Table 1: Summary of Collected 840 RC deep beams database.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Ref.** | **#** | ***a/d*** | ***fc′* (MPa)** | ***ρl* (%)** | ***fy* (MPa)** | ***ρv* (%)** | ***fyv* (MPa)** | ***ρh* (%)** | ***fyh* (MPa)** | **vn =Vu/bwh (MPa)** |
| [1] | 55 | 1.16-2.43 | 14.0-48.0 | 0.98-3.42 | 321-370 | 0.0-1.22 | 0-331 | 0 | 0-331 | 1.08-4.69 |
| [2] | 14 | 1.53-1.53 | 17.0-25.0 | 2.72-4.25 | 302-315 | 0.0-0.95 | 0-326 | 0 | 0 | 2.47-4.68 |
| [3] | 24 | 0.35-1.18 | 19.0-25.0 | 0.52-1.73 | 287-287 | 0.0-2.45 | 0-303 | 0.0-2.45 | 0-303 | 3.8-5.66 |
| [4] | 52 | 1.0-2.08 | 16.0-23.0 | 1.94-1.94 | 431-431 | 0.0-1.25 | 484-484 | 0.0-0.91 | 484-484 | 2.01-5.07 |
| [5] | 8 | 0.42-1.53 | 23.0-33.0 | 0.27-1.15 | 580-580 | 0.2-0.24 | 550-550 | 0.35-0.51 | 550-550 | 2.21-7.5 |
| [6] | 16 | 1.0-1.0 | 13.9-26.4 | 1.08-1.52 | 420-420 | 0 | 0 | 0 | 0 | 1.98-4.37 |
| [7] | 2 | 1.75-1.99 | 89.4-89.4 | 2.8-2.8 | 452-452 | 0.16-0.16 | 569-569 | 0 | 0 | 5.45-6.55 |
| [8] | 24 | 1.5-2.5 | 52.0-73.0 | 3.769-3.77 | 414-414 | 0.24-1.81 | 414-414 | 0 | 0 | 3.16-8.97 |
| [9] | 6 | 0.56-1.13 | 31.0-49.0 | 2.6-2.6 | 520-520 | 0.0-0.12 | 0-240 | 0.0-0.12 | 0-240 | 5.99-12.14 |
| [10] | 7 | 2.0-2.0 | 32.0-91.0 | 2.02-2.02 | 410-410 | 0.34-0.5 | 370-370 | 0 | 0 | 2.66-3.79 |
| [11] | 52 | 0.5-2.0 | 24.0-74.0 | 1.29-1.56 | 414-414 | 0.0-0.37 | 414-414 | 0.0-0.94 | 414-414 | 2.46-10.25 |
| [12] | 12 | 1.1-1.1 | 25.0-32.0 | 1.15-1.28 | 469-522 | 0.0-0.45 | 0-455 | 0 | 0 | 2.79-3.81 |
| [13] | 8 | 0.84-0.85 | 30.7-42.5 | 2.6 | 530 | 0-0.41 | 0-250 | 0-0.89 | 0.0-511 | 4.64-10 |
| [14] | 22 | 0.91-1.67 | 31.0-88.0 | 1.38-3.62 | 364-530 | 0.0-0.22 | 0-448 | 0.0-1.44 | 0-577 | 2.51-9.35 |
| [15] | 5 | 2.5-2.5 | 120.1-120.1 | 1.588-6.699 | 431-472 | 0.43-1.75 | 407-458 | 0 | 0 | 1.32-8.46 |
| [16] | 21 | 0.95-1.96 | 11.3-46.8 | 0.57-3.83 | 483-483 | 0 | 0 | 0 | 0 | 1.05-7.27 |
| [17] | 1 | 1.85-1.85 | 14.9-14.9 | 2.37-2.37 | 328-328 | 0 | 0 | 0 | 0 | 1.34-1.34 |
| [18] | 16 | 1.51-1.51 | 22.0-27.0 | 0.75-3.05 | 267-712 | 0 | 0 | 0 | 0 | 1.94-3.37 |
| [19] | 6 | 1.35-1.38 | 17.9-26.1 | 1.59-1.59 | 483-483 | 0 | 0 | 0 | 0 | 2.71-3.77 |
| [20] | 6 | 2.02-2.22 | 21.0-39.7 | 0.98-3.36 | 303-586 | 0 | 0 | 0 | 0 | 1.58-3.55 |
| [21] | 6 | 1.0-2.0 | 22.3-32.4 | 1.78-2.47 | 426-490 | 0 | 0 | 0 | 0 | 1.47-6.39 |
| [22] | 5 | 0.67-1.34 | 23.3-37.0 | 0.83-1.67 | 463-463 | 0 | 0 | 0 | 0 | 4.24-6.31 |
| [23] | 2 | 0.7-1.01 | 13.7-21.5 | 0.26-0.76 | 320-320 | 0 | 0 | 0 | 0 | 1.31-3.11 |
| [22] | 7 | 0.3-0.88 | 13.1-66.6 | 3.0-6.0 | 364-389 | 0 | 0 | 0 | 0 | 3.54-14.87 |
| [24] | 2 | 1.5 | 23.1-79.5 | 3.34 | 414 | 0 | 0 | 0 | 0 | 2.27-5.38 |
| [25] | 3 | 1.05-1.87 | 26.1-42.4 | 0.95-1.12 | 367-455 | 0 | 0 | 0 | 0 | 1.89-3.49 |
| [26] | 9 | 0.5-1.5 | 15.0-20.6 | 0.66-1.9 | 420-420 | 0 | 0 | 0 | 0 | 1.48-4.42 |
| [27] | 4 | 1.43-2.0 | 19.5-20.3 | 0.84-1.75 | 550-550 | 0 | 0 | 0 | 0 | 1.21-1.5 |
| [28] | 3 | 1.0-1.0 | 35.5-40.8 | 1.69-1.91 | 1004-1026 | 0 | 0 | 0 | 0 | 4.23-5.71 |
| [29] | 19 | 0.53-1.13 | 31.0-79.0 | 0.9-1.0 | 408-408 | 0 | 0 | 0 | 0 | 2.27-11.45 |
| [30] | 4 | 1.68-1.7 | 39.4-44.1 | 2.6-2.6 | 620-620 | 0 | 0 | 0 | 0 | 1.92-4.86 |
| [31] | 3 | 1.93-1.93 | 38.0-51.0 | 0.44-0.72 | 468-865 | 0 | 0 | 0 | 0 | 1.64-1.87 |
| [32] | 10 | 2.3-2.3 | 54.0-98.0 | 1.82-3.24 | 500-500 | 0 | 0 | 0 | 0 | 1.87-4.74 |
| [33] | 4 | 1.14-1.27 | 28.0-32.0 | 1.25-1.4 | 420-420 | 0.1-0.31 | 450-450 | 0.0-0.35 | 450-450 | 4.06-4.86 |
| [34] | 6 | 1.5-2.0 | 22.0-24.0 | 0.54-0.54 | 441-441 | 0.11-0.33 | 420-420 | 0.11-0.33 | 420-420 | 1.98-3.11 |
| [35] | 13 | 1.08-1.08 | 58.0-65.0 | 1.32-1.66 | 585-585 | 0.0-0.82 | 397-397 | 0.0-0.4 | 397-397 | 5.78-9.38 |
| [36] | 31 | 1.2-2.5 | 19.0-37.0 | 2.29-2.93 | 441-503 | 0.0-0.86 | 0-558 | 0.0-0.45 | 0-503 | 2.23-8.46 |
| [37] | 12 | 1.05-2.01 | 27.0-36.0 | 0.4-0.85 | 492-492 | 0.3-0.3 | 605-605 | 0.3-0.3 | 605-605 | 2.41-3.77 |
| [38] | 8 | 0.89-0.89 | 27.0-43.0 | 1.8-1.8 | 541-541 | 0 | 0 | 0 | 0 | 4.82-7.31 |
| [39] | 11 | 1.56-2.08 | 18.0-32.0 | 2.11-2.38 | 454-482 | 0.0-0.3 | 0-421 | 0.0-0.37 | 0-421 | 2.21-4.0 |
| [40] | 12 | 1.0-1.0 | 26.0-70.0 | 1.4-1.47 | 546-569 | 0 | 0 | 0 | 0 | 3.13-7.43 |
| [41] | 19 | 0.5-1.5 | 29.0-86.0 | 4.34-4.34 | 552-552 | 0.0-1.01 | 552-552 | 0.0-1.27 | 552-552 | 4.1-16.65 |
| [42] | 10 | 0.76-1.88 | 77.0-120.0 | 1.34-2.41 | 400-400 | 0.67-1.0 | 427-427 | 0.0-0.37 | 427-427 | 5.9-9.52 |
| [43] | 9 | 1.18-2.39 | 23.0-48.0 | 0.52-2.29 | 401-880 | 0.0-0.33 | 0-405 | 0.0-0.45 | 0-855 | 2.96-7.53 |
| [44] | 9 | 0.53-2.0 | 44.0-54.0 | 1.04-2.18 | 578-589 | 0 | 0 | 0 | 0 | 2.55-11.5 |
| [45] | 6 | 1.0-1.0 | 22.0-28.0 | 0.4-0.54 | 528-528 | 0.11-0.33 | 405-405 | 0.11-0.33 | 405-405 | 2.17-3.8 |
| [46] | 4 | 1.56-1.78 | 27.0-34.0 | 1.89-2.16 | 498-498 | 0.5-0.5 | 529-529 | 0 | 529-529 | 4.2-4.84 |
| [47] | 16 | 0.61-0.83 | 35.0-68.0 | 1.69-1.99 | 439-439 | 0.0-0.57 | 0-463 | 0.0-0.63 | 0-463 | 5.7-11.87 |
| [48] | 7 | 1.55-2.28 | 29.0-38.0 | 0.69-0.69 | 652-652 | 0.0-0.1 | 0-490 | 0 | 0 | 0.87-2.42 |
| [49] | 3 | 1.2-1.2 | 38.0-91.0 | 7.35-11.33 | 457-457 | 0 | 0 | 0 | 0 | 9.99-15.47 |
| [50] | 12 | 0.82-1.57 | 22.0-50.0 | 2.05-4.07 | 427-462 | 0.0-0.75 | 407-407 | 0.0-0.17 | 407-407 | 2.84-10.52 |
| [51] | 7 | 1.18-1.26 | 68.0-80.0 | 3.32-3.32 | 580-580 | 0.0-0.45 | 550-550 | 0 | 550-550 | 5.42-10.47 |
| [52] | 11 | 0.44-0.44 | 36.0-45.0 | 1.13-1.13 | 400-400 | 0.0-0.66 | 0-440 | 0.0-0.48 | 0-440 | 6.73-8.24 |
| [53] | 19 | 0.5-1.5 | 23.0-38.0 | 1.99-2.11 | 372-402 | 0.0-0.8 | 372-402 | 0 | 0 | 2.36-8.56 |
| [4] | 4 | 0.77-1.34 | 20.5-21.7 | 1.93-1.93 | 431-431 | 0 | 0 | 0 | 0 | 3.19-4.39 |
| [54] | 10 | 2.5-2.5 | 39.0-80.0 | 2.23-3.51 | 495-495 | 0.09-0.19 | 820-820 | 0 | 0 | 3.89-5.08 |
| [55] | 5 | 1.37-2.09 | 24.0-28.0 | 0.28-0.56 | 469-490 | 0.29-0.44 | 346-429 | 0 | 346-429 | 1.76-3.03 |
| [56] | 18 | 0.94-2.0 | 55.0-58.0 | 0.73-1.83 | 569-569 | 0 | 0 | 0 | 0 | 1.61-7.65 |
| [57] | 18 | 0.27-2.16 | 41.0-59.0 | 1.23-1.23 | 505-505 | 0.48-0.48 | 375-375 | 0 | 0 | 2.73-12.27 |
| [58] | 11 | 0.85-1.69 | 63.0-80.0 | 2.58-2.58 | 499-499 | 0.0-2.86 | 0-447 | 0.0-3.17 | 0-447 | 6.09-14.09 |
| [59] | 10 | 0.28-1.67 | 65.0-72.0 | 2.0-4.08 | 499-538 | 0.48-0.48 | 353-385 | 0 | 0 | 4.55-16.82 |
| [60] | 49 | 0.5-2.5 | 21.0-98.0 | 0.4-2.14 | 458-1330 | 0.0-0.95 | 0-1051 | 0 | 0 | 2.1-14.5 |
| [61] | 9 | 1.25-1.75 | 21.0-24.0 | 0.65-0.65 | 357-357 | 0.06-0.42 | 248-248 | 0.1-0.54 | 248-248 | 1.8-2.85 |
| [6] | 21 | 0.97-1.01 | 14.0-26.0 | 0.78-1.13 | 420-420 | 0.0-0.35 | 0-420 | 0 | 0-420 | 1.82-4.37 |
| [62] | 8 | 0.3-0.9 | 48.0-48.0 | 0.76-1.43 | 630-670 | 0.0-0.5 | 457-457 | 0.34-0.34 | 457-457 | 6.25-9.17 |
| [63] | 14 | 0.57-2.28 | 38.0-41.0 | 1.24-1.43 | 484-495 | 0.35-0.42 | 328-369 | 0.0 | 0-369 | 2.76-6.93 |

# is the number of tests for each reference.

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