

16. Lohman C, Fortuin L, Wouters M. *European Journal of Operational Research* 2004; 156(2): 267-286.
17. Suanmali S, Phong-arjarn E, Jeenanunta C, Ammarapala V, Watcharapanayawong K. *A Study of Business Performance through Key Performance Indicators (KPIs) in Thai Garment Industry*. In: The 5th International Congress on Logistics and SCM Systems (ICLS2009), Seoul, Korea, 2009.
18. Allen RM. *Performance Measurement of Textile and Apparel Supply Chains in Developing Countries*. North Carolina State University, North Carolina, 2008.
19. Lee SF, Andrew Sai On Ko. *Managerial Auditing Journal* 2000; 15; 1/2: 68-76.
20. Kaplan RS, Norton DP. *Optimize* 2004; February: 61-64.
21. Horngren CT, Srikant MD, Foster G. *Cost Accounting: A Managerial Emphasis*. 11th edition, Prentice Hall International, New Jersey, 2003, p. 447-449.
22. Başbakanlık TC. Devlet Planlama Teşkilatı, Dokuzuncu Kalkınma Planı 2007-2013, Tekstil, Deri ve Giyim Sanayi Özel İhtisas Komisyonu Raporu, No: DPT: 2715, 2007.
23. TGSD Türkiye Giyim Sanayicileri Derneği, Yıllık Raporlar ve İstatistiksel Veriler, 2008.
24. İTKİB (Istanbul Textile and Apparel Exporters' Association), Tekstil Sektörünün İhracat Performansı Yıllık Değerlendirme Ocak-Aralık 2010, 2011.
25. Sanayi Genel Müdürlüğü, Tekstil, Hazır Giyim, Deri ve Deri Ürünleri Sektörlerine Yönelik Strateji Belgesi, 2008.
26. TGSD (Turkish Clothing Manufacturers Association), Ufuk 2015 Sektörel Yol Haritası, 2007.
27. Jin B. *Journal of Fashion and Management* 2004; 8; 2: 230-244.
28. Towers N, Peng X. *Journal of Textile Institute* 2006; 97:6: 541-548.
29. Eraslan İH, Bakan İ, Kuyucu Helvacioğlu AD. *İstanbul Ticaret Üniversitesi Sosyal Bilimler Dergisi Year* 2008; 13, Spring: 265-300.
30. Institut Francais De La Mode and Partners, Study on the Implications of the 2005 Trade Liberalisation in the Textile and Clothing Sector, February 2004, p. 153.
31. TÜBİTAK (The Scientific & Technological Research Council of Turkey), Vizyon 2023 Teknoloji Öngörüsü Projesi, Temmuz, 2003.
32. MUSIAD (Independent Industrialists and Businessmen's Association), Küresel Rekabet Baskısı Altında Tekstil ve Hazır Giyim Sektörünün Dönüşüm Stratejileri ve Yeni Yol Haritası, November 2008.
33. Bilim TC. Teknoloji ve Sanayi Bakanlığı, Tekstil, Hazır Giyim, Deri ve Deri Ürünleri Sektörü Raporu, 2010.
34. TGSD (Turkish Clothing Manufacturers Association), Ufuk 2010 Sektörel Yol Haritası, 2004.
35. Ahn H. *Long Range Planning* 2001; 34: 441-461.

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The Laboratory works and specialises in three fundamental fields:

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- research works on new technology and techniques, particularly environmental protection;
- evaluation and improvement of technology used in domestic mills;
- development of new research and analytical methods;

■ **research services** (measurements and analytical tests) in the field of environmental protection, especially monitoring the emission of pollutants;

■ **seminar and training activity** concerning methods of instrumental analysis, especially the analysis of water and wastewater, chemicals used in paper production, and environmental protection in the paper-making industry.

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- Research and development of waste water treatment technology, the treatment technology and abatement of gaseous emissions, and the utilisation and reuse of solid waste,
- Monitoring the technological progress of environmentally friendly technology in paper-making and the best available techniques (BAT),
- Working out and adapting analytical methods for testing the content of pollutants and trace concentrations of toxic compounds in waste water, gaseous emissions, solid waste and products of the paper-making industry,
- Monitoring ecological legislation at a domestic and world level, particularly in the European Union.

**A list of the analyses most frequently carried out:**

- Global water & waste water pollution factors: COD, BOD, TOC, suspended solid (TSS), tot-N, tot-P
- Halogenoorganic compounds (AOX, TOX, TX, EOX, POX)
- Organic sulphur compounds (AOS, TS)
- Resin and chlororesin acids
- Saturated and unsaturated fatty acids
- Phenol and phenolic compounds (guaiacols, catechols, vanillin, veratrols)
- Tetrachlorophenol, Pentachlorophenol (PCP)
- Hexachlorocyclohexane (lindane)
- Aromatic and polyaromatic hydrocarbons
- Benzene, Hexachlorobenzene
- Phthalates
- Carbohydrates
- Glycols
- Polychloro-Biphenyls (PCB)
- Glyoxal
- Tin organic compounds

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