

CURRICULUM VITAE

Andrea Brenna

Ricercatore legge 240/10 (Senior) – Tempo determinato a tempo pieno
Settore Scientifico Disciplinare: ING-IND/22 – Scienza e Tecnologia dei Materiali
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Andrea Brenna is Ph. D. in Materials Engineering and currently researcher (Ricercatore legge 240/10 (Senior) – Tempo determinato a tempo pieno) at Politecnico di Milano. He is member of PoliLaPP (Laboratory of Corrosion of Materials “Pietro Pedeferrì”) of Politecnico di Milano specialized in high-level corrosion research, corrosion engineering, education and failure analysis.

Education and Career

2018: Researcher (Ricercatore legge 240/10 (senior) – Tempo determinato a tempo pieno)
2015: Researcher (Ricercatore legge 240/10 (junior) – Tempo determinato a tempo pieno)
2012-2015: Post-Doc Research Fellow, Politecnico di Milano
2012: Ph.D. in Materials Engineering, Politecnico di Milano
2008: M.D. in Materials Engineering, Politecnico di Milano
2004: B.D. in Materials Engineering, Politecnico di Milano

Research activity

Scientific activity focuses on corrosion of metallic materials in natural and industrial environments and its prevention. Main research interests are:

- cathodic protection
- a.c. and d.c. interference corrosion
- corrosion in acidic environment
- corrosion of steel in concrete and prevention techniques
- corrosion and cathodic protection monitoring

Teaching activity at Politecnico di Milano (from academic year 2015-2016)

- from a.y. 2019-2020, he is professor of the course “Materiali Cementizi e Ceramici” of the Bachelor in Materials Engineering and Nanotechnology and Chemical Engineering of Politecnico di Milano
- from a.y. 2015-2016, he is professor of the course “Corrosion and Material Protection” of the Master of Science in Energy Engineering of Politecnico di Milano

Scientific publications (Scopus database, update September 2020)

1. Attarchi, M., Brenna, A., Ormellese, M., Cathodic protection and DC non-stationary anodic interference, (2020) Journal of Natural Gas Science and Engineering, 82, art. no. 103497.
2. Brenna, A., Beretta, S., Ormellese, M., AC corrosion of carbon steel under cathodic protection condition: Assessment, criteria and mechanism. A review, (2020) Materials, 13 (9), art. no. 2158.
3. Attarchi, M., Ormellese, M., Brenna, A., Cathodic protection simulation of linear anode alongside coated and uncoated pipe, (2020) Corrosion, 76 (4), pp. 385-397.
4. Attarchi, M., Brenna, A., Ormellese, M., Cathodic protection design optimization of a buried vessel by FEM simulation, (2020) Materials and Corrosion, Article in Press.
5. Dastgerdi, A.A., Brenna, A., Ormellese, M., Pedeferrì, M., Bolzoni, F., Experimental design to study the influence of temperature, pH, and chloride concentration on the pitting and crevice corrosion of UNS S30403 stainless steel, (2019) Corrosion Science, 159, art. no. 108160.
6. Attarchi, M., Ormellese, M., Brenna, A., Simulation of linear anode-pipe cathodic protection system: Primary and secondary current and potential distribution analysis, (2019) Corrosion, 75 (9), pp. 1128-1135.
7. Bolzoni, F., Brenna, A., Beretta, S., Ormellese, M., Diamanti, M.V., Pedeferrì, M.P., Progresses in prevention of corrosion in concrete, (2019) IOP Conference Series: Earth and Environmental Science, 296 (1), art. no. 012016.



8. Attarchi, M., Brenna, A., Bolzoni, F., Ormellese, M., Use of finite element simulation (FEM) to determine the throwing power of a localized corrosion phenomenon [Utilizzo di simulazione agli elementi finiti (FEM) per determinare il potere penetrante di un fenomeno di corrosione localizzata], (2019) *Metallurgia Italiana*, 111 (1112), pp. 11-15.
9. Dastgerdi, A.A., Bolzoni, F., Brenna, A., Pedferri, M., Ormellese, M., Application of DOE to study the effect of environmental parameters on localized corrosion, (2019) *NACE - International Corrosion Conference Series*, 2019-March, art. no. 13152.
10. Dastgerdi, A.A., Brenna, A., Ormellese, M., Pedferri, M., Bolzoni, F., Electrochemical methods for the determination of Pedferri's diagram of stainless steel in chloride containing environment, (2019) *Materials and Corrosion*, 70 (1), pp. 9-18.
11. Brenna, A., Beretta, S., Berra, M., Diamanti, M.V., Ormellese, M., Pastore, T., Pedferri, M., Bolzoni, F., Effect of polymer modified cementitious coatings on chloride-induced corrosion of steel in concrete, (2019) *Structural Concrete*, Article in Press.
12. Noori, S., Diamanti, M.V., Pedferri, M., Brenna, A., Ormellese, M., Effect of water content on the corrosiveness of imidazolium-based ionic liquids, (2018) *Materials and Corrosion*, 69 (11), pp. 1658-1668.
13. Coppola, L., Bellezze, T., Belli, A., Bignozzi, M.C., Bolzoni, F., Brenna, A., Cabrini, M., Candamano, S., Cappai, M., Caputo, D., Carsana, M., Casnedi, L., Cioffi, R., Cocco, O., Coffetti, D., Colangelo, F., Coppola, B., Corinaldesi, V., Crea, F., Crotti, E., Daniele, V., De Gisi, S., Delogu, F., Diamanti, M.V., Di Maio, L., Di Mundo, R., Di Palma, L., Donnini, J., Farina, I., Ferone, C., Frontera, P., Gastaldi, M., Giosuè, C., Incarnato, L., Liguori, B., Lollini, F., Lorenzi, S., Manzi, S., Marino, O., Marroccoli, M., Mascolo, M.C., Mavilia, L., Mazzoli, A., Medici, F., Meloni, P., Merlonetti, G., Mobili, A., Notamicola, M., Ormellese, M., Pastore, T., Pedferri, M.P., Petrella, A., Pia, G., Redaelli, E., Roviello, G., Scarfato, P., Scoccia, G., Taglieri, G., Telesca, A., Tittarelli, F., Todaro, F., Vilardi, G., Yang, F., Binders alternative to Portland cement and waste management for sustainable construction – Part 2, (2018) *Journal of Applied Biomaterials and Functional Materials*, 16 (4), pp. 207-221.
14. Coppola, L., Bellezze, T., Belli, A., Bignozzi, M.C., Bolzoni, F., Brenna, A., Cabrini, M., Candamano, S., Cappai, M., Caputo, D., Carsana, M., Casnedi, L., Cioffi, R., Cocco, O., Coffetti, D., Colangelo, F., Coppola, B., Corinaldesi, V., Crea, F., Crotti, E., Daniele, V., De Gisi, S., Delogu, F., Diamanti, M.V., Di Maio, L., Di Mundo, R., Di Palma, L., Donnini, J., Farina, I., Ferone, C., Frontera, P., Gastaldi, M., Giosuè, C., Incarnato, L., Liguori, B., Lollini, F., Lorenzi, S., Manzi, S., Marino, O., Marroccoli, M., Mascolo, M.C., Mavilia, L., Mazzoli, A., Medici, F., Meloni, P., Merlonetti, G., Mobili, A., Notamicola, M., Ormellese, M., Pastore, T., Pedferri, M.P., Petrella, A., Pia, G., Redaelli, E., Roviello, G., Scarfato, P., Scoccia, G., Taglieri, G., Telesca, A., Tittarelli, F., Todaro, F., Vilardi, G., Yang, F., Binders alternative to Portland cement and waste management for sustainable construction—part 1, (2018) *Journal of Applied Biomaterials and Functional Materials*, 16 (3), pp. 186-202.
15. Prando, D., Brenna, A., Pedferri, M., Ormellese, M., Enhancement of pure titanium localized corrosion resistance by anodic oxidation, (2018) *Materials and Corrosion*, 69 (4), pp. 503-509.
16. Brenna, A., Bolzoni, F., Lazzari, L., Ormellese, M., Predicting the risk of pitting corrosion initiation of stainless steels using a Markov chain model, (2018) *Materials and Corrosion*, 69 (3), pp. 348-357.
17. Brenna, A., Pedferri, M., Bolzoni, F., Ormellese, M., Chloride-induced corrosion inhibition by binary mixtures in reinforced concrete structures, (2018) *NACE - International Corrosion Conference Series*, 2018-April.
18. Brenna, A., Ormellese, M., Pedferri, M.P., Bolzoni, F., Effect of binary mixtures on chloride induced corrosion of rebars in concrete, (2018) *International Journal of Corrosion and Scale Inhibition*, 7 (2), pp. 151-164.
19. Brenna, A., Beretta, S., Brugnetti, F., Ormellese, M., Refrascini, B., Cathodic overprotection and interference condition on a gas transportation pipe encased in a casing pipe in the presence of water in the annulus, (2018) *NACE - International Corrosion Conference Series*, 2018-April.
20. Prando, D., Beretta, S., Bolzoni, F., Brenna, A., Diamanti, M.V., Pedferri, M., Ormellese, M., Anodization treatments to increase commercially pure titanium corrosion resistance [Trattamenti di anodizzazione su titanio commercialmente puro e resistenza a corrosione], (2018) *Metallurgia Italiana*, 110 (10), pp. 5-11.
21. Prando, D., Brenna, A., Diamanti, M.V., Beretta, S., Bolzoni, F., Ormellese, M., Pedferri, M., Corrosion of titanium: Part 2: Effects of surface treatments, (2018) *Journal of Applied Biomaterials and Functional Materials*, 16 (1), pp. 3-13.
22. Prando, D., Brenna, A., Diamanti, M.V., Beretta, S., Bolzoni, F., Ormellese, M., Pedferri, M., Corrosion of titanium: Part 1: Aggressive environments and main forms of degradation, (2017) *Journal of Applied Biomaterials and Functional Materials*, 15 (4), pp. e291-e302.
23. Gronchi, P., Canziani, R., Brenna, A., Visigalli, S., Colominas, C., Montalà, F., Cot, V., Stradi, A., Ferrari, G., Diaz, C., Fuentes, G.G., Georgiadis, A., Electrode surface treatments in sludge electro-osmosis dewatering, (2017) *Materials and Manufacturing Processes*, 32 (11), pp. 1265-1273.
24. Brenna, A., Lazzari, L., Ormellese, M., Stray current control by a new approach based on current monitoring on a potential probe, (2017) *Corrosion Engineering Science and Technology*, 52 (5), pp. 359-364.
25. Beretta, S., Brenna, A., Pedferri, M., Ormellese, M., Cu-Ag ionization system for water sanitation and risks for deposition corrosion [Impianti di ionizzazione Cu-Ag per la disinfezione delle acque e rischi di corrosione per spostamento], (2017) *Metallurgia Italiana*, 109 (7-8), pp. 131-134.
26. Brenna, A., Beretta, S., Bolzoni, F., Ormellese, M., Lazzari, L., Effect of protection current intermittence on cathodic protection of carbon steel [Effetto dell'intermittenza della corrente di protezione nei sistemi di protezione catodica dell'acciaio], (2017) *Metallurgia Italiana*, 109 (7-8), pp. 27-30.
27. Brenna, A., Bolzoni, F., Fumagalli, G., Pedferri, M.P., Sanabria, B.E., Ormellese, M., Characterisation of binary mixtures for corrosion inhibition of carbon steel in alkaline solution [Caratterizzazione di miscele binarie per l'inibizione della corrosione dell'acciaio al carbonio in soluzione alcalina], (2017) *Metallurgia Italiana*, 109 (7-8), pp. 99-102.
28. Brenna, A., Beretta, S., Uglietti, R., Lazzari, L., Pedferri, M., Ormellese, M., Cathodic protection monitoring of buried carbon steel pipeline: measurement and interpretation of instant-off potential, (2017) *Corrosion Engineering Science and Technology*, 52 (4), pp. 253-260.
29. Brenna, A., Beretta, S., Bolzoni, F., Pedferri, M., Ormellese, M., Effects of AC-interference on chloride-induced corrosion of reinforced concrete, (2017) *Construction and Building Materials*, 137, pp. 76-84.
30. Brenna, A., Lazzari, L., Pedferri, M., Ormellese, M., Monitoring cathodic protection of buried pipeline by means of a potential probe with an embedded zinc reference electrode, (2017) *Materials and Design*, 114, pp. 194-201.
31. Brenna, A., Beretta, S., Ormellese, M., Pedferri, M., Effect of intermittent cathodic protection on potential and corrosion rate of carbon steel in soil simulating solution, (2017) *EUROCORR 2017 - The Annual Congress of the European Federation of Corrosion, 20th International Corrosion Congress and Process Safety Congress 2017*.
32. Brenna, A., Bolzoni, F., Beretta, S., Ormellese, M., Can an intermittent cathodic protection system prevent corrosion of buried pipeline?, (2017) *NACE - International Corrosion Conference Series*, 1, pp. 546-556.
33. Prando, D., Pedferri, M., Brenna, A., Ormellese, M., Surface treatment to improve corrosion resistance of pure titanium, (2017) *NACE - International Corrosion Conference Series*, 3, pp. 1606-1619.



34. Brenna, A., Bolzoni, F., Pedferri, M.P., Ormellesse, M., Corrosion inhibitors for reinforced concrete structures: A study of binary mixtures, (2017) *International Journal of Corrosion and Scale Inhibition*, 6 (1), pp. 59-69.
35. Brenna, A., Bolzoni, F., Diamanti, M.V., Pedferri, M., Ormellesse, M., Corrosion inhibitors for reinforced concrete structures: A study of binary mixtures, (2017) *EUROCORR 2017 - The Annual Congress of the European Federation of Corrosion*, 20th International Corrosion Congress and Process Safety Congress 2017.
36. Brenna, A., Bolzoni, F., Lazzari, L., Pedferri, M., Ormellesse, M., Probabilistic model based on Markov chain for the assessment of localized corrosion of stainless steels, (2017) *ESSC and DUPLEX 2017 - 9th European Stainless Steel Conference - Science and Market and 5th European Duplex Stainless Steel Conference and Exhibition*, 2017-May.
37. Prando, D., Diamanti, M.V., Brenna, A., Ormellesse, M., Pedferri, M.P., Photoactive TiO₂ films produced with different techniques in anodic spark deposition regime, (2017) *Advanced Science Letters*, 23 (6), pp. 5962-5965.
38. Prando, D., Nicolis, D., Brenna, A., Diamanti, M.V., Pedferri, M., Ormellesse, M., Enhancement of pure titanium localized corrosion resistance by anodic oxidation, (2017) *EUROCORR 2017 - The Annual Congress of the European Federation of Corrosion*, 20th International Corrosion Congress and Process Safety Congress 2017.
39. Prando, D., Brenna, A., Bolzoni, F.M., Diamanti, M.V., Pedferri, M., Ormellesse, M., Electrochemical anodizing treatment to enhance localized corrosion resistance of pure titanium, (2017) *Journal of Applied Biomaterials and Functional Materials*, 15 (1), pp. e19-e24.
40. Azimi Dastgerdi, A., Beretta, S., Bolzoni, F., Brenna, A., Diamanti, M.V., Pedferri, M.P., Ormellesse, M., Potentiostatic and potentiodynamic polarization tests for the definition of the Pedferri's diagrams of stainless steels, (2017) *ESSC and DUPLEX 2017 - 9th European Stainless Steel Conference - Science and Market and 5th European Duplex Stainless Steel Conference and Exhibition*, 2017-May.
41. Prando, D., Brenna, A., Diamanti, M.V., Pedferri, M., Ormellesse, M., Electrochemical anodizing treatment to improve the corrosion resistance of commercially pure titanium [Trattamenti superficiali di anodizzazione per incrementare la resistenza a corrosione del titanio commercialmente puro], (2016) *Metallurgia Italiana*, 108 (12), pp. 5-12.
42. Fumagalli, G., Brunella, M.F., Tagini, S., Brenna, A., Lazzari, L., Bolzoni, F., Hydrogen embrittlement of high strength martensitic stainless steel: Effect of cathodic polarisation [Effetto della polarizzazione catodica sull'infragilimento da idrogeno di un acciaio inossidabile martensitico a elevata resistenza], (2016) *Metallurgia Italiana*, 108 (12), pp. 83-92.
43. Brenna, A., Ormellesse, M., Lazzari, L., Electromechanical breakdown mechanism of passive film in alternating current-related corrosion of carbon steel under cathodic protection condition, (2016) *Corrosion*, 72 (8), pp. 1055-1063.
44. Diamanti, M.V., Velardi, U.V., Brenna, A., Mele, A., Pedferri, M., Ormellesse, M., Compatibility of Imidazolium-Based Ionic Liquids for CO₂ Capture with Steel Alloys: A Corrosion Perspective, (2016) *Electrochimica Acta*, 192, pp. 414-421.
45. Brenna, A., Lazzari, L., Ormellesse, M., Limits of the ON-OFF technique for the assessment of cathodic protection of buried pipeline, (2016) *NACE - International Corrosion Conference Series*, 6, pp. 4712-4723.
46. Diamanti, M.V., Pedferri, M., Brenna, A., Ormellesse, M., Beretta, S., Increase of corrosion resistance of titanium by anodic oxidation, (2016) *NACE - International Corrosion Conference Series*, 6, pp. 4724-4730.
47. Azimi Dastgerdi, A., Beretta, S., Bolzoni, F., Brenna, A., Pedferri, M., Ormellesse, M., Experimental approach for the definition of the Pedferri's diagrams of stainless steels [Approccio sperimentale per la definizione dei diagrammi Pedferri degli acciai inossidabili], (2016) *Metallurgia Italiana*, 2016 (12), pp. 42-52.
48. Diamanti, M.V., Pisoni, R., Cologni, A., Brenna, A., Corinto, F., Pedferri, M.P., Anodic oxidation as a means to produce memristive films, (2016) *Journal of Applied Biomaterials and Functional Materials*, 14 (3), pp. e290-e295.
49. Bolzoni, F., Beretta, S., Brenna, A., Diamanti, M.V., Lazzari, L., Ormellesse, M., Pedferri, M.P., Evaluation of additional protection methods to control reinforcement corrosion, (2016) *Key Engineering Materials*, 711, pp. 37-44.
50. Brenna, A., Lazzari, L., Ormellesse, M., Monitoring chloride-induced corrosion of carbon steel tendons in concrete using a multi-electrode system, (2015) *Construction and Building Materials*, 96, pp. 434-441.
51. Ormellesse, M., Lazzari, L., Brenna, A., AC corrosion of cathodically protected buried pipelines: Critical interference values and protection criteria, (2015) *NACE - International Corrosion Conference Series*, 2015-January.
52. Brenna, A., Ormellesse, M., Lazzari, L., Effects of intermittent DC stray current on carbon steel under cathodic protection, (2015) *NACE - International Corrosion Conference Series*, 2015-January.
53. Ormellesse, M., Brenna, A., Lazzari, L., Use of a linear continuous reference electrode to monitor the chloride-induced corrosion of steel in prestressed concrete, (2015) *Materials and Corrosion*, 66 (1), pp. 35-44.
54. Brenna, A., Lazzari, L., Ormellesse, M., Pedferri, M., Interpretation and use of the off-potential technique for the assessment of cathodic protection condition, (2015) *European Corrosion Congress*, *EUROCORR 2015*, 3, pp. 1601-1610.
55. Bolzoni, F., Brenna, A., Lazzari, L., Ormellesse, M., Pedferri, M.P., Electrochemical approach for the definition of the Pedferri's diagrams of stainless steels, (2015) *European Corrosion Congress*, *EUROCORR 2015*, 3, p. 2076.
56. Bolzoni, F., Beretta, S., Brenna, A., Diamanti, M.V., Ormellesse, M., Pastore, T., Berra, M., Effect of polymer modified cementitious coatings on chloride induced corrosion of steel in concrete, (2015) *European Corrosion Congress*, *EUROCORR 2015*, 2, pp. 867-876.
57. Diamanti, M.V., Pérez Rosales, E.A., Raffaini, G., Ganazzoli, F., Brenna, A., Pedferri, M., Ormellesse, M., Molecular modelling and electrochemical evaluation of organic inhibitors in concrete, (2015) *Corrosion Science*, 100, pp. 231-241.
58. Bolzoni, F., Brenna, A., Fumagalli, G., Goidanich, S., Lazzari, L., Ormellesse, M., Pedferri, M.P., Corrosion inhibitors for reinforced concrete: 15 years of experiments @PoliLaPP [Inibitori di corrosione per calcestruzzo armato: 15 anni di sperimentazione @PoliLaPP], (2015) *Metallurgia Italiana*, 107 (5), pp. 53-60.
59. Brenna, A., Ormellesse, M., Lazzari, L., Probabilistic model based on Markov chain for the assessment of localized corrosion of stainless steels, (2014) *NACE - International Corrosion Conference Series*.
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69. Bolzoni, F., Ormellese, M., Brenna, A., Efficiency of concrete coatings on chloride-induced corrosion of reinforced concrete structures, (2011) *NACE - International Corrosion Conference Series*, 11 p.
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75. Brenna, A., Lazzari, L., Ormellese, M., Rigozzi, L., Laboratory tests on a potential probe with zinc reference electrode for remote monitoring system of cathodic protection [Prove di laboratorio su sonda di potenziale con elettrodo di zinco per il telecontrollo della protezione catodica], (2010) *Metallurgia Italiana*, 102 (5), pp. 13-19.
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