

hollow interior of the post shaft 3041 and the vertical post 41 during this vertical movement. During rotation of the spindle nut post 304, a relative movement takes place from the downwardly facing end face of the spindle nut post 304 relative to the upwardly facing end face of the vertical post 41. Of course, a spindle nut post 304 may also be introduced into a scaffold node 1 according to the second embodiment that is not part of the invention, or an embodiment according to the invention. When introducing a spindle nut post 304 into a scaffold node 1 according to the embodiment of the invention, the end of the post shaft 3041 remote from the spindle nut 3042 is supported on the load-absorption surface 251 of the inner projection 25.

Fig. 16 is a sectional side view of a scaffold portion 100 according to the invention with two inserted vertical posts 41. A scaffold node 1 according to the invention, in which a vertical post 41 is inserted in each case from above and from below, is arranged centrally. The end faces of these vertical posts 41 rest on an abruptly protruding inner projection 25 that is circumferentially arranged inside the connecting sleeve 2. In this case, the end surfaces of the vertical posts 41 touch the load-absorption surfaces 251 of the inner projection 25. Loads in the vertical direction are introduced into the inner projection 25 via the end face of the vertical post 41 inserted at the top of the scaffold node 1, for example. From the inner projection 25, the vertical loads are then conveyed directly to the vertical post 41 inserted at the bottom of the scaffold node 1, the upwardly facing end face of which post touches the inner projection 25 from below. The inner diameter of the connecting sleeve 2 is slightly larger than the outer diameter of the vertical posts 41. In the embodiment shown, there are no further inner projections 25a on the inner lateral surface 26. In order to further improve the centering in the horizontal direction in the scaffold node 1, however, it is also possible to arrange further inner projections 25a that do not protrude abruptly beyond the inner lateral surface 26. Such further inner projections 25a are shown and described for example in Fig. 1 to 7. Although the embodiments shown in these figures alone are not part of the invention, the further inner projections 25a according to the invention can be combined with the embodiments of a scaffold node 1 according to the invention shown in Fig. 8, 9, 10 and 16 to 19.

In Fig. 16, a horizontal bar 41 is fastened on the left-hand side of the scaffold node 1. This fastening takes place by a shaped element 421 of the horizontal bar 42 being inserted into a receiving recess 32 in the coupling element, designed as a connecting disc 3, of the scaffold node 1.

CLAIMS

1. Scaffold node (1) for connecting scaffold elements extending in different spatial directions, comprising

- a connecting sleeve (2) which is provided as a coupling point for two scaffold components, in particular for two vertical posts (41) or for a vertical post (41) and a spindle nut post (304),

- at least one coupling element which is used to connect the scaffold node to further scaffold components or scaffold elements,

wherein the connecting sleeve (2) has at least one inner projection (25) which protrudes radially inwardly beyond an inner lateral surface (26) of the connecting sleeve (2), wherein the at least one inner projection (25) protrudes abruptly relative to the inner lateral surface (26) of the connecting sleeve (2) and has at least one load-absorption surface (251) which is provided for absorbing loads oriented in the longitudinal direction of the connecting sleeve (2) from a scaffold component, and which has a projection height (28) from its outer edge adjacent to the inner lateral surface (26) to its inner edge that is oriented radially toward the inside of the connecting sleeve (2).

2. Scaffold node (1) according to claim 1, characterized in that the projection height (28) is equal to or greater than the wall thickness (27a) of the connecting sleeve (2).

3. Scaffold node (1) according to either of the preceding claims, characterized in that the coupling element (3) is designed as a connecting disc, the connecting disc (3) having a receiving surface (31) having a plurality of receiving recesses (32), and the receiving recesses (32) being provided for being connected to further scaffold elements, such as horizontal bars (42) or diagonal struts, and the connecting disc (3) being rigidly connected to the connecting sleeve (2), and the receiving surface (31) being substantially perpendicular to the overall length (23) of the connecting sleeve (2).

4. Scaffold node (1) according to either claim 1 or 2, characterized in that the coupling element (301a, 301b) is formed by two Cuplock elements that are collar-shaped, one Cuplock element (301a) being rigidly connected to the connecting sleeve (2) and the other Cuplock element (301b) being mounted so as to be axially displaceable relative to the connecting sleeve (2), and there being a gap between an inner diameter of the Cuplock elements (301a,

301b) and the outer diameter of the connecting sleeve (2), into which gap an end piece of a horizontal strut (4001) can be introduced.

5. Scaffold node (1) according to either claim 1 or 2, characterized in that the coupling element is formed by a plurality, in particular four, wedge-locking pockets (302) a wedge-shaped end region of a horizontal strut (4002) fitting into a wedge-locking pocket (302), and it being possible to insert the wedge-shaped end region of the horizontal strut (4002) into the wedge-locking pockets (302) and to secure it therein.

6. Scaffold node (1) according to either claim 1 or 2, characterized in that the coupling element is formed by a disc washer (303) which is rigidly connected to the connecting sleeve (2), and a plurality of substantially wedge-shaped recesses are introduced into the disc washer (303) which penetrate the disc washer (303), the wedge-shaped recesses being provided to be connected to horizontally extending scaffold elements, such as a horizontal strut (4003).

7. Scaffold node (1) according to claim 3, characterized in that the at least one inner projection (25) is a part of the connecting disc (3), the connecting disc (3) dividing the connecting sleeve (2) into two parts, and the end face of each part of the connecting sleeve (2) being rigidly connected to a receiving surface (31) of the connecting disc (3).

8. Scaffold node (1) according to claim 7, characterized in that the connecting disc (3) has an in particular circular recess (39), and at least one portion outside this recess (39) forms the inner projection (25).

9. Scaffold node (1) according to claim 3, characterized in that the connecting sleeve (2) is made in one piece and the inner projection (25) is formed by an impression that extends radially around the circumference of the connecting sleeve, and the connecting disc is fastened to the outer lateral surface of the connecting sleeve (2).

10. Scaffold node (1) according to any of the preceding claims, characterized in that at least one further inner projection (25a) is formed by indenting the wall (27) of the connecting sleeve (2), the further inner projection (25a) having a constant projection height (28) inside the connecting sleeve (2) in the longitudinal direction of the connecting sleeve (2), or the further inner projection (25a), starting from the inner lateral surface (26) of the connecting sleeve (2), rising steadily up to the projection height (28) and falling.

11. Scaffold node (1) according to claim 10, characterized in that the at least one further inner projection (25a) is designed as a longitudinal bead which extends over the overall length (23) of the connecting sleeve (2).

12. Scaffold node (1) according to claim 11, characterized in that two, preferably three, more preferably four further inner projections (25a) designed as longitudinal beads are provided which are distributed uniformly on the inner lateral surface (26) in the circumferential direction.

13. Scaffold node (1) according to claim 10, characterized in that the at least one further inner projection (25a) is designed as a stamping point which has a stamping center and which, starting from the inner lateral surface (26), steadily rises up to the projection height (28) in all radial directions around the stamping center, the projection height (28) being located in the stamping center.

14. Scaffold node (1) according to claim 13, characterized in that a plurality of inner projections (25a) designed as stamping points are provided which are arranged in at least two rings, the rings being parallel to the receiving surface (31) of the connecting disc and the rings being mutually spaced, and the inner projections (25a) along the rings being uniformly distributed on the inner lateral surface (26) in the circumferential direction.

15. Scaffold node (1) according to claim 14, characterized in that four rings of further inner projections (25a) designed as stamping points are provided, two of the rings being arranged in the region of the end of the connecting sleeve (2) and two further rings being adjacent to the connecting disc (3).

16. Scaffold node (1) according to any of claims 3 or 9 to 15, characterized in that the connecting sleeve is made in one piece, and the connecting disc is fastened, in particular welded, to the outer lateral surface of the connecting sleeve.

17. Scaffold node (1) according to any of the preceding claims, characterized in that the connecting sleeve (2) has an insertion bevel (29) at at least one of its end faces.

18. Scaffold node (1) according to any of the preceding claims, characterized in that the overall length (23) of the connecting sleeve (2) is greater than the sleeve diameter (24) by a factor of from 2 to 5.

19. Scaffold node (1) according to any of claims 3 or 7 to 18, characterized in that the connecting disc (3) is arranged centrally in the longitudinal direction of the connecting sleeve (2).

20. Scaffold node (1) according to any of claims 3, 7, 8 or 10 to 18, characterized in that the overall length (23) of the connecting sleeve (2) on each side of the connecting disc (3) to the end of the connecting sleeve (2) is greater than the sleeve diameter (24) by the factor of 0.9 to 2.4.

21. Scaffold node according to any of claims 3, 7, 8 or 10 to 20, characterized in that the receiving recesses (32), in the plan view of the connecting disc (3) and the receiving surface (31), are arranged regularly, in particular at regular angles with respect to one another based on the axis of symmetry of the connecting sleeve (2), in the circumferential direction.

22. Scaffold node according to any of the preceding claims, characterized in that the connecting sleeve (2) has, at each end in its end regions, at least one locking opening (21) which is directed radially inwardly through the wall (27) of the connecting sleeve (2).

23. Scaffold node according to claim 22, characterized in that the locking opening (21) is arranged at a distance from the receiving surface (31) of the connecting disc (3) that corresponds at least to the factor of 0.5 of the sleeve diameter (24), the locking opening (21) being arranged so as to be offset from the receiving recess (32) at an angle of 45° in the circumferential direction of the connecting sleeve.

24. Scaffold portion (100), comprising at least one scaffold node (1) according to any of the preceding claims, further comprising

- at least one vertical post (41), wherein the vertical post (41) is inserted into the connecting sleeve (2) of the scaffold node (1),
- at least one horizontal bar (42) or a horizontal strut (4001, 4002, 4003), which is connected to the coupling element of the scaffold node (1).

25. Scaffold portion (100) according to the preceding claim 24, characterized in that the coupling element (3) is designed as a connecting disc, the connecting disc (3) having a receiving surface (31) having a plurality of receiving recesses (32), and the receiving recesses (32) being provided for being connected to further scaffold elements, such as horizontal bars (42) or diagonal struts, and the connecting disc (3) being rigidly connected to the connecting

sleeve (2), and the receiving surface (31) being substantially perpendicular to the overall length (23) of the connecting sleeve (2), and a horizontal bar (42) being form-fittingly connected to one of the receiving recesses (32) in the connecting disc (3) of the scaffold node (1), a shaped element (421) arranged at the end of the horizontal bar (42) being inserted into one of the receiving recesses (32) and at least part of the horizontal bar (42) end face that faces the scaffold node (1) abutting the connecting sleeve (2).

26. Scaffold portion (100) according to either claim 24 or claim 25, characterized in that the vertical post (41) has at least one securing opening (411) at its end close to the scaffold node (1), the securing opening (411) corresponding in shape and size to the locking opening (21) of the scaffold node (1), and a plug-in (5) element being provided which is introduced into the securing opening (411) and the locking opening (21) and both axially and radially secures the vertical post (41) and scaffold node (1) with respect to one another.

27. Scaffold portion according to any of claims 24 to 26, characterized in that there is play between the plug-in element (5) and the locking opening and/or between the plug-in element (5) and the securing opening (411), so that the vertical post (41) in the connecting sleeve (2) is movable in the longitudinal direction of said sleeve within the limits of the play.

28. Scaffold portion according to any of claims 24 to 27, characterized in that at least one spindle nut post (304) is provided which comprises a tubular post shaft (3041) with a spindle nut (3042) which is fastened thereto in an axially flush manner, the post shaft (3041) being inserted into the connecting sleeve (2).

29. Scaffold portion according to claim 28, characterized in that the end of the post shaft (3041) remote from the spindle nut (3042) is supported on the inner projection (25) of the connecting sleeve (2).

30. Scaffold portion according to either claim 28 or claim 29, characterized in that the length of the post shaft (3041) corresponds to a factor of from 0.5 to 0.8 of the overall length (23) of the connecting sleeve (2).

hollow interior of the post shaft 3041 and the vertical post 41 during this vertical movement. During rotation of the spindle nut post 304, a relative movement takes place from the downwardly facing end face of the spindle nut post 304 relative to the upwardly facing end face of the vertical post 41. Of course, a spindle nut post 304 may also be introduced into a scaffold node 1 according to the second embodiment that is not part of the invention, or an embodiment according to the invention. When introducing a spindle nut post 304 into a scaffold node 1 according to the embodiment of the invention, the end of the post shaft 3041 remote from the spindle nut 3042 is supported on the load-absorption surface 251 of the inner projection 25.

Fig. 16 is a sectional side view of a scaffold portion 100 according to the invention with two inserted vertical posts 41. A scaffold node 1 according to the invention, in which a vertical post 41 is inserted in each case from above and from below, is arranged centrally. The end faces of these vertical posts 41 rest on an abruptly protruding inner projection 25 that is circumferentially arranged inside the connecting sleeve 2. In this case, the end surfaces of the vertical posts 41 touch the load-absorption surfaces 251 of the inner projection 25. Loads in the vertical direction are introduced into the inner projection 25 via the end face of the vertical post 41 inserted at the top of the scaffold node 1, for example. From the inner projection 25, the vertical loads are then conveyed directly to the vertical post 41 inserted at the bottom of the scaffold node 1, the upwardly facing end face of which post touches the inner projection 25 from below. The inner diameter of the connecting sleeve 2 is slightly larger than the outer diameter of the vertical posts 41. In the embodiment shown, there are no further inner projections 25a on the inner lateral surface 26. In order to further improve the centering in the horizontal direction in the scaffold node 1, however, it is also possible to arrange further inner projections 25a that do not protrude abruptly beyond the inner lateral surface 26. Such further inner projections 25a are shown and described for example in Fig. 1 to 7. Although the embodiments shown in these figures alone are not part of the invention, the further inner projections 25a according to the invention can be combined with the embodiments of a scaffold node 1 according to the invention shown in Fig. 8, 9, 10 and 16 to 19.

In Fig. 16, a horizontal bar 42 is fastened on the left-hand side of the scaffold node 1. This fastening takes place by a shaped element 421 of the horizontal bar 42 being inserted into a receiving recess 32 in the coupling element, designed as a connecting disc 3, of the scaffold node 1.

CLAIMS

1. A scaffold node (1) for connecting scaffold elements extending in different spatial directions, comprising:

a connecting sleeve (2) which is provided as a coupling point for two scaffold components, in particular for two vertical posts (41) or for a vertical post (41) and a spindle nut post (304),

at least one coupling element which is used to connect the scaffold node to further scaffold components or scaffold elements,

in which the connecting sleeve (2) has at least one inner projection (25) which protrudes radially inwardly beyond an inner lateral surface (26) of the connecting sleeve (2), in which the at least one inner projection (25) protrudes abruptly relative to the inner lateral surface (26) of the connecting sleeve (2) and has at least one load-absorption surface (251) which is provided for absorbing loads oriented in the longitudinal direction of the connecting sleeve (2) from a scaffold component, and which has a projection height (28) from its outer edge adjacent to the inner lateral surface (26) to its inner edge that is oriented radially toward the inside of the connecting sleeve (2), in which the coupling element (3) is designed as a connecting disc, the connecting disc (3) having a receiving surface (31) having a plurality of receiving recesses (32), and the receiving recesses (32) being provided for being connected to further scaffold elements, such as horizontal bars (42) or diagonal struts, and the connecting disc (3) being rigidly connected to the connecting sleeve (2), and the receiving surface (31) being substantially perpendicular to the overall length (23) of the connecting sleeve (2), characterized in that the at least one inner projection (25) is a part of the connecting disc (3), the connecting disc (3) dividing the connecting sleeve (2) into two parts, and the end face of each part of the connecting sleeve (2) being rigidly connected to a receiving surface (31) of the connecting disc (3).

2. A scaffold node (1) according to Claim 1, characterized in that the projection height (28) is equal to or greater than the wall thickness (27a) of the connecting sleeve (2).

3. A scaffold node (1) according to Claim 1 or 2, characterized in that the connecting disc (3) has an in particular circular recess (39), and at least one portion outside this recess (39) forms the inner projection (25).

4. A scaffold node (1) according to Claim 1, 2 or 3, characterized in that at least one further inner projection (25a) is formed by indenting the wall (27) of the connecting sleeve (2), the further inner projection (25a) having a constant projection height (28) inside the connecting sleeve (2) in the longitudinal direction of the connecting sleeve (2), or the further
5 inner projection (25a), starting from the inner lateral surface (26) of the connecting sleeve (2), rising steadily up to the projection height (28) and falling.
5. A scaffold node (1) according to Claim 4, characterized in that the at least one further inner projection (25a) is designed as a longitudinal bead which extends over the overall length (23) of the connecting sleeve (2).
- 10 6. A scaffold node (1) according to Claim 5, characterized in that two, preferably three, more preferably four further inner projections (25a) designed as longitudinal beads are provided which are distributed uniformly on the inner lateral surface (26) in the circumferential direction.
- 15 7. A scaffold node (1) according to Claim 4, characterized in that the at least one further inner projection (25a) is designed as a stamping point which has a stamping center and which, starting from the inner lateral surface (26), steadily rises up to the projection height (28) in all radial directions around the stamping center, the projection height (28) being located in the stamping center.
- 20 8. A scaffold node (1) according to Claim 7, characterized in that a plurality of inner projections (25a) designed as stamping points are provided which are arranged in at least two rings, the rings being parallel to the receiving surface (31) of the connecting disc and the rings being mutually spaced, and the inner projections (25a) along the rings being uniformly distributed on the inner lateral surface (26) in the circumferential direction.
- 25 9. A scaffold node (1) according to Claim 8, characterized in that four rings of further inner projections (25a) designed as stamping points are provided, two of the rings being arranged in the region of the end of the connecting sleeve (2) and two further rings being adjacent to the connecting disc (3).
10. A scaffold node (1) according to any preceding claim, characterized in that the connecting sleeve (2) has an insertion bevel (29) at at least one of its end faces.

11. A scaffold node (1) according to any preceding claim, characterized in that the overall length (23) of the connecting sleeve (2) is greater than the sleeve diameter (24) by a factor of from 2 to 5.

12. A scaffold node (1) according to any preceding claim, characterized in that the
5 connecting disc (3) is arranged centrally in the longitudinal direction of the connecting sleeve (2).

13. A scaffold node (1) according to any preceding claim, characterized in that the overall length (23) of the connecting sleeve (2) on each side of the connecting disc (3) to the end of the connecting sleeve (2) is greater than the sleeve diameter (24) by the factor of 0.9 to 2.4.

10 14. A scaffold node according to any preceding claim, characterized in that the receiving recesses (32), in the plan view of the connecting disc (3) and the receiving surface (31), are arranged regularly, in particular at regular angles with respect to one another based on the axis of symmetry of the connecting sleeve (2), in the circumferential direction.

15 15. A scaffold node according to any preceding claim, characterized in that the connecting sleeve (2) has, at each end in its end regions, at least one locking opening (21) which is directed radially inwardly through the wall (27) of the connecting sleeve (2).

16. A scaffold node according to Claim 15, characterized in that the locking opening (21) is arranged at a distance from the receiving surface (31) of the connecting disc (3) that corresponds at least to the factor of 0.5 of the sleeve diameter (24), the locking opening (21)
20 being arranged so as to be offset from the receiving recess (32) at an angle of 45° in the circumferential direction of the connecting sleeve.

17. A scaffold portion (100), comprising at least one scaffold node (1) according to any preceding claim, further comprising

25 at least one vertical post (41), in which the vertical post (41) is inserted into the connecting sleeve (2) of the scaffold node (1),

at least one horizontal bar (42) or a horizontal strut (4001, 4002, 4003), which is connected to the coupling element of the scaffold node (1).

18. A scaffold portion (100) according to Claim 17, characterized in that the coupling element (3) is designed as a connecting disc, the connecting disc (3) having a receiving

surface (31) having a plurality of receiving recesses (32), and the receiving recesses (32) being provided for being connected to further scaffold elements, such as horizontal bars (42) or diagonal struts, and the connecting disc (3) being rigidly connected to the connecting sleeve (2), and the receiving surface (31) being substantially perpendicular to the overall length (23) of the connecting sleeve (2), and a horizontal bar (42) being form-fittingly connected to one of the receiving recesses (32) in the connecting disc (3) of the scaffold node (1), a shaped element (421) arranged at the end of the horizontal bar (42) being inserted into one of the receiving recesses (32) and at least part of the horizontal bar (42) end face that faces the scaffold node (1) abutting the connecting sleeve (2).

19. A scaffold portion (100) according to Claim 17 or 18, characterized in that the vertical post (41) has at least one securing opening (411) at its end close to the scaffold node (1), the securing opening (411) corresponding in shape and size to the locking opening (21) of the scaffold node (1), and a plug-in (5) element being provided which is introduced into the securing opening (411) and the locking opening (21) and both axially and radially secures the vertical post (41) and scaffold node (1) with respect to one another.

20. A scaffold portion according to Claim 19, characterized in that there is play between the plug-in element (5) and the locking opening and/or between the plug-in element (5) and the securing opening (411), so that the vertical post (41) in the connecting sleeve (2) is movable in the longitudinal direction of the sleeve within the limits of the play.

21. A scaffold portion according to any of Claims 17 to 20, characterized in that at least one spindle nut post (304) is provided which comprises a tubular post shaft (3041) with a spindle nut (3042) which is fastened thereto in an axially flush manner, the post shaft (3041) being inserted into the connecting sleeve (2).

22. A scaffold portion according to Claim 21, characterized in that the end of the post shaft (3041) remote from the spindle nut (3042) is supported on the inner projection (25) of the connecting sleeve (2).

23. A scaffold portion according to Claim 21 or 22, characterized in that the length of the post shaft (3041) corresponds to a factor of from 0.5 to 0.8 of the overall length (23) of the connecting sleeve (2).