Damit findet man nach partieller Integration

$$E \int_r^{r_2} \frac{\epsilon_r^{pl}(r, t_{ab})}{x} dx = -E\alpha[\theta(r, t_{ab}) - \theta(r_2, t_{ab})] + \sigma_0 \ln \frac{r}{r_2} \quad (36)$$

und durch Einsetzen dieser Beziehung in Gl. (33) und (34) schließlich die gesuchten Gleichungen (24) und (25).

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Eingegangen am 6.7.1987

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BERICHTIGUNG/CORRECTION

The Phenomenon of Stress Intensification by J.F. Bish

Forschung im Ingenieurwesen Vol. 53 (1987) No. 3., pp. 94/96

Unfortunately some minor errors have crept into the article, for which the author wishes to apologize. Since it is difficult to indicate the errors, the parts of the text of the article in which the errors appear have been printed underneath.

The formula for flexibility of a bend is $k = 1.65/h$, wherein h is the flexibility characteristic:

$$h = tR/r^2$$

where

t wall thickness of the pipe
 R radius of the curved pipe (pipe axis)
 r mean radius of the pipe, $r = (D_u - t)/2$
 D_u outer diameter of the pipe

The stress intensification factor in axial direction is

$$i_x = 0.9/h^{2/3} \geq 1$$

In accordance with the ASA B31.8-1963 Code, the stress intensification factor in tangential direction was shown, for both in-plane and out-of-plane bending, as

$$i_y = 0.9/h^{2/3} \geq 0$$

In this respect, the Kellogg Co. states in Design of Piping Systems:

"The recommendations of the revised ASA B31.3 Code for Pressure Piping are derived principally from these experimental observations. For both in-plane and out-of-plane bending, the Code recommends that the stress intensification factor

$$\beta = \gamma = 0.90/h^{2/3}$$

be used, the choice of a single factor having been accepted for practical reasons only."

....

Final conclusion

If one explicitly does something to reduce ovalizations, i.e. stress intensification, this is correct. However, it does not seem correct to halve the moments in order to bring the calculated stresses in line with the stresses obtained through stress measurements during the tests by using a certain calculation method (and incorrect at that). It is better to apply the theoretical formulas that have never been contested than to adjust the safety in a certain calculation method.

Die Redaktion

Zur Beanspruchung metallischer Werkstoffe im Bereich der Elastizitätsgrenze

von H. Ismar, A. Schmitt und J. Sutor

Forschung im Ingenieurwesen Bd. 53 (1987) Nr. 5, S. 162/68

In diesem Beitrag wurden bedauerlicherweise die Bilder 10 und 11 vertauscht. Wir bitten unsere Leser, diesen Fehler zu entschuldigen.