

# The Global Market for Self-Healing Materials, Polymers and Coatings 2021-2031

https://marketpublishers.com/r/G930DF63060EN.html

Date: January 2021 Pages: 100 Price: US\$ 1,225.00 (Single User License) ID: G930DF63060EN

# **Abstracts**

The need for sustainable manufacturing solutions is driving the growing market interest in self-healing materials, polymers and coatings. Main types of self-healing systems are intrinsic and extrinsic. Intrinsic self-healing is chemically driven by noncovalent bonds or reversible chemical bonds. In extrinsic systems microcapsules or vascular networks release healing agents to damaged locations or wounds.

The Global Market for Self-Healing Materials, Polymers and Coatings provides a comprehensive review of the technology, players, and market for Self-Healing Materials, Polymers and Coatings. The report covers each major type of Self-Healing Materials technology.

It also contains detailed analysis of each target market for haptics, including aerospace, automotive, flexible electronics, energy storage, wind energy, solar, elastomers, construction & building and more. The report also includes detailed profiles of self-healing companies, as well as full historic market data back to 2015 and forecasts to 2031.

## Report contents include:

Global revenues for self-healing materials, polymers and coatings to 2031.

Analysis of self-healing materials, polymers and coatings, by type.

Analysis of self-healing materials, polymers and coatings, by market.

33 company profiles. Companies profiled include Tandem Repeat, Acciona S.A,



Advanced Soft Materials Inc., Arkema S.A., CompPair, Suprapolix B.V., DuPont Teijin Films and many more.



# Contents

#### **1 EXECUTIVE SUMMARY**

- 1.1 Market opportunity for self-healing materials and coatings
- 1.2 Global market revenues to 2031
- 1.2.1 By market

## 2 RESEARCH METHODOLOGY

- 2.1 Report scope
- 2.2 Market opportunity analysis

## **3 INTRODUCTION**

- 3.1 What are self-healing materials?
  - 3.1.1 Extrinsic self-healing
  - 3.1.2 Capsule-based
  - 3.1.3 Vascular self-healing
  - 3.1.4 Intrinsic self-healing
  - 3.1.5 Healing volume
- 3.2 Types of self-healing materials, polymers and coatings
  - 3.2.1 Self-healing coatings
  - 3.2.2 Anti-corrosion
  - 3.2.3 Scratch repair
  - 3.2.4 Self-healing polymer composites
  - 3.2.5 Self-healing metals
  - 3.2.6 Metal matrix composites
  - 3.2.7 Self-healing ceramics
  - 3.2.8 Self-healing nanomaterials
  - 3.2.9 Self-healing biomaterials
  - 3.2.10 3d printing of self-healing materials

## 4 SELF-HEALING MATERIALS, POLYMERS AND COATINGS ANALYSIS

- 4.1 Polyurethane clear coats
  - 4.1.1 Properties
  - 4.1.2 Markets
- 4.2 Micro-/nanocapsules



- 4.2.1 Properties
- 4.2.2 Markets
- 4.3 Microvascular networks
  - 4.3.1 Properties
  - 4.3.2 Markets
- 4.4 Reversible polymers
  - 4.4.1 Properties
  - 4.4.2 Markets
- 4.5 Click polymerization
- 4.5.1 Properties
- 4.5.2 Markets
- 4.6 Carbon nanotubes
  - 4.6.1 Properties
- 4.7 Graphene and other 2D materials
  - 4.7.1 Properties
- 4.8 Polyampholyte hydrogels
- 4.8.1 Properties
- 4.9 Shape memory
- 4.9.1 Properties
- 4.10 Self-healing proteins
  - 4.10.1 Properties

## **5 PRIMARY MARKETS FOR SELF-HEALING MATERIALS AND COATINGS**

- 5.1 Aerospace
  - 5.1.1 Market drivers
  - 5.1.2 Applications
  - 5.1.2.1 Self-healing composites
  - 5.1.2.2 Self-healing thermal interface materials
  - 5.1.3 Commercial activity
  - 5.1.4 Market opportunity
- 5.2 Automotive
  - 5.2.1 Market drivers
  - 5.2.2 Applications
    - 5.2.2.1 Self-healing glass
    - 5.2.2.2 Self-healing coatings for scratch repair
    - 5.2.2.3 Self-healing composites
    - 5.2.2.4 Self-healing tires
  - 5.2.3 Commercial activity



- 5.2.4 Market opportunity
- 5.3 Electronics
  - 5.3.1 Market drivers
  - 5.3.2 Applications
    - 5.3.2.1 Colorless polyimides (CPIs)
    - 5.3.2.2 Self-healing consumer electronic device coatings
    - 5.3.2.3 Flexile insulators
    - 5.3.2.4 Self-healing flexible and stretchable wearables
    - 5.3.2.5 Self-healing soft robotics
  - 5.3.3 Commercial activity
  - 5.3.4 Market opportunity
- 5.4 Energy
  - 5.4.1 Applications
  - 5.4.1.1 Self-healing flexible batteries
  - 5.4.1.2 Gas turbine coatings
  - 5.4.1.3 Wind energy
  - 5.4.1.4 Solar panels
  - 5.4.2 Commercial activity
  - 5.4.3 Market opportunity
- 5.5 Elastomers
  - 5.5.1 Market drivers
  - 5.5.2 Applications
  - 5.5.2.1 Self-healing elastomers
  - 5.5.3 Commercial activity
  - 5.5.4 Market opportunity
- 5.6 Construction
  - 5.6.1 Market drivers
  - 5.6.2 Applications
  - 5.6.2.1 Self-healing concrete
  - 5.6.2.2 Fibre concrete
  - 5.6.2.3 Self-healing road surfaces and asphalt
  - 5.6.3 Commercial activity
  - 5.6.4 Market opportunity
- 5.7 Other markets
  - 5.7.1 Life and health sciences
  - 5.7.1.1 Applications
  - 5.7.2 Textiles
  - 5.7.2.1 Applications
  - 5.7.3 Military



- 5.7.3.1 Applications
- 5.7.4 Oil and gas
- 5.7.4.1 Applications
- 5.7.5 Marine
  - 5.7.5.1 Applications
  - 5.7.5.2 Commercial activity

#### **6 COMPANY PROFILES**

#### **7 REFERENCES**



# **Tables**

#### TABLES

Table 1. The market for self-healing coatings and materials to 2031, Millions USD, total, conservative and high estimates.

- Table 2. Types of self-healing coatings and materials.
- Table 3. Comparative properties of self-healing materials.
- Table 4. Properties of self-healing polymers.
- Table 5. Recent research in self-healing metals.
- Table 6. Types of self-healing nanomaterials.
- Table 7. Companies producing polyurethane clear coat products for self-healing.
- Table 8. Properties of graphene.
- Table 9. Self-healing materials and coatings markets and applications.
- Table 10. Market drivers for self-healing materials in aerospace.
- Table 11. Commercial activity in self-healing aerospace applications.
- Table 12. The market for self-healing coatings and materials to 2027, Millions USD, in the aerospace sector, conservative and high estimates.
- Table 13. Market drivers for self-healing materials in the automotive sector.
- Table 14. Commercial activity in self-healing automotive applications.
- Table 15. The market for self-healing coatings and materials to 2027, Millions USD, in the automotive sector, conservative and high estimates.
- Table 16. Market drivers for self-healing materials in aerospace.
- Table 17. Commercial activity in self-healing energy applications.
- Table 18. The market for self-healing coatings and materials to 2027, Millions USD, in the electronics sector, conservative and high estimates.
- Table 19. Commercial activity in self-healing energy applications.
- Table 20. The market for self-healing coatings and materials to 2027, Millions USD, in the energy sector, conservative and high estimates.
- Table 21. Market drivers for self-healing materials in elastomers.
- Table 22. Types of self-healing elastomers.
- Table 23. Commercial activity in self-healing elastomers.
- Table 24. The market for self-healing coatings and materials to 2027, Millions USD, in the elastomers sector, conservative and high estimates.
- Table 25. Market drivers for self-healing materials in construction.
- Table 26. Types of self-healing concrete.
- Table 27. Commercial activity in self-healing construction applications.
- Table 28. The market for self-healing coatings and materials to 2027, Millions USD, in the construction sector, conservative and high estimates.



Table 29. Market drivers for self-healing materials in the oil and gas.

Table 30. Commercial activity in self-healing marine applications.

Table 31. Recent research in self-healing materials and coatings.



# **Figures**

# FIGURES

Figure 1. Opportunity analysis matrix for self-healing coatings and materials.

Figure 2. The market for self-healing coatings and materials to 2031, Millions USD, total, conservative and high estimates.

Figure 3. The global market for self-healing coatings and materials to 2031, Millions USD, by market, conservative estimate.

Figure 4. The global market for self-healing coatings and materials to 2031, Millions USD, by market, high estimate.

Figure 5. Schematic of self-healing polymers. Capsule based (a), vascular (b), and intrinsic (c) schemes for self-healing materials. Red and blue colours indicate chemical species which react (purple) to heal damage.

Figure 6. Stages of self-healing mechanism.

Figure 7. Self-healing mechanism in vascular self-healing systems.

Figure 8. Comparison of self-healing systems.

Figure 9. Self-healing mechanism of polymers.

Figure 10. Schematic of the self-healing concept using microcapsules with a healing agent inside.

Figure 11. Schematic of single-walled carbon nanotube.

Figure 12. Microspheres incorporating self-healing materials.

Figure 13. Flow of self-healing materials into the crack site.

Figure 14. Opportunity analysis matrix for self-healing coatings and materials in the aerospace sector.

Figure 15. The market for self-healing coatings and materials to 2027, Millions USD, in the aerospace sector, conservative and high estimates.

Figure 16. Nissan Scratch Shield.

Figure 17. Lamborghini self-healing sports-car.

Figure 18. Self-healing tires.

Figure 19. Opportunity analysis matrix for self-healing coatings and materials in the automotive sector.

Figure 20. The market for self-healing coatings and materials to 2027, Millions USD, in the automotive sector, conservative and high estimates.

Figure 21. Self-healing dielectric material for wearable electronics.

Figure 22. Self-healing patent schematic.

Figure 23. Self-healing coating on glass.

Figure 24. Self-healing glass developed at the University of Tokyo.

Figure 25. Opportunity analysis matrix for self-healing coatings and materials in



electronics.

Figure 26. The market for self-healing coatings and materials to 2027, Millions USD, in the electronics sector, conservative and high estimates.

Figure 27. Schematic of self-healing solar cell.

Figure 28. Opportunity analysis matrix for self-healing coatings and materials in energy.

Figure 29. The market for self-healing coatings and materials to 2027, Millions USD, in the energy sector, conservative and high estimates.

Figure 30. Self-healing rubber.

Figure 31. SeRM elastomers.

Figure 32. Opportunity analysis matrix for self-healing coatings and materials in elastomers.

Figure 33. The market for self-healing coatings and materials to 2027, Millions USD, in the elastomers sector, conservative and high estimates.

Figure 34. Self-healing bacteria crack filler for concrete.

Figure 35. Self-healing concrete.

Figure 36. Opportunity analysis matrix for self-healing coatings and materials in construction.

Figure 37. The market for self-healing coatings and materials to 2027, Millions USD, in the construction sector, conservative and high estimates.

Figure 38. Self-healing fabrics.

Figure 39. Schematic of the nanocapsule-based self-healing coatings.



# I would like to order

Product name: The Global Market for Self-Healing Materials, Polymers and Coatings 2021-2031 Product link: <u>https://marketpublishers.com/r/G930DF63060EN.html</u>

Price: US\$ 1,225.00 (Single User License / Electronic Delivery) If you want to order Corporate License or Hard Copy, please, contact our Customer Service: <u>info@marketpublishers.com</u>

# Payment

To pay by Credit Card (Visa, MasterCard, American Express, PayPal), please, click button on product page <u>https://marketpublishers.com/r/G930DF63060EN.html</u>