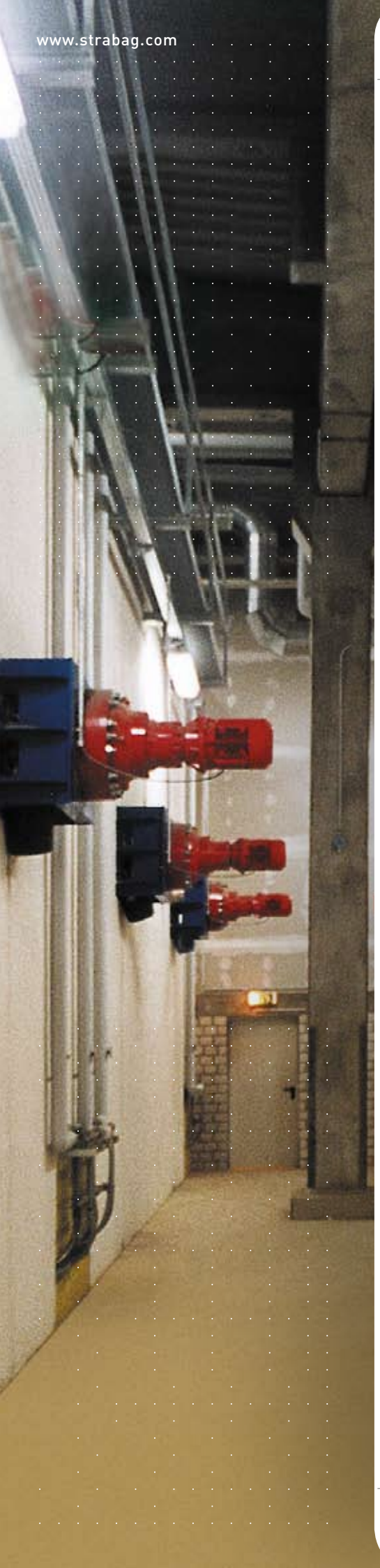


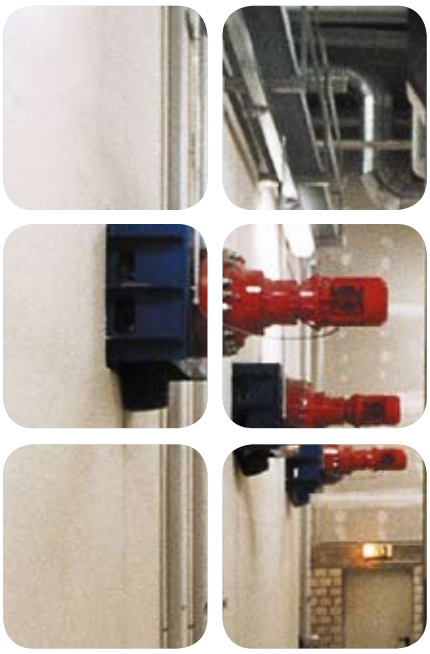
DRY DIGESTION

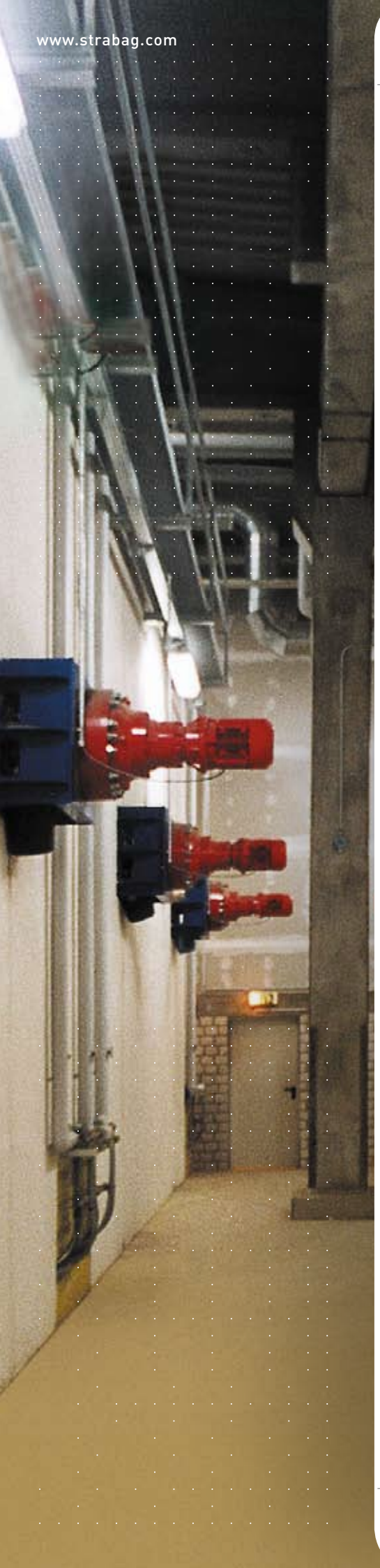
PROCESS

The patented single-stage dry digestion process that can be operated in thermophilic or mesophilic mode has been developed for the anaerobic treatment of solid substrates with dry matter (TS) contents between 15 % and 45 %. The digestion principle is based on a plug-type flow through a horizontally arranged reactor referred to as plug flow reactor.

The most outstanding feature of this dry digester built as a horizontally arranged special-concrete compartment is its extreme sturdiness. It comprises several agitators of transverse in-line arrangement which will reliably prevent the formation of floating scum and settlement of material. A sturdy conveyor frame is fixed to the digester bottom which will reliably transfer the sediments to the fermenter discharge. All components such as feeding unit, agitator drive units, digestion residue discharge units and the gas system are easily accessible for maintenance and normally installed in housings.

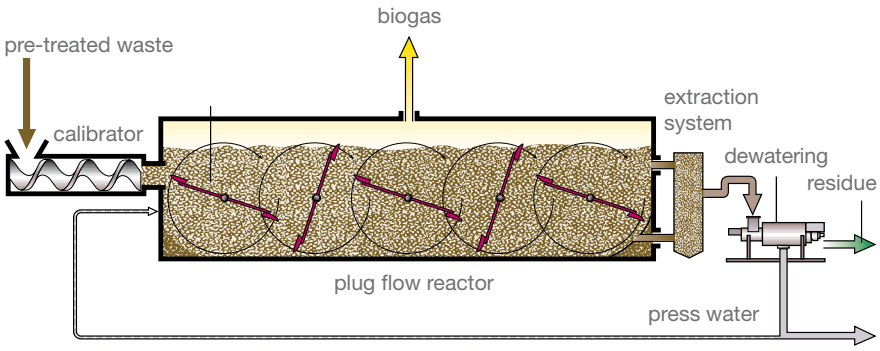
The organic material treated is fed into the digester by a compact feeding unit. If required, the TS content in the input is adjusted as desired at the same time. The substrate passes through the horizontal dry digester according to the plug flow principle. At the digester end the digestion residue is discharged from the reactor through a low-wearing discharge system. Apart from the treatment of biowastes, green wastes and organic industrial wastes this process can very well handle residual wastes and mixed refuse with high TS contents.





PROCESS FEATURES AND ADVANTAGES

- high biogas production rate through large gas discharge area, low digester filling level and several agitators (low-speed units)
- low space requirement
- use of small compact digesters because material needs not be diluted
- low heat requirements and low wear through minimized material flow
- no or very low process water consumption depending on material characteristics
- low energy demand in material handling, conveying and fermentation through the use of low-speed units only and staggered operating times
- flexible adjustment to fluctuating throughput rates through a variable filling level in the digester
- high VSS degradation through quasi-continuous plug flow



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REFERENCES

DIGESTION PLANTS/BIOLOGICAL PROCESSING PLANTS (ANAEROBIC/AEROBIC)

Stand 07/2007

Location	Type of input	Capacity	Technology	Start-up
Lille, France	Biowaste, organic food waste, market waste	62 000 t/a	Dry digestion, horizontal plug flow reactor	2006
Camposampiero, (Padua) Italy	Biowaste, sewage sludge, manure	49 000 t/a	Wet digestion, Linde loop digestor	2005
Burgos, Spain	Fine screened fraction of MSW	40 000 t/a	Wet digestion, Linde loop digestor	2005
Salto del Negro, Spain	Fine screened fraction of MSW	75 000 t/a	Wet digestion, Linde loop digestor	2005
Lisbon, Portugal	Biowaste, organic food waste, market waste, industrial waste	40 000 t/a	Wet digestion, Linde loop digestor	2004
Madrid, Spain	Fine screened fraction of MSW	73 000 t/a	Wet digestion, Linde loop digestor	2003
Barcelona, Spain	Fine screened fraction of MSW	150 000 t/a	Wet digestion, Linde loop digestor	2002
Hoppstädten-Weiersbach, Germany	Biowaste, organic food waste	23 000 t/a	Dry digestion, horizontal plug flow reactor	2002
Weidensdorf, Germany	Potato pulp	37 500 t/a	Wet digestion, Linde loop digestor	2002
Valladolid, Spain	Fine screened fraction of MSW	15 000 t/a	Dry digestion, horizontal plug flow reactor	2001
Lemgo, Deutschland	Biowaste, garden waste	38 000 t/a	Dry digestion, horizontal plug flow reactor	2000
Heppenheim, Deutschland	Biowaste, garden waste, industrial waste	33 000 t/a	Dry digestion, horizontal plug flow reactor	1999
Radeberg, Deutschland	Biowaste, industrial waste, sewage sludge	56 000 t/a	Wet digestion, Linde loop digestor	1999
Fürstenwalde, Deutschland	Biowaste, industrial waste, agricultural residues	85 000 t/a	Wet digestion, Linde loop digestor	1998
Ravensburg, Deutschland	Municipal solid waste	1 500 t/a, großtechnische Pilotanlage (anaerob, aerob)	Dry digestion, horizontal plug flow reactor	1996-97
Wels, Österreich	Biowaste	15 000 t/a	Wet digestion, Linde loop digestor	1996

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Stand 07/2007

Location	Type of input	Capacity	Technology	Start-up
Sagard, Deutschland	Manure, organic food waste, biowaste, industrial waste	48 000 t/a	Wet digestion, Linde loop digestor	1996
Eurasburg/Quarzbichl, Deutschland	Residual waste	3-4 t/d, Pilotanlage	Dry digestion, horizontal plug flow reactor	1996
Behringen, Deutschland	ndustrial waste, manure	23 000 t/a	Wet digestion, Linde loop digestor	1995
Baar, Schweiz	Biowaste, garden waste	6 000 t/a 12 000 t/a	Dry digestion, horizontal plug flow reactor	1994
Himmelgarten, Deutschland	Manure	18 000 t/a	Wet digestion, Linde loop digestor	1987
Berlstedt, Deutschland	Manure	140 000 t/a	Wet digestion, Linde loop digestor	1986
Muhen, Schweiz	Manure, rendering wastes	5 000 t/a	Wet digestion, Linde loop digestor	1986
Vuiteboeuf, Schweiz	Manure, rendering wastes	6 000 t/a	Wet digestion, Linde loop digestor	1986
Vippachedelhausen, Deutschland	Manure	16 000 t/a	Wet digestion, Linde loop digestor	1985

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