

## Laboratory Equipments List

16<sup>th</sup> February 2007

<u>Equipment Description</u>	<u>Model</u>
<p>· "ROSS" flexing machine .....</p> <p><b>Standards:</b> SATRA TM60 ; BS 5131 ; ASTM D-1052 ; ISO 4643 ; ISO 5423</p> <p><b>Purpose:</b> Determine the resistance of polymeric materials to cut growth during repeated flexing, this test is applicable to all types of flexible sheet material and especially those used in footwear solings.</p>	EL-10
<p>· "ROSS" flexing machine with cold chamber .....</p> <p><b>Standards:</b> SATRA TM60 ; BS 5131 ; ASTM D-1052 ; ISO 4643 ; ISO 5423</p> <p><b>Purpose:</b> Same purpose as the anterior equipment but this one fitted inside a cold chamber, so it's possible to adjust the test temperature till -25 °C.</p>	EL-10F
<p>· Rigidity tester for soles .....</p> <p><b>Standards:</b> EN ISO 20344:8.4 ; EN ISO 17707</p> <p><b>Purpose:</b> Measure the rigidity of the complete footwear, to determine if it should be subjected to the "BENNEWART" flexing machine.</p>	EL-12
<p>· "BENNEWART" flexing machine .....</p> <p><b>Standards:</b> SATRA TM161 ; EN ISO 20344:8.4 ; DIN 53 543</p> <p><b>Purpose:</b> Determine the resistance of whole soles to cut growth during repeated flexing, it is also suitable to assess the effect of surface patterns on crack initiation and growth, this test is applicable to the outsoles of footwear.</p>	EL-13
<p>· "BENNEWART" flexing machine with cold chamber .....</p> <p><b>Standards:</b> SATRA TM161 ; EN ISO 20344:8.4 ; DIN 53 543</p> <p><b>Purpose:</b> Same purpose as the anterior equipment but this one fitted inside a cold chamber, so it's possible to adjust the test temperature till -25 °C.</p>	EL-13F
<p>· "VAMP" flexing machine with 12 stations .....</p> <p><b>Standards:</b> SATRA TM25 ; BS 3424 ; ISO 4643 ; ISO 5423 ; EN 13335</p> <p><b>Purpose:</b> Determine the propensity for materials to crack or otherwise fail at flexing creases and assess whether leathers are likely to produce salt spue, this machine simulates conditions in the Vamp part of footwear during walking. This test is applicable to all flexible materials and in particular those used to manufacture outers and linings of footwear uppers such as leathers and coated fabrics.</p>	EL-15
<p>· "VAMP" flexing machine with 12 stations and cold chamber .....</p> <p><b>Standards:</b> SATRA TM25 ; BS 3424 ; ISO 4643 ; ISO 5423</p> <p><b>Purpose:</b> Same purpose as the anterior equipment but this one fitted inside a cold chamber, so it's possible to adjust the test temperature till -25 °C.</p>	EL-15F
<p>· Whole shoe flexing machine (in water) .....</p> <p><b>Standards:</b> SATRA TM230</p> <p><b>Purpose:</b> Determine the resistance to water penetration of completed footwear during flexing, this test is applicable to all types of footwear.</p>	EL-17W

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<u>Equipment Description</u>	<u>Model</u>
<p>. "BALLY" flexing machine with 6 stations .....</p> <p><b>Standards:</b> SATRA TM55 ; BS 3144 ; IUP 20 ; SLP 14 ; UNE 59-029 ; EN 13 512 ; ISO 5402</p> <p><b>Purpose:</b> Determine the resistance of a material to cracking or other types of failure at flexing creases, this test is applicable to all flexible materials and in particular leathers and coated fabrics used in footwear uppers.</p>	<p><b>EL-18/6</b></p>
<p>. "BALLY" flexing machine with 12 stations .....</p> <p><b>Standards:</b> SATRA TM55 ; BS 3144 ; IUP 20 ; SLP 14 ; UNE 59-029 ; EN 13 512 ; ISO 5402</p> <p><b>Purpose:</b> Same purpose as the anterior equipment but with 12 stations.</p>	<p><b>EL-18/12</b></p>
<p>. "BALLY" flexing machine with 12 stations and cold chamber .....</p> <p><b>Standards:</b> SATRA TM55 ; BS 3144 ; IUP 20 ; SLP 14 ; UNE 59-029 ; EN 13 512 ; ISO 5402</p> <p><b>Purpose:</b> Same purpose as the anterior equipment but this one fitted inside a cold chamber, so it's possible to adjust the test temperature till -25 °C.</p>	<p><b>EL-18F/12</b></p>
<p>. "Plis Croisés" flexing machine with 8 stations .....</p> <p><b>Standards:</b> NF G52-020</p> <p><b>Purpose:</b> Assess the behaviour of leather, artificial leather and similar sheet materials when subjected to repeated folding. The machine is equipped with 8 workstations and fitted inside a cold chamber, so its possible to carry out test since room temperature till -25 °C.</p>	<p><b>EL-19F</b></p>
<p>. Operating stand for "Shore" durometers, type: A, C and D .....</p> <p><b>Standards:</b> DIN 53 505 ; ISO 868</p> <p><b>Purpose:</b> Ensure that the Durometers are pressed plane-parallel to the material under test with a standard known force.</p>	<p><b>EL-21</b></p>
<p>. Operating stand for "Shore" durometers, type: A, C and D with timer .....</p> <p><b>Standards:</b> DIN 53 505 ; ISO 868</p> <p><b>Purpose:</b> Same purpose as the above equipment but this one equipped with a suitable timer.</p>	<p><b>EL-21T</b></p>
<p>. Fibreboard flexing machine .....</p> <p><b>Standards:</b> SATRA TM3, TM4, TM6, TM15, TM16 ; BS 5131</p> <p><b>Purpose:</b> Determine the endurance of a material to repeated flexing, this test is applicable to most types of semi-rigid sheet materials and in particular fibreboards.</p>	<p><b>EL-23</b></p>
<p>. Steel midsole flexing machine .....</p> <p><b>Standards:</b> EN ISO 20344:5.9 ; EN 12568 ; Z195-02</p> <p><b>Purpose:</b> Determine the endurance of steel midsoles to repeated flexing.</p>	<p><b>EL-24</b></p>
<p>. Flexing Machine for shanks and insole backparts .....</p> <p><b>Standards:</b> EN 12958</p> <p><b>Purpose:</b> Assessing the fatigue resistance of steel shanks.</p>	<p><b>EL-25</b></p>

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<u>Equipment Description</u>	<u>Model</u>
<p>. "BALLY" penetrometer with 4 stations .....</p> <p><b>Standards:</b> SATRA TM171 ; BS 3144 ; EN ISO 20344:6.13 ; IUP 10 ; DIN 53 338 ; EN 13518</p> <p><b>Purpose:</b> Determine the resistance of a material to water penetration on flexing, this test is mainly applicable to leather but can be used with any flexible sheet material.</p>	<p><b>EL-26/4</b></p>
<p>. "BALLY" penetrometer with 6 stations .....</p> <p><b>Standards:</b> SATRA TM171 ; BS 3144 ; EN ISO 20344:6.13 ; IUP 10 ; DIN 53 338 ; EN 13518</p> <p><b>Purpose:</b> Same purpose as the anterior equipment but this one with 6 stations.</p>	<p><b>EL-26/6</b></p>
<p>. Stiffness tester for leathers .....</p> <p><b>Standards:</b> DIN 53 338 ; EN 13 518</p> <p><b>Purpose:</b> Determine the stiffness of leathers.</p>	<p><b>EL-26/R</b></p>
<p>. Longitudinal and torsional stiffness of insole backparts and shanks .....</p> <p><b>Standards:</b> EN 12959 ; SATRA TM58 / TM59 / TM88</p> <p><b>Purpose:</b> This test machine is intended to assess the stiffness in the longitudinal direction of steel shanks used for reinforcement of the waist region of women's shoes and somemen's and children's shoes. The stiffness in the longitudinal direction of shanks is assessed bymeasuring the deflection of the shank under specified conditions when loadedwith a specified force.</p>	<p><b>EL-28</b></p>
<p>. Longitudinal and torsional stiffness of complete footwear .....</p> <p><b>Standards:</b> SATRA TM194 ; SATRA TM256</p> <p><b>Purpose:</b> Assess the longitudinal and torsional stiffness of complete footwear. This test method is suitable to all types of footwear that are expected to flex during wear.</p>	<p><b>EL-29</b></p>
<p>. "MAESER" upper leather waterproofness tester .....</p> <p><b>Standards:</b> SATRA TM34 ; ASTM D-2099</p> <p><b>Purpose:</b> Determine the resistance of a material to water penetration on flexing, this test is mainly applicable to footwear upper outer materials but can be used with any flexible sheet material.</p>	<p><b>EL-30</b></p>
<p>. Leather permeability / absorption machine .....</p> <p><b>Standards:</b> UNE 59-035-94 ; SATRA TM47</p> <p><b>Purpose:</b> Determine the amount of water vapour an assembly or a single material will absorb and transmit through its structure in a specified time. This test is applicable to leathers and textiles used in footwear uppers.</p>	<p><b>EL-31</b></p>
<p>. Dynamic water-resistance tester for boot and shoe sole leather .....</p> <p><b>Standards:</b> EN ISO 20344:7.2 ; SATRA TM220 ; IUP 11 ; EN 12746 ; EN ISO 5404</p> <p><b>Purpose:</b> Determine the dynamic water-resistance of sole leather.</p>	<p><b>EL-32</b></p>
<p>. Perspiration Tester .....</p> <p><b>Standards:</b> ISO 105:E04</p> <p><b>Purpose:</b> Determine the resistance of the colour of the leathers to the human sweat.</p>	<p><b>EL-33</b></p>

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<u>Equipment Description</u>	<u>Model</u>
<p>. Sewing threads measuring apparatus .....</p> <p><b>Standards:</b> SATRA TM72</p> <p><b>Purpose:</b> Measure the net unextended length of a piece of thread, to assess the linear density.</p>	<p><b>EL-34</b></p>
<p>. Shoe lace abrasion machine (lace to lace) .....</p> <p><b>Standards:</b> SATRA TM154 ; BS 953</p> <p><b>Purpose:</b> Determine the abrasion resistance of a shoe lace to repeated rubbing against either a similar shoe lace, or a lace carrier, this equipment can also be used to assess the abrasion resistance of a lace carrier. This test is applicable to all types of shoe laces and lace carriers, but not used with eyelets.</p>	<p><b>EL-35</b></p>
<p>. Shoe lace abrasion machine with 6 stations .....</p> <p><b>Standards:</b> SATRA TM93 ; BS 5131</p> <p><b>Purpose:</b> Determine either the abrasion resistance of a shoe lace to repeated rubbing against a standard eyelet or the abrasive action of an eyelet on a standard shoe lace, this test is applicable to all types of shoe laces and eyelets.</p>	<p><b>EL-36/6</b></p>
<p>. Shoe lace abrasion machine,with 6 stations (according NF French Standard ...</p> <p><b>Standards:</b> NF G62-020</p> <p><b>Purpose:</b> Determine either the abrasion resistance of a shoe lace to repeated rubbing against a standard eyelet or the abrasive action of an eyelet on a standard shoe lace, this test is applicable to all types of shoe laces and eyelets.</p>	<p><b>EL-36/6NF</b></p>
<p>. Electrostatic resistance tester (ESD) .....</p> <p><b>Standards:</b> IEC 61340-4-3</p> <p><b>Purpose:</b> Measure the electrical resistance of footwear used in the control of electrostatic potential on people.</p>	<p><b>EL-37</b></p>
<p>. Electrical conductivity tester .....</p> <p><b>Standards:</b> EN ISO 20344:5.10</p> <p><b>Purpose:</b> Measurement of electrical resistance of conductive footwear.</p>	<p><b>EL-38</b></p>
<p>. Electrical insulation tester .....</p> <p><b>Standards:</b> EN ISO 20344:5.11 ; EN 50321</p> <p><b>Purpose:</b> Measurement of electrical insulation of protective footwear.</p>	<p><b>EL-39</b></p>
<p>. Liquid column for volume measurement .....</p> <p><b>Purpose:</b> Measurement of liquids.</p>	<p><b>EL-40</b></p>
<p>. Compression set apparatus (constant stress) .....</p> <p><b>Standards:</b> SATRA TM64</p> <p><b>Purpose:</b> Determine the compression set of a material, this is a measure of retention of shape and elastic properties. This test is mainly applicable to solid and cellular footwear soling materials, but can be used with any type of compressible material.</p>	<p><b>EL-41</b></p>

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<u>Equipment Description</u>	<u>Model</u>
<p>. Shoe heels impact tester .....</p> <p><b>Standards:</b> SATRA TM20 ; BS 5131:4.8</p> <p><b>Purpose:</b> Assess the resistance of heels used in women's shoes to occasional heavy blows that occur in wear. This test is applicable to all types of high heels from women's shoes and particularly useful for moulded plastic heels with steel dowel for reinforcement.</p>	<b>EL-42</b>
<p>. Resistance to dynamic compression tester .....</p> <p><b>Standards:</b> SATRA TM159</p> <p><b>Purpose:</b> Value the changes in dimensions of a specimen after a prolonged period of dynamic compression, this test is applicable to all compressible materials.</p>	<b>EL-43</b>
<p>. Falling mass shock absorption tester .....</p> <p><b>Standards:</b> SATRA TM142</p> <p><b>Purpose:</b> Evaluate the shock absorption properties of materials or assemblies. This test is mainly applicable to footwear bottom units of complete footwear, however can also be used with compressible sheet materials, namely those used for midsoles and solings.</p>	<b>EL-44</b>
<p>. Laboratory press .....</p> <p><b>Standards:</b> SATRA TM402</p> <p><b>Purpose:</b> Laboratory pneumatic press to use in the process of specimens bonding, those specimens are intended to be used afterwards in several adhesion tests.</p>	<b>EL-45</b>
<p>. Whole footwear water resistance tester (brush machine method) .....</p> <p><b>Standards:</b> EN ISO 20344:5.15</p> <p><b>Purpose:</b> Dynamic method to assess the resistance of whole footwear to water penetration.</p>	<b>EL-46</b>
<p>. Resistance of heel assemblies to cyclic compression .....</p> <p><b>Standards:</b> SATRA TM156</p> <p><b>Purpose:</b> Determine the likelihood of structural or visually unacceptable damage occurring to the heel of a sole unit due to cyclic compression.</p>	<b>EL-47</b>
<p>. Multiple light chamber for colour comparison .....</p> <p><b>Standards:</b> EN 50081-2 ; EN 60204-1 ; ASTM D1729 ; ISO 3668</p> <p><b>Purpose:</b> Provide controlled viewing conditions for the assessment and comparison of colour variations.</p>	<b>EL-48</b>
<p>. Creep cabinet for testing adhesives (Creep Test) .....</p> <p><b>Standards:</b> SATRA TM3 ; BS 5131 ; FEICA A4 ; DIN 53273 ; EN 1392</p> <p><b>Purpose:</b> Determine the resistance of an adhesive bond, stored at an elevated temperature, to peeling by a constant force. This test is applicable to bonds between footwear uppers, soling materials and all types of bonded joint where at least one of the adherends is flexible.</p>	<b>EL-49</b>

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<u>Equipment Description</u>	<u>Model</u>
<p>. Electronic "Lastometer" .....</p> <p><b>Standards:</b> SATRA TM24 ; BS 3144 ; ISO 3379 ; DIN 53325 ; IUP 9 ; SLP 9</p> <p><b>Purpose:</b> Assess how much a material can be stretched simultaneously in two directions (distended) without being damaged. This simulates conditions experienced during the lasting operation in footwear manufacture. This test is mainly applicable to footwear upper materials, but can be used to asses any sheet material such as leather, plastics and textiles.</p>	<p><b>EL-51E</b></p>
<p>. Repeated extension machine for elastics .....</p> <p><b>Standards:</b> SATRA TM103</p> <p><b>Purpose:</b> Determine the resistance of elastics to repeated stretching to the limit of its useful extension, this test is applicable to elasticated fabrics and any extensible material.</p>	<p><b>EL-52</b></p>
<p>. Zipper fatigue tester .....</p> <p><b>Standards:</b> SATRA TM50</p> <p><b>Purpose:</b> Determine the resistance of a slide fastener to repeated opening and closing, this test is applicable to all types of slide fasteners.</p>	<p><b>EL-53</b></p>
<p>. Velcro closing machine .....</p> <p><b>Standards:</b> SATRA TM123</p> <p><b>Purpose:</b> This equipment is intended to press the two parts of the touch and close fastener together under controlled conditions, prior to determining the peel and shear strenght.</p>	<p><b>EL-54</b></p>
<p>. Velcro fatigue tester .....</p> <p><b>Standards:</b> SATRA TM123 ; EN 1414/A1</p> <p><b>Purpose:</b> This equipment is intended to submit touch and close fasteners to repeated opening and closing cycles to simulate use. The touch and close fasteners subjected to these cycles are intended to be use in subsequent physical tests intended to measure the residualmechanical strength characteristics.</p>	<p><b>EL-55</b></p>
<p>. Laboratory reactivator .....</p> <p><b>Purpose:</b> Laboratory reactivator to use in the process of specimens bonding, those specimens are intended to be used afterwards in several adhesion tests.</p>	<p><b>EL-56</b></p>
<p>. Sole adhesion tester .....</p> <p><b>Standards:</b> SATRA TM404</p> <p><b>Purpose:</b> Assess the strength of the bond between the sole and upper at the toe and heel area of the lasted margin of completed footwear. This non-destructive test is suitable for factory and laboratory use and mainly applicable to stuck-on or moulded-on constructions with an extended sole edge.</p>	<p><b>EL-57</b></p>
<p>. Equipment for corrosion tests .....</p> <p><b>Standards:</b> EN 12472</p> <p><b>Purpose:</b> Subject coated items to constant rotating movement inside one plastic container with suitable abrasive medium to simulate wear and corrosion.</p>	<p><b>EL-58</b></p>

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<u>Equipment Description</u>	<u>Model</u>
. Water vapour permeability tester .....	EL-60
<b>Standards:</b> SATRA TM172 ; EN ISO 20344:6.6 ; IUP 15 ; EN 13 515	
<b>Purpose:</b> Assess the "breathability" of leather and non-leather upper materials (outers and linings).	
. Water vapour absorption tester .....	EL-61
<b>Standards:</b> SATRA TM172 ; EN ISO 20344:6.7 ; EN 13 515	
<b>Purpose:</b> Calculate the coefficient of water vapour on leather and non-leather upper materials (outers and linings).	
. Water vapour absorption tester (for gloves) .....	EL-61L
<b>Standards:</b> EN 420	
<b>Purpose:</b> Calculate the coefficient of water vapour on leather and non-leather used on "gloves" manufacture.	
. Shaking machine for 8 vacuum flasks .....	EL-63
<b>Standards:</b> SATRA TM29 ; BS 1309 ; IUC 6 ; ISO 4045	
<b>Purpose:</b> Agitates up to eight vacuum flasks.	
. Laboratory mill .....	EL-67
<b>Standards:</b> BS 1309 ; IUC 3 ; ISO 4044	
<b>Purpose:</b> This mill is designed to disintegrate swiftly and efficiently leather and non-leather upper materials, to use afterwards on several chemical tests.	
. Equipment to test resistance to cutting by chainsaw .....	EL-68
<b>Standards:</b> EN 381	
<b>Purpose:</b> Assess the resistance to cutting by chainsaw of protective devices.	
. "MARTINDALE" abrasion machine .....	EL-71
<b>Standards:</b> SATRA TM31 ; BS 3424 ; EN ISO 20344:6.12 ; EN 13520 ; ISO 12947	
<b>Purpose:</b> Determine the resistance of a material to wet and dry abrasion, this test its applicable to coated fabrics, leathers and other flexible sheet materials.	
. Hand driven "Crockmeter" .....	EL-73
<b>Standards:</b> SATRA TM167 ; ISO 105-X12	
<b>Purpose:</b> Determine colour fastness to crocking, which is the resistance of the colour of textiles and other materials to rubbing off and staining, this model is hand driven.	
. Motor driven "Crockmeter" .....	EL-73M
<b>Standards:</b> SATRA TM167; ISO 105-X12	
<b>Purpose:</b> Same purpose as the anterior equipment but this model motor driven.	
. Rub fastness tester .....	EL-74
<b>Standards:</b> SATRA TM8/TM14 ; BS 1006 ; BS 5131 ; SLF 5 ; EN 13516	
<b>Purpose:</b> Assess the degree of damage (marring) and transfer of a material's surface colour during mild dry or wet abrasion. This test is mainly applicable to footwear upper materials, but can be used to assess any coloured material.	

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<u>Equipment Description</u>	<u>Model</u>
<p>. Shrinkage temperature of leather .....</p> <p><b>Standards:</b> SATRA TM17 ; IUP 16</p> <p><b>Purpose:</b> Measure the shrinkage temperature of leather when heated in water. This test is applicable to all leather tannages.</p>	<p><b>EL-75</b></p>
<p>. Abrasion test machine "DIN" type for sole material .....</p> <p><b>Standards:</b> SATRA TM174 ; ISO 4649 ; DIN 53 516 ; EN 12770</p> <p><b>Purpose:</b> Determine the abrasion resistance of a material, this test is mainly applicable to polymeric footwear soling materials or suitable material cut from finished soles, but can be used with any polymer based sheet material.</p>	<p><b>EL-78</b></p>
<p>. Abrasion test machine, <u>with rotating test piece holder</u> .....</p> <p><b>Standards:</b> SATRA TM174 ; ISO 4649 ; DIN 53516 ; EN 12770 ; ASTM D5963:A, D</p> <p><b>Purpose:</b> Same purpose as the anterior equipment but also according "ASTM".</p>	<p><b>EL-78R</b></p>
<p>. Abrasion test machine "PFI" type for sole material .....</p> <p><b>Standards:</b> PFI</p> <p><b>Purpose:</b> Serves for finding out the conduct of wear and tear of sole material of any kind.</p>	<p><b>EL-79</b></p>
<p>. Bottom leather grain crack tester .....</p> <p><b>Standards:</b> SATRA TM48 ; BS 3144 ; SLP 8 ; IUP 12 ; ISO 3378</p> <p><b>Purpose:</b> Determine the propensity of the grain of a leather to crack during bending, this test is applicable to all sole leathers.</p>	<p><b>EL-80</b></p>
<p>. Determination of resistance of uppers to cutting .....</p> <p><b>Standards:</b> EN ISO 20344:6.14</p> <p><b>Purpose:</b> Assess the resistance of uppers to cut by blade.</p>	<p><b>EL-82</b></p>
<p>. "VESLIC" rub fastness tester .....</p> <p><b>Standards:</b> ISO 11640 ; EN 13516 ; EN ISO 20344:7.3 ; IUF 450 ; SATRA TM173 ; EN 12 747</p> <p><b>Purpose:</b> Determine the behaviour of the surface of a leather on rubbing with a felt.</p>	<p><b>EL-83</b></p>
<p>. "VESLIC" rub fastness tester with ironing element .....</p> <p><b>Standards:</b> ISO 11640 ; EN 13516 ; EN ISO 20344:7.3 ; IUF 450 ; IUF 458 ; SATRA TM173</p> <p><b>Purpose:</b> Determine the behaviour of the surface of a leather on rubbing with a felt, and also on exposure to a hot iron.</p>	<p><b>EL-83A</b></p>
<p>. Ironing element for "VESLIC" .....</p> <p><b>Standards:</b> IUF 458</p> <p><b>Purpose:</b> Hot iron to fit on "VESLIC" rub fastness tester, to determine the behaviour of the surface of a leather.</p>	<p><b>DP-83A</b></p>

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<u>Equipment Description</u>	<u>Model</u>
. Thermal conductivity tester ..... <b>Standards:</b> SATRA TM146 <b>Purpose:</b> Determine the thermal conductivity of materials. This test is applicable to all sheet form materials.	<b>EL-85</b>
. Slip resistance tester ..... <b>Standards:</b> EN 13287 ; SATRA TM144 <b>Purpose:</b> Determine the coefficient of friction between footwear outsoles and flooring surfaces.	<b>EL-88</b>
. "BELT" flexing machine for sole units ..... <b>Standards:</b> SATRA TM133 <b>Purpose:</b> Determine the resistance of a component or material to crack initiation and growth due to repeated flexing, this test is mainly applicable to footwear outsoles.	<b>EL-90</b>
. Shock absorption tester for ankle protection materials ..... <b>Standards:</b> EN ISO 20344:5.17 <b>Purpose:</b> Assess the shock absorption properties of ankle protective materials.	<b>EL-91</b>
. Heat resistance tester ..... <b>Standards:</b> BS 1006 ; EN ISO 20344:8.7 <b>Purpose:</b> Determine the ability of the finish of shoemaking materials to withstand the heat involved in various shoemaking operations, such as embossing, crimping, hot blasting, flaming and ironing.	<b>EL-92</b>
. Flame resistance tester ..... <b>Standards:</b> ISO 15025 <b>Purpose:</b> Verify the resistance to heat and flame of textile materials.	<b>EL-93</b>
. Leakproofness tester ..... <b>Standards:</b> EN ISO 20344:5.7 <b>Purpose:</b> Assess the leakproofness of whole footwear.	<b>EL-94</b>
. Exposure to a source of radiant heat tester ..... <b>Standards:</b> EN ISO 6942 <b>Purpose:</b> Assess the resistance of protective equipments when exposed to a radiant heat source.	<b>EL-95</b>
. Determination of insulation against heat apparatus ..... <b>Standards:</b> EN ISO 20344:5.12 <b>Purpose:</b> Assess the heat insulating properties of the sole complex of protective footwear.	<b>EL-96</b>
. Determination of insulation against cold apparatus ..... <b>Standards:</b> EN ISO 20344:5.13 <b>Purpose:</b> Assess cold insulating properties of sole complex of protective footwear.	<b>EL-97</b>

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<u>Equipment Description</u>	<u>Model</u>
<p>. Heel fatigue tester .....</p> <p><b>Standards:</b> SATRA TM21 ; BS 5131:4.9</p> <p><b>Purpose:</b> Measures the ability of the heels of ladies shoes to withstand the repeated small impacts of normal walking.</p>	<p><b>EL-98</b></p>
<p>. Steel toe caps impact tester .....</p> <p><b>Standards:</b> EN ISO 20344:5.4 ; EN 12568 ; ANSI Z41 ; CAN/CSA Z195-M92</p> <p><b>Purpose:</b> Measures the impact resistance of the toes of safety footwear and steel toe caps, with additional suitable accessories is also able to carry out the metatarsal impact test.</p> <p><b>Optionals:</b> This test equipment together with the suitable accessories is also able to perform the metatarsal impact test according to "<b>EN ISO 20344:5.16</b>". To carry out this test will be necessary to propose the additional "<u>Vacuum equipment to prepare the wax test forms</u>" and the "<u>Support to hold specimens to perform metatarsal test</u>", both presented below.</p> <p style="text-align: center;"><b>Optional accessories for the "<u>Steel toe caps impact tester</u>":</b></p>	<p><b>EL-99</b></p>
<p>. Dial gauge for measuring the cylinders of modeling clay .....</p> <p><b>Standards:</b> EN ISO 20344:5.4.1.4</p>	<p><b>EL-99/1</b></p>
<p>. Vacuum equipment to prepare the wax test forms for metatarsal test .....</p> <p><b>Standards:</b> EN ISO 20344:5.16</p>	<p><b>EL-99/2</b></p>
<p>. Support to hold specimens to perform metatarsal test .....</p> <p><b>Standards:</b> EN ISO 20344:5.16</p>	<p><b>EL-99/3</b></p>

## Laboratory Equipments List

16<sup>th</sup> February 2007

<u>Equipment Description</u>	<u>Model</u>
<p>Electronic Dinamometer, capacity till 5 KN, complete with:</p> <ul style="list-style-type: none"> <li>1 Load cell 1 KN</li> <li>1 Pair of screw action grips</li> <li>1 Computer with 15" SVGA display monitor</li> <li>1 Ink jet printer</li> <li>1 Software package.</li> </ul> <p><b>Purpose:</b> Carry out all kinds of tension / compression tests till 5 KN.</p>	<b>MARTE</b>
<p>Electronic Dinamometer, capacity till 20 KN, complete with:</p> <ul style="list-style-type: none"> <li>1 Load cell 1 KN</li> <li>1 Pair of screw action grips</li> <li>1 Computer with 15" SVGA display monitor</li> <li>1 Ink jet printer ;</li> <li>1 Software package.</li> </ul> <p><b>Purpose:</b> Carry out all kinds of tension / compression tests till 20 KN.</p>	<b>JUPITER</b>

<u>Parts and Accessories for ours</u> <u>" Dinamometers "</u>	<u>Model</u>
200 N Load cell .....	<b>C20K</b>
500 N Load cell .....	<b>C50K</b>
1 KN Load cell .....	<b>C100K</b>
5 KN Load cell .....	<b>C500K</b>
10 KN Load cell .....	<b>C1000K</b>
20 KN Load cell .....	<b>C2000K</b>
Universal screw action grips .....	<b>GMU</b>
Screw action grips for laces .....	<b>GMC</b>
Universal pneumatic grips <sup>(1)</sup> .....	<b>GPU</b>
Pneumatic shoe laces and yarn grips <sup>(1)</sup> .....	<b>GPFL</b>
Pneumatic kit for grips <sup>(1)</sup> .....	<b>KPG</b>
Extensometer.....	<b>EXT-200</b>

**(1)** - When proposing pneumatic grips (models. GPU or GPFL) it's indispensable to include the pneumatic kit (model. KPG).  
For the same Dinamometer it's only necessary one pneumatic kit independently the number of pneumatic grips to use.