g

# Styli M3

## Stylus: tungsten carbide

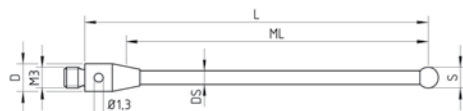
base: stainless steel  
stem: tungsten carbide  
ball: ruby



| Part No. | S   | L     | ML   | ML1 | D | DS | DS1 | Mass |
|----------|-----|-------|------|-----|---|----|-----|------|
| K651106  | 0.3 | 21.85 | 8.85 | 2   | 4 | 1  | 0.2 | 0.98 |
| K651105  | 0.5 | 21.75 | 8.75 | 2   | 4 | 1  | 0.3 | 1    |
| K651104  | 0.6 | 21.7  | 8.7  | 4   | 4 | 1  | 0.4 | 1.07 |
| K651103  | 0.8 | 21.6  | 8.6  | 4   | 4 | 1  | 0.6 | 0.98 |
| K651102  | 1   | 21.5  | 8.5  | 4   | 4 | 1  | 0.8 | 0.99 |

## Stylus: ceramic

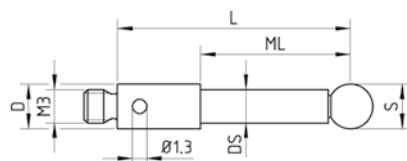
base: stainless steel  
stem: ceramic  
ball: ruby



| Part No. | S | L    | ML   | ML1 | D | DS  | DS1 | Mass |
|----------|---|------|------|-----|---|-----|-----|------|
| K651143  | 3 | 50   | 43   |     | 4 | 2   |     | 1.19 |
| K651136  | 4 | 21   | 16.5 |     | 4 | 2   |     | 0.98 |
| K651140  | 4 | 30   | 27   |     | 4 | 2   |     | 0.89 |
| K651141  | 4 | 40   | 35.5 |     | 4 | 2   |     | 1.13 |
| K651144  | 4 | 50   | 45.5 |     | 4 | 2   |     | 1.27 |
| K651137  | 5 | 21   | 21   |     | 4 | 2   |     | 1    |
| K651139  | 5 | 29.5 | 29.5 |     | 4 | 2   |     | 1.33 |
| K651142  | 5 | 40   | 40   |     | 4 | 2   |     | 1.45 |
| K651145  | 5 | 50   | 50   |     | 4 | 2.5 |     | 1.63 |
| K651135  | 6 | 10   | 10   |     | 4 | 2   |     | 0.86 |
| K651138  | 8 | 21   | 21   |     | 4 | 2   |     | 1.89 |
| K651334  | 8 | 130  | 110  |     | 6 | 4   |     | 9.52 |

## Stylus: carbon fiber

base: stainless steel  
stem: carbon fiber  
ball: silicon nitride



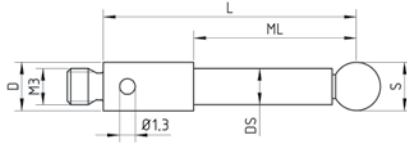
| Part No. | S | L  | ML   | ML1 | D | DS | DS1 | Mass |
|----------|---|----|------|-----|---|----|-----|------|
| K651301  | 4 | 21 | 13.5 |     | 4 | 3  |     | 0.88 |
| K651304  | 5 | 21 | 21   |     | 4 | 3  |     | 0.91 |

Unit: mm Mass: g

# STYLII M3

## Stylus: carbon fiber

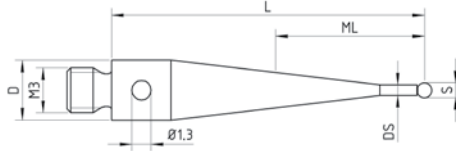
base: stainless steel  
stem: carbon fiber  
ball: ruby



| Part No. | S | L   | ML   | ML1 | D | DS | DS1 | Mass |
|----------|---|-----|------|-----|---|----|-----|------|
| K651297  | 3 | 21  | 14.7 |     | 4 | 2  |     | 0.76 |
| K651298  | 4 | 21  | 13.5 |     | 4 | 3  |     | 0.88 |
| K651299  | 4 | 31  | 23.5 |     | 4 | 3  |     | 0.95 |
| K651300  | 4 | 40  | 32.5 |     | 4 | 3  |     | 1    |
| K651302  | 5 | 21  | 21   |     | 4 | 3  |     | 0.91 |
| K651303  | 5 | 50  | 50   |     | 4 | 3  |     | 1.11 |
| K651305  | 6 | 50  | 50   |     | 4 | 4  |     | 1.76 |
| K651306  | 6 | 75  | 75   |     | 4 | 4  |     | 2.26 |
| K651307  | 6 | 100 | 100  |     | 4 | 4  |     | 2.76 |
| K651308  | 8 | 75  | 75   |     | 4 | 4  |     | 2.43 |
| K651309  | 8 | 100 | 100  |     | 4 | 4  |     | 2.94 |

## Stylus: steel

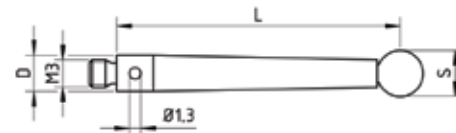
base: stainless steel  
ball: ruby



| Part No. | S | L  | ML | ML1 | D | DS  | DS1 | Mass |
|----------|---|----|----|-----|---|-----|-----|------|
| K651146  | 1 | 21 | 4  |     | 4 | 0.7 |     | 1.05 |
| K651147  | 2 | 21 | 8  |     | 4 | 1.4 |     | 1.06 |
| K651148  | 3 | 21 | 12 |     | 4 | 1.5 |     | 0.96 |
| K651149  | 4 | 21 | 17 |     | 4 | 2.5 |     | 1.38 |
| K651151  | 4 | 31 | 27 |     | 4 | 2.5 |     | 1.78 |
| K651150  | 5 | 21 | 21 |     | 4 | 2.5 |     | 1.48 |

## Stylus: steel

base: stainless steel  
ball: ruby



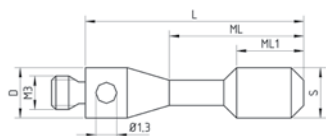
| Part No. | S | L  | ML | ML1 | D | DS | DS1 | Mass |
|----------|---|----|----|-----|---|----|-----|------|
| K651152  | 5 | 31 |    |     | 4 |    |     | 2.61 |

Unit: mm Mass: g

# Styli M3

## Cylinder stylus: steel

stainless steel



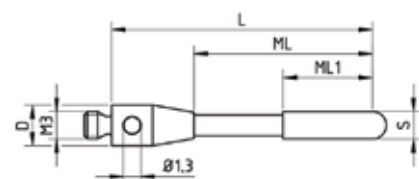
| Part No. | S   | L  | ML  | ML1 | D | DS | DS1 | Mass |
|----------|-----|----|-----|-----|---|----|-----|------|
| K651153  | 1.5 | 11 | 5   | 1.5 | 4 |    |     | 0.53 |
| K651154  | 3   | 13 | 8.5 | 4   | 4 |    |     | 0.79 |

## Cylinder stylus: ruby

base: stainless steel

stem: tungsten carbide

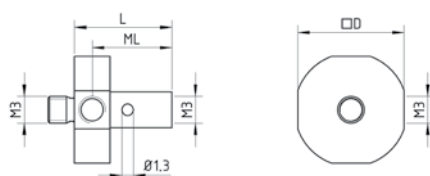
tip: ruby



| Part No. | S | L  | ML | ML1 | D | DS | DS1 | Mass |
|----------|---|----|----|-----|---|----|-----|------|
| K651155  | 2 | 19 | 13 | 6.5 | 4 |    |     | 0.83 |

## 5-way stylus holder

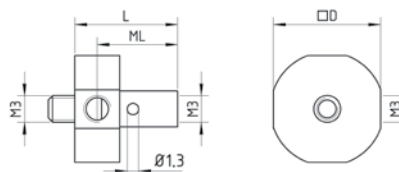
stainless steel, fixed



| Part No. | S | L  | ML | ML1 | D  | DS | DS1 | Mass |
|----------|---|----|----|-----|----|----|-----|------|
| K651167  |   | 11 | 9  |     | 12 |    |     | 3.28 |

## 5-way stylus holder

stainless steel, rotatable



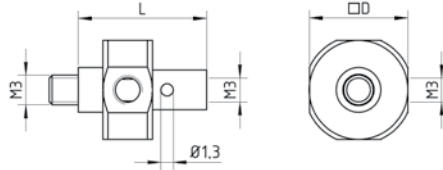
| Part No. | S | L    | ML | ML1 | D  | DS | DS1 | Mass |
|----------|---|------|----|-----|----|----|-----|------|
| K651168  |   | 11.5 | 9  |     | 12 |    |     | 4.24 |

Unit: mm Mass: g

# STYLII M3

## 5-way stylus holder

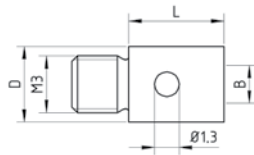
stainless steel, rotatable



| Part No. | S | L  | ML | ML1 | D  | DS | DS1 | Mass |
|----------|---|----|----|-----|----|----|-----|------|
| K651169  |   | 13 |    |     | 10 |    |     | 3.23 |

## Adaptor

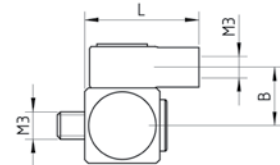
stainless steel



| Part No. | S | L  | ML | ML1 | D | DS | B  | Mass |
|----------|---|----|----|-----|---|----|----|------|
| K651170  |   | 5  |    |     | 4 |    | M2 | 0.41 |
| K651171  |   | 10 |    |     | 5 |    | M4 | 0.9  |

## Knuckle joint

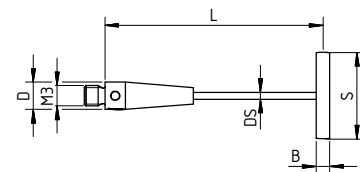
stainless steel



| Part No. | S | L    | ML | ML1 | D | DS | B   | Mass |
|----------|---|------|----|-----|---|----|-----|------|
| K651180  |   | 11.5 |    |     | 4 |    | 5.5 | 3.71 |

## Disk stylus: steel

base: stainless steel  
stem: tungsten carbide  
disk: hardened steel



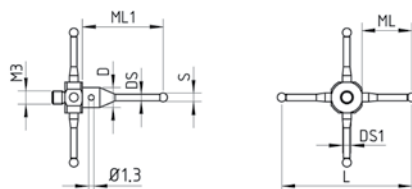
| Part No. | S    | L  | ML | ML1 | D | DS  | B   | Mass |
|----------|------|----|----|-----|---|-----|-----|------|
| K651172  | 12.7 | 31 |    |     | 4 | 3.5 | 2.3 | 4    |

Unit: mm Mass: g

# Styli M3

## 4-way stylus

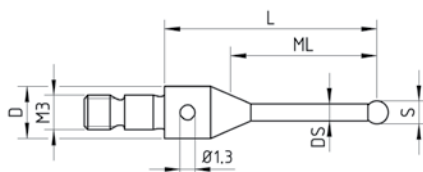
base: stainless steel  
stem: tungsten carbide  
stainless steel  
ball: ruby



| Part No. | S | L  | ML | ML1  | D   | DS  | DS1 | Mass |
|----------|---|----|----|------|-----|-----|-----|------|
| K651163  | 2 | 30 | 8  | 18.5 | 3H7 | 1.5 | 2   | 1.82 |
| K651164  | 2 | 50 | 12 | 28.5 | 3H7 | 1.5 | 2   | 2.58 |

## Stylus for multi-way stylus

base: stainless steel  
ball: ruby



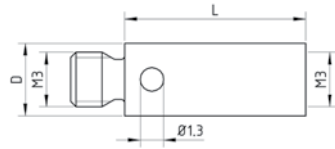
| Part No. | S | L    | ML | ML1 | D   | DS  | DS1 | Mass |
|----------|---|------|----|-----|-----|-----|-----|------|
| K651165  | 2 | 18.5 | 11 |     | 4.5 | 1.5 |     | 1.16 |
| K651166  | 2 | 28.5 | 13 |     | 4.5 | 1.5 |     | 1.75 |

Unit: mm Mass: g



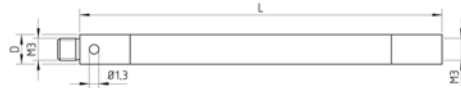
# STYLI M3

**Extension: steel**  
stainless steel



| Part No. | S | L  | ML | ML1 | D | DS | DS1 | Mass |
|----------|---|----|----|-----|---|----|-----|------|
| K651156  |   | 10 |    |     | 4 |    |     | 0.76 |
| K651157  |   | 20 |    |     | 4 |    |     | 1.58 |
| K651158  |   | 30 |    |     | 4 |    |     | 2.63 |
| K651159  |   | 35 |    |     | 4 |    |     | 3.16 |
| K651160  |   | 40 |    |     | 4 |    |     | 3.47 |
| K651161  |   | 50 |    |     | 4 |    |     | 4.44 |

**Extension: ceramic**  
end pieces: stainless steel  
stem: ceramic

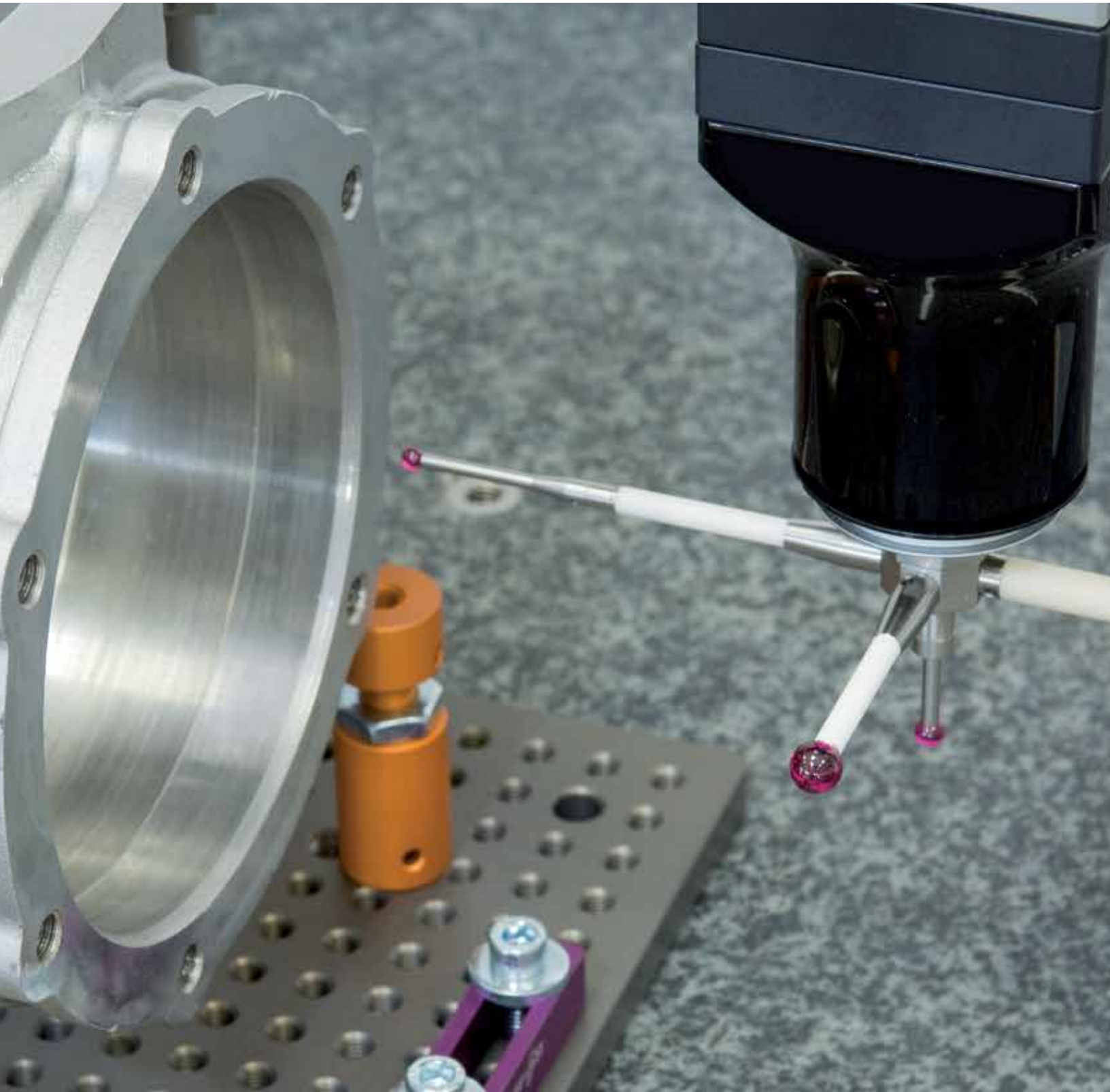


| Part No. | S | L  | ML | ML1 | D | DS | DS1 | Mass |
|----------|---|----|----|-----|---|----|-----|------|
| K651162  |   | 50 |    |     | 4 |    |     | 2.78 |

Unit: mm Mass: g

Components for measuring heads  
**WITH M4 THREAD**

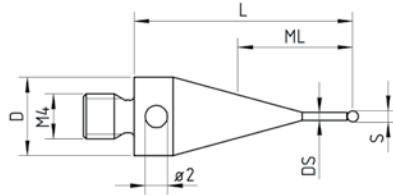
TP7  
SP600  
MPP310  
MTP2000



# STYLI M4

**Stylus: steel**

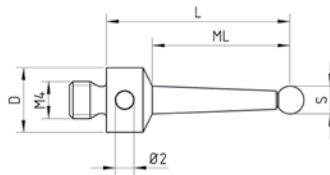
base: stainless steel  
ball: ruby



| Part No. | S | L    | ML   | ML1 | D | DS   | DS1 | Mass |
|----------|---|------|------|-----|---|------|-----|------|
| K651186  | 1 | 19.5 | 4    |     | 7 | 0.7  |     | 2.52 |
| K651187  | 2 | 19   | 8    |     | 7 | 1.35 |     | 2.25 |
| K651188  | 4 | 18   | 13   |     | 7 | 3    |     | 2.13 |
| K651185  | 5 | 17.5 | 12.5 |     | 7 | 3.5  |     | 2.39 |
| K651189  | 5 | 20   | 15   |     | 7 | 3.5  |     | 2.3  |
| K651192  | 5 | 50   | 36   |     | 7 | 4    |     | 4.72 |
| K651193  | 5 | 100  | 86   |     | 7 | 4    |     | 11.3 |
| K651190  | 6 | 20   | 15.5 |     | 7 | 4.5  |     | 3.51 |
| K651191  | 8 | 20   | 20   |     | 7 | 5.5  |     | 4.72 |

**Stylus: steel**

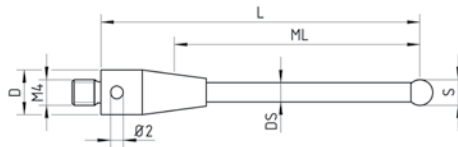
base: stainless steel  
ball: ruby



| Part No. | S | L  | ML   | ML1 | D | DS | DS1 | Mass |
|----------|---|----|------|-----|---|----|-----|------|
| K651194  | 3 | 20 | 14.5 |     | 7 |    |     | 2.03 |

**Stylus: ceramic**

base: stainless steel  
stem: ceramic  
ball: ruby

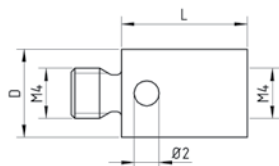


| Part No. | S | L   | ML   | ML1 | D | DS  | DS1 | Mass |
|----------|---|-----|------|-----|---|-----|-----|------|
| K651321  | 4 | 50  | 33.5 |     | 7 | 3   |     | 4.73 |
| K651404  | 6 | 50  | 36   |     | 7 | 4   |     | 5.09 |
| K651403  | 6 | 100 | 86   |     | 7 | 4   |     | 7.76 |
| K651182  | 8 | 50  | 50   |     | 7 | 4.5 |     | 6.06 |
| K651184  | 8 | 100 | 100  |     | 7 | 4.5 |     | 9.14 |

Unit: mm Mass: g

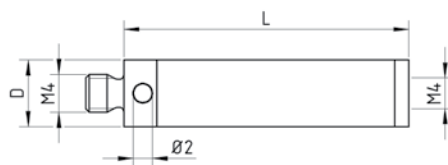
# Styli M4

**Extension: steel**  
stainless steel



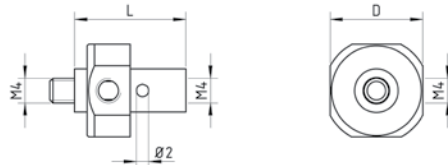
| Part No. | S | L  | ML | ML1 | D | DS | DS1 | Mass |
|----------|---|----|----|-----|---|----|-----|------|
| K651199  |   | 10 |    |     | 7 |    |     | 2.39 |
| K651200  |   | 15 |    |     | 7 |    |     | 3.81 |
| K651201  |   | 20 |    |     | 7 |    |     | 5.33 |
| K651202  |   | 30 |    |     | 7 |    |     | 8.52 |

**Extension: ceramic**  
end pieces: stainless steel  
stem: ceramic



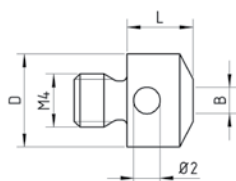
| Part No. | S | L   | ML | ML1 | D | DS | DS1 | Mass |
|----------|---|-----|----|-----|---|----|-----|------|
| K651203  |   | 30  |    |     | 7 |    |     | 5.09 |
| K651204  |   | 50  |    |     | 7 |    |     | 6.15 |
| K651205  |   | 100 |    |     | 7 |    |     | 10.6 |

**5-way stylus holder**  
stainless steel, rotatable



| Part No. | S | L  | ML | ML1 | D  | DS | DS1 | Mass |
|----------|---|----|----|-----|----|----|-----|------|
| K651206  |   | 18 |    |     | 15 |    |     | 12.1 |

**Adaptor**  
stainless steel

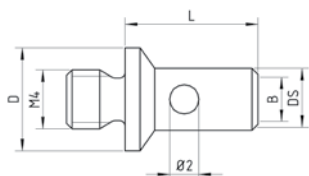


| Part No. | S | L | ML | ML1 | D | DS | B  | Mass |
|----------|---|---|----|-----|---|----|----|------|
| K651207  |   | 5 |    |     | 7 |    | M2 | 1.41 |

Unit: mm Mass: g

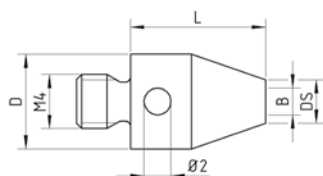
# STYLI M4

**Adaptor**  
stainless steel



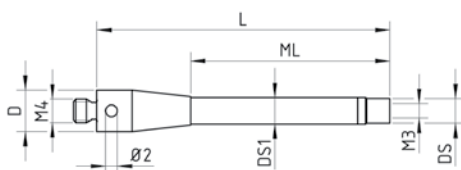
| Part No. | S | L  | ML | ML1 | D | DS  | B  | Mass |
|----------|---|----|----|-----|---|-----|----|------|
| K651208  |   | 9  |    |     | 7 | 4.2 | M3 | 1.45 |
| K651209  |   | 20 |    |     | 7 | 4.2 | M3 | 6.15 |

**Adaptor**  
stainless steel



| Part No. | S | L  | ML | ML1 | D | DS  | B  | Mass |
|----------|---|----|----|-----|---|-----|----|------|
| K651212  |   | 10 |    |     | 7 | 3.2 | M2 | 2.2  |
| K651213  |   | 10 |    |     | 7 | 4.2 | M3 | 2.2  |

**Adaptor ceramic**  
end pieces: stainless steel  
stem: ceramic



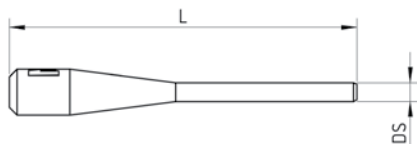
| Part No. | S | L   | ML | ML1 | D | DS  | DS1 | Mass |
|----------|---|-----|----|-----|---|-----|-----|------|
| K651214  |   | 50  | 34 |     | 7 | 4.2 | 4.5 | 4.4  |
| K651215  |   | 75  | 59 |     | 7 | 4.2 | 4.5 | 5.48 |
| K651216  |   | 100 | 84 |     | 7 | 4.2 | 4.5 | 6.71 |

Unit: mm Mass: g

# Accessories

## Pin spanner

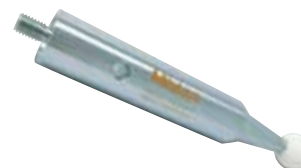
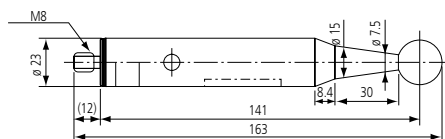
stainless steel or  
hardened steel



| Part No. | S | L  | ML | ML1 | D | DS  | DS1 | Mass |
|----------|---|----|----|-----|---|-----|-----|------|
| K651223  |   | 23 |    |     |   | 1.2 |     | 0.51 |

## Master ball

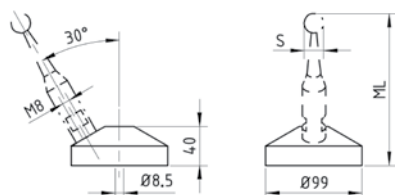
Base: Stainless Steel  
Tip: Ruby (ø 10 mm)  
Ceramic (ø 20 mm)



| Part No.  | S  | L | Description   | B | Mass |
|-----------|----|---|---|---|------|
| 06ABH830D | 10 |   | incl. factory certificate   |   |      |
| 06ABM941D | 20 |   | High-accuracy master ball (e.g. for LEGEX and FALCIO-Apex Series)<br>Incl. Calibration Certificate from Swiss National Laboratory METAS |   |      |
| 06ABM944D | 20 |   | Standard Master Ball  |   |      |

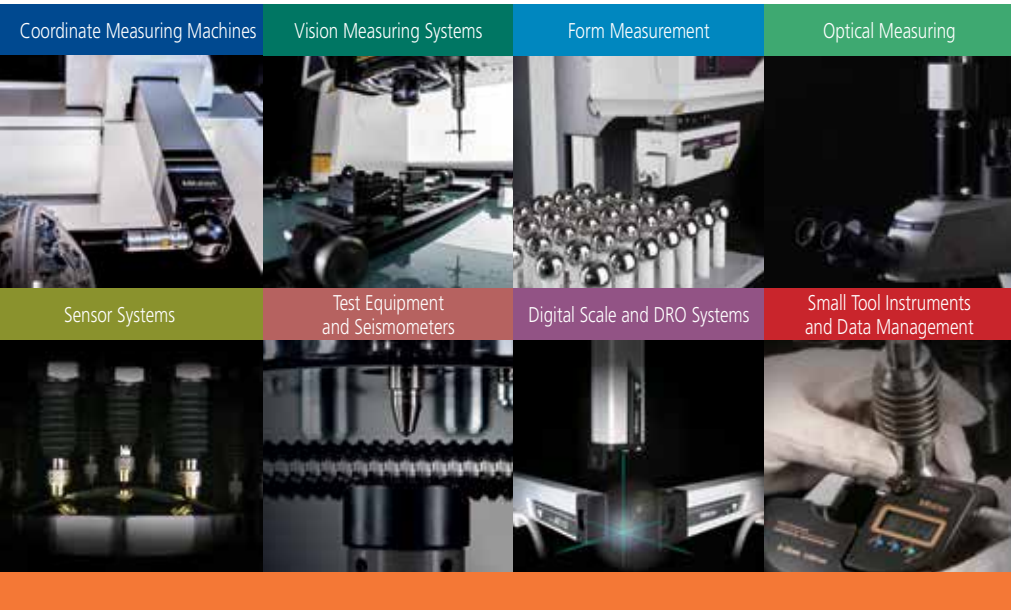
## Base plate for calibration sphere

stainless steel



| Part No. | S | ML  |  | B | Mass |
|----------|---|-----|--|---|------|
| K651222  |   | 141 |  |   |      |

Unit: mm Mass: g



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