

## Title (en)

Dual-phase type high-strength steel sheets having high impact energy absorption properties

## Title (de)

Hochfeste Zweiphasen-Stahlbleche mit hohen Stoßenergieaufnahmeeigenschaften

## Title (fr)

Feuilles d'acier biphasé à haute résistance ayant d'excellentes propriétés de déformation dynamique

## Publication

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## Application

**EP 10181225 A 19980316**

## Priority

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- JP 8243497 A 19970317
- JP 19029797 A 19970715
- JP 19029997 A 19970715
- JP 22300897 A 19970806
- JP 25893897 A 19970924

## Abstract (en)

The invention relates to dual-phase type high-strength steel sheets, for automobiles, which have excellent dynamic deformation properties and exhibit impact absorption properties, and are intended to be used as structural members and reinforcing materials primarily for automobiles, as well as to a method of producing them, which dual-phase type high-strength steel sheets with excellent dynamic deformation properties are characterized in that the final microstructure of the steel sheets is a composite microstructure wherein the dominating phase is ferrite, and the second phase is another low temperature product phase containing martensite at a volume fraction between 3% and 50% after 5% deformation of the steel sheet, wherein the difference between the quasi-static deformation strength  $\bar{\sigma}_s$  when deformed in a strain rate range of  $5 \times 10^{-4}$  -  $5 \times 10^{-3}$  (s<sup>-1</sup>) after pre-deformation of more than 0% and less than or equal to 10% of equivalent strain, and the dynamic deformation strength  $\bar{\sigma}_d$  when deformed in a strain rate range of  $5 \times 10^2$  -  $5 \times 10^3$  (s<sup>-1</sup>) after the aforementioned pre-deformation, i.e. ( $\bar{\sigma}_d - \bar{\sigma}_s$ ), is at least 60 MPa, and the work hardening coefficient at 5-10% strain is at least 0.13.

## IPC 8 full level

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## Citation (applicant)

- JP H0718372 A 19950120 - KAWASAKI STEEL CO
- JP H0898000 A 19960412 - MURATA MACHINERY LTD
- JP H08109224 A 19960430 - UNION CARBIDE CHEM PLASTIC
- JP S59219473 A 19841210 - NIPPON STEEL CORP
- CAMP-ISIJ, vol. 9, 1966, pages 1112 - 1115

## Citation (search report)

- [A] EP 0719868 A1 19960703 - KAWASAKI STEEL CO [JP]
- [A] PATENT ABSTRACTS OF JAPAN vol. 1995, no. 7 31 August 1995 (1995-08-31)
- [A] PATENT ABSTRACTS OF JAPAN vol. 1997, no. 4 30 April 1997 (1997-04-30)

## Cited by

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**EP 0969112 A1 20000105**; **EP 0969112 A4 20030521**; **EP 0969112 B1 20110817**; **EP 0969112 B2 20170308**; AU 6311898 A 19981012; AU 717294 B2 20000323; CA 2283924 A1 19980924; CA 2283924 C 20061128; CN 1080321 C 20020306; CN 1251140 A 20000419; EP 2314729 A1 20110427; EP 2314729 B1 20120208; EP 2314729 B2 20170308; KR 100334949 B1 20020504; KR 20000076372 A 20001226; TW 426742 B 20010321; WO 9841664 A1 19980924

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