Compressive behavior of SFRC in new EC2, Annex L

Gonzalo Ruiz

Ángel De La Rosa, Elisa Poveda,

Riccardo Zanon, Markus Schäfer, Sébastien Wolf

Universidad de Castilla-La Mancha | Université du Luxembourg

2nd Generation EC2 — Madrid, October 17th 2023

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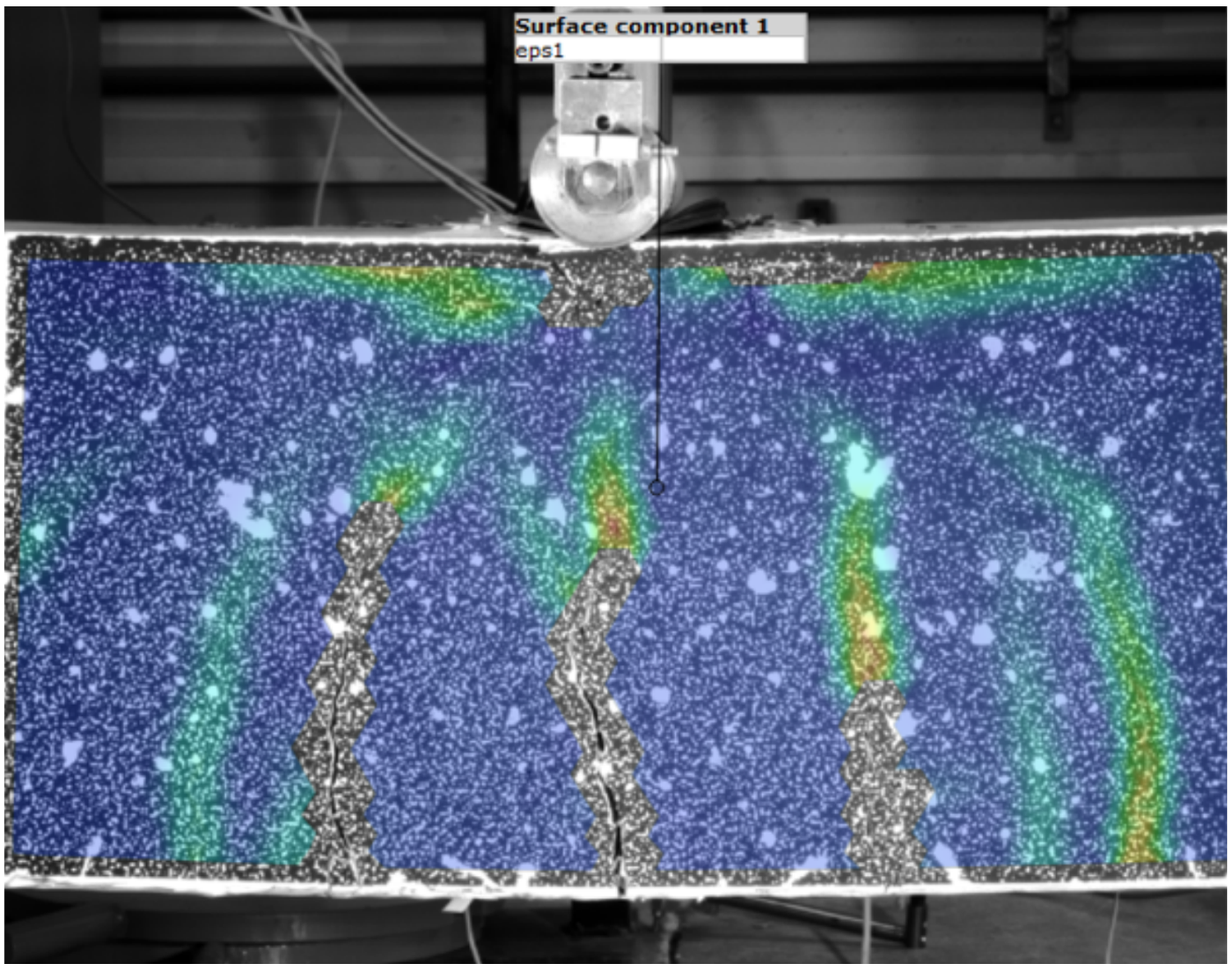
1. Introduction



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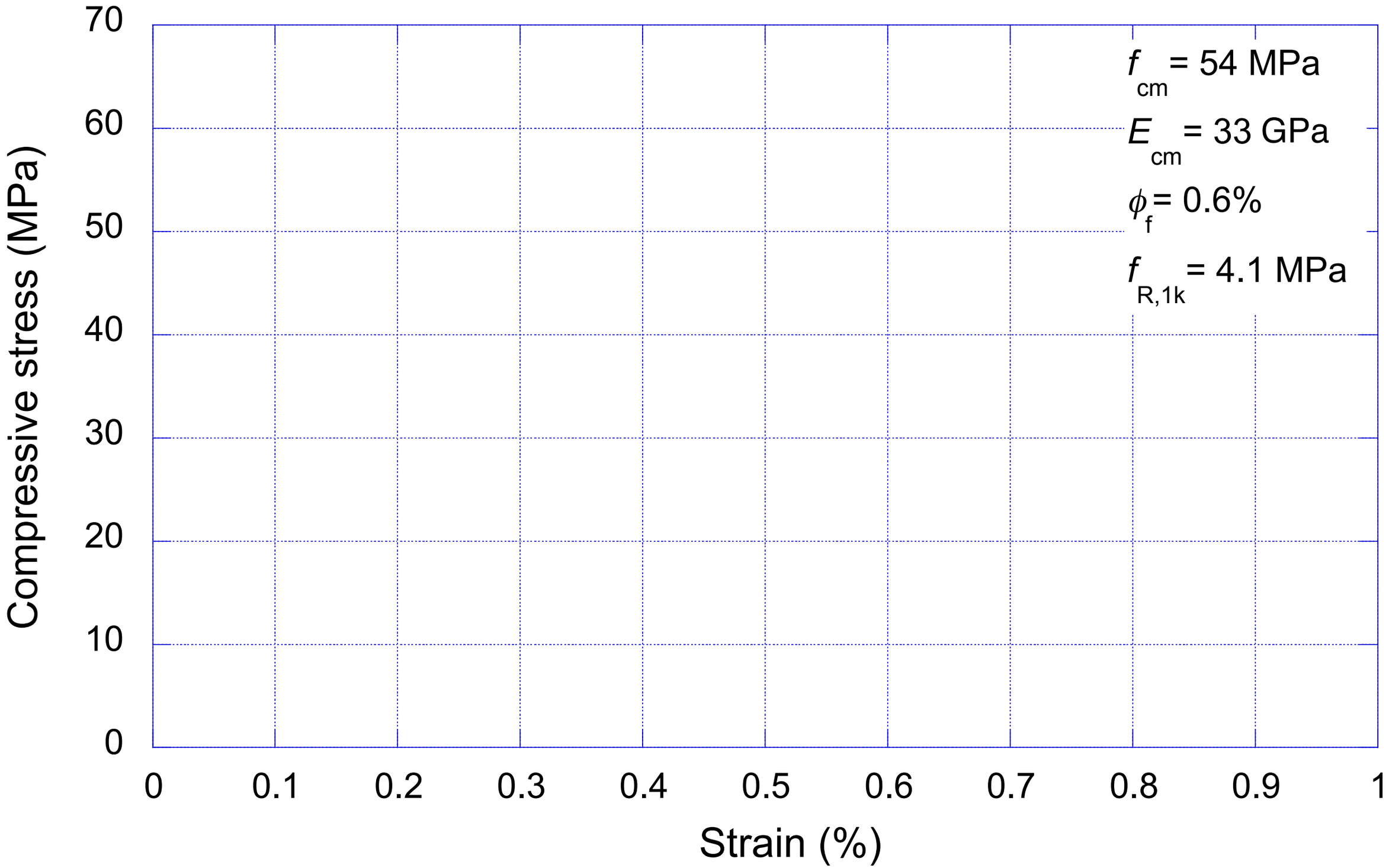
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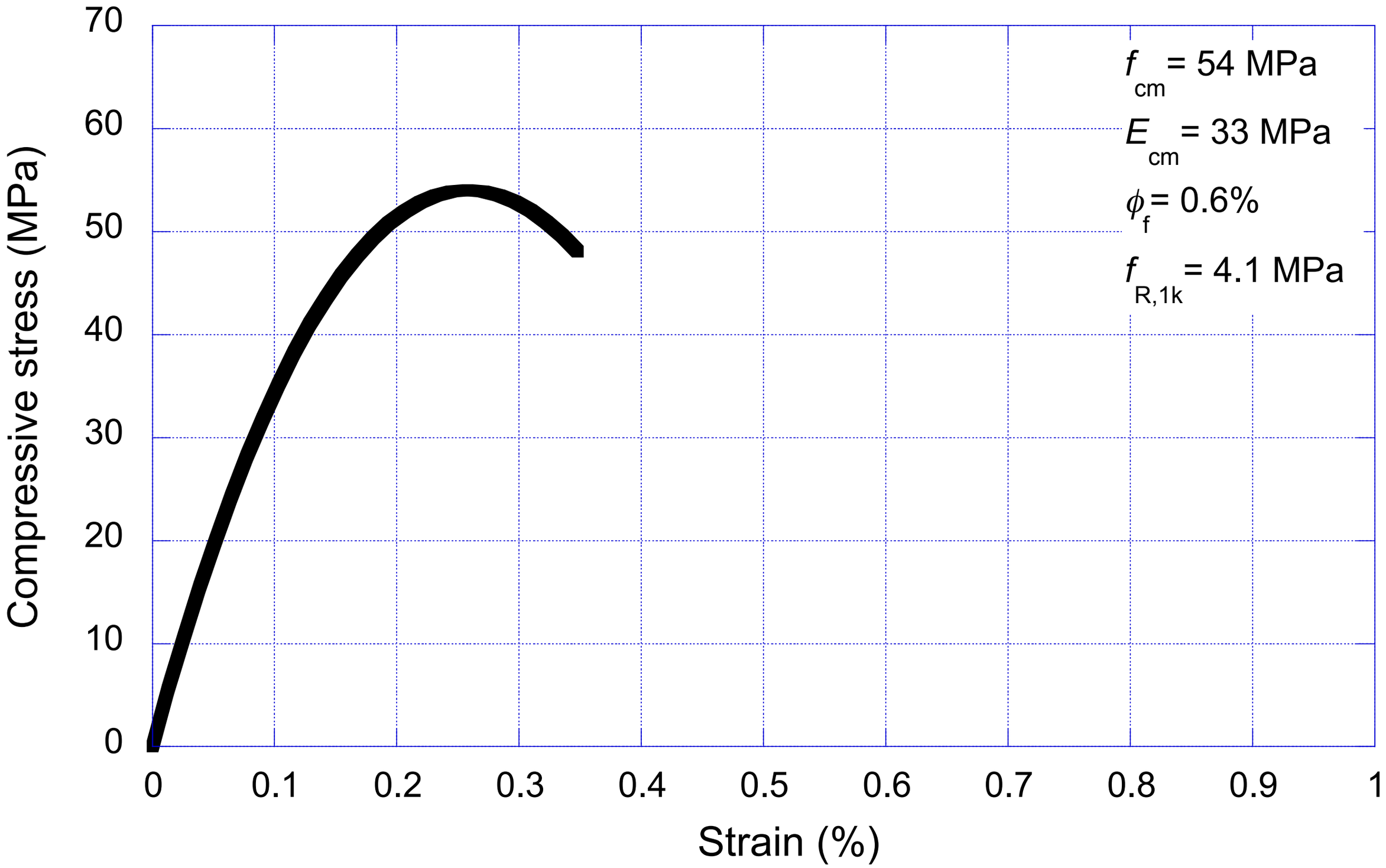
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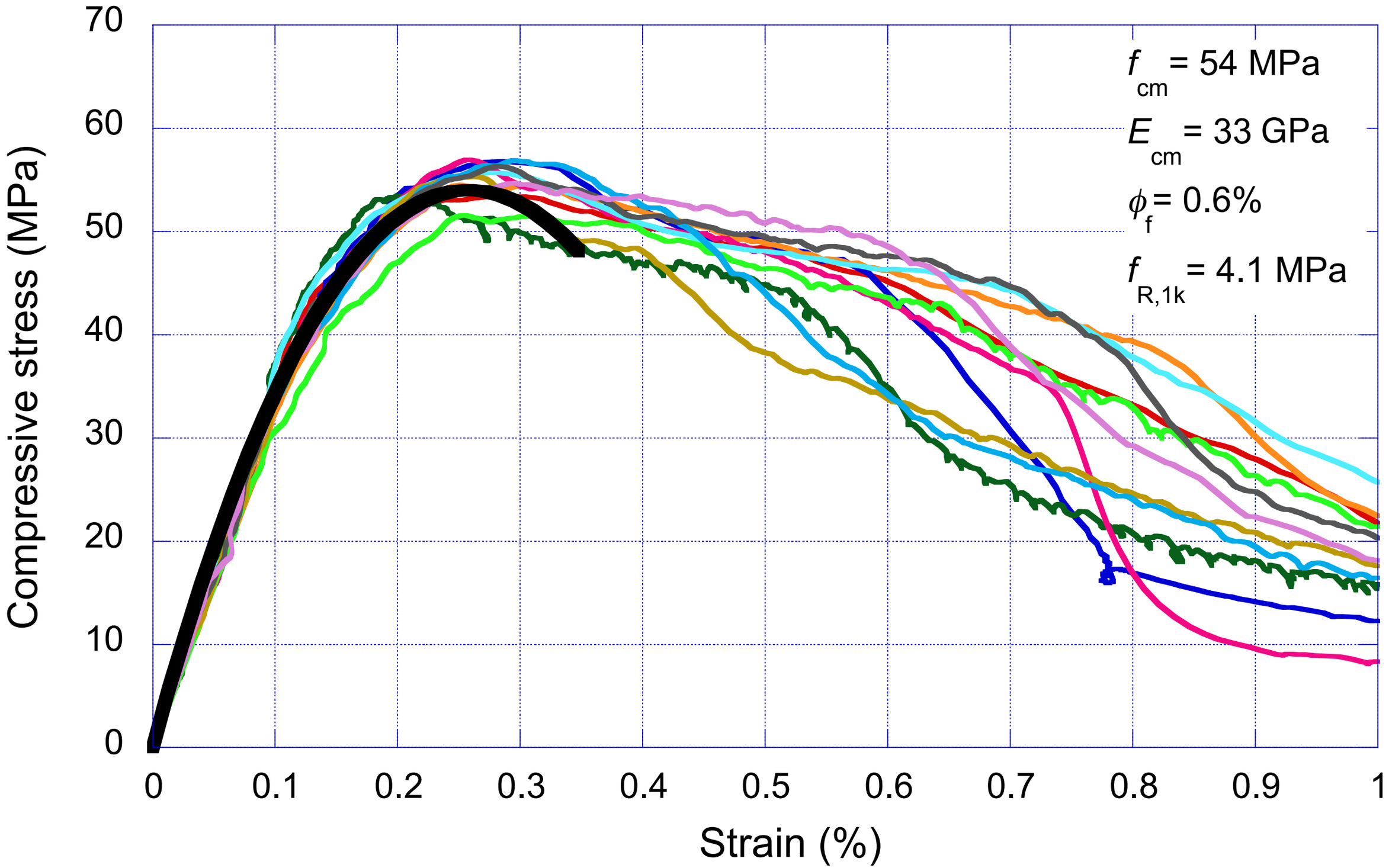
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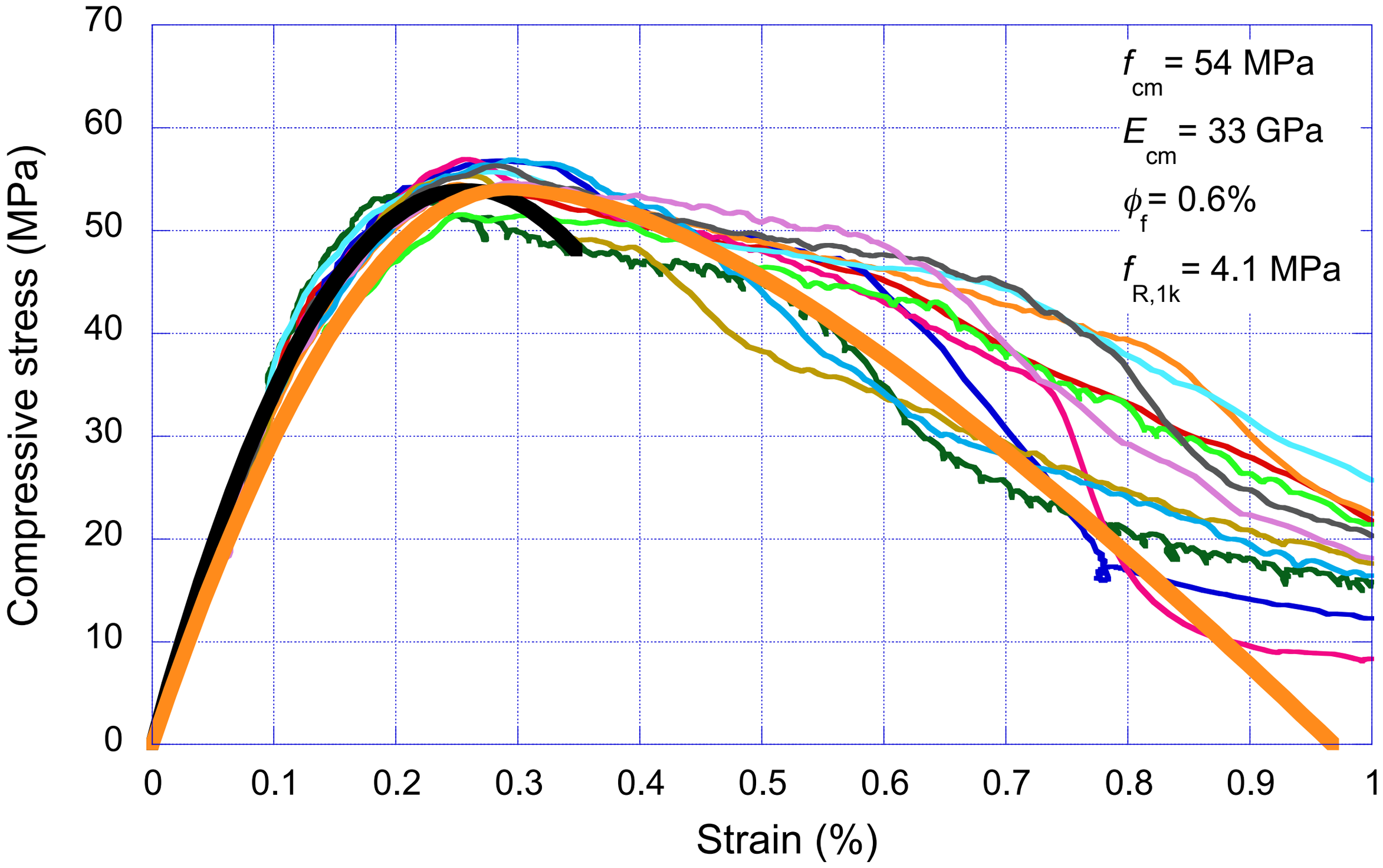
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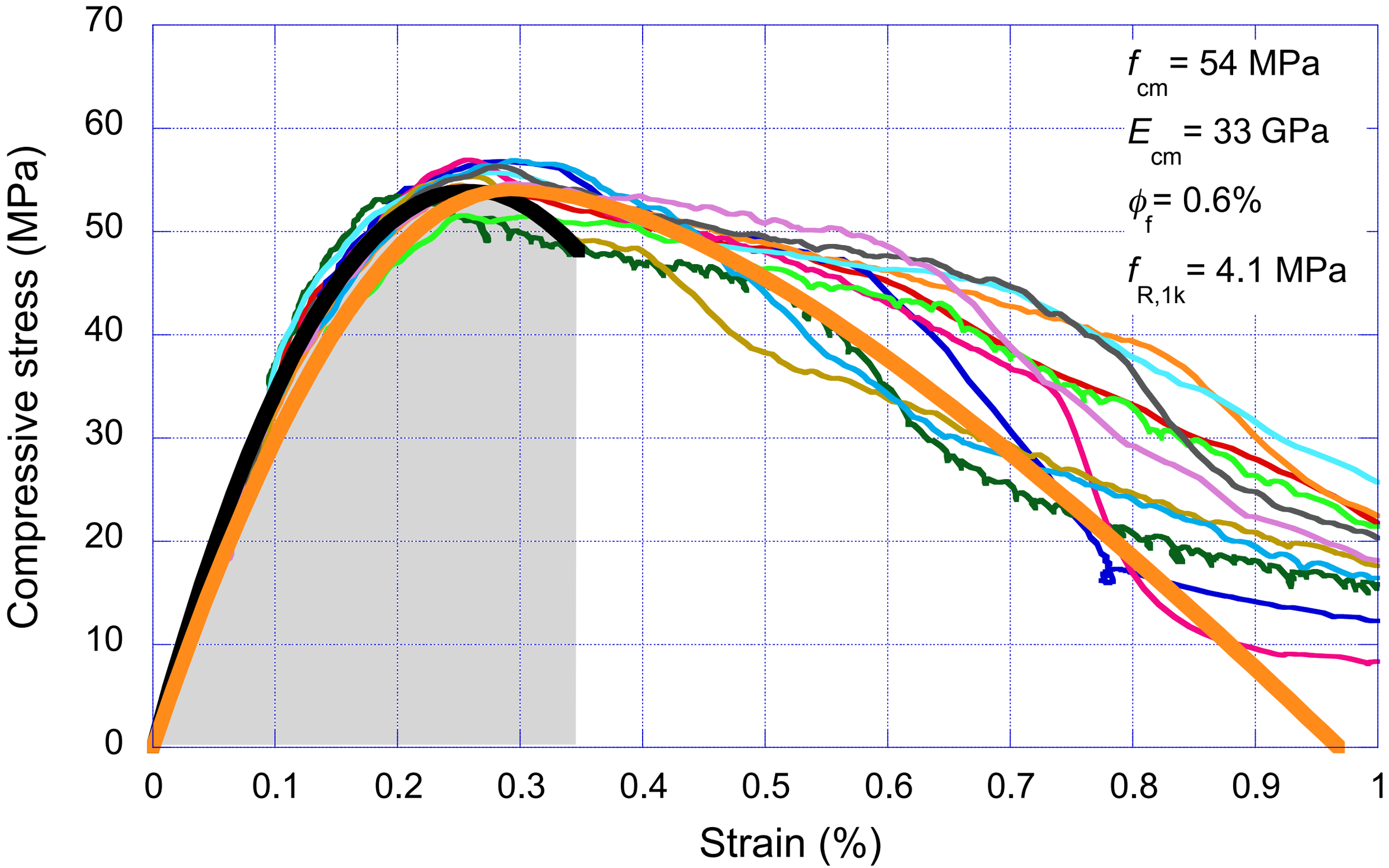
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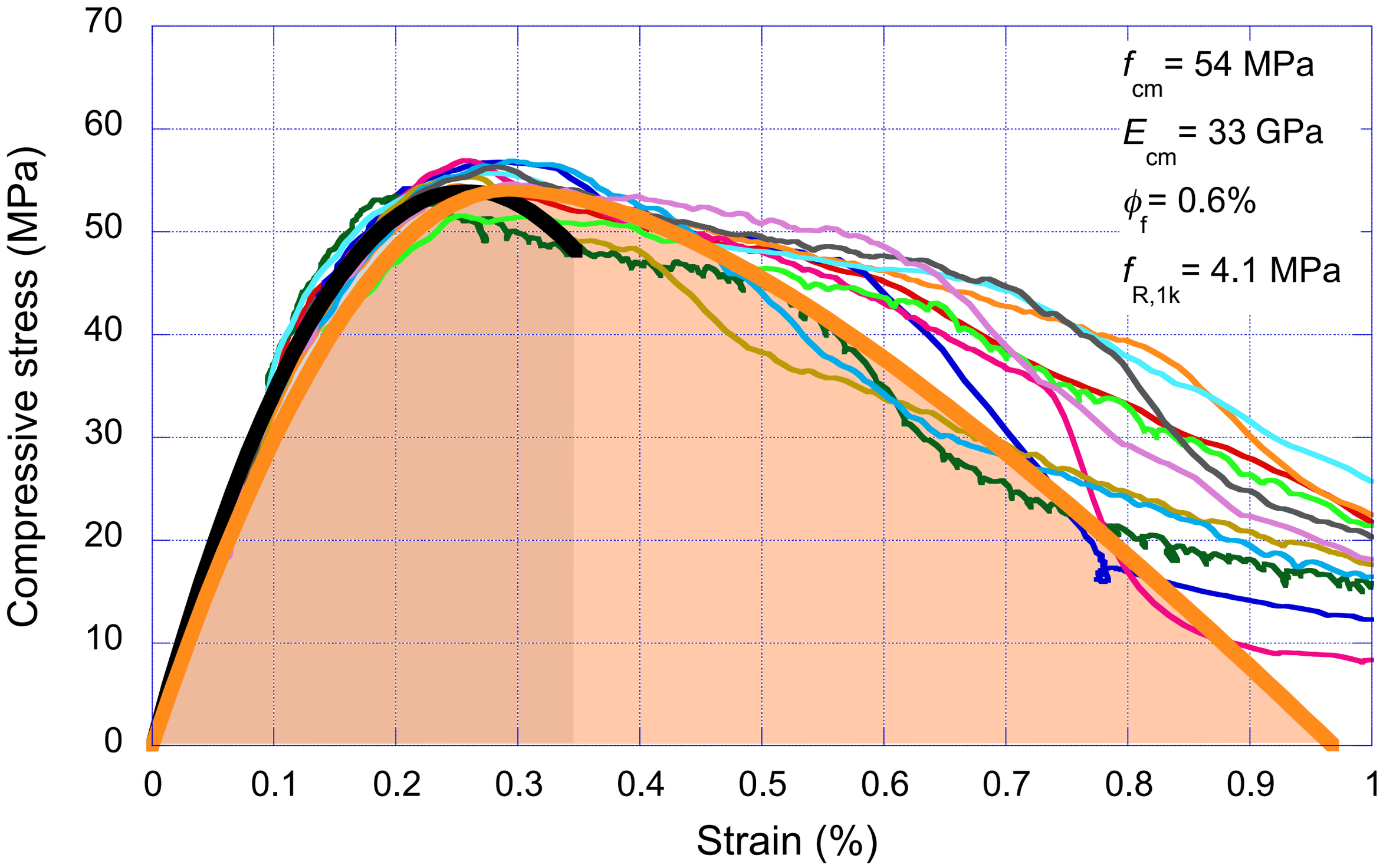
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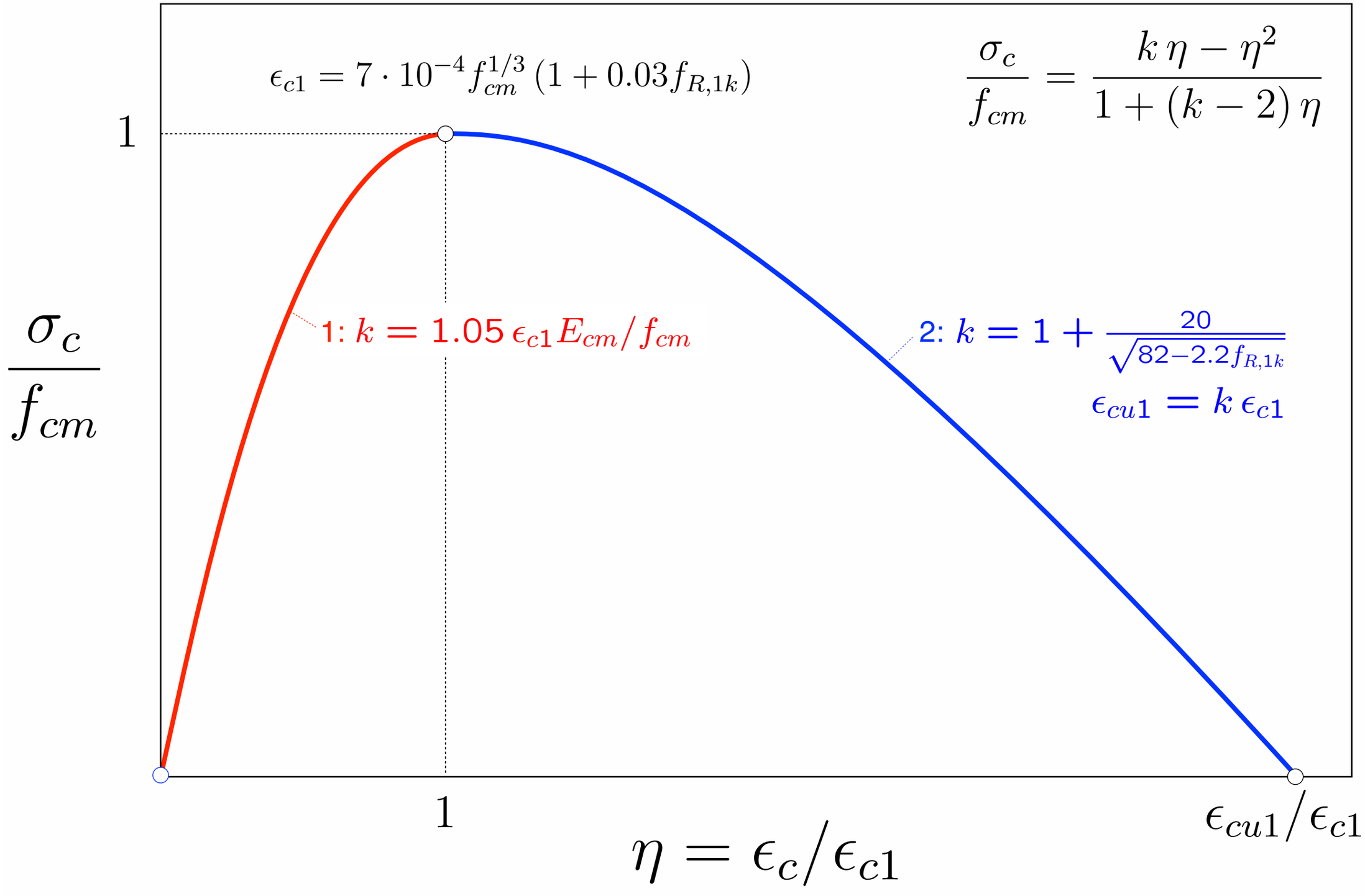
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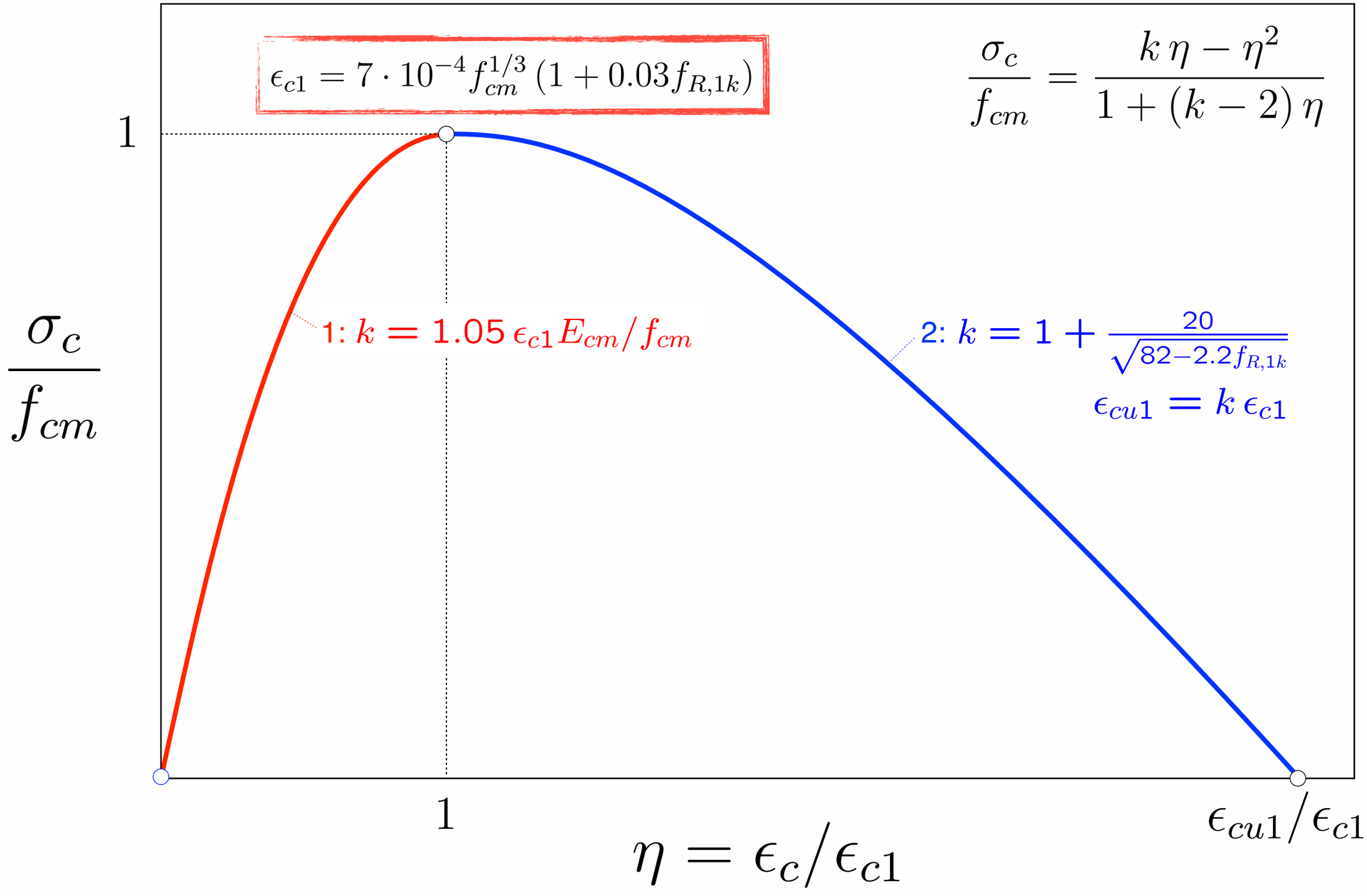
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2. SFRC in compression: σ-ε relationship



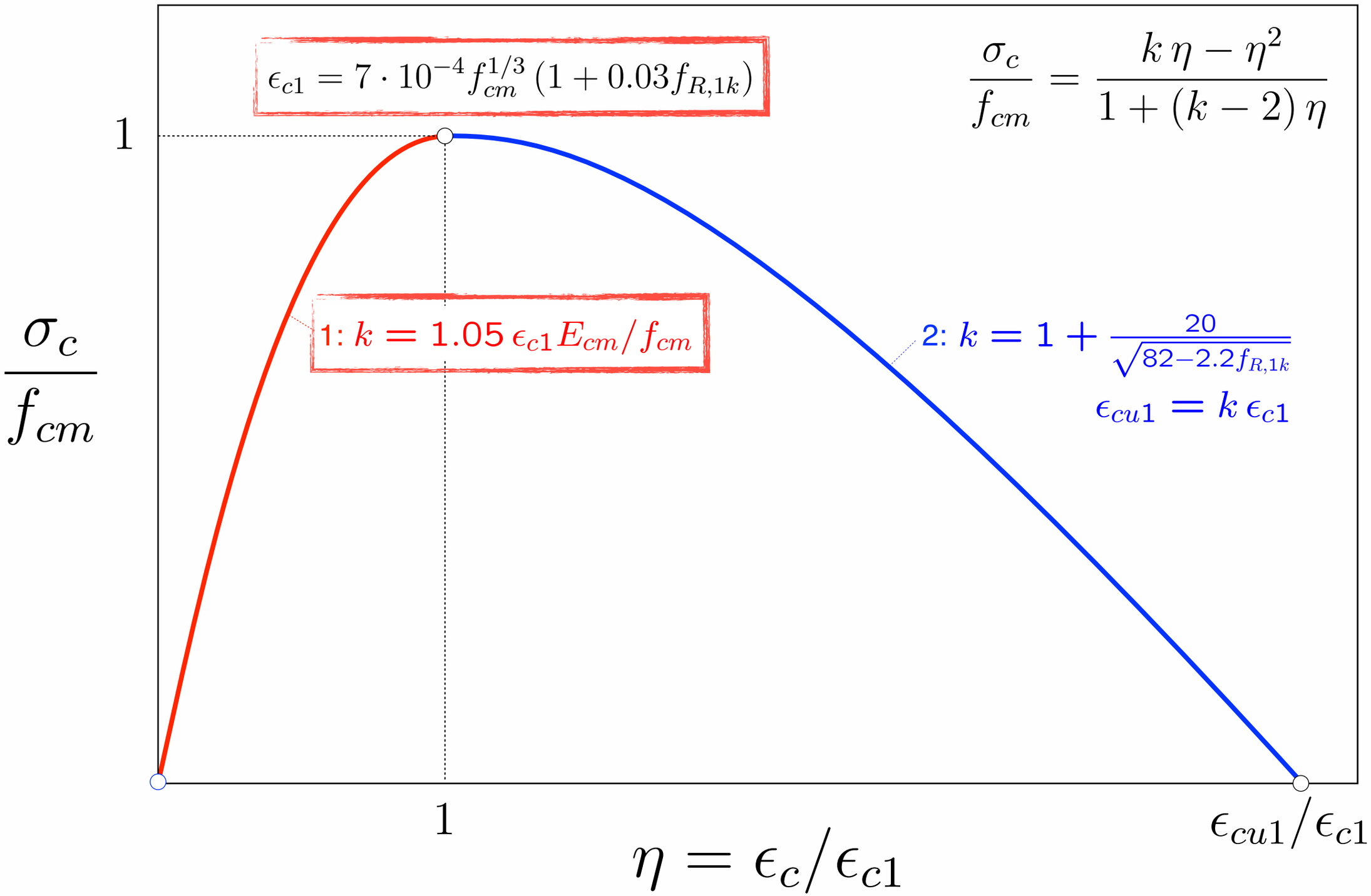
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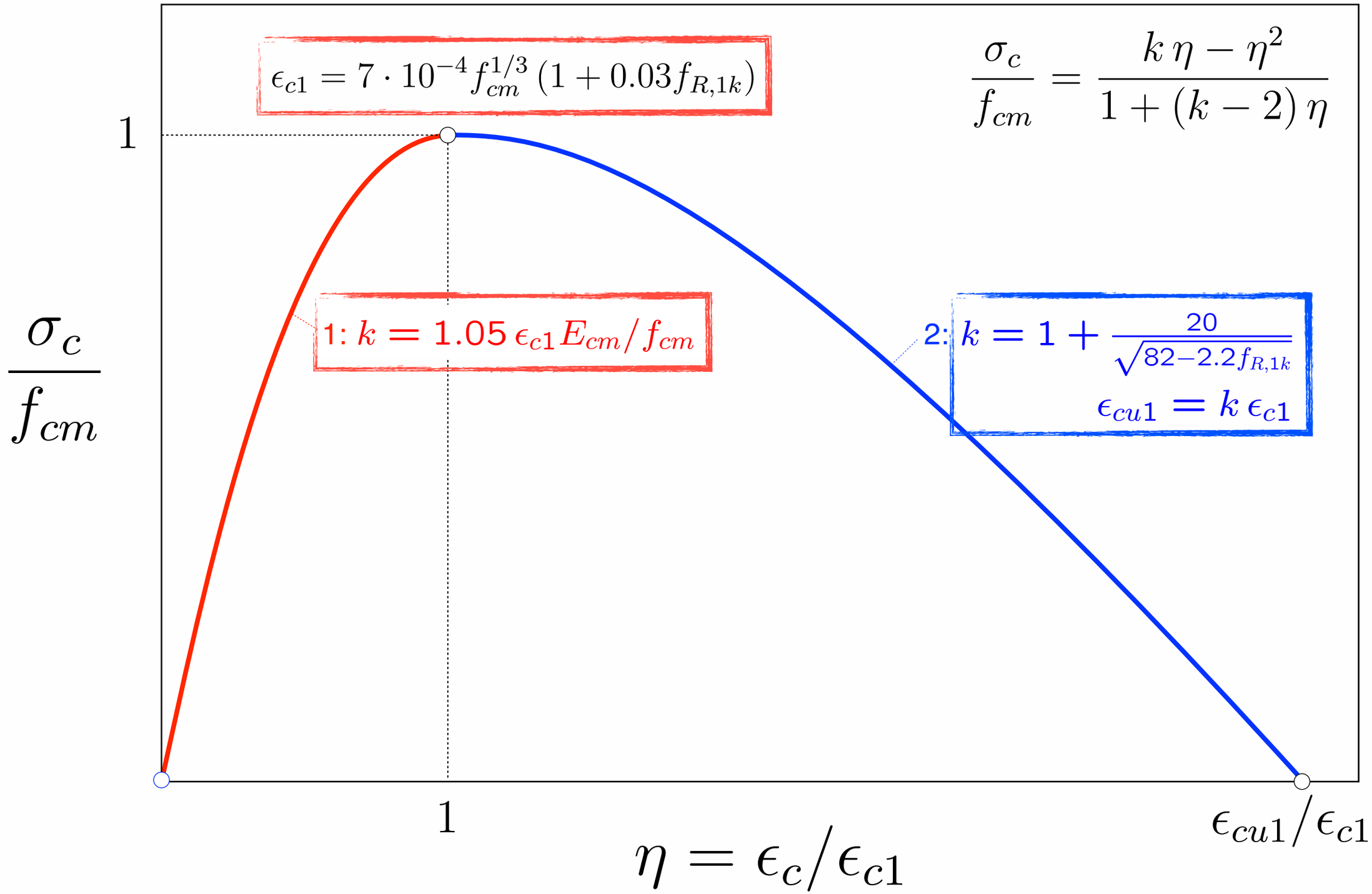
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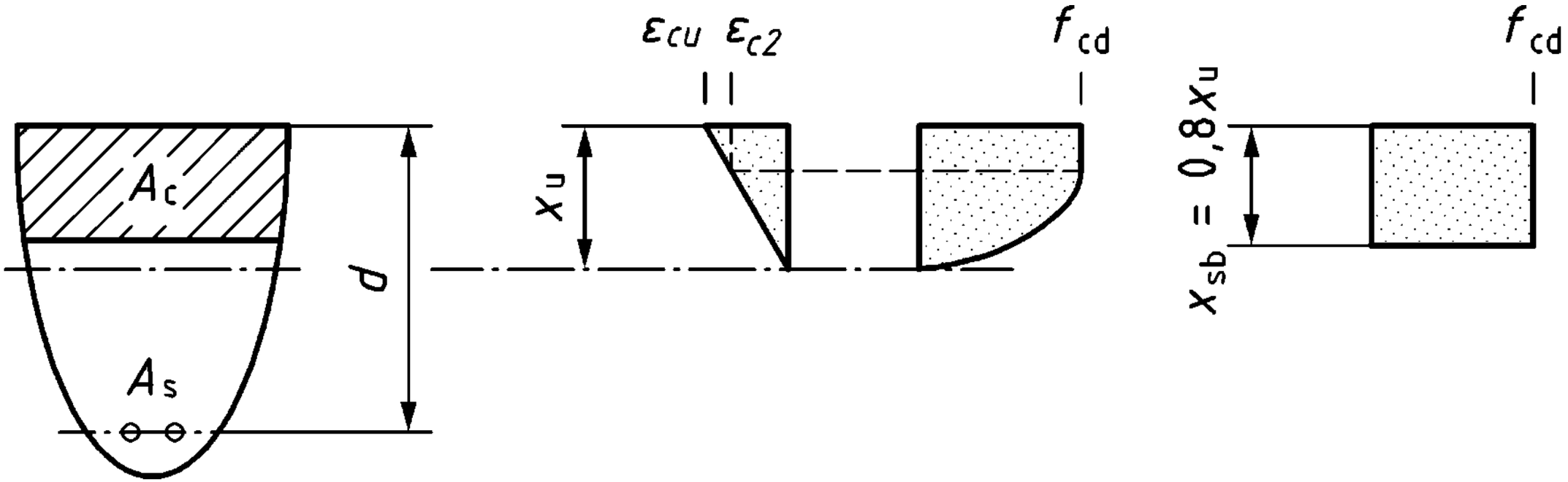
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2. SFRC in compression: ULS

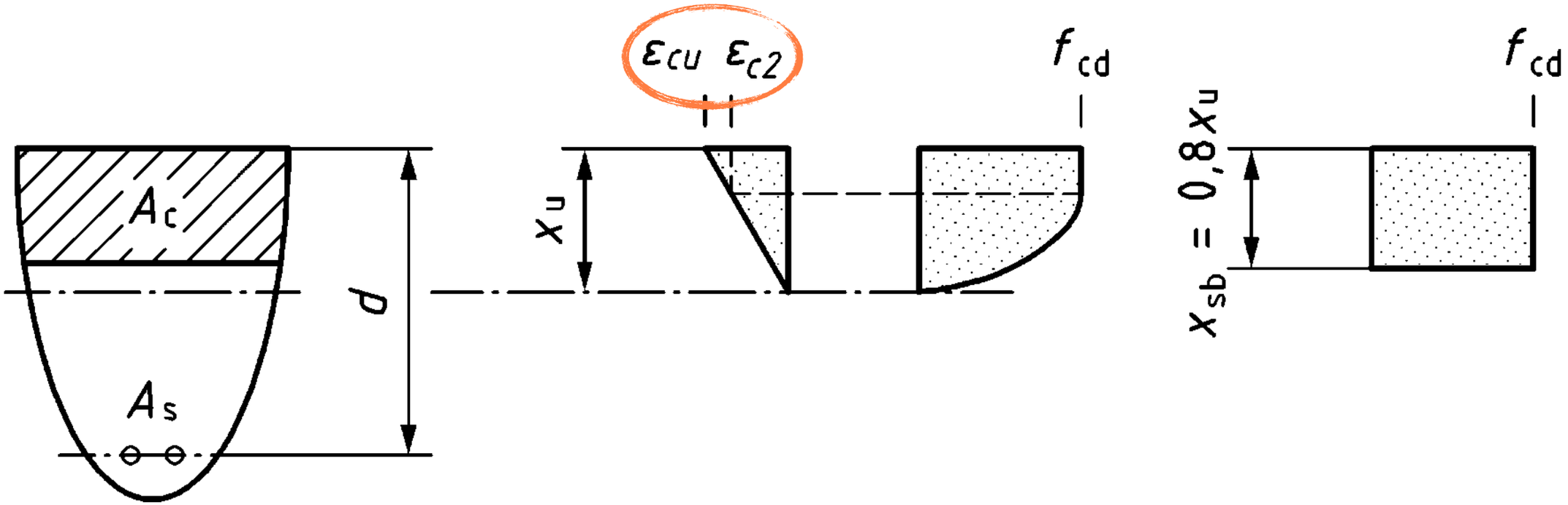


a) b) c) d)

These parameters are 0.0020 and 0.0035, respectively, for concrete without fibres.

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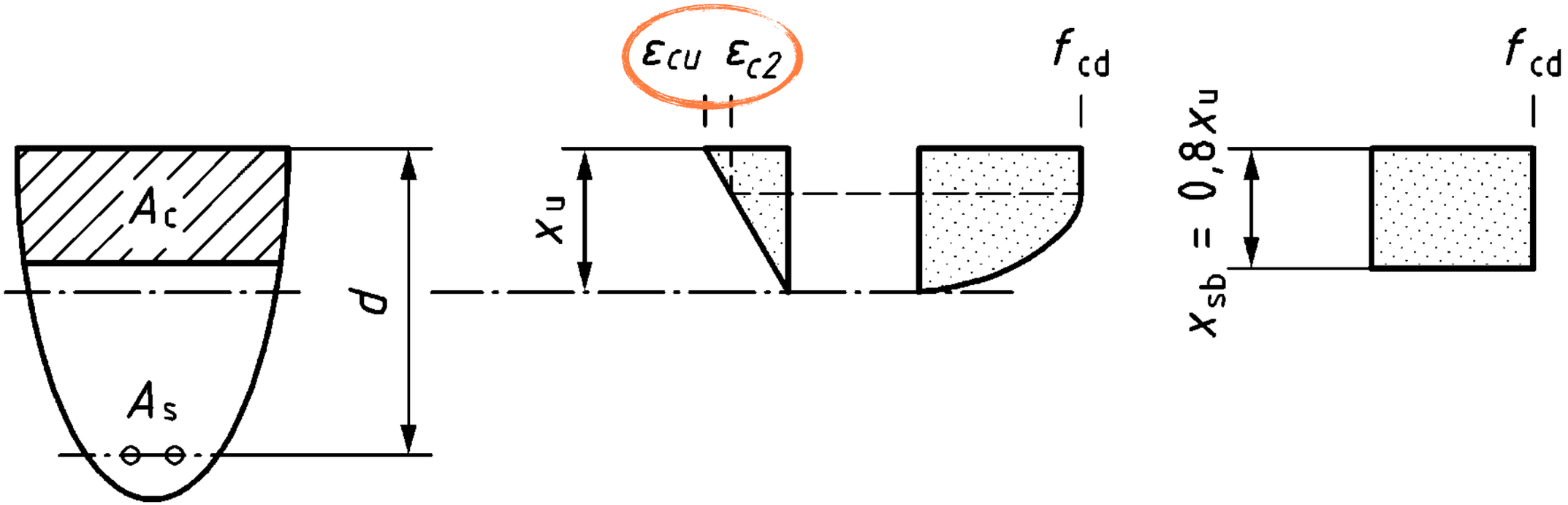


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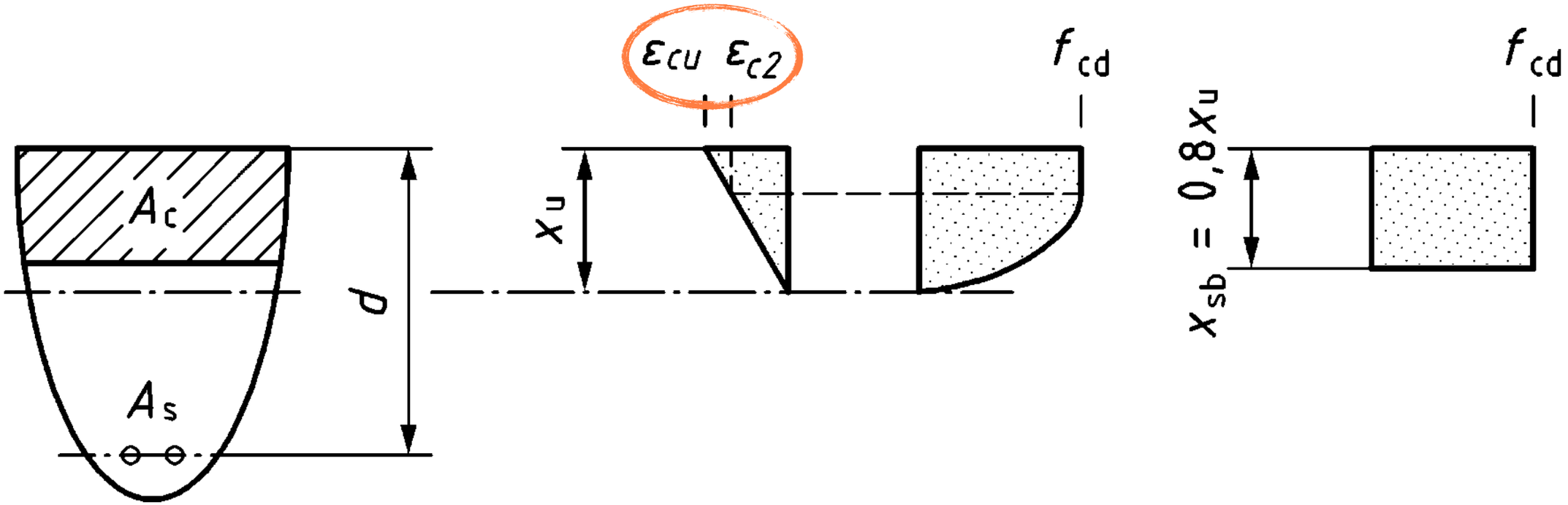


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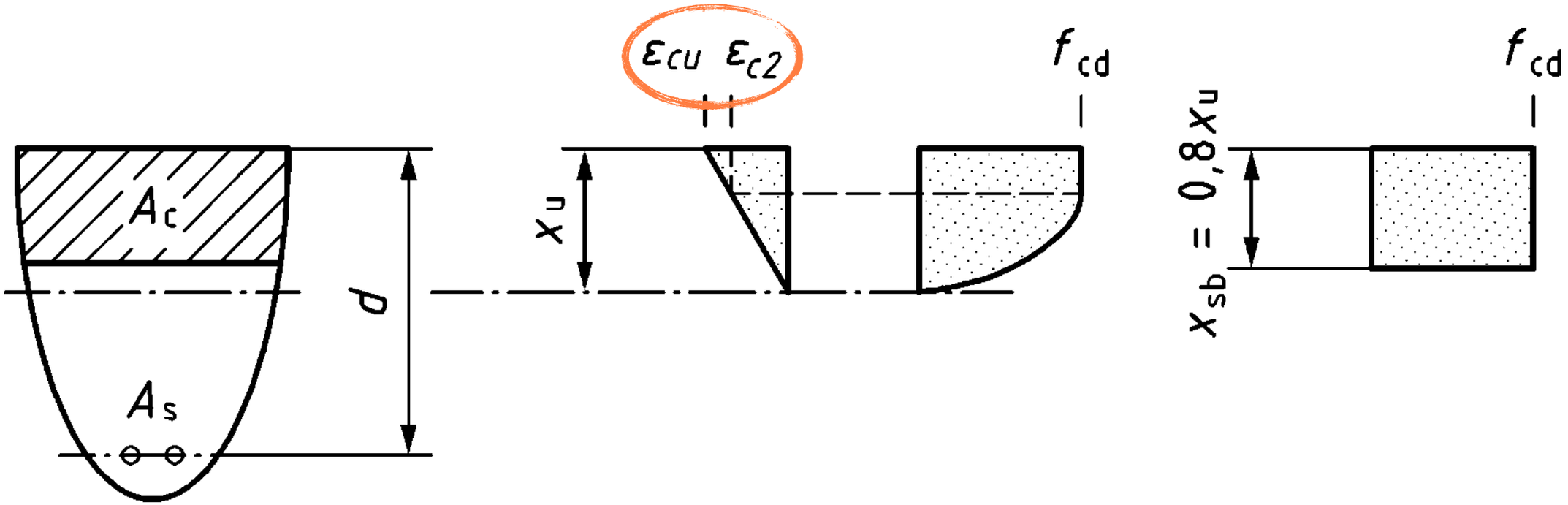
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"The stress distribution according to Formula (8.4) may be modified for SFRC by applying $\epsilon_{c2} = 0.0025$ and $\epsilon_{cu} = 0.006$."

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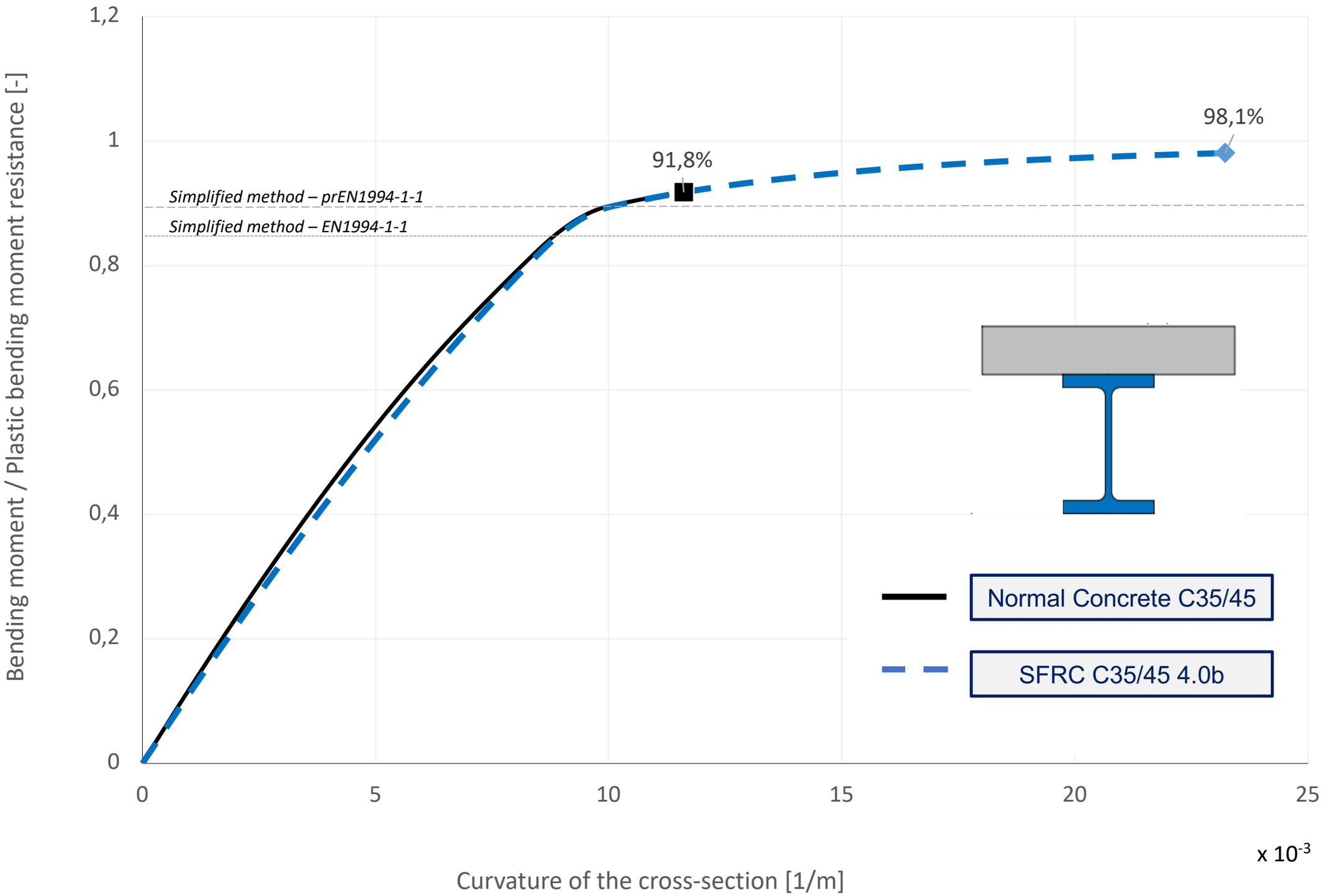
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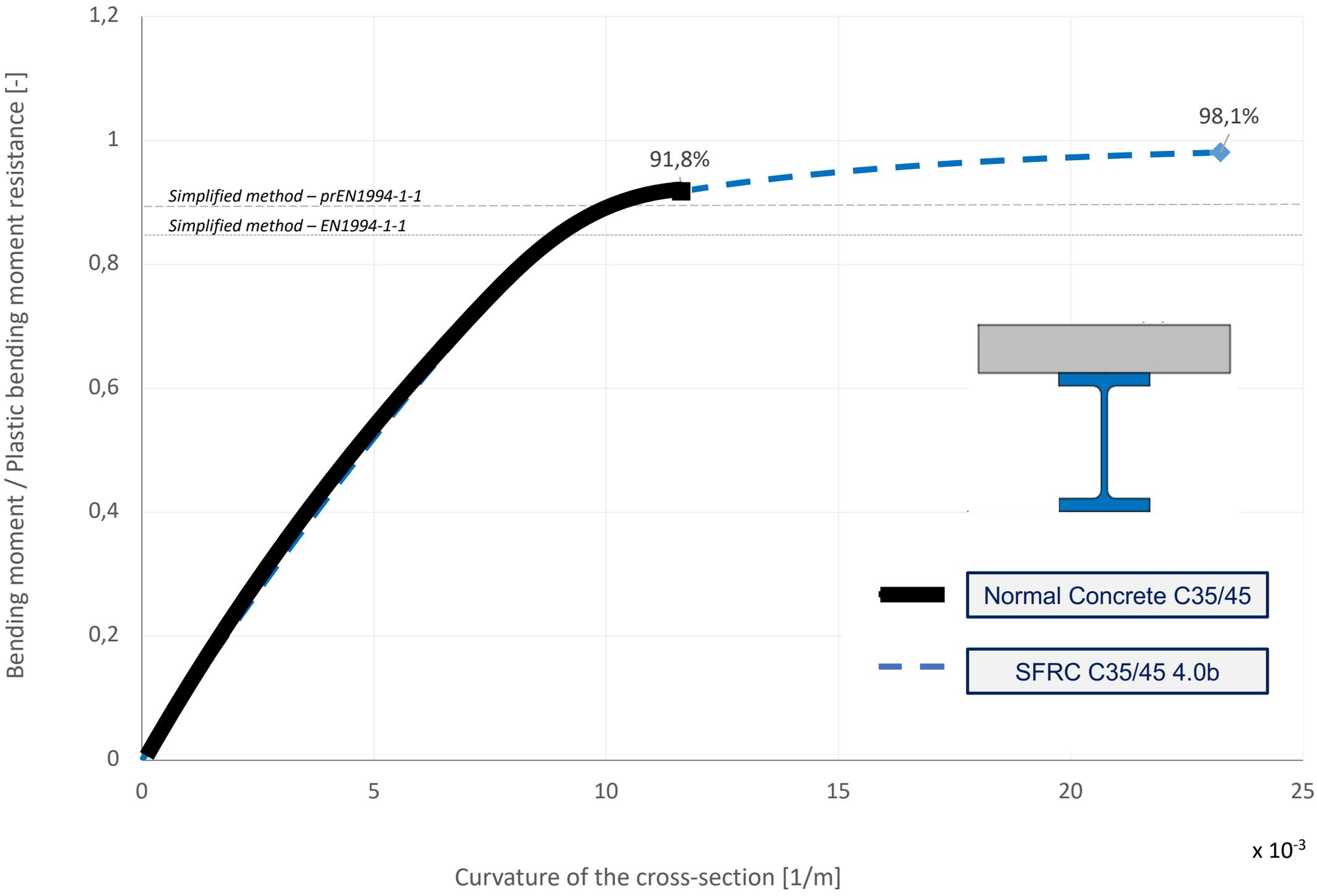
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4. Application example: Composite beam



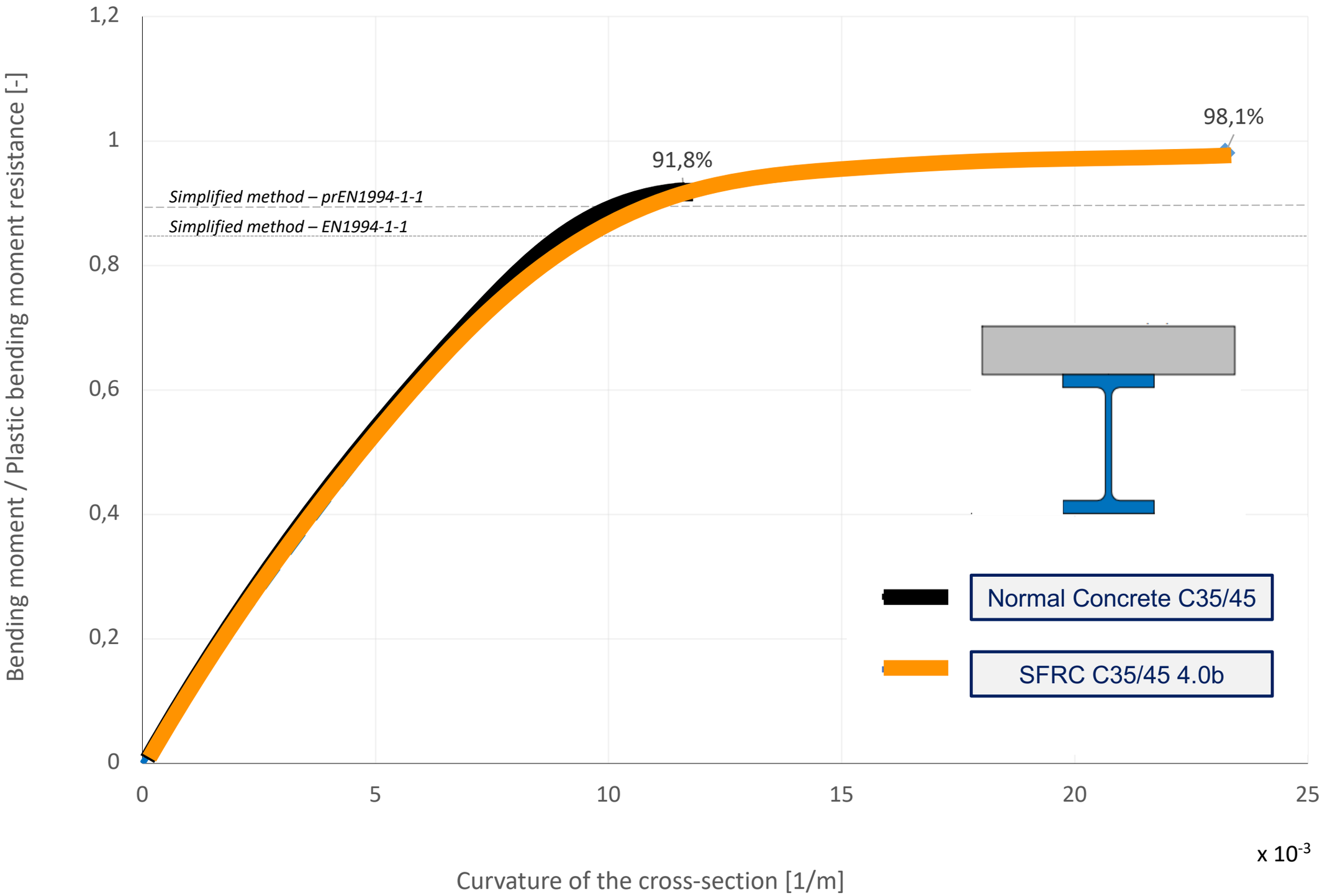
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5. Conclusions

- Annex L of new EC2 accounts for the additional ductility due to fibers

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- Compressive and flexural classes for SFRC are coupled

- The ultimate compressive strain in ULS goes up to 0.6%

- These new criteria are advantageous for composite structures

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References

Disponible en **www.hormigonyacero.com**

Hormigón y Acero 2023; 74(299-300):187-198
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Compressive Behaviour of Steel-Fibre Reinforced Concrete in Annex L of New Eurocode 2

Comportamiento en compresión del hormigón reforzado con fibras de acero según el Anejo L del nuevo Eurocódigo 2

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References

DOI: 10.1002/stab.202200070

Riccardo Zanon, Markus Schäfer, Gonzalo Ruiz, Ángel De La Rosa, Qingjie Zhang

ARTICLE

Steel-fibre reinforced concrete in composite structures as a mean to increase resistance and ductility

Outlook in a new generation of composite structures

In honor of the jubilarian Prof. Dr.-Ing. Wolfgang Kurz

Steel-fibre reinforced concrete is a well-known material used for decades for industrial floorings, shotcrete, or other specific applications. Its use is now spreading in structural applications as a complement or a substitute for conventional bar-reinforced concrete since the normative framework is ready to provide design approaches for several concrete applications.

Steigerung der Tragfähigkeit und Duktilität für Verbundkonstruktionen aus Stahl und Beton durch Anwendung von Stahlfaserbeton – eine neue Generation von Verbundtragwerken

Stahlfaserbeton ist ein bekanntes Baumaterial, welches seit Jahrzehnten für Industrieböden, Spritzbeton oder andere spezifische Anwendungen zum Einsatz kommt. Seine Verwendung

Zanon, R.; Schäfer, M.; Ruiz, G.; De La Rosa, Á.; Zhang, Q. (2022) *Steel-fibre reinforced concrete in composite structures as a mean to increase resistance and ductility – Outlook in a new generation of composite structures.* Stahlbau 91, H. 12, S. 801–811. https://doi.org/10.1002/stab.202200070

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Compressive behavior of SFRC in new EC2, Annex L

Thanks for your attention

2nd Generation EC2 — Madrid, October 17th 2023

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