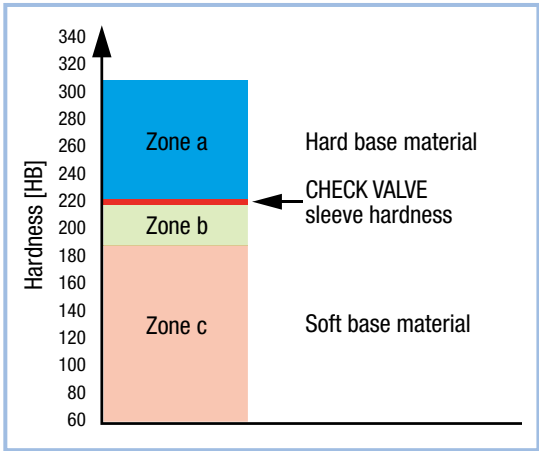


Anchorage principles

The required bore roughness is directly related to the hardness and the mechanical characteristics of the base material. Depending on the combination of the KOENIG CHECK VALVE® and the base material, anchorage takes place either by the groove profile of the KOENIG CHECK VALVE® sleeve biting into the base material or on anchorage to the surface roughness of the bore.

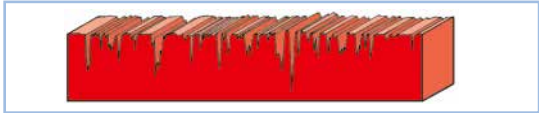
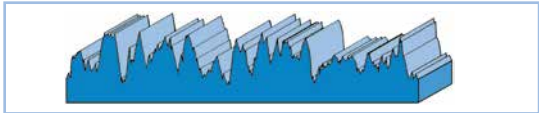
Note:
When selecting a KOENIG CHECK VALVE®, the bore roughness must always be adjusted according to the hardness of the base material. Anchorage between sleeve and base material is achieved when the sleeve is a minimum of HB = 30 greater than the base material. If the hardness difference is less, hole roughness of 10 to 30 µm is needed to achieve good anchorage for the rated working pressure differential values.



- Zone a – Hard base material (HB > 220)
To achieve the allowable working pressure, anchorage to the bore roughness of the base material is required.
Roughness $R_z = 10-30\ \mu\text{m}$.
- Zone b – Transition Zone (HB 190 - 220)
To achieve the allowable working pressure, anchorage to the bore roughness of the base material is required.
Roughness $R_z = 10-30\ \mu\text{m}$.
- Zone c – Soft base material (HB < 190)
Anchorage to the bore of the base material occurs automatically due to the serrations on the sleeve.

Reference:

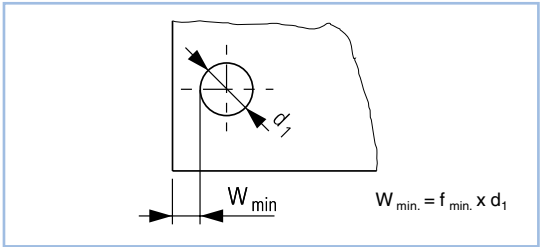
Base material of the installation		
Steel	Cast iron	Aluminum alloy
$R_z = 10-30\ \mu\text{m}$		$R_z = 4-30\ \mu\text{m}$



- Roughness profil**
Required roughness profile
The ideal bore roughness for anchorage is attained by drilling with a twist drill or a core drill.
- Undesirable roughness profile**
By reaming, a one-sided, smooth roughness profile is created. This is not desirable.

Wall thickness/Distance from edge

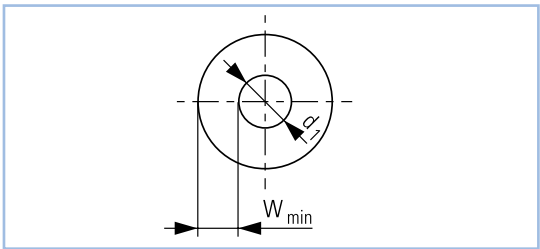
Distance to external wall: straight



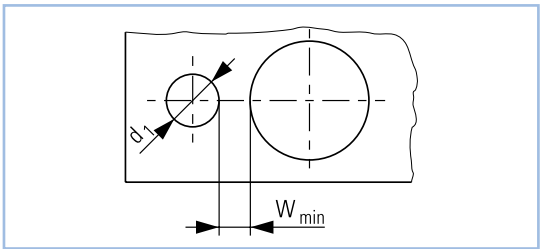
As the radial expansion of the KOENIG CHECK VALVE® sleeve occurs, the base material in which it anchors plastically deforms. The resultant strength, as well as the hydraulic pressure and temperature service conditions depending on the characteristics of the base material, require a minimum wall thickness or distance from edge.

The guideline values for minimum wall thickness and distance from edge [W_{min}] express these influencing factors. At these minimum values, only slight deformation on the exterior profile of the base material of less than 20 µm is likely. This does not affect the function of the KOENIG CHECK VALVE®. Below the guideline values [W_{min}] the possibility of overloading the base material exists, which can adversely influence the function of the KOENIG CHECK VALVE®. In such cases, tests must be conducted.

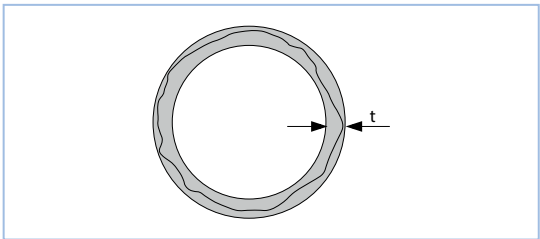
Distance to external wall: round



Wall thickness between bores:



Base material of the installation				
ETG-100 / 44SMn28 AISI 1144	EN 1563: GJS-600-3 ASTM A536: 80-60-03	AISI 303 EN 1.4305 X8CrNiS18-9	EN 1563: GJS-450-10 ASTM A536: 65-45-12	AlCu4Mg1 / EN AW-2024-T3 AA: 2024 T4/T6
Factor f_{min}				
0,4	0,5	0,5	0,8	0,5



Roundness tolerance

To ensure reliable functioning of the KOENIG CHECK VALVE® with regard to pressure performance and to ensure leak tight sealing, a **roundness tolerance of $t = 0,05 \text{ mm}$** must be held. By using a double-lipped twist drill, the called out hole and roundness tolerances are reached. Better tolerances, particularly for larger diameter holes, can be held by using a triple-lipped twist drill.

Conicity of the bore

Within the **effective anchorage area** of the KOENIG CHECK VALVE®, the bore must be in accordance with the **dimensional sheets**. The bore lead in can be chamfered up to a depth of **$0,25 \times d_1$** (check valve diameter) because this area has no significant effect on the anchorage function..