

PROFESSIONAL MEASURING

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KERN & SOHN

SAUTER

SAUTER - A BRAND OF KERN & SOHN YOUR PARTNER FOR MEASUREMENT TECHNOLOGY



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METROLOGICAL TERMS

A BRIEF INTRODUCTION TO THE BASICS OF MEASUREMENT TECHNOLOGY



METROLOGICAL TERMS

- **Readability [d]**
Smallest readable value for a force gauge (numerical step)
- **Resolution**
Calculated from the quotient of maximum force / readability
- **Reproducibility**
Measure of agreement for repeat measurements under the same conditions

METROLOGICAL TERMS

- **Calibration of a measuring device (DAkkS calibration/factory calibration)**
 - Determining the accuracy of a measured variable without interfering with the measuring system
 - DAkkS calibration is a service monitored by the state to ensure high quality requirements according to DIN EN ISO 9000ff and other standards

CORE MARKETING MATERIAL YOUR SALES SUPPORT



CORE MARKETING MATERIAL

KERN Main Catalog Scales

- Scales
- Accessories
- Test weights
- Testing services



KERN medical scales

- Personal scales
- Veterinary scales
- Measuring instruments for the medical sector



KERN Optics

- Microscopes
- Microscope Cameras & Software
- Refractometer
- Polarimeter



SAUTER measuring instruments

- Force, material thickness,
- torque, hardness, sound, light
- thermometers
- Measuring cells, Color spectrometer



CORE MARKETING MATERIAL

KERN Flyer

- New products
- Special offers



KERN Banner

- For email signatures
- For websites



KERN anniversary brochure

- Overview of 255 years of scale construction in the Sauter family
- Perfect for customer acquisition, for new customers, offers etc.

SAUTER force measurement



FS Series



- 3 model series
 - FS 2/4 with internal cell (up to 500N), 2 (4) external cells possible
 - FS 2, 2 external cells possible
 - FS 4, 4 external cells possible

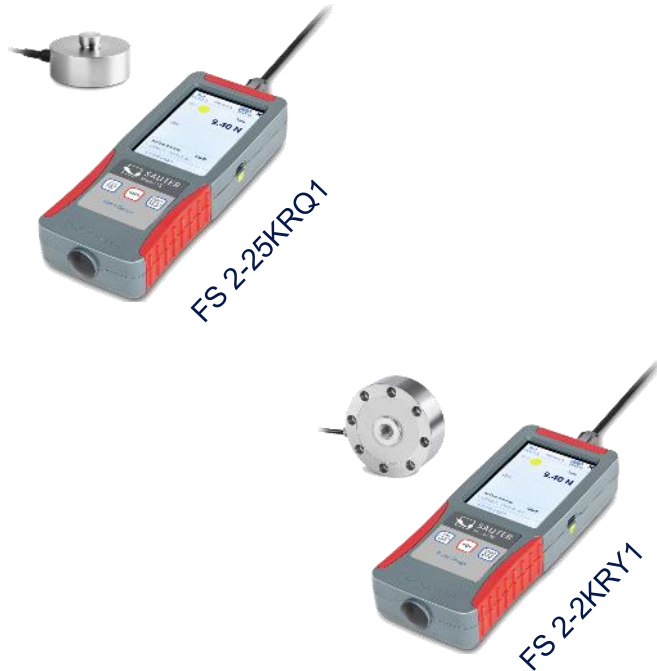


FS Basics



- Touchscreen, 3.5"
- Li-Ion battery
- Multilingual menu navigation
 - DE
 - EN
 - ES
 - IT
 - FR
- Internal memory 16 GB
- USB data transfer

FS Bundles



- Various combinations in stock.
- Preconfigured for immediate delivery
 - (the delivery time changes with additional services)
- Something in the range for every application

Applications



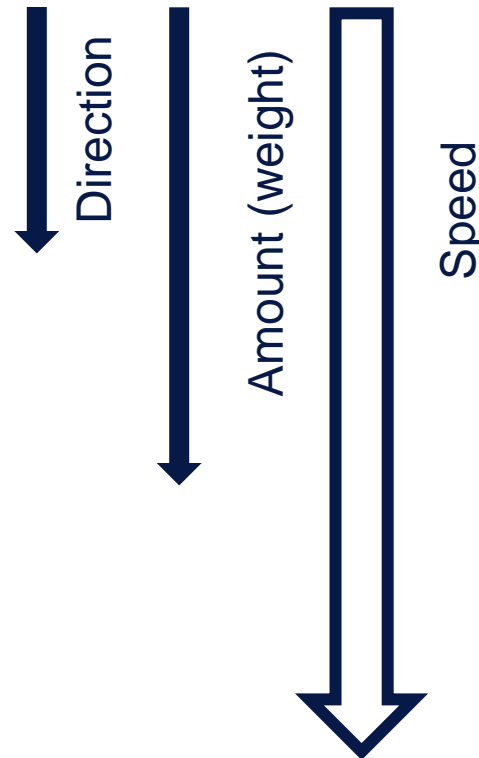
- Cable pull test
- Bending test
- Pressure test

Technical adaptation FH Series

- Customization of the electronics
 - Charging via USB-C plug (5V)
- Conversion of the 9-pin plug to USB C plug (1)
 - Data transmission
- Mini-DIN connector for connection to the TVM, TVS, TVO-S test benches



Basics



- Forces are directed physical quantities that can be represented by vectors.
- The SI unit of force is the Newton.

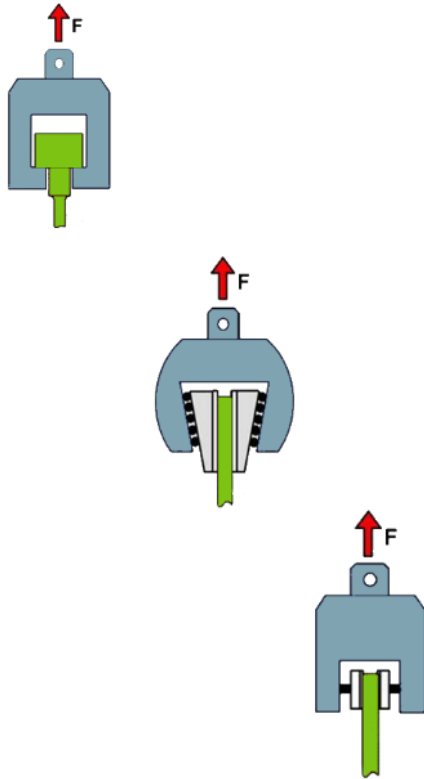
How do I hold my test object



- The right "holder" is important
- Sometimes "Standard" does not work
- And "worked" as a statement is not a solution for future measurements

We always look for the "best" solution

Form-fit/force-fit



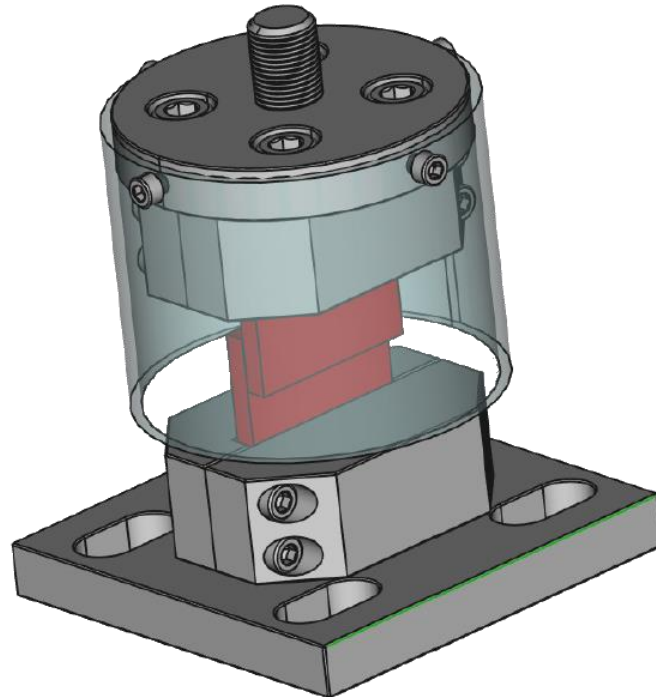
- Form-fit
- Force-locking

Clamps



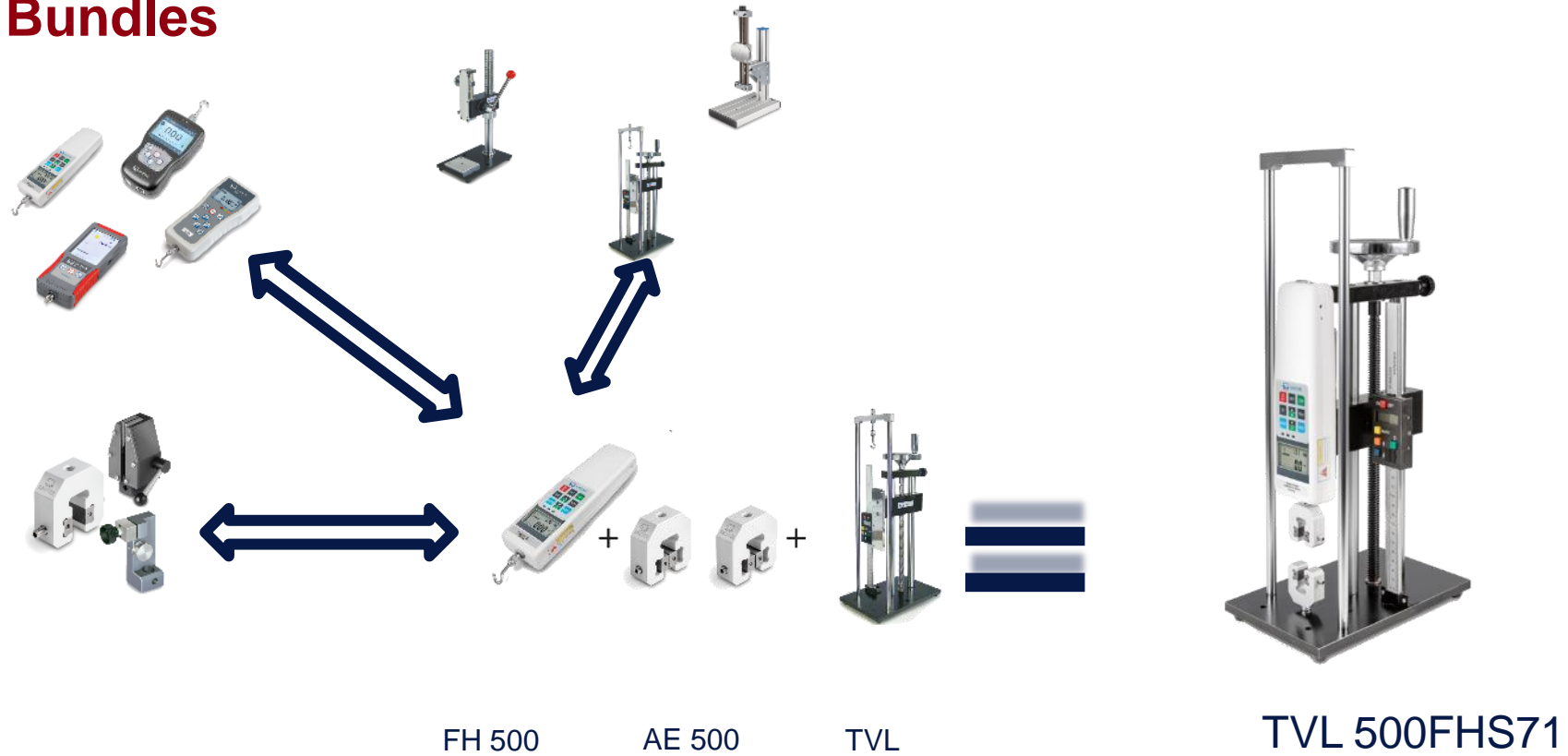
- Clamping clamps
- Wedge clamps
- Roller chip clamps
- Bending devices

Terminal search



- We offer the "best" solution
- For this we need
 - Technical drawing
 - Better pattern
- Choose from our range
- We can optionally design the solution for you

Bundles

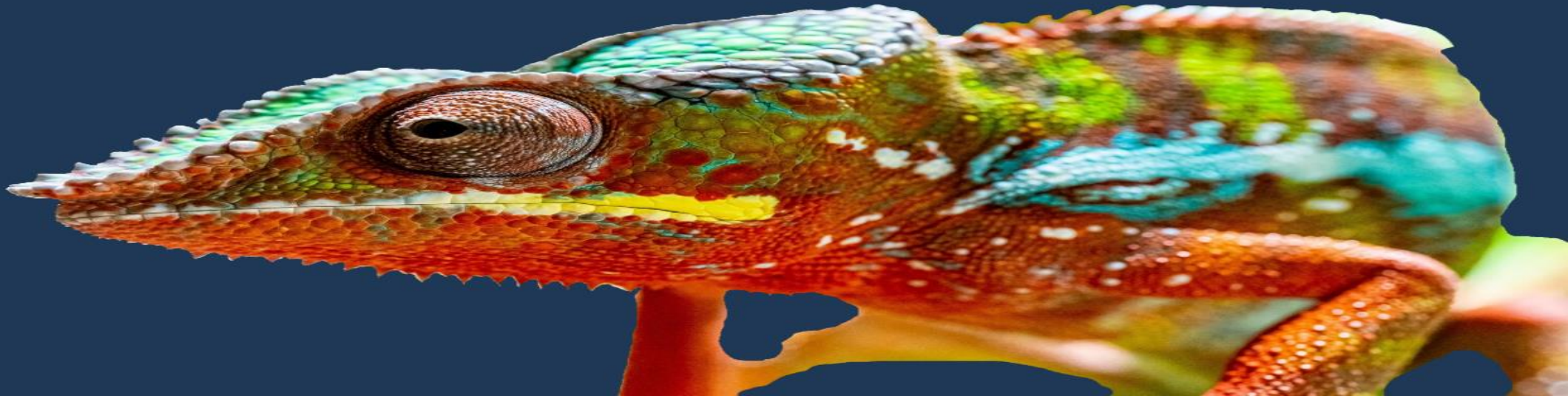


Test stand + length measuring device



- An article name
 - Test stand TVS or TVO-S
 - Suitable length measuring device
 - Fully assembled
- Directly from stock
 - Short delivery time
- Ending of the article number
 - XXX YYYY-**LD**
 - Example: TVO 500N500S-LD

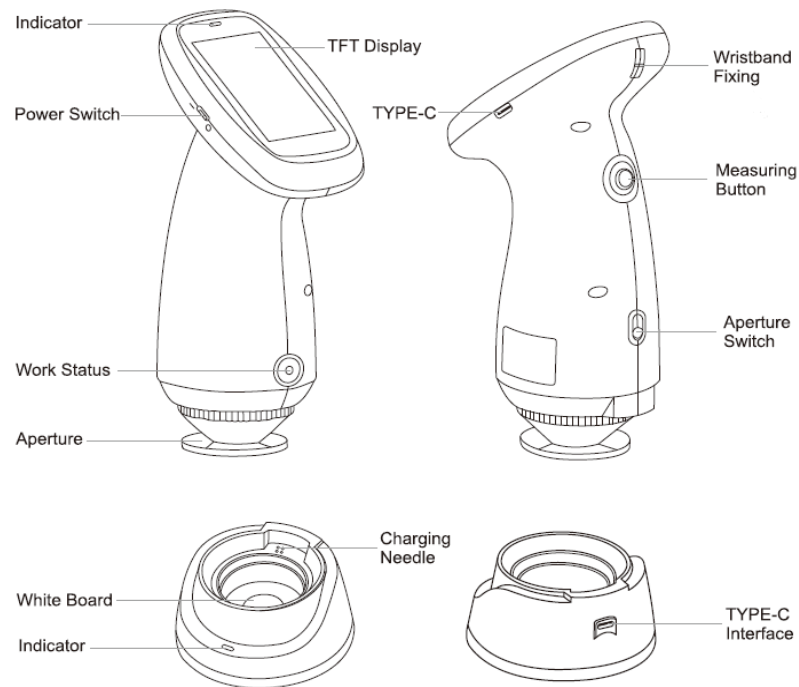
Color spectrometer



JCS 100, JCS 200



Functional start



- Internal memory
- Data transfer (USB, BT)
- Color graphic display
- Internal battery
- Charging station with calibration function
- Innovative design
- Evaluation software

Extensive setting options

- Optical geometry
 - 8° Conforms to CIE No.15,GB/T 3978,GB 2893,GB/T 18833,ISO7724-1,ASTM E1164,DIN5033 Part7
- LED light source
- Various attachments
 - MAV:Φ8mm/Φ10mm ; SAV:Φ4mm/Φ5mm ; LAV:1x3mm
- Extensive entry options
 - Color space
 - CIE LAB, XYZ, Yxy, LCh, CIE LUV,s-RGB, HunterLab, βxy, DIN Lab99
 - Formula for color difference
 - ΔE^*ab , ΔE^*uv , ΔE^*94 , $\Delta E^*cmc(2:1)$, $\Delta E^*cmc(1:1)$, ΔE^*00 , DIN $\Delta E99$, ΔE (Hunter)
 - Light source
 - D65,A,C,D50,D55,D75,F1,F2(CWF),F3,F4,F5,F6,F7(DLF),F8,F9,F10(TPL5),F11(TL84),F12(TL83/U30),U35,NBF,ID50,ID65
 - Observation angle
 - 2° and 10°

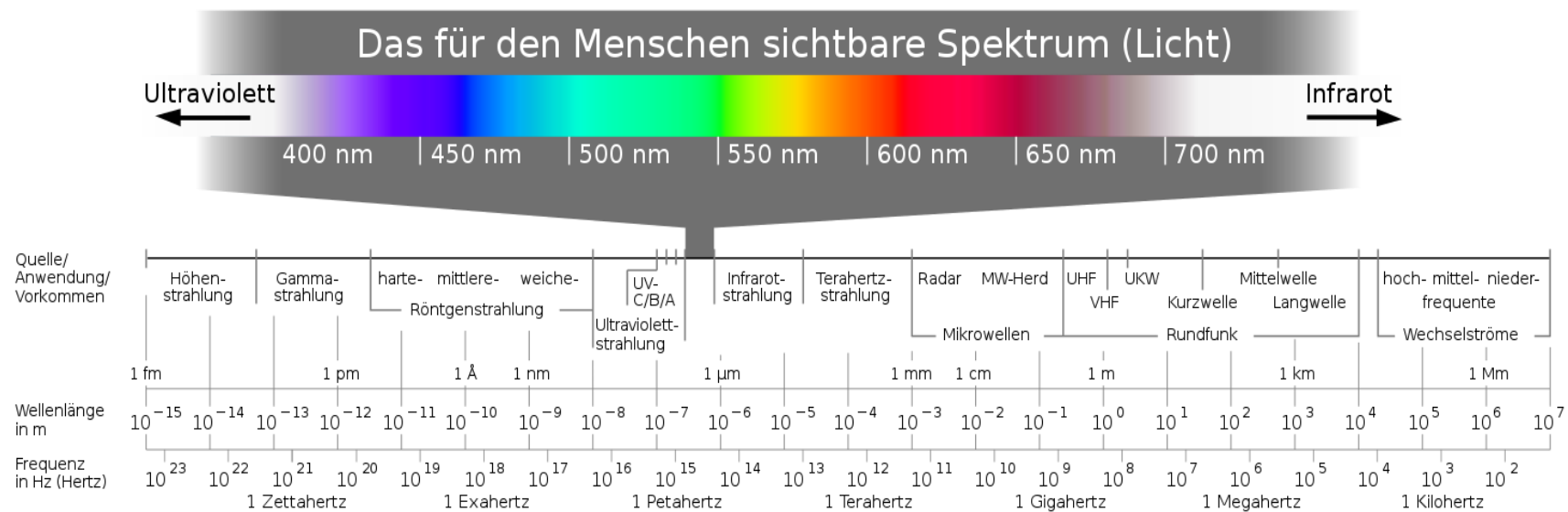
Field of application



- "Everywhere"
- Stable color measurement, comparisons, quality control
- In many industries
 - Automobile
 - Building materials
 - Cosmetics
 - Packaging
 - Print media
 - Food
 - Textile

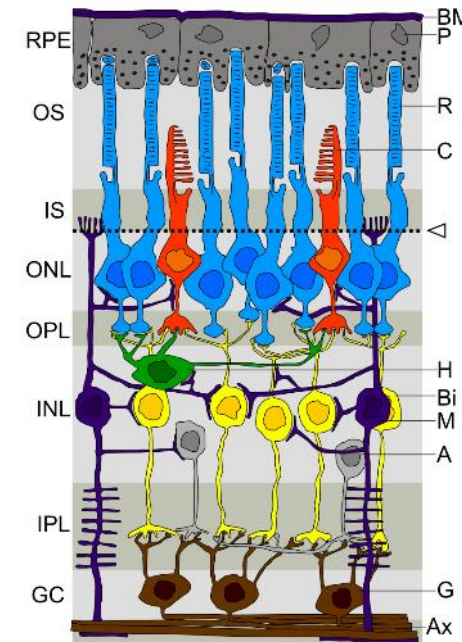
Definition

- Color is the visible part of the electromagnetic spectrum



How to determine color (human)

- For this purpose, humans have so-called light-sensitive receptor cells
- Humans have 3 different ones
 - Rods (image recognition)
 - Enable light-dark vision
 - Approx. 130,000,000 per eye (retina)
 - Cones (image recognition)
 - Photopic vision (vision with sufficient brightness)
 - Approx. 6,000,000 per eye
 - Photosensitive ganglion cells (regulation of day-night rhythm)

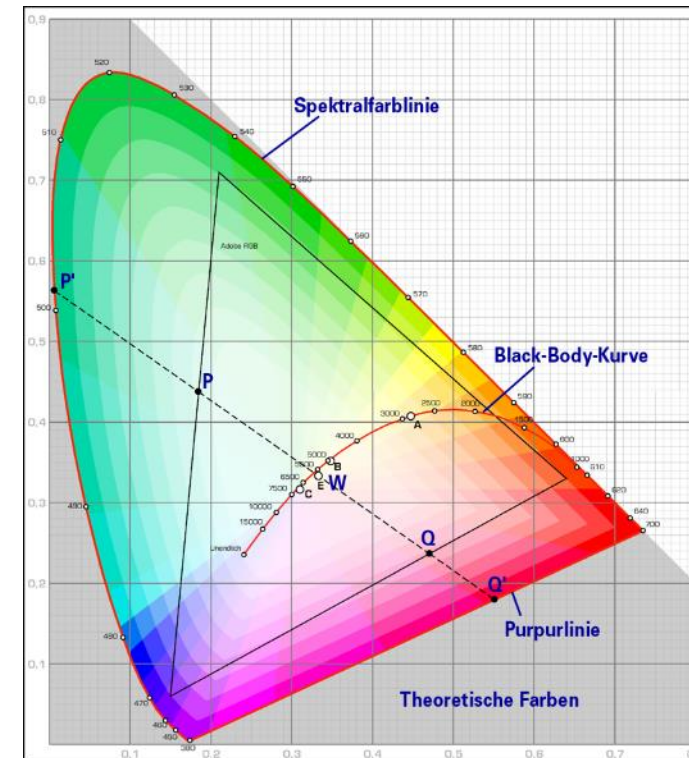


- "My car is the color of an apple"



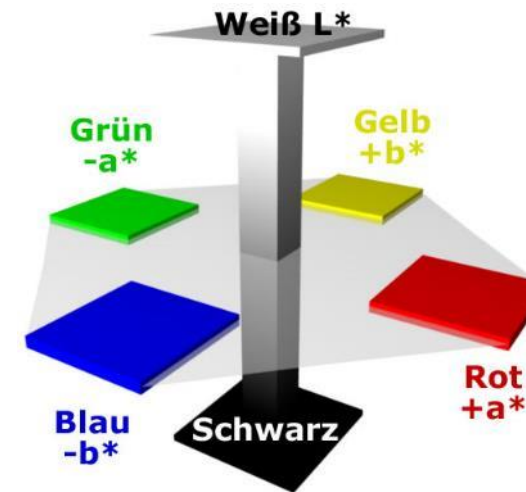
How to get around the subjective perception of color

- Standard tables that break down the color mathematically.
- CIELAB
 - Cartesian coordinates
- Outside CIE
 - DIN99



Color space

- CIELAB
 - Cartesian coordinates
 - L = Brightness from 0 (black) to white (100)
 - a^* = red-green axis, negative values green, positive values red
 - b^* = yellow-blue axis, negative values blue, positive values yellow.



Hardness

Shore



HEA 100, TI-HEA
HED 100, TI HE "D" (TI-HEA + TI-HE)



Why the HE series?



- Design
- Battery
- Precise (working on DaKKs version)
- Improved bracket in the test bench
- Test stand can only be used with additional weight for Shore A and D

Functions



- Average measurement
- Maximum measurement
- Clocked measurement (test time can be set)
- USB
- Internal battery
- 500 internal measured values

TI - Series

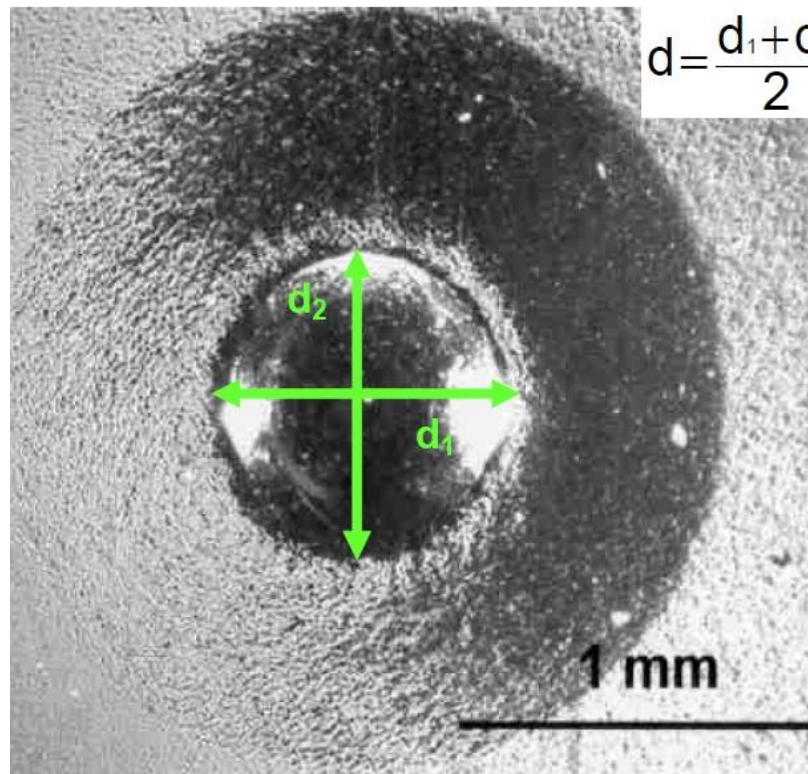


Shore A



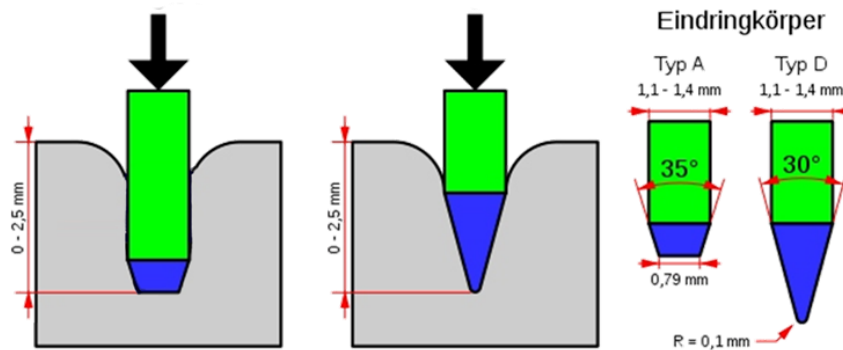
Shore D

Hardness definition

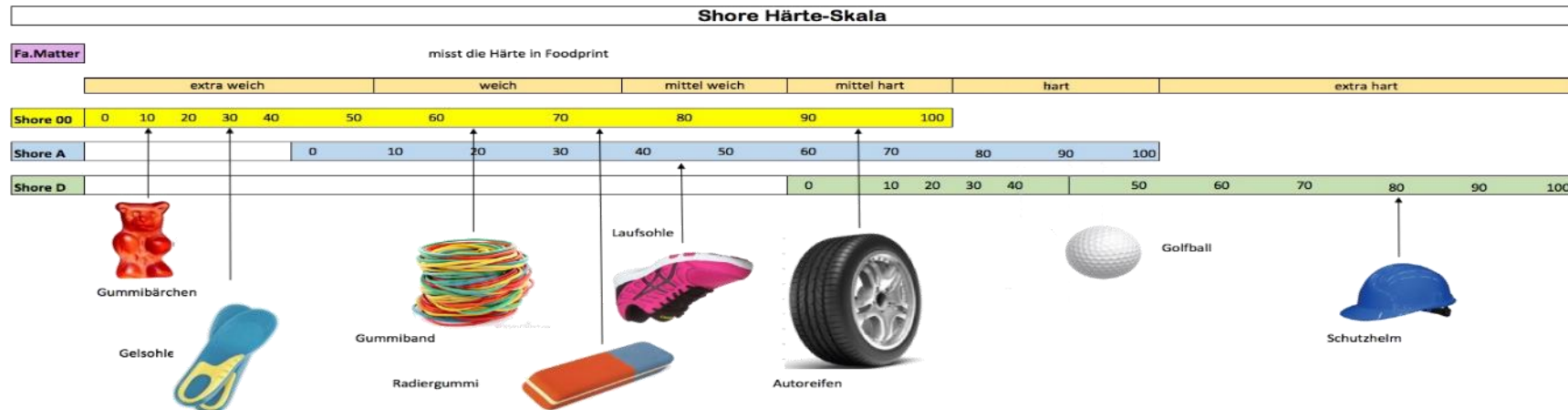


- Hardness is the mechanical resistance that a material offers to the mechanical penetration of another body.
- Is not a fundamental property of a material.
- There are only hardness ranges in which a material moves.
- Hardness can be influenced by heat
- Material becomes harder after heat treatment.

How Shore works



- A defined test specimen is inserted into the material with a defined force (approx. 10N for A and 0.50 N for D), the penetration depth is converted into the Shore hardness.
- Several tips, not interchangeable, as the force for pressing in also varies.



- The scales are overlapping.
- You cannot draw conclusions about the scale from the material.

Temperature measurement

IR thermometer



JIT 100 JIT 200



Equipment JIT 100, JIT 200



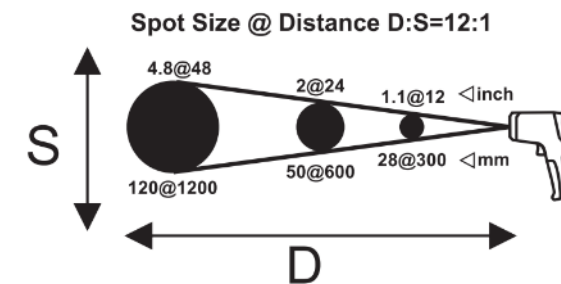
- Different temperature ranges
- Range of functions
 - MIN - MAX - AVG display
 - Hold function
 - Alarm function
 - °C/°F changeover
- Fast response time (≤ 250 ms)
- Adjustable emission value

JIT 100



-32°C to 420°C

- Single laser for targeting the measuring range (center point)
- Range of functions
 - MIN - MAX - AVG display
 - Hold function
 - Alarm function
 - °C/°F changeover
- Fast response time (≤ 250 ms)
- Adjustable emission value
- D:S ratio 12:1

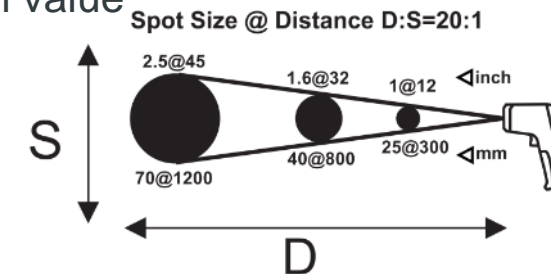


JIT 200

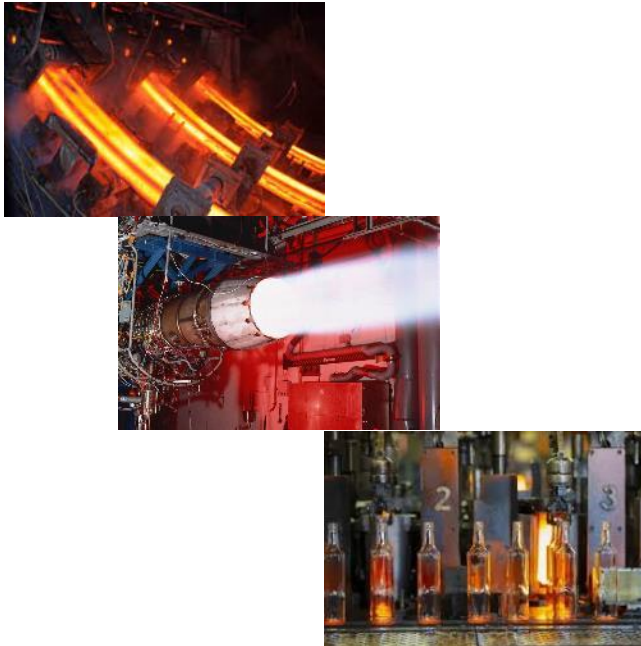


-32°C to 1100°C

- Dual laser for targeting the measuring range (gap)
- Range of functions
 - MIN - MAX - AVG display
 - Hold function
 - Alarm function
 - °C/°F changeover
 - Internal memory for 99 values with date and time
- Fast response time (≤ 250 ms)
- Adjustable emission value
- D:S ratio 20:1

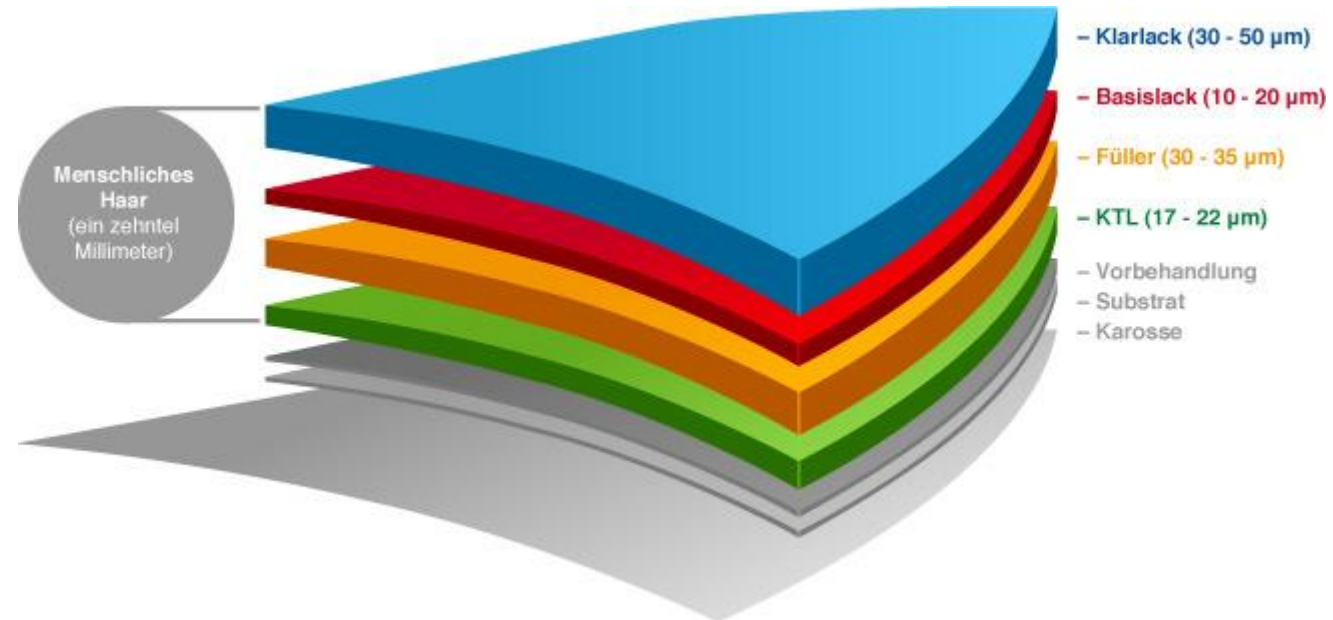


Area of application



- Metalworking industry
- Chemical industry
- Monitoring systems
- Troubleshooting
- Production of motors

Layer thickness




JCT 100




Why the JCT 100?



- Design
- Automatically rotating display (90° steps)
- Battery
- 
- USB
- Price (*compared to existing coating thickness gauges*)

Functions



- Measuring range up to 2000µm (2mm)
- Low tolerance $\pm (2\%H+2\mu\text{m})$
- BT 
- Color display
- Automatically rotating display
- MIN/MAX/AVG measurement
- Single / continuous measurement
- USB
- Internal battery

Once around



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THANK YOU FOR YOUR ATTENTION
TO FURTHER SUCCESSFUL COOPERATION



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