



Shape code 22 reports as Shape Code 99

When BS8666 was issued in 2000 to replace the older BS4466 shape set standard, it offered a very basic shape set with many of the standard shapes from BS4466 omitted. The BS8666:2005 revision sought to redress this by introducing 16 additional shapes to reduce the high number of 99 shapes that were regularly required when detailing to BS8666.

One of these new shapes was shape code 22 which appears to be the same as the shape code 85 from the old BS4466 but in fact is subtly different.

85	<p>Semi-circular</p>	$A + B + 0.57 C + (D) - \frac{1}{2} r - 2.57 d$ <p>If C is greater than $400 + 2d$, see note 2 to clause 10</p>
22	<p>Key 1 Semi-circular</p>	$A + B + C + (D) - 1.5r - 3d$ <p>C shall not be less than $2(r + d)$. Neither A nor (D) shall be less than P in Table 2. (D) shall not be less than $C/2 + 5d$.</p>

If you check the length calculation for BS4466 shape code 85 ($A + B + 0.57C + D - 1/2r - 2.57d$), this allows for a variable C dimension so the radius of the hook can change provided it is not less than $2(r+d)$.

On the new BS8666 shape 22 introduced with the 2005 edition of the code, the length calculation is different and uses the formula $A+B+C+(D) - 1.5r - 3d$. Now $0.5r+d$ is the simplified deduction used for one standard radius 90° bend as you can see on the L shape 11. Thus $1.5r+3d$ is the deduction for three 90° bends of standard bend radius. We contacted the BS8666 steering committee in late 2004, after seeing the draft standard, to report an error in the shape 22 length formula which did not allow for a variable C dimension. However, they confirmed that the length formula was correct and it was their intent that the hook always be a standard radius bend and if C exceeds $2(r+d)$ then the shape must be reported a 99 shape.

To comply with this, we designed the shape code 22 to report as a 99 automatically if C exceeds $2(r+d)$.

If you have an existing shape code 22 that is reporting as a 99 that you want to convert to a standard 22 with a standard radius hook then edit the C dimension to be $2(r+d)$. Assuming you have minimum dimensions enabled in your CADs-RC, you could enter a small value for C such as 10 which CADs-RC will then complain is too small and automatically increase to the correct $2(r+d)$ value for the current bar size.

Shape code 22 has been a matter of contention ever since it was introduced in 2005 where it has singularly failed in its objective of reducing the use of 99 shapes due to the regular need to define n/s radius hooks to avoid bar clashing. However, after many years of passing on detailers complaints about the limitations of the current shape code 22, the good news is that there has been some movement in the position of the BS8666 steering committee who have agreed to revisit the definition of the 22 for the next update to BS8666 so that a variable C may be reintroduced. The bad news is that they see no urgency to do this in the near future.