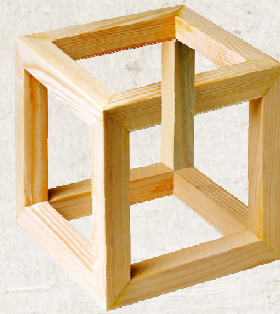


# CONTENTO TRADE SRL

Technological innovation for the environment



## INTRODUCTION

Contento Trade is a private and accredited research centre founded in 1987 by Maria Pia Contento. Based on almost 30 years of experience, Contento Trade is able to offer the wide range assistance in technological problem solving for various industries.

The company operates in the environmental sector including processes optimisation, LCA, energy use optimisation, waste, residues and subproducts valorisation, and new products creation.

Contento Trade develops new systems for the industrial waste recycling, reuse and valorisation. It is a leading European expert in ashes valorisation and designed aggregates.

Contento Trade also develops new materials for the building industry and multiple other industrial applications. It also promotes innovation in food processing for agrifood and sea food industry.

Contento Trade R&D unit combines Advanced Instant Controlled Decompression (AICD), thermic and chemical technologies according to the specific application.

Contento Trade offers analysis and innovative problem solving for many production cycles as well as flexible technological solutions, easily inserted into an existing industrial line while optimising various key macro-processes.

Food sector solutions such as debacterisation, swell-drying, desiccation, extraction for frozen, fresh, desiccated, and liquid products can be applied directly at an optimal process points.

Construction sector solutions include R&D for demolition, ceramisation, granulation, inertisation, stabilisation, and expansion processes.

Contento Trade also operates as a test facility, reference laboratory, industrial pilot units producer and offers qualified services of environmental strategic consulting.

It is open to cooperation and partnership for new products development, industrial prototyping, and layout design for technological transfer with costs of industrialisation.



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# RESEARCH

## INNOVATIVE INDUSTRIAL PROCESSES

Contento Trade has independently or in collaboration created, tested and developed a series of innovative **industrial processes** for industrial wastes processing, residues and discard transformation (“not recycling but transformation”) and closure of the life cycle (“it is no longer waste of discard but turns to be a raw material”).

The numerous industrial processes that Contento Trade created and patented were developed and tested as a part of various research projects in various fields.

On the base of more than 20 years of experience, Contento Trade is able to offer its assistance in technological problem solving by means of application based on in-house processes and project development in collaboration.

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### General typology:

#### Thermal processes

Search for producing new materials for construction or materials that use wastes instead of virgin raw material for conventional or innovative construction material production.

Rebuild process      Production of lightweight aggregates with exceptional physical-mechanical properties process based on carbon combustion ash use.

LAWprocess      Combined production of lightweight aggregates and energy process based solely on industrial waste use.

WBRMprocess      Reinforced glass fibres production from incinerator's light ash and other toxic waste.

#### Processes based on DIC (Instantaneous Controlled Decompression) swell-drying technology

Preliminary treatment for the desiccation, the texturisation and the debacterisation of vegetable materials. High performance and energy efficiency.

DIC process      Preliminary treatment for the desiccation, the texturisation and the debacterisation of vegetable materials.

PIDIC process      Treatment for the extraction of essential oils and active principles from vegetable materials without altering their characteristics.

TERMODICprocess      Integrated process for the desiccation by the use of the instant controlled decompression cycles combined with the heat recovery with the help of the heat pump.

#### Decontamination processes

Processes based on the chemical complexation/making inert without utilizing thermal treatment, used for wastes stabilising and production of innovative materials for various application in construction.

Zincotekprocess      Produzione di additivi attivanti per la vulcanizzazione della gomma da polveri di abbattimento fumi di fonderia.

Hivalueprocess      Processi per la rimozione o l'immobilizzazione a freddo di inquinanti.

#### Wood strengthening and restoration

Arkè method      Strengthening and restoration of water soaked archaeological finds using starches and thermal-mechanical treatments of low temperature desiccation

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## INDUSTRIAL PLANTS PROTOTYPES

Contento Trade can project and realize plant structures specifically studied for the application of its own processes, offering the client a "turnkey" service.

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ARKEplants	Integrated plants for the impregnation and thermal-mechanical desiccation of archaeological waterlogged wood finds.
DICplants	Integrated plants for the drying, the texturisation and the de-bacterisation of vegetable products
Foxyplants	Plants for the vegetable products extraction.
TERMODICplants	Plants for the low temperature, high energetic efficiency desiccation.
LAWplants	Integrated plants for the production of lightweight aggregates and electric energy using waste mixtures.
Hivalueplants	Plants for the industrial waste low temperature clearing, decontamination or inerting.

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## FROM STRATEGIC AUDITING TO IMPLEMENTATION

In last 20 years of searching for innovative solutions, Contento Trade has developed the knowhow that allow us to offer services and consultancy of high strategic value.

First part of the auditing starts with a series of cognitive inquiries about processes and technologies applied on the production site that is integrated with the accurate quantification and characteristics of produced wastes.

This information are then elaborated by Contento Trade that, using its own knowhow, will identify possible fields for wastes reuse according three possible scenarios:

- ✓ Direct wastes reuse without additional treatments;
- ✓ Wastes reuse prior to treatment execution;
- ✓ Company's production process modification and wastes redesign into the reuse purposes.

On this stage the information is collected about the state of the potential market of generated product, on clients expectations, on the technological tendencies in the field and on the prices on the market.

If necessary, on this stage the research is completed to establish new possibilities of application of the considered wastes; this activity are normally carried out in the Contento Trade's testing premises and laboratories.

On the final stage the written communication is delivered to the client that contains a series of identifying diagrams for possible solutions accompanied with the budget estimations for each stage and data on market prospective of the final products. The critical points in the proposed processes are also indicated.

After this the company's strategy is elaborated.

The second valorisation phase implies the definition of intervention strategy. This activity is normally performed by client's management department on the base of technical communication prepared on the previous stage by Contento Trade and could be assisted by Contento Trade with additional information on future possible changes of regulations, market tendencies, innovative technologies, etc.

General suggestion advise not to limit the strategy to a unique course, complementary or alternative, to be ready to face sudden changes on the market.

Once the strategy is chosen, the stage of the applications development starts. It is always suggested for the client to plan periodical revisions to allow strategic decisions and real time monitoring.

The third valorization stage consists of the effective development of the applications. In this case the Contento Trade service offers:

- ✓ Eventual production of the plant's prototype and pilot scale for testing completely innovative technologies;
- ✓ Elaboration of the project of the plants necessary for the waste treatment with the level of detail requested by the client;
- ✓ The eventual production and installation of the industrial plants;
- ✓ Assistance on the testing stage and fine-tuning the plants;
- ✓ Assistance in elaboration of the procedure and treatments specification, in acceptance of the waste or raw materials, for the end product qualification or certification.
- ✓ Periodic monitoring of the plant/process system, and elaboration of the suggestions for its adaptation and technological and environmental improvement

## RESEARCH AND APPLICATION SECTOR

<b>Cinders and combustion wastes valorisation:</b>	
Brite "Silex"	Recovery of the elements mainly present in carbon combustion flyash – the Brite Silex project made a contribution in this development.
Life "wbrm"	Reinforced fibres obtained from waste – new process for glass fibres production starting from industrial waste and ash that come from the urban wastes incineration. The Life "wbrm" project demonstrated the technical possibility of this process.
BriteThematic Network "Progres"	Innovative products from the combustible vitreous waste.
Cosmos	The flyash made inert reuse – ash pre-treatment techniques and prototype system construction for production of the sufficient quantity of the new base product, the 'COSMOS' filter and new composite materials obtained with it. (ongoing project)
ECSC Hivalue	European power plants waste valorisation based on an integrated gasification combined cycle (IGCC) by using two technologies: high value metals (Ni, V, Ge, Ga) extraction from light ash; production of glass fibres, lightweight aggregates, hydraulically bound materials and slags deriving aggregates.
<b>Metallurgic and tanning wastes valorisation:</b>	
Brite "Smelters"	The primary smelters' lead and zinc wastesvalorisation for ceramic prefabs.
Brite "Rebuild"	Advanced construction materials and ceramic aggregates obtained from the recycling metallurgic toxic wastes and flyash.
Life "LAW"	Ceramic lightweight aggregates production from metallurgic and tanning industrial wastes mixtures.
Eureka EU 1176	Ceramic granulates production using depurative muds for tanning effluents and solid residue of tanning workings as the raw material and developing of the prototype machine for optimized execution of the raw processing necessary for its molding.
<b>Construction:</b>	
City of Tomorrow "IRMA"	Innovative integrated management of the construction and demolition urban areas residue and environmental impact minimising of the restructuration or demolition of the civil or industrial buildings processes - <a href="http://projweb.niras.dk/irma/">http://projweb.niras.dk/irma/</a>

Eureka EU220 "Hard Road"	Road materials consolidation process and construction by the optimising of the natural processes like diagenesis and laterisation.
Brite "Rebuild"	Advanced construction materials obtained from the toxic wastes and Fly ashes re cycling.
Brite "Tescop"	Clean technological solutions in concrete products life cycle.
Life "LAW"	Lightweight ceramic aggregates production starting from industrial wastes mixtures.
BriteThematic Network "Recy"	Recycled materials use as aggregates in construction industry.
CraftAsbestos	Transformation of the asbestos wastes into a product similar to natural stone for the use in civil engineering (dam construction). The process includes the system for the asbestos residue processing in the fusion ovens and a part for the prefabs production.
<b>Wood:</b>	
Craft "West"	Wood valorisation by means of its enrichment with starches and DIC technology application
Raffaello "Arke"	European site for submersed wooden patrimony studying and valorisation.
Raffaello "How"	Efficient wood.
<b>Agribusiness:</b>	
Life "Terpene"	The Terpene and other valuable products extraction from the residue of the citrus juices production.
Craft "New Substrate"	New environmentally friendly substrate obtained from the compost and vegetable residue for greenhouse agriculture and reforestation.
Innovation "DIC"	High quality DIC swell-drying application for extraction, desiccation and sterilization, to the food farming and pharmaceuticals industry.
Miurext	Innovative extraction of high value components technique like essential oils and main active components of different nature from vegetable materials (citruses, aromatic herbs, medicinal herbs used in cosmetics, dyework plants) based on the innovative thermal - mechanical – chemical combined treatment.
Sava	A sequence of the integrated processes for the vegetable citrus materials processing using brushwood that rests after trimming (not necessary of citrus trees), based on the PIDIC process use for extraction and TERMODIC process for desiccation.

## SERVICES

Thanks to knowhow accumulated in 20 years of successful operation, the company is able to propose consultancy of high strategic value.

The fields covered by consultancy mainly regards:

The **environmental sector** where the vast variety of technologies and services is offered for evaluation, monitoring and problem solving for the liquid, solid and gaseous emissions of the industrial processes and for the questions of energy saving in the productive divisions.

The **construction materials sector** for which we offer integrated service packages to guarantee support to the products, designers and clients when it comes to the norms, analysis, informatics and statistical for various product types like aggregates, pavement and cladding stone materials and various typology of small concrete manufactured materials like tubes, pavement and masonry blokes, curbs andsumps.

## 1.1 CE MARKING

The European Union Construction Products Directive 89/106 (CPD) has introduced more than 20 directives setting out the product categories requiring CE marking. The essential requirements that products have to fulfill (e.g. safety) are harmonised at EU level and are set out in general terms in these directives. Harmonised European standards are issued with reference to the applied directives and express in detailed technical terms the essential requirements.

All construction products had been devised in 33 families. For each of that family the European Commission issued a mandate in a form of a thorough specification in order to request the balanced norms necessary elaboration from the CEN.

Those mandates also specify the requirements for each family that should be met in order to obtain a certificate of conformity. The European Construction Products Directive 89/106 (CPD) introduced a vast variety of harmonised standards and technical specification level for the products placed on the market.

Contento Trade is an expert in three sectors of construction products typology:

### AGGREGATES, PREFAB NATURAL STONE PRODUCTS AND PRECAST CONCRETE

The most commonly used certification systems for these three products types are:

#### System 2+

The declaration of conformity is issued by the manufacturer basing on the basic tests performed on his own account and responsibility and on the intervention of the production control supervising body conclusion.

#### System 4

The declaration of conformity is issued by the manufacturer basing on the basic tests and production control performed on his own account and responsibility.

Contento Trade and partners participate in this case as the producer's Supporting Laboratory offering the following services:

- ✓ Execution of all tests required by the harmonised standards.
- ✓ Elaboration of the statistics based on the obtained results and the products continuous monitoring with the real-time access to the results.
- ✓ Consultancy for determination of the possible improvements of the product, production system and control system as from the technical and quality view, as for the requested hygiene, security and environmental friendliness levels.
- ✓ Planning and execution of the sampling assistance.
- ✓ Assistance in standards interpreting and the Conformity declaration elaboration.
- ✓ Assistance and intermediation in communication between the client, designer, production management and Public administration.

This turnkey product is extremely useful as for small-scale producers that usually have few resources available to optimally follow product marking, as for medium to large-scale producers that could significantly reduce personnel engagement in the processes documentation management that will increase control system efficiency.

Apart from that, Contento Trade have designed specific services destined for the [recycled aggregates](#) that, thanks to a new European standard, could be used regularly in the future and are becoming an object of close interest from the major producers.

## 1.2 RECYCLED AGGREGATES

The Ministry decree of 9 October 2003 requires the public administration and companies with major public capital to secure its stocks of manufactured products and goods with no less than 30% of it deriving from the recycled products.

The newsletter n.5205 from 15.07.2005 specify the performance characteristics required from the recycled aggregate in order to be inscribed in "Index of recycling"

Contento Trade and partners offer two types of services: ACE 1, performing all the tests required for the recycled aggregates by the newsletter and other standard services mentioned above; and ACE 2, that will include annual service that concerns CE marking of the various products and includes execution of all the tests required by the harmonised standards and the rest of the standard services.

## 1. LA VALORIZZAZIONE DEI RIFIUTI

The coming into force of the law for European landfills standards application created big difficulties for the waste producers as costs of the landfilling augmented that is especially significant for large-scale producers of non-toxic or inert waste.

Contento Trade offers the producers an interesting alternative to the landfill: waste valorization.

The waste valorization requests the change of attitude on producer's hand, who should begin considering the waste as a part of the productive cycle.

The valorization process is effectuated in three stages:

- ✓ Possible ways of valorization mapping;
- ✓ Operational strategy definition;
- ✓ Application development.

Contento Trade developed the series of technologies that allow not only to close the productive cycle in various industries without creating solid or liquid waste, but to create the products of the additional value.

The investments required by the Contento Trade technologies are often facilitated thanks to the environmental benefits.

The idea behind these technologies presume an economical auto sufficiency and highlights that the valorization process should be economically convenient in respect to the current landfill discharge costs and should permit a full payback in less than 5 years.

## 2. CONSULTING SERVICES

Contento Trade can suggest and advice the producing companies (mainly in the metallurgic, agro-food, wood, building and manufacturing sectors) on which could be the suitable actions to simply improve both their environmental image and minimize the real problems that the production can cause to the environment.

With a minimum investment, the company that applies to Contento Trade can reach the maximum result in terms of solution to its environmental problems, offering at the same time an image of modernity and seriousness towards the environment both to Institutions and to the clients.

The instruments with which Contento trade analyzes the companies situation are:

- ✓ Analysis on the spot of the situation and of the production cycle connected to the activity of the client.
- ✓ Redaction of an ecobalance to examine in detail the company situation, the air emissions and the quantity of the produced wastes, the typologies of used materials and their origin. The conclusions that it's possible to understand from the ecobalance suggest which can be the best ways that allow the firm to obtain environmental advantages. To the environmental advantages also the economical advantages are

automatically connected (a good environmental image can make the access to grants easier, can reduce the insurance costs, can bring to a costs rationalization, etc..).

- ✓ Individuation of the critical areas in the production cycle and proposal of cleaner technologies optimal for the resolution of the environmental problems. Suggestions on the possibilities of reuse, recycle and valorization of the produced scraps as alternative to dumping.
- ✓ Elaboration of some advice as integrated operative proposal to obtain a "cleaner" company image and/or an effective environmental improvement of the production process.

Contento Trade Srl is registered in the List of Consultants by Umbria, Puglia and Friuli-Venezia Giulia regions.

### 3. ECOBILANCI

In 1994, Contento Trade in collaboration with ENEA created the eco-balance procedure refresher course. This course was repeated in 1995 in Rome based in ANPA (Environment protection Agency).

This experience allowed to utilise the data of the LCA, Life cycle analysis, in a way to explore the problematic issues on the industrial scale and to be able to study and suggest the most sufficient solution.

This instrument has evolved to become to become an alone standing service that could be extremely useful for the companies that intend not just receive the certification but to participate in the research targeting bigger productivity and environmental friendliness.

### 4. TRAINING

In the recent years Contento Trade participated in several educational projects with a primary goal of developing new specialists.

#### **LEONARDO "ECOCOMPTE"**

(Information support and eco-balance tools necessary for the development of new specialists in the building and agro-industry fields)

Other innovative educative courses are:

**"Consulting companies and the new Millennium innovation"** course.

Technological transmission module, "The Dream analysis" report – February 2006.

**"Eco-balance procedure update"** course in collaboration with ENEA.

This course was repeated in 1995 in Rome at the ANPA (Environment protection agency) headquarters - Udine 1994.

## **ANALYSIS AND TESTS**

Our laboratories are equipped with all necessary tools required for the execution of chemical, physical and mechanical tests on building materials, mainly recycled and traditional aggregates, lightweight plasters and brickwork or facing mortars.

Moreover the firm developed a series of know-how for the execution of environmental analysis, such as the sampling and leaching tests on wastes and waste waters analysis.



The structure is subdivided in five operative labs:

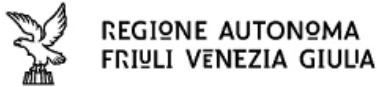
- ✓ Aggregate lab
- ✓ Mortar and plaster lab
- ✓ Precast concrete products lab
- ✓ Waste analysis lab
- ✓ Watersanalysis lab

We are inscribed in the Albo's High quality External laboratories List.

Authorized to perform applicable research according to the PMI (decree n° 473, 27.09.99 published in "GazzettaUfficiale", 09.10.99)

Recognised applied research laboratory of Friuli Venezia Giulia.

We are inscribed in the Albo's research experts of Trieste.



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